



**EREK** European  
Resource Efficiency  
Knowledge Centre

# Green Action Plan for SMEs – implementation report

Addressing resource  
efficiency challenges and  
opportunities in Europe for  
SMEs



## **Green Action Plan for SMEs – implementation report**

Addressing resource efficiency challenges and opportunities in Europe for SMEs

European Resource Efficiency Knowledge Centre – EREK ([www.resourceefficient.eu](http://www.resourceefficient.eu))

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# Green Action Plan for SMEs – implementation report

Addressing resource efficiency challenges and opportunities in Europe  
for SMEs

July 2018

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## Executive Summary

Europe's continuous economic development over many decades has been fuelled by the intensive use of both renewable and non-renewable resources. However, today it faces multiple challenges of stimulating growth, ensuring jobs and the well-being of its citizens, while securing ecological sustainability and addressing climate change. There is a growing challenge of resource scarcity, growing prices for materials and dependence of the European economy on the import of resources.

Transition to the new models of economies, such as circular, resilient and green economies offer new opportunities for sustainable economic growth of European countries. Adoption of the Circular Economy package and the Roadmap to a Resource Efficient Europe intends to put Europe on a new road of development and introduction to alternative economic models. Businesses and industries are the important actors in building a circular and more resilient economy. Small and medium-sized enterprises (SMEs) are equally an essential element of the European economy. There are over 22 million SMEs in the EU providing over 133 million jobs and creating over half of the gross value added.<sup>1</sup> Diffusing sustainability and resource efficiency practices among SMEs and involving them in eco-innovations and new business models will have significant impact in making the EU economy not only green but also more competitive and sustainable.

The European Union **Green Action Plan for SMEs** introduced in 2014 brings together two important priorities for the European economy: supporting SMEs and promoting resource efficiency. It aims *"to contribute to the re-industrialisation of Europe... by enhancing SMEs competitiveness and supporting green business developments across all European regions, notably in view of the fact that, at this stage, significant differences in resource efficiency exist between sectors and Member States"*.<sup>2</sup>

The Green Action Plan (GAP) sets out a series of objectives and lists actions that will be implemented at European level within the framework of the Multiannual Financial Framework 2014-2020. All the actions are either new or revised versions of previous actions that now take into account the potential for business of resource efficiency and access to green markets.

The present report provides an overview of the implementation of the selected Actions of the Plan until end of 2017. It aims to demonstrate intermediate progress and outcomes and draw lessons for future actions.

The report focuses on the four thematic strands of the GAP's actions:

- I. Greening SMEs for more competitiveness and sustainability
- II. Green entrepreneurship for the companies of the future
- III. Opportunities for SMEs in a greener value chain
- IV. Access to the markets for green SMEs

<sup>1</sup> Eurostat: [http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics\\_on\\_small\\_and\\_medium-sized\\_enterprises](http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_small_and_medium-sized_enterprises)

<sup>2</sup> COM/2014/044 <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014DC0440>

Within these strands a selected set of 13 Actions (out of 39 in total) and their contribution to the specific objectives of the Action Plan have been analysed.

**I. Greening SMEs for more competitiveness and sustainability** is guided by the following objectives:

- I.1 Provide European SMEs with practical information, advice and support on how to improve their resource efficiency in a cost-effective manner
- I.2 Support efficient technology transfer mechanisms for green technologies
- I.3 Facilitate the access to finance for resource-related improvements and energy efficiency in SMEs.

The actions geared towards these objectives address a set of challenges behind why many SMEs are not persuaded to gain the benefits of resource efficiency. The GAP addresses these challenges by increasing awareness, offering tailored information, technical and advisory support e.g. via the EU Resource Efficiency Knowledge Centre's services, Enterprise Europe Network, as well as facilitation of the investment schemes for enterprises.

**The European Resource Efficiency Knowledge Centre** is pivotal in the provision of crucial tools. Through it, several achievements have been realised, leading among them:

1. the database of *the resource efficiency measures, technologies and good practices* that can inspire SMEs;
2. the *Resource Efficiency Self-Assessment Tool for SMEs* adapted to realities of several sectors, which assesses SMEs and provides recommendations for improvements. Close to 400 SMEs across the EU have been involved in testing the pilot version of the Tool. Based on the feedback, several questionnaires of the Tool have been further improved during 2017, while all questionnaires are expected to be functional by mid-2018 and;
3. the building of the *network of SME support organisations* from Member States and the regions, who will facilitate the interaction of the Centre with local SMEs and provide local support and advise on resource efficiency issues. The network already includes over fifteen members and will expand to other EU Member States and/or regions where it is not present yet.

The European Commission and the European Investment Bank have launched the **Private Finance for Energy Efficiency (PF4EE)**<sup>3</sup> and the **Natural Capital Financing Facility (NCFF)** instruments to offer SMEs investment opportunities in energy and resource efficiency directly or through financial intermediaries and equity funds.<sup>4</sup> NCFF is helping to establish a pipeline of replicable, bankable natural capital projects with the resource efficiency consideration that will serve as a "proof of concept", demonstrate the economic attractiveness of natural capital projects, and attract private investors for these projects. The NCFF signed the first loan agreement with Rewilding Europe Capital in April 2017, through which 30 nature-focused businesses across Europe will have access to up to EUR 6m.

The **Network for Eco-innovation financiers** and investors has been launched under the Inneon Project. It provides a direct access to Business Angels Network, venture capital and investors, offering coaching and support to businesses for "investor readiness" and

<sup>3</sup> More information can be found here <http://www.eib.org/products/blending/pf4ee/index.htm>

<sup>4</sup> For more information, please consult:  
[http://ec.europa.eu/environment/life/funding/financial\\_instruments/ncff.htm](http://ec.europa.eu/environment/life/funding/financial_instruments/ncff.htm) and  
<http://www.eib.org/products/blending/ncff/index.htm>.



networking opportunities with relevant stakeholders. It also provides information on other EU funding for eco-innovation initiatives.

Furthermore, the **20th European Forum for Eco-innovation** held in October 2016 in Estonia, explored new financing opportunities for eco-innovative SMEs that are moving to a circular economy business model. The event brought together representatives from nearly all EU financing instruments, as well as many private investors and SMEs seeking external funds to roll out green products and services.

- Finally, **Flash Eurobarometer surveys “SME, resource efficiency and green markets” and “SMEs and Circular Economy”<sup>5</sup>**, have helped policy makers to understand the various drivers and barriers to resource efficiency and circular economy activities, which should be helpful in designing support measures for SMEs.

**II. Support green entrepreneurship** is guided by the following objectives:

- II.1 Promote all forms of eco-innovation, including non-technological eco-innovation
- II.2 Facilitate business partnering, skills and knowledge for green entrepreneurship
- II.3 Exploit better the role of clusters in support of eco-innovative SMEs

The objectives under this strand focus on addressing obstacles facing the introduction of the new innovative solutions such as resource efficiency technologies, circular economy business models, services, or start-ups. The GAP Actions highlights or presents many elements that can create favourable framework conditions for these solutions, such as incentives schemes for research, development and demonstration, building entrepreneurship skills and knowledge, supporting networking and collaboration among businesses, knowledge and financial organisations.

The promotion of all forms of eco-innovations, including non-technological eco-innovations has been done through the “SME Instrument” and the Societal Challenge “Climate Action, Environment, Resource Efficiency and Raw Materials” under Horizon 2020.

**The SME Instrument** is explicitly targeting private for-profit SMEs and has supported projects testing the feasibility of promising ideas, the innovative solutions closer to the market. Examples of the close to market eco-innovations supported are robotic recycling, renewable energy conversions, energy efficiency in buildings, innovative photovoltaics, algae-based waste water treatments, engine running on hot water, etc. Some 160 projects were funded, receiving 7.2% (€50.4m) of the total SME Instrument funding in 2014-2016 (cut-off date July 2016). The mid-term evaluation of the SME Instrument found that the funding has been influencing positively the beneficiaries’ capacity to manage innovation, in providing strategic intelligence for marketing their innovations. It also supported the SMEs in scaling up business activities and offers a “quality mark” that attracts further investors. SMEs having received funding from the SME Instrument in Phase 2 (scaling-up phase) have managed to leverage on average €800,000 each as co-financing from private investors.<sup>6</sup>

<sup>5</sup> Reports by Reference number 342, 381, 441 and 456, Link: [http://ec.europa.eu/public\\_opinion/archives/flash\\_arch\\_en.htm](http://ec.europa.eu/public_opinion/archives/flash_arch_en.htm)

<sup>6</sup> Technopolis Group, 2017: [Programme Evaluation of the SME instrument and the activities under Horizon 2020 Work Programme “Innovation in SMEs”](#), for DG RTD



**H2020 Societal Challenge 5 "Climate Action, Environment, Resource Efficiency and Raw Materials"** has funded 9 R&D projects in the areas of circular economy, industrial symbiosis and eco-innovative waste management for sustainable urban development for a total amount of €78m out of which close to 22% went to SMEs.

The **Climate Knowledge and Innovation Community (Climate-KIC)** of the European Institute of Innovation and Technology (EIT) has contributed significantly to the promotion of green entrepreneurship and to the development of Europe's human capital for climate-related innovations. It has operated within four specific sub-themes including decision metrics and finance, sustainable production systems, urban transitions and sustainable land use. Climate-KIC has set up accelerator of cleantech start-ups, an entrepreneurial summer school, an executive business programme, programmes for Masters and PhDs, as well as a "greenhouse" for supporting business ideas of students. Climate-KIC has had a wide outreach by offering knowledge and skills to over 700 students and graduates, involving 443 organisations, and supporting over 400 start-ups annually.

The **European Environmental Technologies Verification programme** has been helping to establish a viable system to boost confidence in eco-innovative technologies and help them to reach market. Since its launch in 2011 a total of 17 verifications have been completed, 62 technologies have begun the verification process and 175 applications have been submitted. The technology areas covered: 'Materials, Waste and Resources', 'Water Treatment and Monitoring', and 'Energy Technologies'. Of the companies submitting a technology for verification, 90% were SMEs and over 50% are micro-enterprises.

**III. Exploitation of the opportunities of greener value chains** is guided by the following objective:

- III.1 Address systemic barriers to cross-sectoral and cross-national value chain collaboration and business creation and cooperation, by facilitating the creation of service business models and the re-use of materials, products and waste.

Fostering circular economy and long-term resource independence for the EU will require introduction of the systemic eco-innovations and alternative business practices based on new value chains, valorisation of waste, new cross-sectoral linkages and the exchange of secondary materials across businesses and industries. The challenges here are the lack of understanding of what can drive needed changes and how to facilitate these new forms of collaborations that will sustain circular economy. The GAP addressed these by investing in in-depth analysis of the barriers and drivers and tapping into the potential of the European clusters and the cross-regional exchange.

Several studies have focused on **investigating the barriers and drivers for circular economy and circular business models** were used by the Commission in preparation of the Circular Economy Action Plan. These include the *"Scoping study to identify potential circular economy actions, priority sectors, material flows & value chains"*<sup>7</sup>, analysis of the *"Socioeconomic impact of increased reparability"*<sup>8</sup>, study *"Implementation of Circular*

<sup>7</sup> "Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains » <https://ieep.eu/publications/potential-priorities-and-policy-options-to-support-the-circular-economy-in-the-eu>

<sup>8</sup> "Study on socioeconomic impacts of increased reparability of increased reparability", available at <http://bookshop.europa.eu/en/study-on-socioeconomic-impacts-of-increased-reparability-of-increased-reparability-pbKH0216507/>

*Economy Business Models by SMEs: Barriers and Enablers”<sup>9</sup>, and “Regulatory barriers to circular economy”<sup>10</sup>.*

The European Cluster Observatory has focused on delivering a wide range of support in exploring the opportunities for clusters and regions, including the ones in the circular economy and environmental industries areas. The Observatory has analysed the **cluster specific framework conditions for development of the emerging industries in the area of circular economy**, by focusing on integration and diffusion of recycling, re-use, remanufacturing, repair/maintenance, sustainable product design, circular and resource saving business models. In its other studies it analysed emerging linkages and spillovers between environmental and other industries, as well as identified resource efficiency as one of the most important drivers of cross-clustering opportunities. It has also developed the **tools for mapping of the competences and benchmarking the regional cluster policies**, which allow to spot possible disparities and orientation of the policies. The European Observatory for Clusters and Industrial Change (EOCIC) was launched in October 2017 in order to help regions and countries in designing more evidence-based cluster policies to accelerate industrial modernisation and to boost entrepreneurship in emerging industries with growth potential.

All these activities have contributed to filling this knowledge gap and starting to understand the barriers to and enablers of circular economy. The analysis produced in one of the studies has been helpful in providing the European Commission with a solid evidence base necessary for revising the Circular economy package in 2015. The implications of other studies on national or regional policy practices has not been closely tracked yet, but it is expected that the policy makers find them useful in adopting policy and regulatory frameworks to support circular economy practices.

**IV. Facilitation of market access for green SMEs** is guided by the following objectives:

- IV.1 Promote a greener European internal market
- IV.2 Facilitate access to international markets for green entrepreneurs
- IV.3 Facilitate the uptake of resource efficiency technology in partner countries through cooperation with European SMEs

The actions towards these objectives address the problem associated with the weak internationalisation of European SMEs. This problem is not unique to the green technology industries, but the faster growing environmental technology markets urges for quick action from the European green technology and service providers, including SMEs. The GAP is offering to address this issue by promoting matchmaking activities, platforms, technology transfer activities and special support services. The European cluster organisations are envisaged to play a significant role in these activities.

Among activities envisaged by the Action Plan is the establishment of the **European Strategic Cluster Partnerships for Going International (ESCP-4i) in the field of green technologies**, among other fields. The [European Cluster Collaboration Platform \(ECCP\)](#) funded through the COSME programme has been supporting these activities on international cluster and business network cooperation and the promotion of ESCPs. Through the Clusters Go International (CGI) action, the COSME Programme has supported the establishment of 15 co-funded 1<sup>st</sup> generation ESCPs and 10 “voluntary” partnerships

<sup>9</sup> “Implementation of Circular Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers”, available at <http://www.mdpi.com/2071-1050/8/11/1212/htm>

<sup>10</sup> Regulatory barriers for the Circular Economy: Lessons from ten case studies, Published on: 10/11/2016, available at: [http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item\\_id=8986&lang=en](http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8986&lang=en)

as alliances between clusters from different sectors, with a view to develop and implement a joint strategy for internationalisation in 2016-2017. Together, the ESCPs bundle 150 cluster organisations across 23 European countries and more than 17,000 European SMEs. However, given their cross-sectoral character, it is difficult to identify the share of SMEs that are active in green areas.

Some of the 1<sup>st</sup> generation ESCPs focus on water, energy, clean-technology, etc., such as the NATUREEF<sup>11</sup> consortium dealing with resource efficiency or the REINA PLUS<sup>12</sup> cluster partnership that supports renewable energy businesses. The NATUREEF project supported SMEs mentoring and disseminating innovative technologies promoting a new Natural Efficient Resource Concept. Thanks to this initiative the participating European clusters have established partnerships in Latin America, China and Philippines. The REINA PLUS project has brought together the internationalisation efforts of four European regions and cluster initiatives with high concentration of energy businesses in different value chains. It has successfully facilitated the establishment of business partnerships between European companies and developing country firms from Mexico, Chile and Colombia.

The interim evaluation of the COSME programme performed in 2017 found that the Clusters Go International (CGI) action that funded the ESCPs is highly relevant and valuable to the needs of clusters to support SMEs in internationalising their activities, both within Europe and beyond. At this stage, through the design and implementation of the common internationalisation roadmaps, the clusters improved understanding of the internationalisation process and their managers' enhanced capacity to support SMEs in internationalising. As an outcome a number of official European partnerships, as well as the first 'global' partnerships between the clusters have been created. The actions show good potential to lead to an improved strategic position in global value chains and an enhanced access to potential inward investors. Participants in the programme, however, face two significant hurdles for their internationalisation activities, i.e. the limited budget and the underestimated implementation timetable<sup>13</sup>.

After the successful activity of a first generation of European Strategic Cluster Partnerships for Going International (ESCP-4i), the European Commission launched early 2018 a second generation of 23 co-funded EU Cluster Partnerships for the period of 2018-2020. This initiative involves 123 European clusters active in various industrial sectors, including energy and environment, smart cities, mobility and transport, agro-food and biotechnology<sup>14</sup>.

**The facilitation of the uptake of environmental technologies in partner countries through cooperation with the European SMEs**, has been pursued by the European Commission through the *Low Carbon Business Action (LCBA) initiatives in Brazil and Mexico*. These two actions have a mandate to 'contribute to sustainable development and greening of Brazilian and Mexican industries through the adoption of low emission technologies. The main activities supported through the LCBA are a sectoral market and technology analysis, communication and outreach activities and matchmaking missions as a key tool to facilitate cooperation opportunities between Mexican / Brazilian companies and EU SMEs. The LCBA programmes in both countries are proving 'extremely popular'. While being still in the middle of the implementation period, LCBA Brazil has already

<sup>11</sup> <http://www.natureef.eu/introduction/>

<sup>12</sup> <http://www.clustercollaboration.eu/escp-profiles/reina-plus>

<sup>13</sup> Interim Evaluation of the COSME Programme, commissioned by DG GROW, <http://ec.europa.eu/DocsRoom/documents/28084>

<sup>14</sup> <http://www.clustercollaboration.eu/eu-cluster-partnerships/escp-4i/second-generation>

exceeded its target of 80 cooperation agreements (CPA) and reached **643 CPAs** signed between European and Brazilian companies before December 2017. The evaluation of agreements in Brazil is ongoing. Under the LCBA Mexico **93 CPAs** have been signed by end of 2017, out of which 47 are already receiving financial assistance.

## Overall Conclusions

It should be noted that the study has covered only 14 out of 39 Actions of the Plan, therefore, the conclusions should not be extended to the entire scope of the GAP. Hence, this section will present conclusions which should be endorsed in their relevance to the selected scope of Actions.

The overall conclusions on the quality of the advancement and outcomes of the Actions is the following:

- The analysis has demonstrated a *notable progress* in the initiatives set under the selected Actions. None has had significant delay or failed in launching the planned activities
- All actions seem to be *on a right track in fulfilling the objectives* of the GAP Strands and some intermediary objectives have been achieved
- *Wider impact* from the Actions in terms of resource efficiency improvements on the ground, or launch of circular economy business models are *still early to expect* at this point of time. In most of the cases, a dedicated evaluation exercise of the initiative would be able to demonstrate the impact
- Not all initiatives under these Actions apply a system ensuring regular and long term monitoring of the progress, outcomes and impact.

## Lessons for future actions

### ***Lessons for Actions of Strand 1 "Greening SMEs for more competitiveness and sustainability"***

- A proper reach, accessibility, clarity and specificity of virtual platform and the self - assessment tool for SMEs set up under the European Resource Efficiency Knowledge Centre must be ensured, and complemented with direct, individually tailored offline support and advice;
- The uneven distribution of support facilities among European regions and industry sectors, even when including various types of stakeholders, must be taken into account, as well as potential time-lapse and barriers to flexibility while disseminating knowledge and advice to SMEs through regional SME intermediary organisations (e.g. financial institutions, SME support providers);
- Proper monitoring and facilitating 'soft' dialogue and networking processes among stakeholders is essential to evaluate their success and to derive potential follow-up activities;
- In generating output per action, it is important to avoiding direct market intervention and minimise negative effects on competitiveness;
- Simple processes must be developed to ensure high quality of data acquisition as well as monitoring and evaluation of effects and results per action (which often remains challenging)..

### ***Lessons for Actions of Strand II "Green entrepreneurship for the companies of the future"***

- Monitoring and reporting in the eco-innovation support programmes of EC implemented under this strand should be strengthened to ensure each project delivers the expected resource efficiency and eco-innovation impacts. Training programmes should entail a follow up system allowing monitoring of how and whether the knowledge obtained during the training is applied and generating any impact.
- Dissemination and showcasing of the project results and best practices is one of the important ways of spreading the benefits of the programme across the wider SME's community, especially those who did not have the opportunity to directly benefit from the programme.
- It is necessary to ensure that the coaching supported by the SME support instrument is delivering information on topics such as resource efficiency and circular economy
- Cluster organisations and other SME intermediaries are seen as an important channel for passing the knowledge to SMEs. However, the case with the trainings programme showed that the cluster managers often can under-prioritise the resource efficiency topic due to lack of awareness and not being able to see the gains. It is therefore important to use diverse channels for increasing the awareness about opportunities of the resource efficiency, greening and circular economy models to both clusters and SMEs. The new Resource Efficiency Knowledge Centre and the EU Cluster Observatory can play a significant role in this by outreaching cluster organisations, informing and mobilising them to support their customers to benefit from the new opportunities.

### ***Lessons for Action of Strand III "Opportunities for SMEs in a greener value chains"***

- Despite its rapid growth, the current body of knowledge still lacks assessment and evidence of opportunities in many sectors. Therefore, it is important to further promote the research of circular economy business opportunities and barriers in a wider range of economic sectors. In doing so, it is important to closely connect academic research with policy needs.
- While the Stress Test tool offers interesting analysis for regions, it is vaguely suited to address a resource efficiency or circular economy opportunities related assessment. The potential actions for the upcoming activities under the European Clusters Observatory would be to incorporate the circular economy and eco-innovation dimension in the Tool in a more explicit fashion.
- Many relevant lessons and recommendations have been generated by studies of the Clusters Observatory (i.e. foresight, analysis of framework conditions, cross sectoral collaborations trends). It is not clear to what extent these lessons and recommendations are being taken on board by the regions, national governments or cluster organisations, but it is important to take them into consideration in the planning of further activities and initiative of the EC in the area of circular economy.

### ***Lessons for Action of Strand IV "Access to (international) markets for green SMEs"***

- The initiatives pursued under this strand (European Strategic Cluster Partnerships NATUREFF, Low Carbon Business Action in Brazil and Mexico) can already offer many good practice examples in how to facilitate the cooperation and matchmaking

of companies that can be taken up by the intended programmes targeting other world regions.

- A positive *lesson learned* in the programmes was the importance of good preparation including the specific market intelligence in the first phases of the programme. The mapping in the early phase and the quality of the Background study that has identified the business opportunities for the project were very helpful in the success of further activities.

# 1 Introduction

## 1.1 Why resource efficiency

The GAP itself defines resource efficiency as “using the Earth's limited resources in a sustainable manner while minimising impacts on the environment while allowing economic growth (through relative decoupling of material use)”<sup>15</sup>.

Benefits of resource efficiency can best be evaluated whilst looking holistically at manufacturing processes, resulting in goods, services or a combination of both. The quality of a good or service, its product lifetime or efficiency within production or recycling processes are dimensions in which companies can benefit from the implementation of resource efficiency measures.

The following factors determine the demand for raw materials and simultaneously highlight the necessity for resource efficiency (‘pull-factors’ for resource efficiency).

- The availability of non-renewable raw materials is limited, at the same time price volatility on the raw materials market remains high. Future technologies require a vast range of raw materials, some of which are considered very rare. Rapid technological developments require an equally rapid flexible reaction on the side of raw materials provision, in order to avoid bottlenecks in supply.
- Especially for companies in the production industry the actual market prices for raw materials, semi-finished products and primary products are of high importance. Price fluctuation however follows a short-term nature and can result in a final price, which is often a multiple of the starting price. Price volatilities and supply shortages of these materials have been critical factors especially for small and medium enterprises (SMEs), which in comparison to larger companies, often lack the capacities and capabilities to secure themselves against these developments, e.g. by means of financial instruments.
- Statistics highlight that about 45% of costs within the manufacturing industries result from the purchase of raw materials.<sup>16</sup> It therefore seems reasonable for companies to implement measures leading to a reduction of raw material costs. Minimising costs for raw materials with the same production results leads directly to an increase in profits and competitiveness on the market.
- Further direct and indirect benefits of an increase of resource efficiency in businesses include lower production costs, lower dependencies from, often volatile raw material markets, lower operational costs, higher competitiveness and improved corporate images as advantage on the market. This benefits the total level of innovation of European businesses as well as their green products, services and solutions. Through the implementation of adequate measures European companies can strengthen their market position and gain access to new and green markets.

Finally, resource consumption is present over the entire product life cycle from material production up to the final disposal. This requires an adequate coverage of measures of both, production processes and product life cycles. It must be born in mind that an

<sup>15</sup> Green Action Plan for SMEs (2014): p.1

<sup>16</sup> Statistisches Bundesamt (2013): Kostenstruktur der Unternehmen des Verarbeitenden Gewerbes sowie des Bergbaus und der Gewinnung von Steinen und Erden 2011, Fachserie 4 Reihe 4.3, Wiesbaden, 2013. Link: <https://www.destatis.de/DE/Publikationen/Thematisch/IndustrieVerarbeitendesGewerbe/Strukturdaten/Kostenstruktur.html> (17.01.2017).



optimisation of resource efficiency within a specific life cycle phase can lead to a deterioration of other life cycle phases and the overall balance. In order to prevent such trade-offs, a full examination of potentials and challenges is necessary. The reduction of the loss of valuable resources offer significant business opportunities, especially for SMEs, in strengthening their competitiveness and selling green products, services and solutions. Further business opportunities can arise from developing and integrating concepts of circular business and green technologies into business concepts, production processes and product life cycles.

Considering its crucial role for the competitiveness of the companies, resource efficiency is chosen to be the cornerstone of the EU SME Green Action Plan (2014).

## **1.2 Scope and objectives of this report**

The present report provides an overview of implementation of the Green Action Plan for SMEs until end of 2016. It aims to demonstrate intermediate progress and outcomes and draw lessons for future actions.

The report focuses on the four thematic strands of the GAP's actions:

- I. Greening SMEs for more competitiveness and sustainability
- II. Green entrepreneurship for the companies of the future
- III. Opportunities for SMEs in a greener value chain
- IV. Access to the markets for green SMEs

Within these strands a selected set of 14 actions (out of 39 in total) and their contribution to the specific objectives of the Action Plan have been analysed. Figure 1-1 presents the scope of the GAP actions and objectives covered in this report.

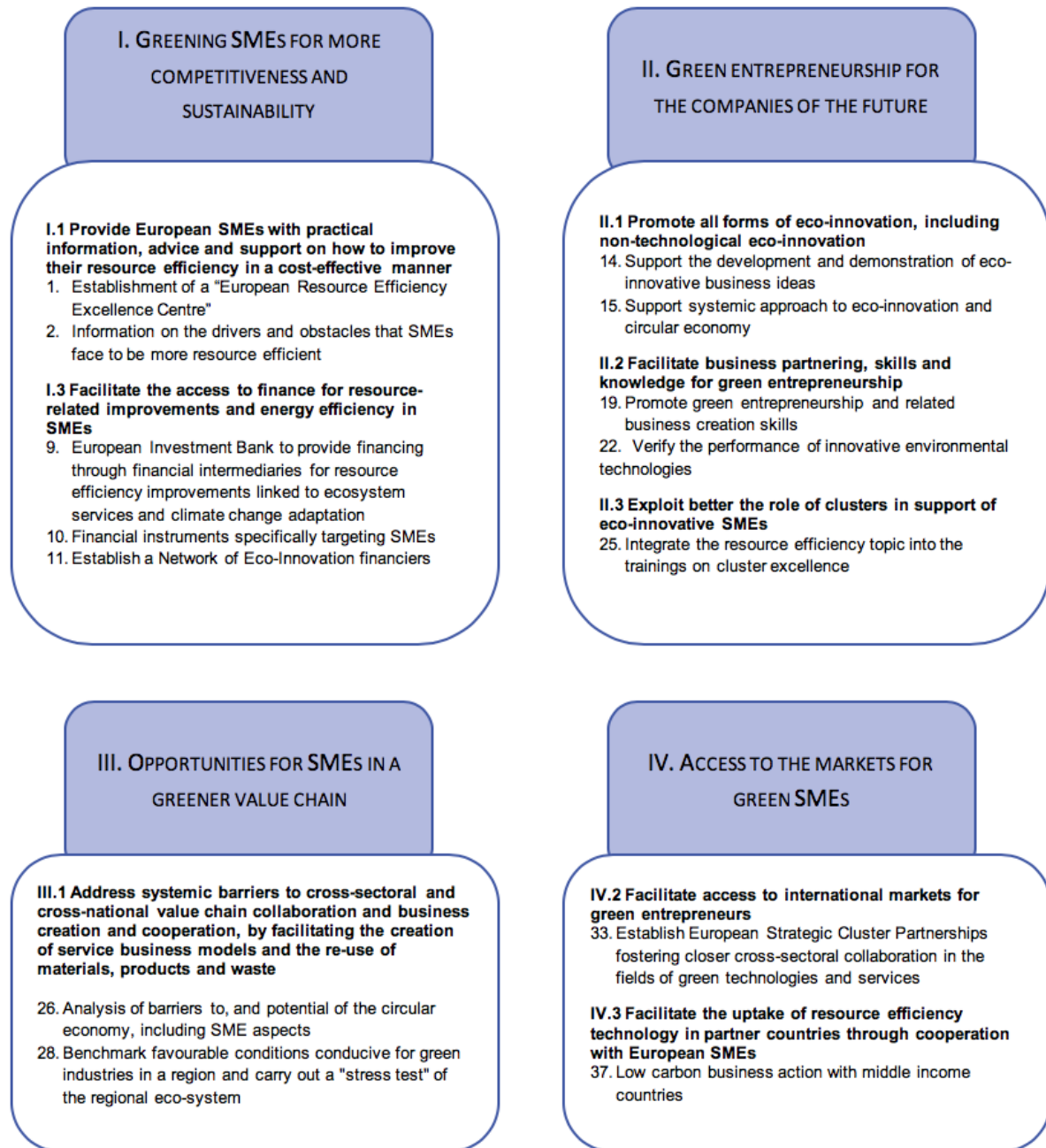
The report is structured in the following way:

Section 2 discusses the resource efficiency challenges and opportunities in Europe and how the Green Action Plan for SMEs is addressing them.

Section 3 presents the analysis of the implementation of the selected GAP actions. It is organised around each of the four strands of actions, their objectives and rationale, followed up with the overview of the progress in addressing the objectives set up under the strands and discussed the outcomes and lessons.

The last section presents the conclusions of the study that link observed outcomes of the actions with the actions to be proceeded or set in the near future.

Figure 1-1: The scope of the GAP Actions covered in this report



## 2 Resource efficiency challenges and opportunities in Europe

### 2.1 Resource efficiency challenges and opportunities for SMEs

The economic growth across the countries has been based on tapping into natural resources including land, water, fossils, minerals, etc. There is a clear sign that the traditional linear economic systems coupled with the existing patterns of consumption and the growing world population will soon lead to a situation where the resources of the planet will not be sufficient to meet the needs. Furthermore, the continuous reliance on the fossil fuel resources will intensify climate change and make both economies and people vulnerable to new risks.

Europe's continuous economic growth over many decades has been fuelled by the intensive use of resources. However today it faces multiple challenges of stimulating the growth needed to provide jobs and well-being to its citizens, while ensuring that this growth is economically and ecologically sustainable. There is a growing challenge of resource scarcity, growing prices for materials and dependence of the European economy on imported resources. Energy use, water scarcity, land shortages, the depletion of materials and the management of waste are among the most discussed issues posing sustainability challenges.<sup>17</sup>

All these call for new solutions and development strategies that ensure economic and ecological sustainability.

Transition to the new models of economies, such as circular, resilient, green economies offer new opportunities for European countries' sustainable growth. Adoption of the Circular Economy package and the Roadmap to a Resource Efficient Europe intends to put Europe on a new road of development and an introduction to alternative economic models.

Businesses and industries are important actors in building circular and more resilient economies. A major part of the new solutions has to come from them. Stimulating these actors to innovate, to switch to better, cleaner and less resource intensive practices is the ultimate task for the European policy. This is reflected in the overall purpose of the EU Green Action Plan for SMEs too.

SMEs are also an essential element of the European economy. There are over 22 million SMEs in the EU, providing over 133 million jobs and creating over half of the gross value added.<sup>18</sup> Diffusing the sustainability practices among SMEs, involving them in eco-innovations and new business models will have significant impact in greening the EU economy.

The broad strategic orientation of the GAP emphasises the central role of SMEs in advancing and harvesting the benefits of green/circular economy and resource efficiency. The European Commission set the overall goal of "enabling SMES to turn environmental challenges into business opportunities" (as the GAP's title already suggests). EU policies follow the direction that was set by the EU Circular Economy Action Plan and the Europe 2020 Strategy, which sets clear targets for the EU to become a sustainable economy. The

<sup>17</sup> "Accelerating the move to a sustainable, low carbon economy – The Carbon Trust Annual Report 2013/14". Available at <https://www.carbontrust.com/resources/reports/advice/opportunities-in-a-resource-constrained-world/>

<sup>18</sup> Eurostat: [http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics\\_on\\_small\\_and\\_medium-sized\\_enterprises](http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_small_and_medium-sized_enterprises)

Small Business Act states that the EU should help SMEs seize the opportunities created by the new economic paradigm that is the green economy.

Circular economy package<sup>19</sup> put forward by the European Commission in December 2015 aims to stimulate Europe's transition towards a circular economy in order to boost global competitiveness, foster sustainable economic growth and generate new jobs. It puts forward a legislative proposal on waste, as well as a comprehensive set of actions targeting market barriers in specific sectors or material streams, as well as horizontal measures to stimulate innovation and investments. The Green Action Plan complements the circular economy package by reinforcing the role of SMEs in transition to the circular economy and offers measures that help to build capacities and steer SMEs to become the key players in the circular economy.

The basic rationale of providing public support in order to improve the resource efficiency performance of businesses, with special focus on SMEs, is based on both economic and environmental benefits from a reduction of production costs as well as productivity gains.

The issue of resource efficiency entails specific challenges and opportunities for SMEs. Using natural resources more efficiently, businesses are able to take advantage of a number of economic benefits in several ways, such as the following:

- Competitiveness -

An optimisation of processes and the more efficient use of resources reduce costs and thus increase (global) competitiveness. Recent studies show that e.g. German enterprises were able to save 7% of raw materials per year. The payback times of the investment were less than one year, in small companies, payback was possible after 8 months.<sup>20</sup>

- Innovation capabilities and new markets –

Searching new ways to reduce resources is expected to increase the innovative capabilities of employees. New products and services can consequently be used to open up new markets for the enterprises within EU and beyond.

- Risk management –

A reduced resource input does not only reduce costs but also reduces business risks. Raw material markets are increasingly characterised by rising prices and higher volatility. Increased resource efficiency reduces the risks going along with these factors. For SME, rising prices and a higher volatility might be more critical than it is for larger companies, as most SME do not have the knowledge and the capacities to use financial instruments to reduce price fluctuations (e.g. by hedging strategies).

- Supply shortages –

There are supply shortages for certain critical minerals, used in many green e.g. resource efficient and high-tech products. An increase of resource efficiency over the whole life cycle can help companies to reduce their dependency on these critical minerals or rare earths.

- Stakeholder acceptance –

<sup>19</sup> [http://europa.eu/rapid/press-release\\_MEMO-15-6204\\_en.htm](http://europa.eu/rapid/press-release_MEMO-15-6204_en.htm)

<sup>20</sup> Greenovate! Europe E.E.I.G (2013), Resource Efficiency Potentials of Manufacturing Industries Summary Paper. Link: [https://www.greenovate-europe.eu/sites/default/files/publications/REMake\\_Greenovate%21%20Europe%20-%20DEFRA%20study%20on%20resource%20efficient%20manufacturing%20%282013%29.pdf](https://www.greenovate-europe.eu/sites/default/files/publications/REMake_Greenovate%21%20Europe%20-%20DEFRA%20study%20on%20resource%20efficient%20manufacturing%20%282013%29.pdf) (17.01.2017)

Increased resource efficiency can benefit stakeholder relations, for instance with clients, employees, suppliers or the public and can have positive effects on the image of a company.

However, at the same time SMEs face many challenges and barriers preventing them from starting the new eco-innovative and resource efficiency practices. The studies show that in comparison with the large companies, the SMEs have less capacities and abilities to introduce resource efficiency and circular economy practices<sup>21</sup>. In many cases SMEs just lack information on how and where to start, and fail to see opportunities.

Initiation and uptake of circular economy and resource efficiency innovations also face weak framework conditions, that is lack of funding or special incentives schemes, no information and connections to investors, lack of access to necessary skills and knowledge, lack of access to research and testing infrastructure, weak or no linkages with knowledge organisations, etc.

While there is a significant potential in foreign markets for green technologies including the ones for resource efficiency and circular economy, 92% of SMEs across the EU focus the sales of their green products in their own market – 20% sell them elsewhere in the EU + EFTA<sup>22</sup>. This is due to their limited capacity – both human and the financial – to invest in the exploration of the new markets, lack of linkages with the local players and failure to deploy channels for internationalisation like use of platforms, services of the chambers of commerce, etc.

## 2.2 Addressing Resource Efficiency challenges and opportunities via Green Action Plan for SMEs

Resource efficiency is the core principle of the Green Action Plan. Across its many actions, the Plan systematically addresses resource efficiency through addressing challenges and opportunities of European SMEs. It sets direction and framework for support activities that intend to help SMEs exploit the business opportunities that the resource efficiency offers. In doing this, the Action Plan presents a series of new or revised SME-oriented actions proposed at European level. These actions are organised around following four strands:

**I. Improve resource efficiency of European SMEs**, which is guided by the following objectives:

- I.1 Provide European SMEs with practical information, advice and support on how to improve their resource efficiency in a cost-effective manner
- I.2 Support efficient technology transfer mechanisms for green technologies
- I.3 Facilitate the access to finance for resource-related improvements and energy efficiency in SMEs

The actions geared towards these objectives address a set of challenges hindering many SMEs from participating and benefiting from resource efficiency. As discussed in the previous section, lack of knowledge and information prevents SMEs to foresee opportunities. The GAP addresses this challenge by increasing awareness, offering adjusted information, technical and advisory support directly (e.g. via the EU Resource Efficiency Knowledge Centre's online tools and resources or EEN network), or indirectly via local SME support organisations and public agencies. Initiatives under the GAP also offer targeted

<sup>21</sup> For example, 59% of large companies in the EU recycle by reusing waste within the while only 42% of SMEs do so. Source: Flash Eurobarometer 456 on 'SMEs, resource efficiency and green markets

<sup>22</sup> Flash Eurobarometer 456, released in January 2018

financing schemes for resource saving measures offered in a package with the technical advice.

**II. Support green entrepreneurship**, which is guided by the following objectives:

- II.1 Promote all forms of eco-innovation, including non-technological eco-innovation
- II.2 Facilitate business partnering, skills and knowledge for green entrepreneurship
- II.3 Exploit better the role of clusters in support of eco-innovative SMEs

The objectives under this strand focuses on addressing obstacles facing introduction of the new innovative solutions such as resource efficiency technologies, circular economy business models, services and start-ups. The GAP Actions addresses many elements that can create favourable framework conditions for these solutions, such as incentives schemes for research, development and demonstration, building entrepreneurship skills and knowledge, supporting networking and collaboration among businesses, knowledge and financial organisations. Existing and new European funding instruments have been deployed for the resource efficiency and circular economy oriented initiatives.

**III. exploit the opportunities of greener value chains**, is guided by one objective:

- III.1 Address systemic barriers to cross-sectoral and cross-national value chain collaboration and business creation and cooperation, by facilitating the creation of service business models and the re-use of materials, products and waste

Fostering circular economy and long-term resource independence for the EU will require introduction of the systemic eco-innovations and alternative business practices based on new value chains, valorisation of waste, new cross-sectoral linkages and exchange of secondary materials across businesses and industries. The challenges here are (for policy makers) lack of understanding of what can drive needed changes, how to facilitate these new forms of collaborations that will sustain circular economy. The GAP addressed these by investing in in-depth analysis of the barriers and drivers, tapping into the potential of the European clusters and support of the cross-regional exchange.

**IV. facilitate market access for green SMEs**, guided by the following objectives:

- IV.1 Promote a greener European internal market
- IV.2 Facilitate access to international markets for green entrepreneurs
- IV. 3 Facilitate the uptake of resource efficiency technology in partner countries through cooperation with European SMEs

The actions towards these objectives address the problems associated with weak internationalisation of the European SMEs. This problem is not unique to the green technology industries, but the faster pace of growth in environmental technology markets urges for quick action from the European green technology and service providers, including SMEs. The GAP is offering to address these issues by promoting matchmaking activities, platforms, technology transfer activities and special support services. The European cluster organisations are envisaged to play a significant role in these activities.



## 3 Pan-European impact of the GAP in Resource Efficiency

### 3.1 I. Greening SMEs for more competitiveness and sustainability

#### 3.1.1 Objectives and rationale

Under the GAP's pillar "Greening SMEs for more competitiveness and sustainability" the Commission set three objectives to be achieved through the following measures:

#### **Objective I.1 Provide European SMEs with practical information, advice and support on how to improve their resource efficiency in a cost-effective manner**

This objective follows the assumption that businesses often lack organisational capacities and time for resource efficiency efforts, due to routine and entrenched business practices. Beyond that, and perhaps even more significantly, SMEs are often confronted with a lack of expertise on new processes, technologies and materials necessary to reach higher resource efficiency. This underlines the importance to improve ways and opportunities for SME to participate in knowledge transfer and learning about best practices. Most SMEs often do not have an environmental management system put in place from the onset, and its introduction often materialises as a time- and cost-intensive venture. Consequently, there is often a lack of information about their internal material flows and have only limited knowledge about the potential effects of an improvement of resource efficiency on costs and profits.

#### **Objective I.2 Support efficient technology transfer mechanisms for green technologies**

This objective follows the assumption that green technologies and innovative solutions profit from a proper organisation, creation and distribution of expertise, such as best practice examples and other information, both online and offline. Furthermore, opportunities and structures for professional networking, such as events and institutions contribute to achieving a solid technology transfer. Such complex technological and financial processes are often only successful with external support and advice, e.g. through respective institutions and experts, qualified for consulting within the individual field and sector.

#### **Objective I.3 Facilitate the access to finance for resource-related improvements and energy efficiency in SMEs.**

This objective follows the assumption that financing of resource efficiency measures, especially in SMEs, remains a central issue. It can be stated that many companies face a lack of financial resources, exacerbated by bureaucratic difficulties in the acquisition of capital from the financial sector as well as through public funds. To tackle this issue, both private sector intermediaries as well as public financing institutions have to be involved in the process. Enabling an adequate involvement of the private sector in financing resource efficiency measures as well as leveraging capital through the involvement of public institutions (such as the European Investment Bank) are essential steps, contributing to climate action and environmental sustainability.

This report presents the progress in the selected activities that address two of the above stated objectives of this strand.



### 3.1.2 Progress in addressing the objectives of Strand I

#### 3.1.2.1 Objective I.1 Provide European SMEs with practical information, advice and support on how to improve their resource efficiency in a cost-effective manner

The action plan has envisaged a set of initiatives focused on offering SMEs information, advice and support in how to improve resource efficiency.

Among these is the establishment of the **European Resource Efficiency Knowledge Centre for SMEs** (Action 1 in GAP) which will be a virtual platform offering a wide range of support for SMEs and SME intermediaries, including information and technical advice, networking, self-assessment, benchmarking, linking to supporting services, etc. While the official launch of the online platform is expected in February of 2018, the pilot and preparatory activities leading to the establishment of the Centre have been pursued since early 2015 and resulted in development of the following resources of the Centre:

- Database of the resource efficiency measures, technologies and good practices that can inspire SMEs to start implementing activities to cut solid wastes, reduce use of materials, water and energy. They range from simple quick pay back activities to more complex ones assuming a change of the SME's business models.
- Resource Efficiency Self-Assessment Tool for SMEs including several questionnaires that allow companies through answering testing questions to get an automatically generated report with water, energy, material, waste efficiency assessment and recommendations for improvements with examples of measures that can be taken. There is one universal questionnaires that can be applied by SMEs from all sectors which focuses on resource efficiency performance in an office, and nine industry specific questionnaires (covering food, hotel and restaurants, construction, metal and plastic(s), chemicals, textile, wood and furniture, retail and logistics, manufacturing of machineries, waste management industries) that offer more specialised assessment and the recommendations. It is envisaged that four questionnaires will be launched along with the launch of the Centre's online platform, while the rest will be functional during the first half of 2018.
- Library of policy measures and tools, which aims to support SMEs in finding the information about technical, knowledge and financial support available in their region, country or at EU level for improving their resource and energy efficiency and introducing circular economy business models. Examples of support measures include advisory help, material and energy audits, training, information, self-assessment tools and calculators, funding programmes, and other measures.

Figure 3-1: Snapshots of the components of the Self-Assessment Tool and of the report



Source: European Resource Efficiency Knowledge Centre online platform (beta version)

Close to 400 SMEs across the EU have been involved in testing the pilot Tool during 2016. Based on the collected feedback the Tool elements have been improved or redeveloped during 2017, including graphical presentation, interactivity, user friendliness and expanded content.

Another important activity of the Centre is the building of the *network of SME support organisations* from Members States and regions, who will facilitate the interaction of the Centre with local SMEs and provide local support and advise on resource efficiency issues. Networking has already started between some organisations with an ambition to expand further in coming years. In addition, the network members have been contributing to the database, redesign of the self-assessment tool and building the library of policy measures of the Centre.

Table 3-1: List of the members of the Network of the Resource Efficiency Knowledge Centre as of November 2017

	Business Upper Austria - Upper Austria Business Agency (BIZ-UP), Austria		Italian National agency for new technologies, Energy and sustainable economic development (ENEA), Italy
	Public Waste Agency of Flanders (OVAM), Belgium		MOTIVA, Finland
	Copenhagen Resource Center (CRI) and the Danish Environmental Protection Agency, Denmark		Netherlands Enterprise Agency (RVO), Netherlands
	Effizienz-Agentur NRW - competence center for resource efficiency in North Rhine-Westphalia (EFA NRW), Germany		Portuguese National Innovation Agency (ANINOV), Portugal
	Environmental Protection Agency, Ireland		Public Environmental Management of the Basque Government (IHOBE), Spain
	Enviros, Czech Republic		VDI Centre for Resource Efficiency (VDI ZRE), Germany
	French Environment and Energy Management Agency (ADEME), France		Waste and Resources Action Programme (WRAP), UK
	Hungarian Association for Sustainable Economies (KÖVET), Hungary		Zero Waste Scotland, UK
	Institute for Ecology of Industrial Areas (IETU), Polish Ministry of Environment, Poland		

- Better understanding of what hinders SMEs from starting resource efficiency oriented measures is crucial for better design of policy approaches. The European Commission has been paying a significant attention to these hindrances through investing in in-depth research. The dedicated **Flash Eurobarometer surveys "SME, resource efficiency and green markets" and "SMEs and Circular Economy"** (Action 2 in GAP), launched in 2013 and 2015 and 2016 and January

2018<sup>23</sup>, addresses various driving and hindering factors SMEs face in becoming more resource efficient or engaging in circular economy activities.

- The overarching objective of the survey is to assess activities of companies, especially SMEs, regarding green markets, resource efficiency and circular economy.

The Eurobarometer surveys include topics such as current or planned resource efficiency and circular economy activities, reasons for their implementation; financing of these activities; barriers to implementation; experiences with proposals for contracting authorities including environmental criteria; role and impact of financial incentives and policies supporting green business and circular economy initiatives and current status of the green market.

Brief summary of the results of the latest Flash Eurobarometer survey:

- Minimising waste and saving energy are the most common resource efficiency actions among European SMEs and have become more widespread since 2015
- The most common resource efficiency actions that are planned for the next two years are energy savings (59%), waste minimisation (57%) and materials savings (51%).
- SMEs are more likely to be planning additional resource efficiency actions than they were in 2015, particularly minimising waste (+10 pp), saving energy (+9 pp) and saving materials (+8 pp).
- For 41% of SMEs, resource efficiency actions decreased production costs
- SMEs are much more likely to rely on internal rather than external support for resource efficiency efforts. Amongst SMEs that have taken resource efficiency actions, 60% rely on their own financial resources and 58% on their own or technical expertise. Comparatively few rely on external support (22%). The most common forms of external support are advice or other non-financial assistance from private consulting and audit companies (47%),
- 24% of SMEs in Europe offer green products or services. Most SMEs that sell green products or services have been doing so for more than three years (68%)
- SMEs are much more likely to rely on their own resources, to produce green products or services although the proportion relying on external support has increased
- Financial incentives are increasingly considered to be the most helpful support for expanding ranges of green products or services by SMEs (45%). This proportion has increased by 10 percentage points since 2015.
- 40% of SMEs have at least one full time employee in a green job for at least some of the time
- SMEs in the US are more likely than their EU counterparts to be selling green products or services (32% vs. 24%), however, EU SMES are more likely to report a higher turnover from green product or service sales: 41% say these represented more than 10% of annual turnover, compared to 33% of US SMEs. EU SMEs have also been selling green products or services for longer: 68% have been doing so for more than three years, compared to 56% of those in the EU.

<sup>23</sup> Reports By Reference number 342, 381, 441 and 456, Link: [http://ec.europa.eu/public\\_opinion/archives/flash\\_arch\\_en.htm](http://ec.europa.eu/public_opinion/archives/flash_arch_en.htm)

*Objective I.1 Provides European SMEs with practical information, advice and support on how to improve their resource efficiency in a cost-effective manner*

**Who has benefited so far?**

SMEs who took part in testing the Self-Assessment Tool of the European Resource Efficiency Knowledge Centre and SME intermediaries improving their services to SMEs thanks to the exchange of knowledge and practices facilitated by the Centre.

**Who are the stakeholders?**

National and regional SME intermediaries who became a part of the network of the European Resource Efficiency Knowledge Centre.

National and European policy makers who needed the Eurobarometer data in their decision making.

**3.1.2.2 Objective I.3. Facilitate the access to finance for resource-related improvements and energy efficiency in SMEs**

To address this objective, the Action Plan envisaged the establishment of special funding programmes projects in resource and energy efficiency initiated by SMEs, as well as nurturing the community of financiers focusing on investments in eco-innovative solutions and promoting matchmaking between them and SMEs. Below are some examples of the initiatives launched by the European Union.

- *European Investment Bank to provide financing through financial intermediaries for resource efficiency improvements linked to ecosystem services and climate change adaptation (Action 9 in GAP)*

In February 2015, within the Activity 9 the European Commission and the European Investment Bank launched the Natural Capital Financing Facility (NCFF), an instrument that aims to establish a pipeline of replicable, bankable natural capital projects that will serve as a "proof of concept", demonstrating the economic attractiveness of natural capital projects and attract private investors for these projects.

The NCFF has started with a pilot phase (2014-2017) with a total amount of €100m-€125m for the financing of 9 to 12 operations, with an additional grant facility of €10m for technical assistance. SMEs can access NCFF-financing (loans) directly or through financial intermediaries or equity funds.

In addition, sharing of best practices for innovative financing for biodiversity, including for SMEs, will be developed through the EU Business @ Biodiversity Platform.<sup>24</sup>

- *Financial instruments specifically targeting SMEs (Action 10 in GAP)*

The Private Finance for Energy Efficiency (PF4EE)<sup>25</sup> instrument is a joint project between the European Investment Bank (EIB) and the European Commission, addressing the limited access of energy efficiency investments to suitable commercial financing. It is managed by

<sup>24</sup> [http://ec.europa.eu/environment/biodiversity/business/index\\_en.htm#](http://ec.europa.eu/environment/biodiversity/business/index_en.htm#)

<sup>25</sup> <http://www.eib.org/products/blending/pf4ee/index.htm>

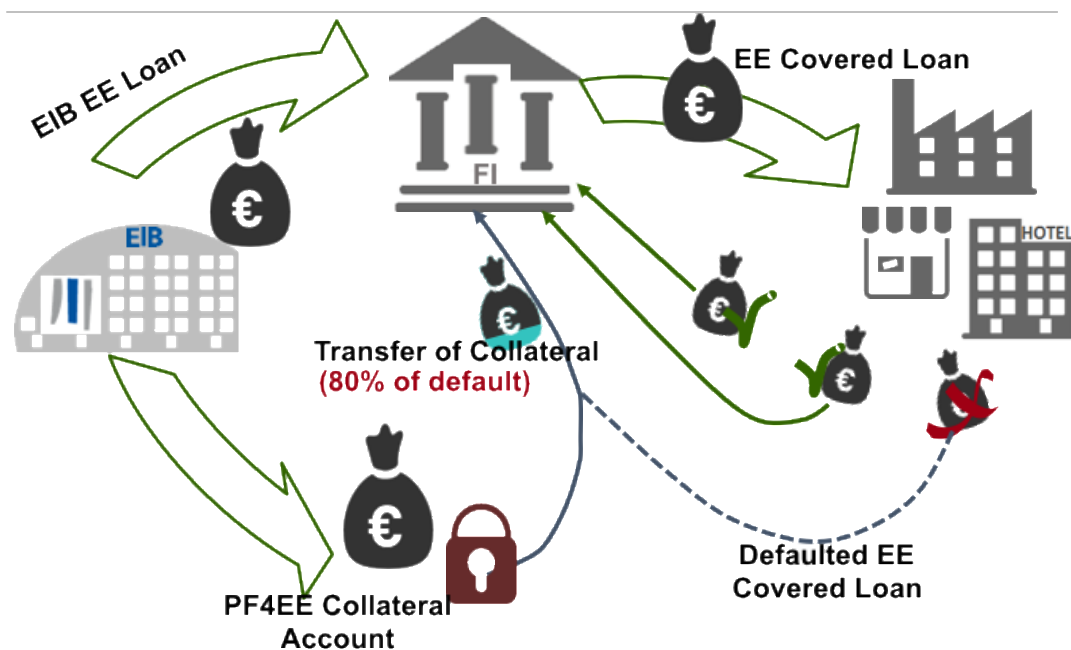
the EIB and funded by the Programme for the Environment and Climate Action (LIFE programme).

The LIFE Programme committed €80m to fund the instrument. A corresponding Delegation Agreement was signed on 8 December 2014 (to be implemented in 2015 – 2017). The EIB plans to leverage this amount, offering a minimum of €480m .

According to the EIB the European Union energy efficiency (EE) sector is experiencing sub-optimal levels of investments mainly because of high investment costs, limited access to credit, too long payback times and credit risks.

The beneficiaries of PF4EE can be described as Financial Intermediaries (private commercial banks and other financial intermediaries in the private sector<sup>26</sup>) on the one hand, profiting from EIB loans to be on-lent, risk mitigation mechanisms and consultancy services, supporting with the creation of EE loans portfolios. Since these actions are often in line with priorities identified by the Member States' National Energy Efficiency Action Plans, their political efforts can be seen as overall beneficiaries. Finally, lenders (natural persons, home-owner associations, enterprises, public institutions/bodies and any other legal entities undertaking an EE Investment) ultimately benefit from increasing lending volumes, which have a positive effect on access to credit, investment costs, payback times and credit risks.

Figure 3-2: The PF4EE loan scheme



source: PF4EE

<sup>26</sup> Criteria applied:

- Intermediary: Sound financial standing and acceptable counterpart to EIB; capacity to reach Financial Recipients in line with EE priorities; one financial intermediary per country on "first-come first-served" basis
- Investments: e.g. compliant with EU directives; capital costs not exceeding 10 million Euros; fulfils EIB EE technical and economic criteria (cost-benefit-analysis, environmental externalities should at least cover 50% of the total project cost; additional specific criteria apply for District Heating / District Cooling, Energy Savings / Energy Efficiency in Buildings and High efficiency Co-Generation of Heat and Power



- *Establish a Network of Eco-Innovation financiers* (Action 11 in GAP)

The project Inneon (Network for Eco-Innovation Investment), launched by the EC and led by Zabala Innovation Consulting<sup>27</sup> (Spain) aims at creating a network of eco-innovation stakeholders while providing them with a point of reference. According to Inneon's own definition, the project can be characterised by three main objectives:



1. "Establishing a strategically aligned community focused on the accelerated commercialization of eco- and social innovation within Europe",
2. "Providing an integrated service across the innovation chain from identification and enhancement of proposals (via the development of investor-ready proposals) or through facilitating deals between investors and innovators" and
3. "Establishing a European network of selected professionals with a defined interest in eco- or social innovation that plans to continue after completion of the project".

In detail, the above-mentioned objectives can be summarised as creating a platform, offering coaching and support to businesses for "investor readiness", creating a network of investors and financiers, offering contacts and links to relevant stakeholders, leveraging additional sources of EU funding, and profiting from further eco-related initiatives funded by the European Commission.

Table 3-2: Services offered by INNEON project

What INNEON offers to...	
<b>Businesses:</b>	<b>Investors:</b>
<ul style="list-style-type: none"> <li>• Its help-tools and know-how on eco-innovation and turning ideas into ventures, available both online and in direct contact,</li> <li>• Coaching activities and assistance regarding the preparation of products for their introductions to potential investors,</li> <li>• Direct access to business angels, venture capital and corporate investors,</li> <li>• Networking opportunities and events in cooperation with investors and other stakeholders, also including an online matchmaking platform.</li> </ul>	<ul style="list-style-type: none"> <li>• Access to investment proposals from eco- and social innovators who have been coached by the Inneon experts,</li> <li>• Access to sector specific market intelligence to inform individual decision-making processes,</li> <li>• Networking and opportunities for cooperation with other European investors</li> </ul>

Businesses and innovations related to the fields of energy, waste, water and air management profit the most from Inneon's activities. Further beneficiaries include organisations engaged in cross-cutting themes, comprising building design, construction and management, clean production/manufacturing, industrial symbiosis, integrated catchment management, new materials, public health and safety, resource security, smart cities, agriculture, and transportation.

- The results achieved during the project duration have exceeded the initial objectives. The investor network registered a total of 65 investors from 17 European

<sup>27</sup> <http://www.zabala.es/>



countries, also comprising representatives from Business Angel associations, Venture Capitalists, crowd funders and corporate investors.

- After 30 months of activity, the consortium pre-screened 198 companies and evaluated 157 applications from SMEs from 19 European countries. Of these 80 SMEs were selected and benefited from coaching support in order to become part of the Inneon network. Furthermore, 15 SMEs were successful in securing funding while additional SMEs are in ongoing negotiation processes to raise funding.

Finally, this cross-cutting approach highlights the multi-sectoral reach of the project. However, the total outreach to individuals or organisations, including eco-innovators and/or potential investors, is difficult to estimate. While each sector, industry and market niche has different characteristics, purchasing behaviours and business or investor profiles influencing their relationship to eco-innovation have to be considered individually.

- *Bringing SMEs and investors together at the EU Forum for Eco-innovation*

The 20th European Forum for Eco-innovation held in Tallinn, Estonia, from 26-28 October 2016, was another notable event organised by the European Commission that brought SMEs and investors together. The event brought together representatives from nearly all EU financing instruments, as well as many private investors, with SMEs seeking external funds to roll out green products and services. The Forum's overall theme was financing SME eco-innovations, and the room discussions unveiled many lessons for SMEs on how to seek investment and for the investors on why the future is with the circular economy business models<sup>28</sup>

*Objective I.3. Facilitate access to finance for resource-related improvements and energy efficiency in SMEs*

#### **Who has benefited so far?**

*PF4EE and NCFF:* lenders including enterprises/SMEs, natural persons, home-owner associations, public institutions/bodies and any other legal entities undertaking the investment located in selected Member States (e.g. Czech Republic, Spain, France, Belgium, Italy, Portugal, Croatia).

*INNEON:* First 18 months: 79 applications received, 32 applications retained for coaching. 21 SMEs introduced to investors, 2 successfully received investments. Network accelerated expansion and included 17 investors. Last 12 months: Additional 25 SMEs introduced to investors and 13 SMEs successfully raising finance.

#### **Who are the stakeholders?**

Financial Intermediaries, including private commercial banks and other financial intermediaries in the private sector, European Commission, European Investment Bank.

### *3.1.3 Outcomes and lessons*

Looking from an overall perspective, actions within the GAP strand "Greening SMEs for more competitiveness and sustainability" prove to succeed in activities connected with *providing, supporting and facilitating* structures and schemes for the transfer of knowledge, finance and technologies.

<sup>28</sup> [http://ec.europa.eu/environment/ecoinnovation2016/1st\\_forum/index\\_en.html](http://ec.europa.eu/environment/ecoinnovation2016/1st_forum/index_en.html)

Noteworthy outcomes include the following effects on SMEs and resource efficiency, according to the individual actions:

**Action 1** follows the objective to provide European SMEs with practical information, advice and support on a predominantly virtual basis. So far, SMEs taking part in testing the Resource Efficiency Self-Assessment Tool profit from its virtual content and practical implications. Future national and regional SME intermediaries who will become part of the network of the European Resource Efficiency Knowledge Centre will profit from its virtual platform for knowledge sharing and inter-organisational networking opportunities which transcend industry sectors, European regions and types of expertise.

In brief, **Action 2** informs interested parties about developments and trends in resource efficiency in various aspects. Any national and European policy makers benefit from the quality and scope of the data while deriving individual strategies, both with theoretical or practical implications.

More specific, **Action 9** contributes to enhance available funding schemes through market-based mechanisms, attracting long-term investors. In the long run, this presumably leads to a facilitation of financing schemes for resource-related improvements and energy efficiency in SMEs. Green infrastructure projects, diverse payments for ecosystem services, biodiversity offsets or compensation beyond legal requirements as well as pro-biodiversity and adaptation businesses can be considered among the beneficiaries of this action.

Finally, **Action 11** directly provides a point of reference and networking facilities for stakeholders in eco-innovation, including a virtual platform as well as coaching and support activities. As a result, additional sources of EU funding will be leveraged, and SMEs can benefit from further eco-related initiatives funded by the European Commission.

After summarizing these individual action-related approaches and focusing on lessons derived from their implementation, the following aspects are observed as determining the scope and success of the GAP strand:

- The reach, accessibility, clarity and specificity of virtual platforms in contrast to networking structures utilising direct or personal individually tailored, possibly on-site support and advice systems;
- Use and effect of individually adaptable self-assessment opportunities in comparison to the provision of broad, general expertise and knowledge;
- Implications of market-based approaches on the facilitation of services versus pre-selected, e.g. sector-specific opportunities;
- Speed and flexibility of approach to spread knowledge in a decentralized manner among European SMEs through cooperation with regional and specialised SME intermediary organisations (e.g. financial institutions, SME support providers etc.);
- Impact of regional- or pan-European foci of activities selected;
- Balance of sector, regions and type of organisations benefitting from respective activities;
- Ease of dialogue and networking processes among stakeholders;
- Effect of individual activity on the empowerment of SMEs in self-learning and takeover of implementation processes, seeking for guidance or advice when they see a necessity for it;
- Efficiency in generating outputs per action, while minimising negative effects on competitiveness and avoiding direct market intervention;

- Quality and simplicity of data acquisition as well as monitoring and evaluation of effects and results per action (which often remains challenging, according to stakeholders);
- Success in determining 'readiness' of scheme, platform or other support and in finding the right time for its implementation in order to avoid pre-maturity and loss of effect.

### **Good Practices : The Inneon Effect**

*The following selected case studies give two examples of SMEs which successfully raised funding, benefitting from the Inneon initiative. Dutch company BioBoxx and the Danish SpaceInvader both profited from Inneon's support ranging from business plan consulting to business-matchmaking, including potential investors.*

*"BioBoxx" offers a new solution in collecting and processing waste through a solidboard box for the collection of organic waste. This box is equipped with a water and dirt repellent coating which ensures that no leaks will occur, enabling clients to collect the full boxes safely on top of each other until pick-up time. The box is delivered folded, so it occupies up to 20x less space over existing regular waste containers. Full boxes are processed as a whole, including their organic waste contents - completely compostable and fermentable. The box is said to be a much cheaper solution than the regular waste container, saving more than 40% waste costs by eliminating combustion and cleaning costs and offering a significant decline in waste transport costs. Overall, less transport leads to less reduction of CO2 emissions.*

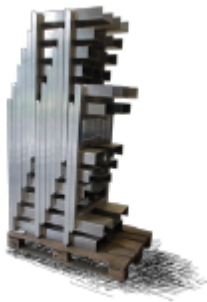


further information on <https://bioboxx.com/>

**Good Practice "SpaceInvader: how to make profit of space"**

*SpaceInvader's solution is an extension of the present pallet technology to accommodate the shift in cargo weight. SpaceInvader has developed a multilayers system, called the SpaceInvader. Combined with the existing equipment, the SpaceInvader enable pallets to be stapled in two layers and thereby utilize the free top space available in 80–90 % of all truck transportations.*

*The product consists of two light frames made of aluminum. These devices can be applied to pallets for stacking in multiple layers. The potential value of the solution for transportation companies is very high, as the sector makes revenue and compete on very low marginal costs. By being able to fully optimize the load of their trucks, transportation companies become more competitive, and can reduce their carbon footprint by simply having to drive fewer times in order to deliver the same amount of goods.*



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further information on <http://spaceinvader.com>

## 3.2 II. Green entrepreneurship for the companies of the future

### 3.2.1 Objectives and rationale

The aim of this strand is to support the promotion of all kinds of eco-innovation in SMEs including an innovation ecosystem which nurtures business ideas and demonstration projects and providing sufficient financing. In addition, this eco-system should benefit from the existence of knowledge institutions and entrepreneurs who are well-prepared to meet the resource and climate challenges of the future. Formally the GAP set up the following three objectives under this pillar.

#### **Objective II.1 Promote all forms of eco-innovation, including non-technological eco-innovation**

Eco-innovation is the innovation that makes both economic and ecological sense. In the condition of growing global environmental, resource-scarcity and overpopulation challenges, eco-innovative solutions both on product and systems level are the only alternative to sustain economic development and keep our planet healthy. To step towards the sustainable path of economic growth, there is a need for much more eco-innovations to appear in all sectors of EU and world economies. Therefore, it is one of the objectives of the SME Green Action Plan to promote eco-innovations through research, development and demonstration. SMEs are particularly encouraged to get involved as they often have new and interesting ideas but have limited resources to bring them to life.

## **Objective II.2 Facilitate business partnering, skills and knowledge for green entrepreneurship**

The importance of the skills, knowledge as well as public private and B2B partnerships among the green SMEs and entrepreneurs for building green, low carbon and circular economy has been highlighted by the GAP. New business models based on new value chains, different resources, different relationships among society players and new investment schemes will be the fundamental elements of a new greener and more circular economy. Many SMEs, current and future entrepreneurs (current students) will need to get new knowledge and skills to be able to fit into and succeed in the new economic models. That is why the existing European programmes will reinforce their support to boost confidence of SMEs and entrepreneurs in resource efficiency, circular economy, eco-innovation, new business models, as well as promoting various forms of partnerships for a greener economy.

## **Objective II.3 Exploit the role of clusters better in support of eco-innovative SMEs**

The rationale of this objective is that the cluster organisations are important multipliers and channels of the new knowledge. They are constantly in close interaction with their SME members, they have their trust and they know their SMEs capabilities and needs. All these makes them a very suitable intermediary for passing the knowledge on eco-innovations, resource efficiency, etc. to SMEs. The GAP plans to exploit this opportunity and involve cluster organisations in building capacities of SMEs.

### *3.2.2 Progress in addressing the objectives of Strand II*

#### **3.2.2.1 Objective II.1 Promote all forms of eco-innovation, including non-technological eco-innovation**

Several actions have been envisioned to address these objectives, among which are the following:

- *Supporting the development and demonstration of eco-innovative business ideas (Action 14 in GAP).* This has been implemented through the SME instrument under Horizon 2020
- *Supporting systemic approach to eco-innovation and circular economy (Action 15 in GAP).* This has been implemented through supporting R&D projects within Societal Challenge "Climate Action, Environment, Resource Efficiency and Raw Materials"

The Horizon 2020 SME Instrument supports SMEs in scaling-up their innovation activities, with funding awarded to two types of projects: While Phase 1 only tests the feasibility of promising ideas, phase 2 funds SMEs to take their tested ideas much closer to the market.<sup>29</sup> In Phase 2, the following types of innovations have been taken up within the projects:

- Novel and innovative technologies (transportation, (robotic) recycling, RE conversion, energy efficiency in buildings, etc.)
- Renewable energy systems (innovative photovoltaic);
- Greener agriculture;

<sup>29</sup> Green action plan for SMEs enabling SMEs to turn environmental challenges into business opportunities, List of Actions and interview with Tomas Turecki (DG RTD)

- Innovative services (algae-based waste water treatment);
- Radical innovations (engine running on hot water);
- Reduced emission services and products.<sup>30</sup>

The latest data on SME Instrument under Horizon 2020 shows that as of July 2016, 131 phase one projects have received the amount of €6.6m and 29 phase 2 projects were funded with €43.8m under the Societal Challenge "Climate Action, Environment, Resource Efficiency and Raw Materials" pillar<sup>31</sup>.

The most common bottlenecks for SMEs for undertaking eco-innovative actions include their lack of access to finance. Consequently, a link with complementary financial facilities for growth under COSME has been established. The fact that other higher priority investments exist and the reluctance of commercial banks to provide resource efficiency investments to SMEs necessitates linkages with these other financial facilities. The mid-term evaluation of the SME Instrument found that SMEs having received funding from the SME Instrument in Phase 2 have managed to leverage on average €800 each as co-financing from private investors<sup>32</sup>. This way, the SME Instrument helped the SMEs in scaling up business activities and offered a "quality mark" that attracted further investors. The funding has also been positively influencing the beneficiaries' capacity to manage innovation, and in providing strategic intelligence for marketing their innovations.

The Horizon 2020 SME Instrument ([Action 14](#)) is explicitly targeting private for-profit SMEs. In the case of the H2020 research funding under the Societal Challenge 5 on Climate action ([Action 15](#)), in addition to SMEs, the beneficiaries of Action 15 include research institutions, big industries, universities, local authorities, etc. SMEs received slightly more than 20% from the overall funding within the two related calls.

Under Societal Challenge 5 "Climate Action, Environment, Resource Efficiency and Raw Materials" so far there have been two calls which are of relevance to circular economy namely "Waste-1-2014: Moving towards a circular economy through industrial symbiosis" and "Waste-6-2015-a: "Promoting eco-innovative waste management and prevention as part of sustainable urban development". Some five projects were funded under the former topic amounting to €43m out of which SMEs received €8.78m. Four projects were funded under the latter topic with a total funding of €35m out of which SMEs received €8.58m. The interest for both calls was very high, with 56 projects applying for Waste-1-2014 and 96 projects – for Waste-6-2015-a. This proves the relevance of the calls to the priorities of potential beneficiaries.<sup>33</sup> Under these two calls, a total of 59 SMEs are actively engaged in research and innovation projects together with other various local stakeholders.<sup>34</sup> Examples of SMEs' engagement in such projects include (ibid):

- In the project BAMB - Buildings as Material Banks: Integrating Materials Passports with Reversible Building Design to Optimise Circular Industrial Value Chains – two European SMEs are leading beneficiary in developing and implementing key concepts to move towards circular economy in the construction sector: DREES &

<sup>30</sup> Cordis database

<sup>31</sup> Technopolis Group, 2017: [Programme Evaluation of the SME instrument and the activities under Horizon 2020 Work Programme "Innovation in SMEs"](#), for DG RTD

<sup>32</sup> the data is valid at all SME Instrument level, as it is not possible to provide information specific to SMEs in the field of resource efficiency or eco-innovation.

<sup>33</sup> Interview with Tomas Turecki, DG RTD

<sup>34</sup> European Commission, DG GROW: GAP Actions' state of play and implementation



SOMMER ADVANCED BUILDING TECHNOLOGIES GMBH and SUNDAHUS I LINKOEPING AB.

- In the project FORCE - Cities Cooperating for Circular Economy – Letbæk Plast is a Danish SME contributing with a vast experience and knowhow with recycling of plastics. In FORCE, the SMEs will demonstrate a novel approach to recycling of contaminated household flexible plastics. The aim is to expand their product lines and to access new markets by using the FORCE results on 10 new applications of recycled plastic and utilising their business potential.

The expected outcomes of this Action are mainly associated with a 'measurable reduction of waste generation and resource use in the medium term'. Additionally, financed projects should lead to gains in productivity for waste treatment plants and improved material and energy efficiency and associated GHG emission reductions in the short term. Other potential benefits may include identification of the best available techniques and emerging techniques under the Industrial Emissions Directive. In the medium term, the expectation is to reach a 'global market up-take and replicability of eco-innovation solutions. In the short term, it is the reinforcement of the eco-industry landscape in Europe. Support is also expected to the implementation and evaluation of technology verification schemes. Action 15 targets urban and peri-urban areas and the development of the urban metabolism approach. This would lead to better and cleaner cities and eventually to a European leadership in waste management and prevention. In terms of RE impact this will lead to improvement of cost, material and energy recovery efficiency as well as improved treatment technologies and strengthened markets for recycled products.<sup>35</sup>

The market outcomes and increase in competitiveness are impossible to gauge at this stage for both Action 14 and 15 as it is too early. Some information is available in the reports, but it is rarely quantified. In the future the EC will certainly launch an ex-post evaluation which will attempt to measure these precise impacts.<sup>36</sup>

The stakeholders in the Actions are the Enterprise Europe Network (EEN) including 500 business support organisations and a transversal Resource Efficiency Thematic Group. These support organisations offer coaching services to beneficiaries to strengthen innovation management capacity and to support better access to funding but also to implement awareness and training programmes on resource efficiency and eco-innovation targeted at professionals and entrepreneurs.<sup>37,38</sup> Other potential services include: self-assessment tools; resource efficiency consultancy; support for technology and knowledge transfer; learning platforms on resource efficiency; advice about funding possibilities; financial planning; preparation of proposals to get funding and funding for resource efficiency investments. The SME Instrument Business Community - Interactive Platform and SME Instrument Business Community Activities need to be mentioned as well. These are SME Phase 3 actions which will be launched soon. In addition, the network of National Contact Points (NCPs) is the main structure on a national level to provide guidance, practical information and assistance on all aspects of participation in Horizon 2020. One measure to ensure involvement within Action 15 was the H2020 Waste clustering workshop (08/12/2015).

<sup>35</sup> Horizon 2020 Work Programme 2014-2015

<sup>36</sup> Interview with Tomas Turecki, DG RTD

<sup>37</sup> The Horizon 2020 Strategic Programme for the 2014-2016 Programmes

<sup>38</sup> Consultation on Green Action Plan for SMEs



*Objective II.1 Promote all forms of eco-innovation, including non-technological eco-innovation*

**Who has benefited so far?**

Large number of SMEs, research institutions, big industries, local authorities – through funding of the research and demonstration projects

**Who are the stakeholders?**

Enterprise Europe Network (EEN) including 500 business support organisations, a transversal Resource Efficiency Thematic Group, H2020 National Contact Points, – provided self-assessment tools; resource efficiency consultancy; support for technology and knowledge transfer; learning platforms on resource efficiency; advice about funding possibilities; financial planning; preparation of proposals to get funding; and funding for resource efficiency investments

**3.2.2.2 Objective II.2 Facilitate business partnering, skills and knowledge for green entrepreneurship**

The GAP has set up a number of actions to address this objective, among them is:

- *Promotion of green entrepreneurship and related business creation skills (Action 19 in GAP).*

This action has been implemented through the Climate Knowledge and Innovation Community (Climate-KIC) of the European Institute of Innovation and Technology (EIT). It has been implemented with the aim to develop Europe's human capital for climate-related innovations. It has operated within four specific sub-themes including decision metrics and finance, sustainable production systems, urban transitions and sustainable land use. It should also be mentioned that KIC Raw Materials takes up Circular Economy as an area of interest. KIC InnoEnergy also mentions circular economy and sustainable and renewable energy as sub-themes.<sup>39</sup>



Climate-KIC has developed several initiatives worth mentioning:

- *High performance Accelerator for start-ups and SMEs* focused on cleantech commercialisation trying to boost climate-related innovations into valuable, investable businesses. Early-stage start-ups and SMEs get an opportunity to boost their growth, to cross national borders and to become worldwide technology leaders with substantial climate impact.
- *Climate-KIC Journey* is a five-week pan-European, cross discipline and cross-sector entrepreneurial summer school relying on the learn-by doing approach.
- *EIT-labelled programme for Masters and PhDs* – the label targets students who will be able to stimulate and contribute to climate relevant innovations in Europe by transforming climate change science into new products and services and building on market drivers of climate innovation.

<sup>39</sup> EIT, 2016, Assessment of the implementation of the EIT Knowledge and Innovation Communities (KICs) educational activities,

- *Greenhouse* - the aim is to support students (MSc, PhD, PostDoc), alumni and researchers in the design of a first draft business model for a sustainable product or service idea in an informal and flexible environment.
- *Climate Business School* - In 2014 the Climate Business School was established with the aim to educate visionary global leaders to catalyse change for a sustainable environmental and economic future. Climate-KIC intends to fill a gap in the market by offering a leadership perspective on systemic integrated solutions based on fundamental applied knowledge drawn from the unique thematic platforms of Climate-KIC. Climate-KIC delivers executive education through a broad spectrum of short-duration courses to executives, business leaders, and functional managers.

Climate-KIC uses a network of 180 coaches that have been trained previously, therefore they are relying on the train-the-trainer concept. With the growth of the services Climate-KIC will use the intermediation of education provider institutions which will act as examination authorities and as validation intermediaries.<sup>40</sup>

This Action has also been implemented through Erasmus+, Key Action 2 Cooperation for Innovation and the Exchange of Good Practices, Sector Skills Alliances, Environmental Technology. Since 2014, some 59 projects (443 organisations) have been supported at the amount of €54.2m

Beneficiaries of these initiatives include entrepreneurs (start-ups), young urban professional people and graduates (Master, PhD). The Accelerator has supported around 400 start-up teams per year. In 2015, the external funding raised by start-ups amounts to €68m. Since the start of the *Journey* in 2010 there have been eight journeys and more than 300 students from 22 cities, 50+ nationalities who have worked on over 50 climate change business ideas with a number of them launching successfully in the market. Since the start of the *EIT-labelled Masters* and PhD programmes there have been more than 250 Master students from 42 nationalities and more than 160 PhD students from 34 nationalities. Since the inception of *Greenhouse* there have been more than 100 teams with more than 300 budding entrepreneurs. *Erasmus+* targets the following types of beneficiaries: ICT-start-ups/spin-offs - culture/tourism - life science and health - medical/pharmaceutical studies - circular/bio/green economy/energy - engineering - manufacturing, logistics, transport - management of Career, skills/competences, coaching - well-being and health at work - social/commercial entrepreneurship - PhD/postdoc.

- *Verification of performance of eco-innovative technologies* has been another important element of the GAP ([Action 22 in GAP](#))

The confidence boost in eco-innovation and reduction of investment in risk has been promoted through the Environmental Technology Verification (ETV) programme. Launched in 2011, **the European ETV programme** has been an important tool helping environmental technologies to reach market. The Pilot phase ended in December 2016. The ETV programme evaluation will be finalised in the first half of 2018 and will drawing conclusions on the best way forward. Since its launch a total of 17 verifications have been completed, 62 technologies have initiated the verification process and 175 applications have been submitted. The verifications have been issued in the three technology areas of the Pilot Programme: 'Materials, Waste and Resources', 'Water Treatment and Monitoring', and 'Energy Technologies'. The market support offered by ETV is viewed as particularly

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<sup>40</sup> Interview with Ebrahim Mohamed, Climate-KIC

useful for SMEs: of companies submitting a technology for verification, 90% are SMEs and over 50% are micro-enterprises.<sup>41</sup>

*Objective II.2 Facilitate business partnering, skills and knowledge for green entrepreneurship*

**Who has benefited so far?**

Entrepreneurs (400+ start-ups), young urban professional people and graduates (over 700 students and graduates), 443 organisation participants of Erasmus+, 17 companies whose technology got verified

**Who are the stakeholders?**

Climate KIC Partners network including research, business and technology organisations (e.g. Universities, city authorities, corporations, consultancies), 180 coaches in green entrepreneurship, business model innovation, technology verification bodies including experts in the field, specialised agencies and authorities.

**3.2.2.3 Objective II.3 Better Exploit the role of clusters in support of eco-innovative SMEs**

This objective is intended to be addressed through *integrating the resource efficiency topic into the training on cluster excellence (Action 25 in GAP)*. This has been implemented by introducing the resource efficiency focused sub-module into the training programme “The Essence of Cluster Excellence Management” of the European Foundation for Cluster Excellence (EFCE).<sup>42</sup>

- The core focus of the training programme is on value chain management. It teaches how to address strategic challenges, use strategic management tools, increase attractiveness of business and their fit into value chain. There are five core modules and six elective modules in the module (see Table 3-3) in the 2,5 days programme. One of the topics within the elective module is focused on the resource efficiency in clusters (Module 8 “Project Management for Clusters”, session “Resource efficiency in clusters”). The Resource Efficiency session lasts for half a day (3-4h) and focuses on building a capacity and knowledge/awareness of cluster managers in area of resource efficiency, familiarises with the resource efficiency challenges, presents the economic and environmental benefits and business opportunities associated with resource efficiency. It is assumed that the cluster managers would become more aware about the topic and motivate the companies in their cluster to think about resource efficiency.
- Case studies are at the core of the training programme. In doing that the methodology of the business schools is used, where case studies are an important tool for teaching. For the resource efficiency session, the case study based on Clusterland Upper Austrian, which is one of the leading clusters in Europe, and which have managed to integrate the energy and resource efficiency as a horizontal support activity in their package of services is used.

<sup>41</sup> ETV Newsletter, Issue N09 – January 2017

<sup>42</sup> [www.clusterexcellence.org](http://www.clusterexcellence.org)

Table 3-3: EFCE training modules for the cluster managers

CORE MODULES				OPTIONAL ELECTIVES		
Core of Content		Knowledge Area	Concepts and/or techniques	Knowledge Areas		Concepts and/or techniques
	Module 1	Cluster Economics	Location theory, Industrial Districts, Clusters, Innovation Systems	Module 6	Change Management	Individual Behavioral Change, Group Change, Communication Strategies, Presentation Skills, Creativity and Traditional Industries
	Module 2	Cluster Initiative Screening	Statistical Cluster Mapping, Cluster Initiative Selection (Industry Analysis and Segmentation, Value Chain and System)	Module 7	Cluster Organization Management	Organizational structures, Non-profit Organizational Management, Pattern Identification, Governance Models
	Module 3	Industry Analysis and Segmentation	Industry Analysis (5 Forces), Strategic Segmentation	Module 8	Project Management for Clusters	Project Planning, Project Monitoring, Project Evaluation, Resource Efficiency in Clusters, Key Enabling Technologies
	Module 4	Value Chain Analysis	Value Chain, Local Value System, Global Value System	Module 9	Continuous Policy Input	Policy Review, Diamond Analysis, National and Supranational Competitive Framework
	Module 5	Benchmarking and Internationalization of SMEs	Advanced Buyer Purchase Criteria, Key Success Factors, Value Chain Activity Benchmarking	Module 10	Cluster Policy Evaluation	Cluster Management Evaluation, Cluster Policy Monitoring, Impact Analysis
				Module 11	Innovation Management & Assessment (with IMP <sup>3</sup> rove Academy)	Innovation Strategy, Innovation Organization and Culture, Innovation Life-cycle Management, Innovation Enabling Factors

Since introducing the elective module with the topic on resource efficiency in 2014 around six to eight trainings have been conducted by the EFCE. Around 45 participants, the cluster managers, have received knowledge in the resource efficiency topic. The final beneficiaries that are supposed to benefit from the knowledge applied and passed by the cluster managers are the SMEs.

*Objective II.3 Exploit better the role of clusters in support of eco-innovative SMEs*

#### Who has benefited so far?

Around 45 cluster managers who took part in the training. The final beneficiaries are SMEs, as well as the cluster organisations. However, the impact on activities of clusters and SMEs has not been monitored

#### Who are the stakeholders?

Cluster organisations are also the main stakeholders in the training programme as they are supposed to channel the knowledge to the SMEs members of their clusters.

### 3.2.3 Outcomes and lessons

Based on the insights about the initiatives associated with this Strand, one can conclude that the progress towards addressing the objective of the promotion of the green entrepreneurship for the companies of the future is on a good track. However, in many cases it is too early to expect a tangible impact.

The implementation of SME Instrument under H2020 (Action 14) has been advancing well judging by the number of SMEs which benefited from the SME Instrument and by the variety of innovative ideas within the projects. Although additional SMEs can be targeted to participate in the SME Instrument, the competition is already high, and the dissemination of results represents a key opportunity for enhancing resource efficiency and

eco-innovation in the SMEs. In addition, DG RTD and DG GROW could work with EASME to ensure that the coaching supported by this instrument is delivering information to potential beneficiaries on topics such as energy and resource efficiency. Monitoring and reporting can be further strengthened to ensure that projects deliver the expected resource efficiency and eco-innovation impacts.

The already funded projects are the immediate outcomes of collaborative R&D actions under H2020 (Action 15) while the concrete impact cannot be defined yet. Eventually, at the end of the projects, information could be extracted from the Final Report Key Performance Indicators (KPIs). An ex-post evaluation of the programme will need to be carried out in the future in order to assess the precise impact of the individual projects.<sup>43</sup>

Action 19 implemented mainly through Climate-KIC is on the right track with a big variety of initiatives going on at the same time. Nevertheless, there is a big opportunity for improvement. The independent evaluation of EIT KICs<sup>44</sup> proposes a number of actions that could be taken up such as: creating an EIT Academy; pursuing an education-specific self-sustainability strategy; cooperating more actively with external EU-wide stakeholders and/or 'visibility multiplier' organisations; furthering cross-KIC cooperation for the dissemination of good practices. Currently, it is not possible to assess the extent the above efforts have contributed towards the improvement of resource efficiency in enterprises other than the assumption that better educated professionals would trigger innovations which would subsequently improve resource efficiency. In order to be able to quantify the impact, it is necessary to significantly improve the monitoring and evaluation systems of the different KICs and other programmes.

The ETV Pilot Programme (Action 22) has enabled a large-scale experiment of ETV in near-real conditions. ETV has an important role to play in contributing to a more resource efficient and competitive economy through enhancing the quality and reliability of information on the performance of new environmental technologies arriving on the market. Being above all a proof-of-performance tool, ETV could be utilised to support performance-based legislation, to encourage better integration of eco-innovations in public procurement processes, or to complement or replace existing certification schemes. An Innovative Technology Verification scheme could even be established, opening the scope of validating the performance of new technologies to all innovations.<sup>45</sup>

Within Action 25 the objective of integrating the Resource efficiency into a training module on Cluster Excellence Programme has been fulfilled. The trained cluster managers have received the knowledge on possibilities for boosting the resource efficiency within their clusters, which contributed to the objective of increasing their awareness of resource efficiency opportunities for clusters. However, it is still not clear how this knowledge has been or is intended to be used. An important challenge in this activity is the limited interest of cluster managers in the topic of resource efficiency. Cluster managers do not see this as a priority topic for their capacity building. Given the options of the programme, they are likely to select other topics. The lesson coming from this experience is that lack of awareness about specific issue seems to be leading to lack of interest, suggesting a need for a popularisation of the issues among the clusters through additional channels. Another challenge is the lack of clear monitoring system that allows to follow up on how the

<sup>43</sup> Interview with T. Turecki, DG RTD

<sup>44</sup> European Commission, 2017: Evaluation of EIT, Final Report, performed by ICF and Technopolis Group [https://ec.europa.eu/education/sites/education/files/2017-eit-interim-evaluation\\_en.pdf](https://ec.europa.eu/education/sites/education/files/2017-eit-interim-evaluation_en.pdf)

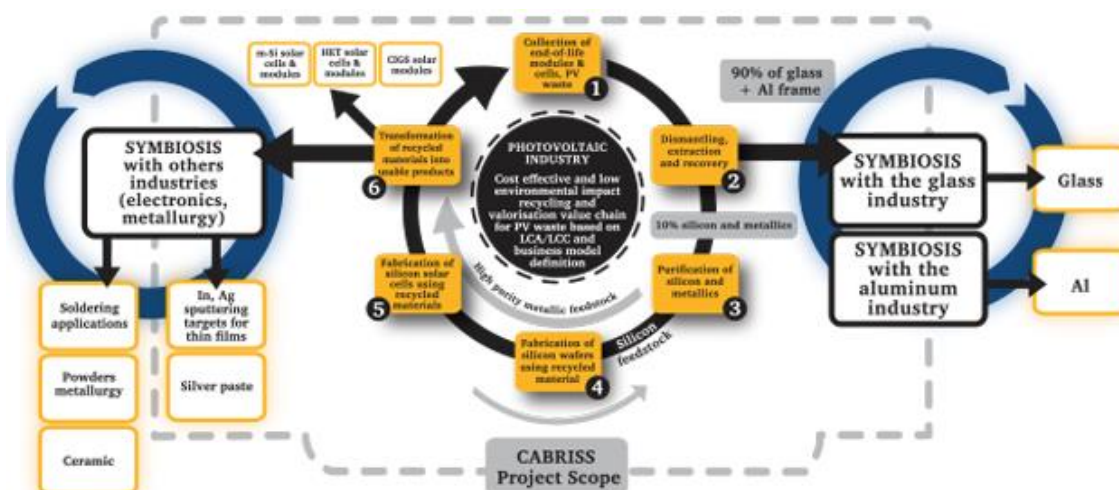
<sup>45</sup> ETV Newsletter, Issue N09 – January 2017



knowledge of Resource Efficiency is applied, where is it influencing any changes within the clusters.

**Good Practice "Implementation of a Circular economy Based on Recycled, reused and recovered Indium, Silicon and Silver materials for photovoltaic and other applications (CABRISS)"**

The main vision of CABRISS project is to develop a circular economy mainly for the photovoltaic, but also for electronic and glass industry. It consists of the implementation of: (i) recycling technologies to recover Indium (In), Silver (Ag) and Silicon (Si) for the sustainable PV technology and other applications; (ii) a solar cell processing roadmap, which will use Si waste for the high throughput, cost-effective manufacturing of hybrid Si based solar cells and will demonstrate the possibility for the re-usability and recyclability at the end of life of key PV materials. The developed Si solar cells will have the specificity to have a low environmental impact by the implementation of low carbon footprint technologies and as a consequence, the technology will present a low energy payback (about 1 year). The originality of the project relates to the cross-sectorial approach associating together different sectors like the Powder Metallurgy (fabrication of Si powder based low cost substrate), the PV industry (innovative PV Cells) and the industry of recycling (hydrometallurgy and pyrometallurgy) with a common aim : make use of recycled waste materials (Si, In and Ag). CABRISS focuses mainly on a photovoltaic production value chain, thus demonstrating the cross-sectorial industrial symbiosis with closed-loop processes.



Source of image and further information about the CABRISS project at <https://www.spire2030.eu/cabriiss>



### **Good Practice "Zurich Climathon" – Climate KIC**

*Climathon is one of the initiatives of Climate-KIC that brings together the challenges of the cities with the people who have the passion and ability to solve them. Participants come with their ideas & develop them during 24 hours. Jury of relevant local stakeholders will select best idea in each city.*

*In Zurich Climathon six winning teams had the opportunity to present their solutions to city officials and discuss the potential of future collaboration. The teams were given five minutes each to present their solutions. Then teams had the opportunity to give an in-depth explanation of their idea in a marketplace style environment, where interested parties could find out more about the ideas presented and discuss the opportunity of collaboration.*

**Foodshelf** - An app that allows the uploading of pictures of food that is not being consumed anymore to a virtual shelf. In this way it makes it available for other people leading to less food wastage.

**Moss Cape** - Street lamps wrapped in moss can help bear the summer heat and clean the air at the same time. The installation of flexible moss fabrics will decrease the average temperature within urban heat islands through so called evaporative cooling.

**One Team** - A collaboration platform that connects interested citizens with projects and companies. The application makes it easy for people to find and participate in, or co-organise, climate-related projects in their area.

**Encom** - Investing in new heating systems demands upfront investments that are not always available for the owners of private homes. By offering an interesting investment opportunity to a group of small scale investors, the aim is to collect the money needed to finance heating systems in private homes.

**Green together** - An app that shows travel options with different means of transportation in Zurich. It provides information about the distance and time of travel, CO2 emissions, calorie consumption, and price difference. Points will be rewarded if the journey has reduced CO2 emissions.

**Y7K** - Max is a personal foodie-bot that give recommendations on what and where to eat to reduce your carbon footprint. It is possible to save up to 100,000kg of CO2 emissions. Max will even take into account any dietary and allergy requirements, too, as well as sending seasonal recipes and giving advice on what to do with your leftovers!



Citizens around the world take direct climate action by coming up with innovative solutions to local climate change challenges



Students, start-ups, entrepreneurs, big thinkers, technical experts and app developers meet simultaneously for a 24-hour marathon session



Locations include major universities, research centres, government facilities and corporate offices around the world

Source: <http://www.climate-kic.org/news/zurich-climathon-winners-meet-city-officials-present-climate-solutions>

**Good Practice "Certified Professional Competency Framework of Climate-KIC"**

*Climate-KIC has launched the development of a competency framework for societal challenges including climate change and energy. It aims to fill in a gap in professional skills oriented to the future such as creativity, systemic thinking, trans-disciplinary communication, and inspirational change management capabilities. These skills and competencies are not formally taught at universities but future job markets require them. The initiative provides a standardised framework for recognition of these competencies. Key functions to foster systemic innovation include innovation, entrepreneurship, transitioning and management. The Universal Competence Framework incorporates a model of performance at work that defines the relationships between competency potential, competency requirements and competencies themselves.*

*Certified Professional will build a generic database of competencies, which can be applied across the EIT community and beyond.*

*The main working areas include:*

- *System analysis and problem definition;*
- *Visioning and defining goals;*
- *Seeking change and experimenting;*
- *Strategic network and communication;*
- *Monitoring and adaptation*

*The generic competency database serves as a basis for the development of specific competency frameworks also for challenges in the fields of "Health", "Demography", "Energy", etc. These competences are developed using courses which will follow an innovative learning approach with a mixture of work-based, online and in-class training. All courses will follow a learn-by-doing approach to ensure practical relevance.*

*Certified Professional was piloted by Climate-KIC in 2016 for one of the innovation functions (Accelerating Transitions). A full EIT and cross-KIC framework will be launched in 2017. The Certified Professional Competency Framework has been tested with 300-400 people*

*Source: Interview with Ebrahim Mohamed (Climate-KIC), and <http://www.certifiedprofessional.eu/>*

### 3.3 III. Opportunities for SMEs in a greener value chain

#### 3.3.1 Objectives and rationale

The following objective has been formulated to lead the actions under this strand:

**Objective III.1 Address systemic barriers to cross-sectoral and cross-national value chain collaboration and business creation and cooperation, by facilitating the creation of service business models and the re-use of materials, products and waste**

This objective has been set up because there is a big untapped potential for SMEs in terms of valorisation of their waste, access to cheaper secondary or shared resources via cross-business and cross-sectoral value chains, starting new economic activities through new business models based on remanufacturing, repair, maintenance, recycling, servitisation, industrial symbiosis, as well as eco-design of products. However, today SMEs have not managed to explore this potential because of the regulatory, institutional, technical and

cultural obstacles that represent systemic barriers. SMEs often simply lack knowledge on possibilities that waste can be a resource in a different value chain. They do not know other companies that could be interested in exchange of secondary resources and waste.

Several actions have been planned to address these problem from various perspectives starting from the analysis of the barriers to direct support for activities promoting circular and value chain innovations. The actions have a direct relevance to the circular economy agenda pursued by the EC. The present report focuses on the progress in the following actions:

- Analysis of barriers to, and potential of the circular economy, including SME aspects (Action 26 in GAP)
- Benchmark favourable conditions conducive for green industries in a region and carry out a "stress test" of the regional eco-system (Action 28 in GAP)

### 3.3.2 Progress in addressing the objectives of Strand III

#### 3.3.2.1 Objective III.1 Address systemic barriers to cross-sectoral and cross-national value chain collaboration and business creation and cooperation, by facilitating the creation of service business models and the re-use of materials, products and waste

In order to address the objective of this strand of the GAP, there is a need in the analysis of the systemic barriers impeding the deployment of circular business models by SMEs, the efficient use of materials from waste streams and industrial symbiosis processes.

The dedicated studies have been initiated to carry out these analysis (for Action 26), among which the study *"Scoping study to identify potential circular economy actions, priority sectors, material flows & value chains"*.<sup>46</sup> The Commission has used the findings of this study in the preparation of the revised package on the circular economy. The study provided an initial scoping assessment of potential priorities and policy options to support the transition to a circular economy in the EU. The study identified potential priority areas for action where accelerating the circular economy would be beneficial and where the EU policy has a particular role to play, and developed policy options for consideration across a range of areas. It also discussed the general barrier to circular economy.

A further study under the focus on this Action is *"Socioeconomic impact of increased reparability"*.<sup>47</sup> Published in 2016, it has analysed impacts of applying reparability requirements on four specific product groups in product policy instruments. The study demonstrated that *the economic impacts* will be in the slowing down of the turnover growth for manufacturers, who are largely placed outside the EU. On the other hand, the gains of turnover on the repair sector will occur largely on SMEs and social enterprises located in the EU. The assessment also shows positive *social impacts* for the EU. As in the case of the economic impacts, there will be some reductions in the projected increase of jobs, part of which will occur outside the EU. However, a significant amount of jobs will be created in the repair sector, most of those in SMEs. Overall the *environmental impacts* are shown to be neutral to positive, but with some clear gains of resources. Many other references explored in this study showed that the extended durability lead to clear positive

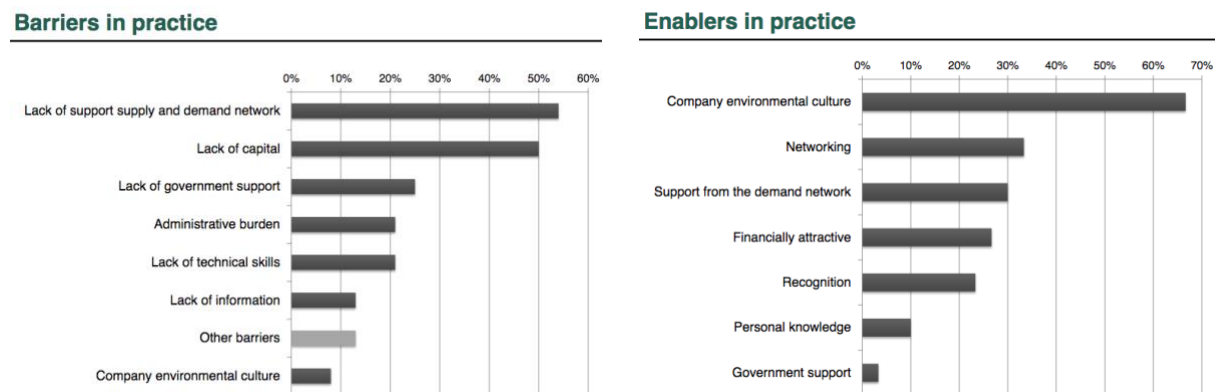
<sup>46</sup> [http://www.ieep.eu/assets/1410/Circular\\_economy\\_scoping\\_study\\_-\\_Final\\_report.pdf](http://www.ieep.eu/assets/1410/Circular_economy_scoping_study_-_Final_report.pdf)

<sup>47</sup> <http://bookshop.europa.eu/en/study-on-socioeconomic-impacts-of-increased-reparability-of-increased-reparability-pbKH0216507/>

environmental impacts, not only in relation to the use of resources but also with regards to abiotic depletion of elements, freshwater eutrophication and ecotoxicity.

The analysis of barriers to and drivers of adoption of the circular economy business models by SMEs has been addressed in the following studies. One of them was an initiative of GreenEcoNet project. Charts below present the results of the GreenEcoNet project study<sup>48</sup> based on the analysis of 30 business case studies from various sectors.

Figure 3-3: Circular economy business model barriers and enabler, GreenEcoNet study results



source: GreenEcoNet/ Rizos et al 2016.

The earlier mentioned scoping study on identifying a potential for circular economy<sup>49</sup>, also discussed the barriers to circular economy on wider perspective without a focus on SMEs. It is in line with the finding of GreenEcoNet, but it further highlighted such barriers as resource price, shortfalls in consumer awareness and their still limited acceptance of new service-oriented business models, insufficient waste separation at source, lack of policy coherence, and widespread obsolescence in products.

Another study focused on the in-depth analysis of *regulatory barriers to circular economy* development taking a value chain perspective in a 10 cases' analysis<sup>50</sup>. Regulation is one of the important determinants of the framework conditions and certainly defines the behaviour of the companies. The study suggests that high-quality recycling is not prevented by regulatory obstacles, but there are legal uncertainties (e.g. lack of end-of-waste criteria and of quality standards for secondary raw materials) that motivates companies to continue to focus on primary raw material input.

On **Action 28** assuming the benchmark of favourable conditions conducive for green industries the European Cluster Observatory has pursued a number of activities to address this objective. It developed *the methodology for the analysis of the cluster specific framework conditions conducive for the development of emerging industries*. It follows the

<sup>48</sup> "Implementation of Circular Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers", available at <http://www.mdpi.com/2071-1050/8/11/1212/htm>

<sup>49</sup> [http://www.ieep.eu/assets/1410/Circular\\_economy\\_scoping\\_study\\_-\\_Final\\_report.pdf](http://www.ieep.eu/assets/1410/Circular_economy_scoping_study_-_Final_report.pdf)

<sup>50</sup> Regulatory barriers for the Circular Economy: Lessons from ten case studies, Published on: 10/11/2016, available at: [http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item\\_id=8986&lang=en](http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8986&lang=en)

methodology developed for the Regional Ecosystem Scoreboard<sup>51</sup> that identified six key regional framework conditions of regional business ecosystems, including

- entrepreneurial conditions
- regional collaboration and international linkages,
- highly-skilled knowledge base,
- access to finance,
- demand conditions
- regulation

This methodology was applied by the European Clusters Observatory in the analysis of several emerging industries. One of them is the *study analysing the industry and cluster-specific framework conditions relevant for the development of emerging industries and clusters in the area of circular economy*<sup>52</sup>. The study specifically investigated the importance of these framework conditions for better integration and diffusion of *recycling, re-use, remanufacturing, repair/maintenance, sustainable product design, circular and resource saving business models*, which are the key activities or pillars of the circular economy. The results of the study are summarised in the box below:

*Figure 3-4: Framework conditions relevant for the development of emerging industries and clusters in the area of circular economy*

*Findings of the Clusters observatory study analysing the industry and cluster-specific framework conditions relevant for the development of emerging industries and clusters in the area of circular economy:*

- *Entrepreneurial conditions:* entrepreneurial conditions are considered to be most important for business models and sustainable design and of (generally) lesser but similar importance for recycling, re-use, remanufacturing, repair/maintenance.
- *Regional collaboration and international linkages:* For an emerging sector like circular economy, the focus seems to be directed more inwards than outwards. Regarding specific activities of the circular economy, this factor is again considered to be most important for sustainable design and business models for resource efficiency.
- *Highly-skilled knowledge base:* For circular economy in general and across all activities the knowledge base seems to be the most critical and central issue. This might be due to the fact that circular economy activities require new combinations of skillsets, which at present might not be easily available on the labour market
- *Access to finance:* While finance is considered to be of importance for all circular economy activities, the consultation with stakeholders shows that for recycling it has the highest relevance. This might be explained by the fact that especially for recycling, large investments in infrastructure are necessary.
- *Demand conditions:* For sustainable design and business models for resource efficiency demand conditions seem to play a relatively more important role than for the other activities. For repair and maintenance, the importance is considered to be lowest in comparison. This is an interesting result as one might expect that for this activity demand conditions are rather important as there is – for instance in comparison to business models – a more direct link between the activity itself and (customer) demand.
- *Regulation:* Presence of good and adequate regulations is a framework condition that a majority of respondents considers important. Some differences can be made out with regard to the different circular economy activities. Sustainable design and business models are the activities for which regulation is considered to be of greatest importance. For remanufacturing and repair and maintenance it is considered less important in comparison.

<sup>51</sup> Regional Ecosystem Scoreboard – Methodology Report is available on <http://ec.europa.eu/DocsRoom/documents/17983>

<sup>52</sup> [ec.europa.eu/DocsRoom/documents/16266/attachments/1/translations/en/renditions/native](http://ec.europa.eu/DocsRoom/documents/16266/attachments/1/translations/en/renditions/native)

Report also provides a set of recommendations for cluster managers on how to promote the circular economy, both in the activities of the companies in their cluster and in the regional strategies.

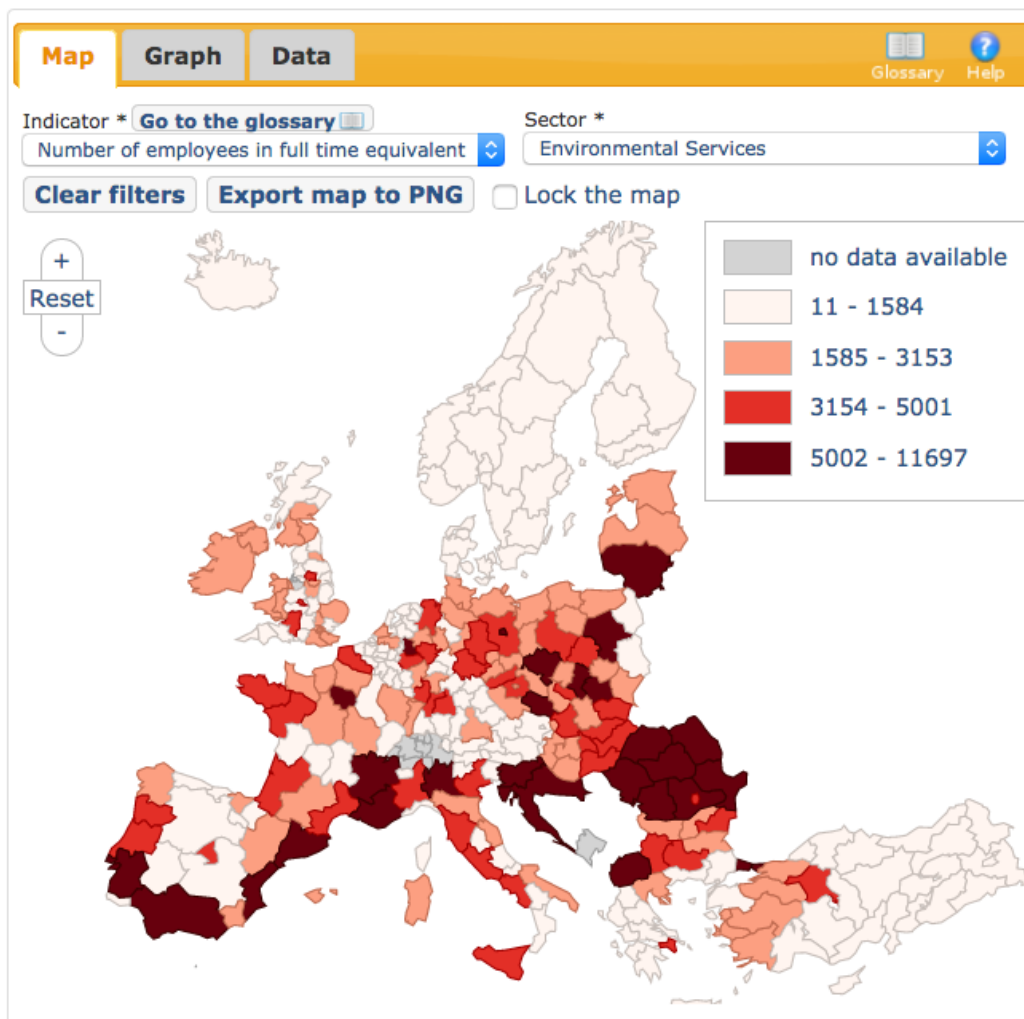
Link to the study:

[ec.europa.eu/DocsRoom/documents/16266/attachments/1/translations/en/renditions/native](https://ec.europa.eu/DocsRoom/documents/16266/attachments/1/translations/en/renditions/native)

Furthermore, The European Cluster Observatory has developed a *better regional mapping of geographic concentrations of competences* in 51 traditional and 10 emerging industries, among which are eco-industries and environmental services that are of interest for this reports and for the EU SME Green Action Plan. The interactive map is available on [https://ec.europa.eu/growth/smes/cluster/observatory/cluster-mapping-services/mapping-tool\\_en](https://ec.europa.eu/growth/smes/cluster/observatory/cluster-mapping-services/mapping-tool_en).

The industrial strength of cluster development is illustrated by *Cluster stars indicators* that reveal the presence of critical mass depending upon the cluster's size (via N of employees), the degree to which it is specialised (Location Quotient) and how productive it is (measured via wages and salaries). An example of a visual presentation of the mapping for specific industry and indicator is presented below.

Figure 3-5: Regional mapping of geographic concentrations of competence, developed by the European Clusters Observatory

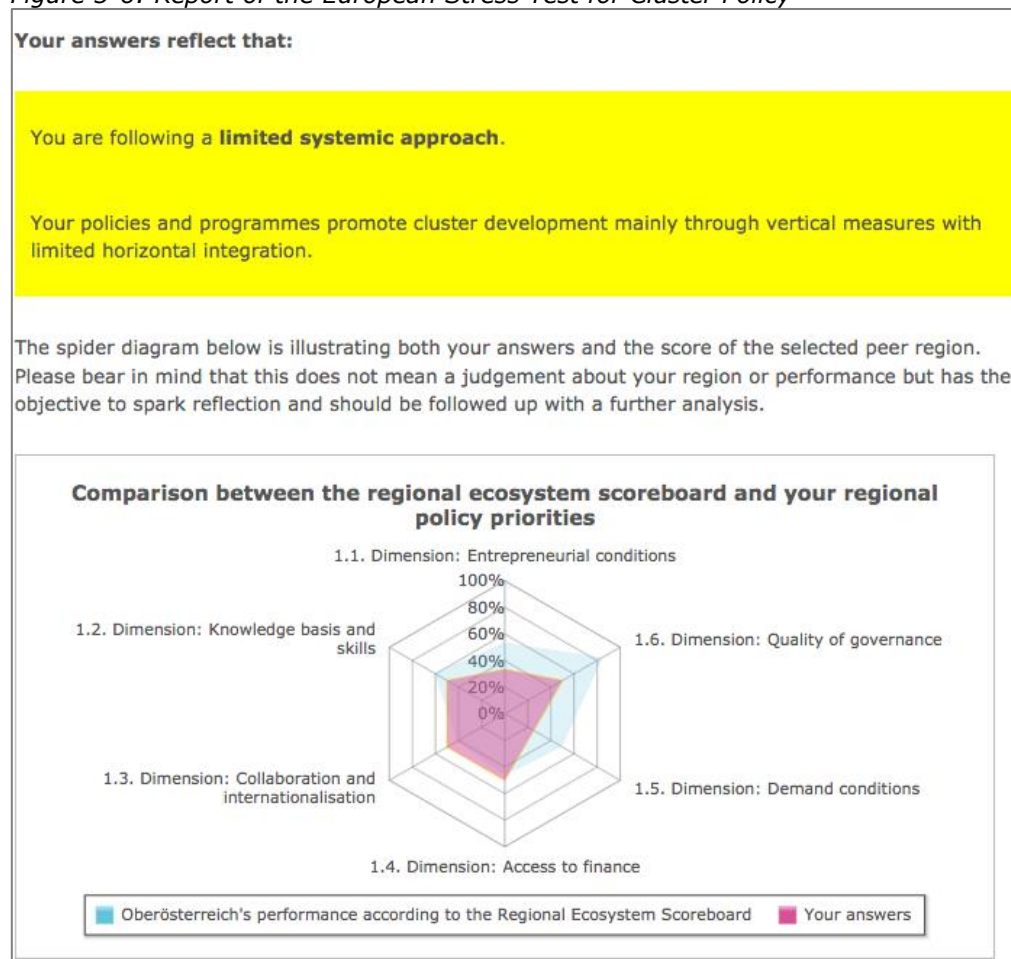




The Hotspot Indicators included in the map can inform about geographic locations and the number of the Cross-Sectoral clusters and Emerging Industries in the regions of EU. Industries and regions can both be selected to visually display and compare cluster strengths and developments over time. Together with more than 20 other regional indicators, it offers a key tool for analysing local competitiveness.

The Clusters Observatory has also launched the *self-assessment tool "European Stress Test for Cluster Policy"*<sup>53</sup>, which offers a preliminary analysis of whether cluster policies are geared towards improving framework conditions and supporting cross-sectoral cluster collaboration with a view to facilitating structural change and the development of emerging industries. The tool allows to spot possible disparities between the weaknesses of individual parts of the regional eco-system as identified by the Regional Ecosystem Scoreboard, the priorities of the regional policy and the extent to which these individual policy orientations may be perceived as elements of good cluster policy. The Stress Test has been recently finalized and have been used in the assessment of the six model demonstrator regions selected under the European Cluster Observatory initiative. Example of the report provided by the Stress Test is presented below.

Figure 3-6: Report of the European Stress Test for Cluster Policy

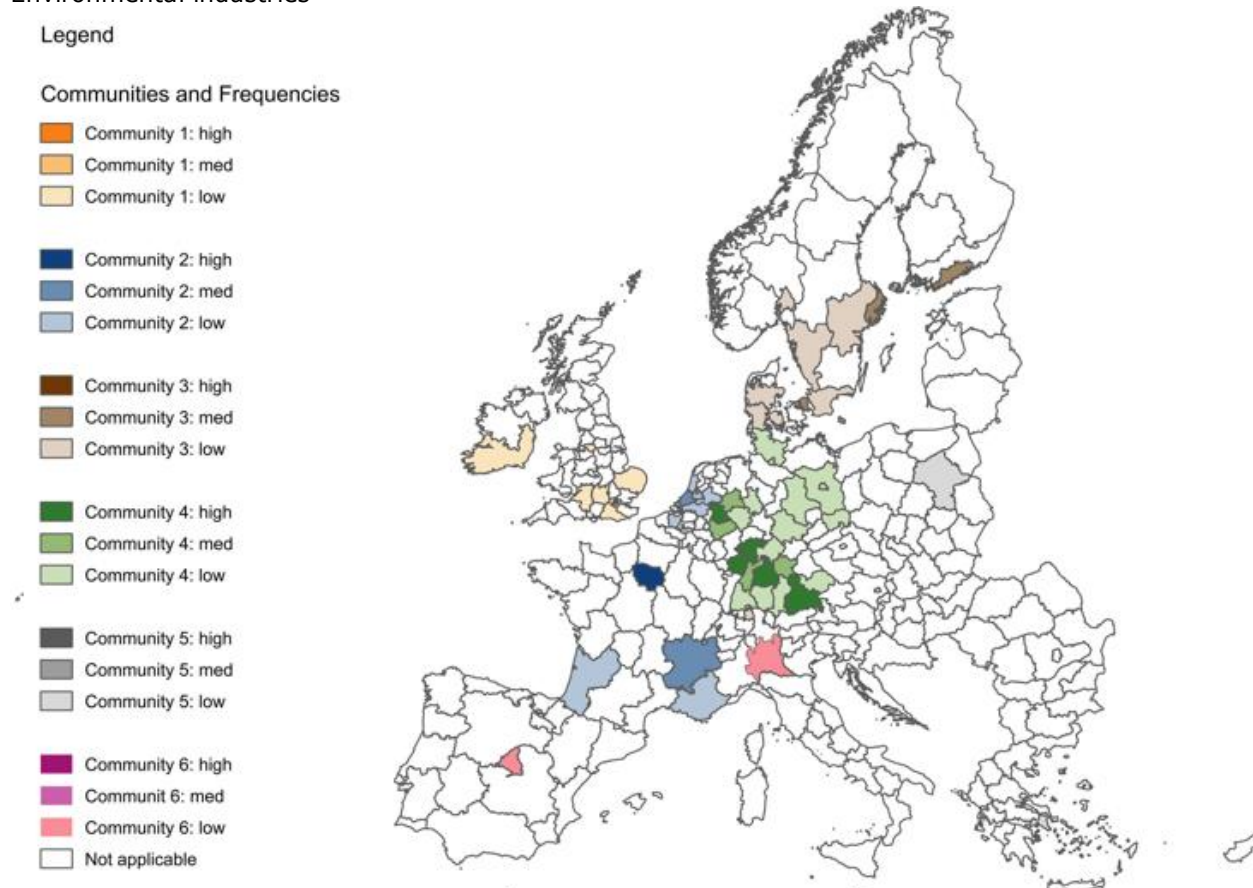


Source: European Clusters Observatory: Stress Test

<sup>53</sup> <https://ec.europa.eu/growth/smes/cluster/observatory/cluster-policy/stress-test>

In *analysis of cross-sectoral clustering trends, internationalisation and transformation*, the European Clusters Observatory has implemented a set of studies focusing on trends in emerging industries. The *environmental industries were a focus of a dedicated study*<sup>54</sup>, which captured signals of cross-sectoral linkages among the core industry and other industries, and identified geographic concentrations of cross sectoral spill-overs. The study demonstrated that these industries seriously rely on cross-sectoral collaboration and have high interdisciplinary nature. For example, in the case of recycling, the most dynamic links shown in joint patenting were found with semiconductors, audio-visual technology and pharmaceuticals industries. Alternative energy industry are strongly linked with nano-technologies, electrical machinery, and digital communication industries. In mergers and acquisitions, environmental industry companies tend to acquire companies in semiconductors, electronics, biotech, household products, and being bought by petrochemicals, textile, food and transport and infrastructure companies. In joint venture creations, environmental industries tend to go with oil and gas, electronics and construction. The study has also identified the regional hotspots in Environmental industries, which are presented in the map below.

Figure 3-7: Map of regional hotspots and communities showing cross-sectoral dynamics in Environmental industries

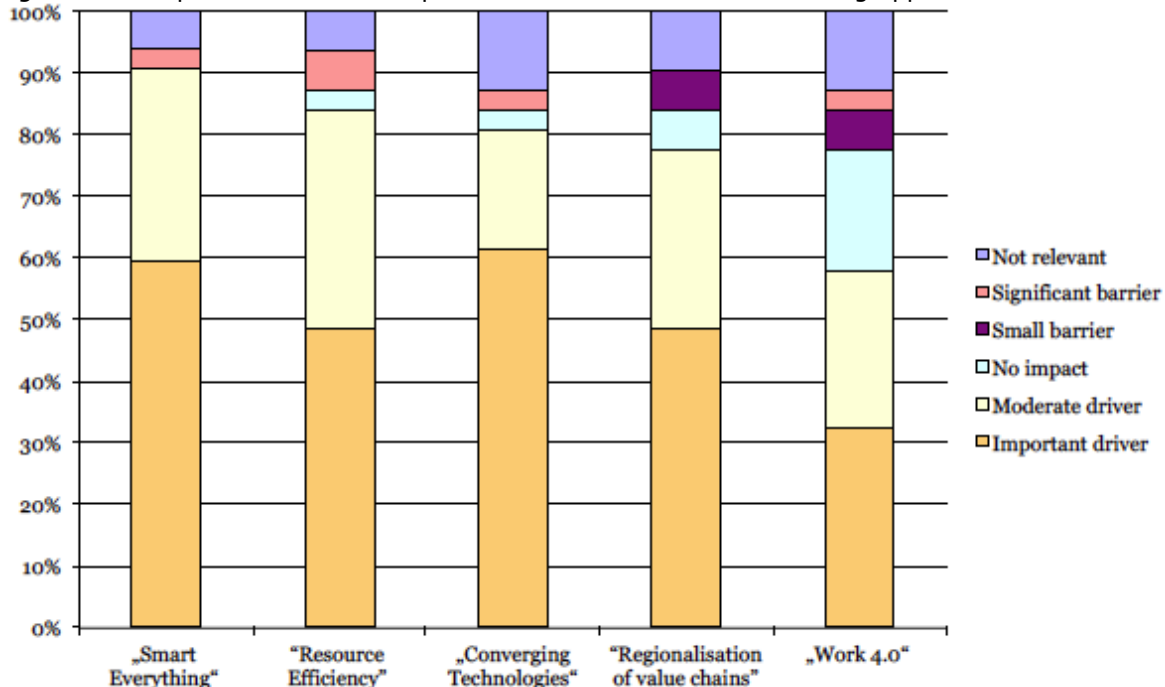


Source: European Clusters Observatory, study "Cross-sectoral Trends and Geographic Patterns in Environmental Industries"

<sup>54</sup> "Cross-sectoral Trends and Geographic Patterns in Environmental Industries" published in October 2014, available at <http://ec.europa.eu/DocsRoom/documents/10043>

In the *Foresight report on industrial and cluster opportunities* of the Cluster Observatory<sup>55</sup>, resource efficiency has been identified as one of the important challenges and also a promising and dynamic area of industrial transformation and cluster-development, collaboration patterns and value creation (see Figure below).

Figure 3-8: Importance of the five prioritised trends for cross-clustering opportunities



Note: based on the survey of cluster managers implemented within the “Foresight study on industrial and cluster opportunities” for the Cluster Observatory

Based on the expert interviews, the results of the survey amongst cluster managers and output from other work strands of the European Cluster Observatory, three thematic topics for further discussion at the foresight workshop were selected including Resource Efficiency. Resource Efficiency was among the two considered to be the most important drivers of cross-clustering opportunities by the survey respondents and foresight workshop participants. Subsequent horizon scanning largely supported the identified findings, while the scenario development exercises provided a better understanding of driving forces and the ways in which they may interact, and thus be able to make better informed choices in the present.

### 3.3.3 Outcomes and lessons

This strand of the GAP focuses on greening the value chains for building the circular economy. In this study we focused only on the Actions that create knowledge that can potentially be used for policy analysis and decisions. There is a wide scope of activities ranging from the analytical studies to benchmarking tools and mapping, the policy impact of which is not easily traceable. Nevertheless, there seem to be an agreement on the usefulness of these products in terms of enriching the knowledge base and understanding of the conditions in which circular economy can thrive.

<sup>55</sup> Foresight report on industrial and cluster opportunities, published in August 2015, available at: <http://ec.europa.eu/DocsRoom/documents/16264/attachments/1/translations>

Prioritising the Circular economy in the overall economic policy of the EU, as well as in the Members States, created a need for a deeper understanding of the opportunities it offers in various sectors especially for SMEs, as well as in cross sectoral value chains. Policy makers at various levels (EU, national, regional, local) are willing to learn how they can promote circular economy business practices that can also strengthen the economies and create jobs. The studies conducted under [Actions 26](#) discussed in this chapter have contributed to filling this knowledge gap and starting an understanding of the barriers to and enablers of circular economy. The analysis produced in one of the studies has been helpful in providing the European Commission with a solid evidence base necessary for revising the Circular economy package in 2015. This can be seen as an example of a practical contribution to the policy making process. However, the implications of the studies on national or regional policy practices have not been closely tracked. Nevertheless, since the studies are openly accessible online and have had extensive publicity at the European level, we expect that the policy makers in the Members States have an opportunity to look into them and may find them useful in adopting policy and regulatory frameworks to support circular economy practices.

The genuine interest of governments in circular economy model is growing and so is the need for a good understanding of opportunities in all industries. The existing knowledge (including the studies mentioned here) is growing, but not yet sufficient to provide a solid perspective across industries. Until now, a very limited range of sectors have been covered and not all barriers have been investigated. There is a lack of real life examples of strong circular economy business models, hindering the evidence-based research and policy developments in this topic. One of the lessons and point for action is to further promote the research of circular economy business opportunities and barriers in wider selection of sectors. Linking policy needs with the academic research agenda will stimulate needed knowledge generation in evidence-based format.

In addressing the objective via [Action 28](#), the European Clusters Observatory has so far played a major role. Its foresight study has confirmed the high importance of the resource efficiency as a driver for cross-clusters collaborations. The findings of its study on cross sectoral collaboration trends and new specialisation patterns in European environmental industries allow policy makers and cluster practitioners to see where and what new value chains related to the circular economy activities are emerging in order to facilitate further policy efforts in this regard. It was also expected to contribute to improving the implementation of regional smart specialisation strategies, as well as to help European regions identify cross sectoral and cross border collaboration opportunities. Whether such collaboration emerged as a result of the mapping have not yet been investigated and can be a possible subject for future activities under the Cluster Observatory Project.

Cluster Observatory has also provided insights based on the study benchmarking framework condition, which are relevant for the development of circular economy activities in the regional clusters settings. Availability of knowledge and skills has been shown to be the most important condition for the emergence of circular economy activities, while demand, access to finance, regulation, entrepreneurship, education and collaboration were rated to be of similar or relatively high importance. The study produced a set of policy recommendations for fostering circular economy as an emerging industry and better implementation of regional smart specialisation strategies. While the study found a great interest among the stakeholders partly due to their involvement in the survey, the practical implications still need to be explored.

The Cluster Observatory Stress test has drawn some interest, but since it was introduced relatively not long ago it is too early to evaluate the practical impact of this tool. It has

been used in the assessment of the six model demonstrator regions selected under the European Cluster Observatory initiative, but the results are still to be seen. There is no information on how many cluster policy-makers might have used it outside of the project yet. Furthermore, this Stress Test does not address resource efficiency or the circular economy directly and even indirectly, it is hard to find the links. The tool can help regional policy-makers to test whether their policies are aligned towards emerging industries, which eventually can also mean eco- or circular economy industries.

### 3.4 IV. Access to the markets for green SME

#### 3.4.1 Objectives and rationale

This strand of the Action Plan pursues the following objectives:

**Objective IV.2 Facilitate access to international markets for green entrepreneurs**

**Objective IV.3 Facilitate the uptake of resource efficiency technology in partner countries through cooperation with European SMEs**

The rationale behind these objectives is the fact that the large share of European green technology SMEs, while having a leading expertise and technologies, are very rarely present in foreign markets. The demand for environmental technologies is growing globally, and therefore there is a very big potential for the European SMEs in foreign markets. This lack of SME internationalisation is usually explained by the absence of a supportive framework that can help SMEs access the foreign markets.

Achieving better resource efficiency in Europe and helping SMEs to successfully integrate into global value chains requires more international cooperation. To compete internationally, SMEs in the resource efficiency field need to look for international partners not only to sell but also to source raw materials, and gain access to research, knowledge or skills along the value chain. At the same time the EU also aims to promote sustainable economic development beyond the borders of Europe, by supporting clean technology uptake in other countries.

#### 3.4.2 Progress in addressing the objectives of Strand IV

##### 3.4.2.1 Objective IV.2. Facilitate access to international markets for green entrepreneurs

The European Union, as well as the Member States and their regions have been promoting internationalisation of the European industries and SMEs through programmes like EU – Gateway Business Avenues<sup>56</sup>, activities of the Chambers of Commerce and the Eurochambers, etc.

Among activities envisaged by the Action Plan has been the establishment of so-called *European Strategic Cluster Partnerships for Going International (ESCP-4i) in the field of green technologies* (Action 33 in GAP). Green technologies is one of the field of focus on Partnership. The [European Cluster Collaboration Platform](#) (ECCP) funded through the COSME programme has been supporting these activities on international cluster and business network cooperation and the promotion of ESCPs. Through the Clusters Go International (CGI) action, the COSME Programme has supported the establishment of 15 co-funded 1<sup>st</sup> generation ESCPs and 10 “voluntary” partnerships as alliances between

<sup>56</sup> <https://www.eu-gateway.eu/>




clusters from different sectors, with a view to develop and implement a joint strategy for internationalisation in 2016-2017. Together, the ESCPs bundles 150 cluster organisations across 23 European countries and more than 17,000 European SMEs. Given their cross-sectoral character, it is difficult to identify the share of SMEs that are active solely in green areas. However, many of the existing ESCPs focus on water, energy, clean-tech and natural resource efficiency, mobilising cluster partners and SMEs towards developing a common strategy to approach markets outside the EU in these fields. Moreover, the ESCPs act as “gateways” on both sides of the markets: for EU SMEs towards external markets, and vice-versa, for non-EU customers or investors towards the internal market.<sup>57</sup>

One of the European Strategic Cluster Partnerships of 1<sup>st</sup> generation is NATUREEF<sup>58</sup>, which has a resource efficiency focus. With the co-sponsorship from COSME programme it was set up in early 2016 to design and implement a joint strategy promoting cross-sectoral cooperation and facilitating the internationalisation of SMEs through SMEs mentoring and through the dissemination of their innovative technologies considering a new Natural Efficient Resource Concept.

During the first year, the project implemented exploratory activities before the implementation of the joint internationalisation strategy with the involvement of their cluster members. It prepared the consortium in NATUREEF territorial working groups (NTWG) focusing on Latin America, China, and the Philippines, which are in charge of the study visits, needs and challenges of the territories, and the search for an Ambassador figure, the person/institution that will represent the NATUREEF in the local area. They prepared the study visits and Cluster missions in Latin America, in Mexico, Peru, Colombia, China, the region of Fuzhian, the Philippines, Manila and surroundings areas.

*Figure 3-9: Team of the NATUREEF project and their SME outreach potential*



NATUREEF partners	SME membership
VEGEPOLYS (France)	280
INBIOM (Denmark)	700+
Biomastec (Germany)	17
Green Chemistry Cluster (Poland)	40
INNOSKART ICT Cluster (Hungary)	43
FEMAC (Spain)	37
CREA Hydro&Energy z.s. (Czech Rep.)	20
Green Synergy Cluster (Bulgaria)	28
Agrocluter Ribatejo	114

In January 2017 the VIBE-NATUREEF International Business Event was organised by the NATUREEF partners during the European Plant Production trade fair SIVAL in Angers. This event was the first step of introducing the 60 SMEs from clusters from 10 countries in the seminars where internationalisation opportunities were presented. Each participant had the chance to target one specific market between Latin America, China and the Philippines. During the seminars, the participants had the opportunity to learn about the challenges and needs of these second and third countries, in order to identify a combined business

<sup>57</sup> <https://www.clustercollaboration.eu/eu-cluster-partnerships/escp-4i/first-generation>

<sup>58</sup> <http://www.natureef.eu/introduction/>



offer and prepare the commercial missions. 120 attendees from 20 countries took part at a special networking session of this event. Furthermore, 230 B2B meetings of 30 minutes were carried out during six hours between 130 companies from 20 different countries.

The REINA Plus cluster partnership is a cooperation of four cluster organisations from Austria, Spain, Portugal and Finland that work on renewable energy. Its objective is to reinforce the internationalisation of European SMEs in selected renewable energy markets, to develop joint promotional activities and to integrate European SMEs into global value chains. One of the most successful mission of REINA PLUS was organised in Mexico. After the initial exploratory trips, the cluster partnership brought 13 SMEs from the four clusters to Mexico where the European firms could build business partnerships in the field of renewable energy. Further trade missions were organised in Chile and Colombia and are also planned for North Africa and North America.

The interim evaluation of the COSME programme performed in 2017 found that the Clusters Go International (CGI) action that funded the ESCPs is highly relevant and valuable to the needs of clusters to support SMEs in internationalising to their activities, both within Europe and beyond. At this stage, through the design and implementation of the common internationalisation roadmaps, the main achievements have been the clusters' improved understanding of the internationalisation process, as well as clusters' managers' enhanced capacity to support SMEs in internationalising. As an outcome a number of official European partnerships, as well as the first 'global' partnerships between the clusters have been created. The actions show good potential to lead to an improved strategic position in global value chains and an enhanced access to potential inward investors. Participants in the programme, however, face two significant hurdles for their internationalisation activities, i.e. the limited budget and the underestimated implementation timetable <sup>59</sup>

After the successful activity of a first generation of European Strategic Cluster Partnerships for Going International (ESCP-4i), the European Commission launched early 2018 a second generation of 23 co-funded EU Cluster Partnerships (ESCP-4i) for the period of 2018-2020. These initiative involves 123 cluster organisations across 25 European countries active in various industrial sectors, including energy and environment, smart cities, mobility and transport, agro-food and biotechnology providing a great space for focusing in sustainable innovations<sup>60</sup>.

*Objective IV.2. Facilitate access to international markets for green entrepreneurs*

**Who has benefited so far?**

European SMEs and cluster representatives that took part in the networking events, missions and study visits

**Who are the stakeholders?**

*European Strategic Cluster Partnerships for Going International consortia and the European Cluster Collaboration Platform*

*European Enterprise Network – helped in B2B meetings*

*EU Latin America Business Network (ELAN) – support in promotion around Latin America*

<sup>59</sup> Interim Evaluation of the COSME Programme, commissioned by DG GROW, <http://ec.europa.eu/DocsRoom/documents/28084>

<sup>60</sup> <https://www.clustercollaboration.eu/eu-cluster-partnerships/escp-4i/second-generation>

### **3.4.2.2 Objective IV.3 Facilitate the uptake of resource efficiency technology in partner countries through cooperation with European SMEs**

To contribute to this objective, the European Commission is funding *Low Carbon Business Action (LCBA) initiatives in Brazil and Mexico* (Action 38 in GAP). These two actions have a mandate to 'contribute to sustainable development and greening of Brazilian and Mexican industries through the adoption of low emission technologies.

Both Low Carbon Business Actions are structured according to the following dimensions, with a view to support the formation of business partnerships between European and Mexican / Brazilian companies for the development of low carbon emission technology. The main activities supported through the LCBA for both Mexico and Brazil are a sectoral market and technology analysis, communication and outreach activities and matchmaking missions as a key tool to facilitate cooperation opportunities between Mexican / Brazilian companies and EU SMEs.

*Expected Benefits for SMEs participating in LCBA missions in Brazil and Mexico include:*

- Advice and assistance in business development (for both EU and Brazilian and Mexican SMEs)
- Facilitation of exploring new opportunities for business cooperation
- Contribution to the low carbon economy and reduction of GHG emissions in Brazil and Mexico
- Stimulated technological innovation, competitiveness and sustainability of SMEs
- Increase export sales revenues
- Enhance prospects for the production and adoption of climate-friendly technologies, energy and resource-efficient processes
- Preparation for receiving EU technical assistance for the development of Cooperation Partnership Agreements within the LCBA Brazil and Mexico (if eligible for project phase II)

Source: <http://www.lowcarbonbrazil.com>

The end goal of the projects is to establish Cooperation Partnership Agreements (CPA) that can facilitate the technology transfer from EU companies to Brazilian and Mexican companies and adapting the products to the Mexican and Brazilian customers. Joint research and technology development is not necessarily foreseen, but rather customisation of products.

Business modalities that are possibly to be established through the CPAs include: 1) Sale/Purchase agreements (import/export); 2) Establishment of partnerships for sales/distribution; 3) Mergers and Acquisition (M&A) deals; 4) Joint Ventures and investment partnerships; 5) Establishment of a production and manufacturing facility; 6) Agreements on knowledge exchange; 7) Joint technology research and development; 8) Agreements between SMEs cluster organizations and within corporate supply chains.

*Thematic focus of the LCBA Brazil*



**The LCBA Brazil Project** aims to foster the transition to low carbon economy of SMEs in Brazil in the following areas: energy efficiency in buildings and industry, industrial processes, solid waste management, energy, forestry, aquaculture, agriculture and biomass.

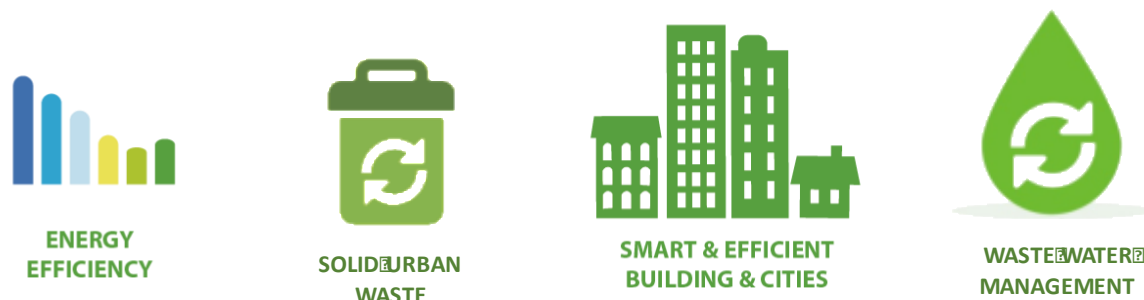
The objectives of the project are to engage 720 Small and Medium-sized Enterprises (SMEs) from Brazil and from the EU through

a series of Business Matchmaking missions to be held between May 2016 and February 2018. For this purpose, the Project seeks to identify and promote business partnerships between selected companies, and strengthen liaisons between industry clusters and other industry organisations.

The end-goal of the project is to establish 80 Cooperation Partnership Agreements for better competitiveness and environmental sustainability of the participating EU and Brazilian enterprises. As a follow-up of the agreements, companies will be assisted in developing bankable proposals in a second phase of the LCBA initiative.

**The LCBA Mexico project** aims to contribute to the reduction of CO2 emissions in Mexico and to generate cooperation opportunities in the sectors of solid urban waste, waste water management and energy efficiency in building construction and industry.

*Thematic focus of the MCBA Mexico*



The LCBA Mexico project hopes to identify potential partners in the targeted sectors in Mexico, carry out three online and five face-to-face matchmaking events in Mexico, to link more than 200 European organizations with Mexican enterprises and to achieve 40 cooperation agreements for the introduction of low carbon technologies in Mexico.

Both projects have carried out the mapping exercises and identified potential partners in the target sectors in Mexico and Brazil. Each project has developed a project website – [www.lowcarbon.mx](http://www.lowcarbon.mx) and [www.lowcarbonbrazil.com](http://www.lowcarbonbrazil.com) for willing participants to find information to apply and participate, upload their profile, register their interest in the events of the project and exhibit their projects to potential targets. Four matchmaking events and field visits under LCBA Mexico and five events including three days of 12-15 business meetings and personalised field visits under the LCBA Brazil were organised in 2016.

The LCBA Mexico first event gathered over 80 professionals and 50 Mexican and European companies. The companies participated in a total of 400 B2B/C2C meetings in 16 rounds. The identified opportunities will be monitored in phase two of the programme. At the end of 2016, there were already 37 cooperation agreements (CPAs) signed. There was no information on the mobilisation of beneficiaries in the three other events in Mexico.

In Brazil, the five Business-to-business matchmaking events organised engaged over 110 Brazilian SMEs and 70 European SMEs in total (see figure below). The last 2016 event was organised at the Polutech fair in Lyon, France, where 25 European SMEs met with 31 Brazilian SMEs, including SMEs and clusters.

*Table 3-4: Overview of LCBA Brazil missions, participants and CPAs*

Date	Sector	Location	Name of the Event	Brazilian SMEs	EU SMEs	Nr of signed CPAs
Aug 2016	Energy efficiency in Building	Sao Paulo, Brazil	Green Building Brazil	38	15	85
Oct 2016	Solid Waste Management	Sao Paulo, Brazil	FIMAI Ecomonido	21	11	41
Oct 2016	Biogas and Biomethane	Sao Paulo, Brazil	3 <sup>rd</sup> Forum of the Biogas industry	23	23	73
Nov 2016	Renewable Energy	Sao Paulo, Brazil	ELAN – EU Latin America Business Network Renewable Energy Conference	28	21	72
Nov 2016	Clean Energy	Lyon, France	Pollutec 2016 (1 <sup>st</sup> reverse mission)	31	25	95
<b>Total:</b>				<b>141</b>	<b>95</b>	<b>366</b>

Source: LCBA Brazil project documents (consolidated figures as of January 2017)

The latest available data on the progress of Action 38 in GAP shows that by the end of 2017, the LCBA actions have surpassed their targets considerably. 93 and 643 Cooperation Partnership Agreements have been signed in Mexico and Brazil respectively. In Mexico, after evaluation, 47 agreements are already receiving technical assistance. The evaluation of agreements in Brazil was ongoing at the end of 2017.<sup>61</sup>

The stakeholders involved in these projects included Clusters, SME Intermediaries in the EU, Brazil and Mexico; Chambers of commerce, environmental consultants from Brazil and Mexico. Measures to ensure involvement included the organisation of online matchmaking

<sup>61</sup> European Commission, GAP Actions state of play

prior to the on-site visit, which ensured the sectoral focus and fit of the applying companies. The participating SMEs were selected based on a sound mechanism of business intelligence and analytics matching companies according to their business, technology and environmental potentials. The involvement of the clusters supported the targeted mobilization of companies and increased the effectiveness of the outreach of the project. This was especially visible in the case of the LCBA Brazil participation at the Pollutec fair in Paris, France, where the participation of clusters had a positive impact on facilitating partnerships.

*Objective IV.3 Facilitate the uptake of resource efficiency technology in partner countries through cooperation with European SMEs*

#### **Who has benefited so far?**

Over 600 European SMEs, which have established Cooperation Partnership Agreements with Brazilian and Mexican counterparts opportunities

#### **Who are the stakeholders?**

Clusters, SME Intermediaries in EU, Brazil and Mexico; Chambers of commerce, environmental consultants from the EU, Brazil and Mexico.

### *3.4.3 Outcomes and lessons*

The NATUREEFF programme has shown notable progress with matchmaking activities between European SMEs and potential partners from Mexico, Peru, Colombia, China and the Philippines. While the overall satisfaction with the project achievements was positive, the partners felt it is too early to report on the more concrete outcomes such as concrete plans and cooperation agreements signed by the clusters or companies.

The LCBA programmes in both countries are proving 'extremely popular'. While they are still in the middle of the implementation period, LCBA Brazil reached **643 CPAs** signed between European and Brazilian companies by December 2017. Under the LCBA Mexico **93 CPAs** have been signed by end of 2017, with 47 of them already receiving technical assistance. Both LCBA actions exceeded their targets considerably.

Based on data available only by January 2017, circa 58% of the CPAs in Brazil involved concrete development projects (the rest are joint ventures) out of which it is believed that around 40% are rather expected to have a high level of feasibility. The results are not even across all domains, as traditional sectors such as wastewater treatment are more popular and there are higher needs, while technologies or services in the field of energy efficiency and renewables, or other applications like agriculture and industry are much less demanded. There is also an observed bias towards participation of companies from Latin language based EU countries in the case of LCBA Mexico, potentially due to the ease of making business in countries with similar languages. In the case of LCBA Brazil, there is a slight concentration of the EU companies' origin from Germany, Italy, France, but there are companies from Poland, Spain or Portugal that are also represented in the CPAs.

A *lesson learned* in the programmes is the importance of good preparation and collection of specific market intelligence in the first phases of the programme. The mapping phase of the LCBA Mexico was considered a good practice example for the quality of the Background study that has identified the business opportunities for the project. The interviewees

mentioned that, as the project started out with a very good background study to guide activities, the project implementation was successful and even exceeded expectations.

The partnership agreements directly target the commercialisation of European technologies, or cooperation on designing or implementation of improved environmental technologies in Brazilian or Mexican companies. This is directly relevant to the GAP *goal to facilitate the uptake of resource efficiency technology in partner countries through the cooperation with European SMEs*. Moreover, through the cooperation partnerships signed with Mexican and Brazilian SMEs, the European SMEs can enter new markets and increase their competitiveness. At the same time, the Brazilian and Mexican companies are able to better understand the conditions in Europe in the specific environmental technology fields they target, and, by cooperating with the EU partners, improve their own competitive position on the domestic markets.



## 4 Conclusions: Linking current impact and lessons to future actions

### 4.1 Overall conclusions

The study was set to overview the implementation of the Green Action Plan for SMEs with the focus on the selected Actions each addressing one of four Strands of the GAP and the objectives established there, demonstrate intermediate progress and outcomes, as well as draw lessons for future actions.

It should be noted that as the study has covered only 14 out of 39 Actions of the Plan, the conclusions should not be extended to the entire scope of the GAP. Hence, this section will present conclusions which should be endorsed in their relevance to the selected scope of 14 Actions.

The following are the overall conclusions on the quality of the advancement and outcomes of the Actions:

- The analysis has demonstrated a *notable progress* in the initiative set up under the selected Actions. None has had significant delay or failed in launching the planned activities
- All actions seem to be *on a right track in fulfilling the objectives* of the GAP Strands, some intermediary objectives have been achieved
- *Wider impact* from the Actions in terms of resource efficiency improvements on the ground or launch of circular economy business models are *still early to expect* at this point in time. In most of the cases a dedicated evaluation exercise of the initiative would be able to demonstrate the impact
- Not all initiatives under these Actions apply a system ensuring *regular and long-term monitoring of the progress, outcomes and impact*, neither do many of them use indicators for measuring and quantification of outcomes and impact.

### 4.2 Lessons for Actions of Strand I

The actions aiming at **“Greening SMEs for more competitiveness and sustainability”** address challenges behind the poor uptake by many SMEs and their reluctance to access the benefits of resource efficiency. Due to a lack of knowledge and information, many SMEs struggle to foresee relevant opportunities. The respective strand of the GAP addresses this challenge by increasing awareness, offering tailored technical and advisory support, self-assessment opportunities as well as networking facilities. These activities take place either directly (e.g. via the EU Resource Efficiency Knowledge Centre’s online tools and resources or EEN network), or indirectly through local SME support organisations and public agencies. This further includes targeted financing schemes for resource saving measures.

The scope and success of “Greening SMEs for more competitiveness and sustainability” will therefore substantially be determined by several factors, taking into account the different types of support structures, target groups and ways of dissemination of expertise, knowledge and other relevant information.

In summary, the lessons learned from the implementation of these projects, which are partially derived from personal interviews with stakeholders involved, at this stage are that it is essential to:

- Ensure a proper reach, accessibility, clarity and specificity of virtual platforms to be implemented and complement these in a balanced way with direct, individually tailored support, advice and networking structures;
- Monitor and facilitate the use and effect of self-assessment facilities for SMEs but also to provide broad, general expertise and knowledge, both on- and offline;
- Consider potential time-lapse and barriers to flexibility while disseminating knowledge and advice to SMEs through regional SME intermediary organisations (e.g. financial institutions, SME support providers etc.);
- Take into account the uneven distribution of support facilities among European regions and industry sectors, also including various types of stakeholders;
- Properly monitor and facilitate 'soft' dialogue and networking processes among stakeholders, in order to evaluate their success and to derive potential follow-up activities;
- Ensure efficiency in generating outputs per action, while minimising negative effects on competitiveness and, if applicable, avoiding direct market intervention;
- Develop simple processes to ensure high quality of data acquisition as well as monitor and evaluate the effects and results per action (which often remains challenging, according to stakeholders).

### 4.3 Lessons for Actions of Strand II

The actions under the Strand **"Green entrepreneurship for the companies of the future"** aim to cultivate innovation and entrepreneurship culture for fostering green, circular, resource efficient and sustainable economy. It does it via stimulating the SMEs to be involved in R&D activities, demonstration projects, boosting the trust to specific eco-innovative technologies via official verification programmes, encouraging green start-ups, building skills of SMEs and cluster organisations for eco-innovations. While the in-depth analysis and interviews showed that the activities have progressed well, there are lessons to be taken on board, as well as with the follow up actions for ensuring positive spillovers of knowledge and good practices generated under these initiatives. In proceeding with the initiatives, the following lessons and suggestions should be considered:

- Monitoring and reporting should be strengthened to ensure that projects deliver the expected resource efficiency and eco-innovation impacts. Training programmes should entail a follow up system allowing monitoring of how and whether the knowledge obtained during the training is applied and generating any impact.
- Dissemination and showcasing of the project results and best practices is one of the important ways of spreading the benefits of the programme across the wider SME's community, especially those who did not have the opportunity to directly benefit from the programme.
- It is necessary to ensure that the coaching supported by the SME support instrument is delivering information on topics such as resource efficiency and circular economy
- Cluster organisations and other SME intermediaries are seen as an important channel for passing the knowledge to SMEs and supporting them to grasp green opportunities. However, the case with the trainings programme showed that the

cluster managers often can under-prioritise the resource efficiency topic due to lack of awareness and not being able to see the gains. It is therefore important to use diverse channels for increasing the awareness of both clusters and SMEs about opportunities of the resource efficiency, greening and circular economy models. The new Resource Efficiency Knowledge Centre and the EU Cluster Observatory can play a significant role in this by outreaching cluster organisations, informing and mobilising them to support their customers to take up the new opportunities.

#### 4.4 Lessons for Actions of Strand III

Addressing the **“Opportunities for SMEs in a greener value chains”** has become a dedicated objective under GAP. Growing focus on transition to the Circular Economy model call for exploring the untapped potential for SMEs in remanufacturing, repair, maintenance, recycling, servitisation, industrial symbiosis, as well as eco-design of products. However, such activities mean entering new systems of value chains and redefining business models, which posed uncertainties and hesitation. Governments also need a solid understanding of the drivers and barriers to a circular economy in order to effectively promote circular business activities. Activities covered in this study focus on building such understanding though initiating in-depth studies and facilitating assessment of region’s opportunities by using the stress test tool. A few lessons and observations for further actions have been generated based on analysis of these activities:

- The current body of knowledge despite its rapid growth still lacks assessment and evidence of opportunities in many sectors. Therefore, it is important to further promote the research of circular economy business opportunities and barriers in wider range of economic sectors. In doing so, it will be useful to more closely connect academic research with policy needs, since academia is well equipped to supply evidence-based research and analysis.
- While using the Stress Test tool offers interesting analysis for regions, it is vaguely suited to address resource efficiency or circular economy opportunities related assessment. The potential actions for the upcoming activities under the European Clusters Observatory would be to incorporate the circular economy and eco-innovation dimension in the Tool in a more explicit fashion.
- Many relevant lessons and recommendations have been generated by studies of the Clusters Observatory (i.e. foresight, analysis of framework conditions, cross sectoral collaborations trends). It is not clear to what extent these lessons and recommendations are being taken on board by the regions, national governments or cluster organisations, but it is important to take them into consideration in the planning of further activities and initiative of the EC in the area of circular economy.

#### 4.5 Lessons for Actions of Strand IV

Promoting the **“Access to (international) markets for green SMEs”** from Europe was the core objective of the Actions analysed in this study. The programmes, especially the ones focused on collaboration with Mexico and Brazil have progressed very quickly in demonstrating solid outcomes in the form of the cooperation agreements signed between European and Brazilian or Mexican companies. The partnership agreements target the commercialisation of European technologies, or cooperation on designing or implementation of improved environmental technologies, which explicitly feed the objective under the GAP.

These projects can already offer many good practice examples of how to facilitate the cooperation and matchmaking of companies that can be taken up by the intended programmes targeting other world regions. They also drew lessons learned that will be helpful in future actions either in these programmes or in new or similar initiatives:

- A positive *lesson learned* in the programmes was the importance of good preparation including the specific market intelligence in the first phases of the programme. The mapping phase of the LCBA Mexico and the quality of the Background study that has identified the business opportunities for the project were very helpful in the success of the further activities.



