A guide for policy makers, stakeholders and managing authorities, especially at regional level, who want to support resource efficiency in small and medium-sized enterprises and help them reduce production costs and innovate.
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Although the guidebook was prepared under the guidance of the European Commission’s officials, the views expressed in this guidebook do not necessarily represent the opinions of the European Commission.

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Translations of this guidebook into a number of European languages are available on the web at: http://ec.europa.eu/growth/smes/business-friendly-environment/regional-policies

This guidebook has been prepared with the aim of providing information on using European Structural and Investment Funds (ESI Funds). The information is provided without assuming any legal responsibility for correctness or completeness. Specific requests for the use of ESI Funds will always have to be assessed against the applicable rules in force at the date and in the country of the application.

This guidebook is part of a series in which the following titles have been published so far:
1. Building Entrepreneurial Mindsets and Skills in the EU
2. Using standards to support growth, competitiveness and innovation
3. Facilitating Transfer of Business
4. The Smart Guide to Service Innovation
5. Regional implementation of the SBA – Small Business Act for Europe
6. How to use structural funds for SME & Entrepreneurship Policy
7. Supporting the Internationalisation of SMEs
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ISSN 1977-6624
doi: 10.2873/06009

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Small and medium-sized enterprises (SMEs) are the backbone of European Union’s economy. They provide two-thirds of the total private sector employment in the EU and 85% of newly created jobs. SMEs and entrepreneurship are key to ensuring economic growth, innovation, job creation, and social integration in the EU.

Small companies are very closely associated with the regions in which they operate. The regions thus benefit directly from economically strong SMEs.

By enhancing their resource efficiency, SMEs improve their productivity, drive down costs, open up business opportunities in a greener, circular value chain and move Europe forward into a more resource efficient, low-carbon economy. Resource efficiency is a driver for growth.

Some regions have already developed specific supporting actions for SMEs. This guidebook presents case studies and initiatives already implemented with public and private funds. We therefore wish to intensify exchange of information between regional authorities, in order to learn from good practices in implementing support measures for resource efficiency improvements in SMEs.

We recommend this guidebook to all policymakers and actors in the regions and hope that it will inspire them to take concrete actions on the ground.

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Since the time of the Industrial Revolution, our well-being has continued to rely on cheap and supposedly unlimited available natural resources. However, over the last two decades this landscape has changed rapidly because of volatile and rising resource costs, combined with increasing pressure on companies to improve their governance and reduce their supply chain risks. Over time, this has influenced the competitiveness of Europe’s regions. In other words, resource efficiency, with the inherent aim of implementing a circular economy, is a real opportunity to meet these challenges. We need a major transition towards using the earth’s limited resources in a way that minimises the impact on the environment.

This guidebook shows how regions can support resource efficiency in small and medium-sized enterprises (SMEs). It is addressed to all national, regional and local stakeholders interested in promoting resource efficiency in SMEs, and in particular to the decision-makers in the managing authorities sector of the European Structural and Investment Funds (ESI Funds).

The guide aims to illustrate how strategic regional public support can offer SMEs a favourable environment, and support them in implementing resource-efficiency measures with a view to saving costs and staying competitive. It should be viewed as a practical toolbox, with ideas and input having been taken from several projects at national, regional and local level.

Member States can support SMEs in becoming more resource efficient by creating a positive environment and by means of financial support, by providing advice, training and enabling networks. This guidebook presents a number of concrete examples of projects taken from across Europe. Many of these projects contain potential instruments for developing and implementing regional strategies that reflect this new direction.

Some of the examples depicted here are either co-financed by the European Structural and Investment Funds (ESI Funds) or by other European Funds, whereas others have not benefited from this type of funding. They do, however, all illustrate how European Funds, when used effectively, can generate and stimulate resource-efficiency improvements and opportunities for SMEs.
This chapter gives a brief overview of the concepts of resource efficiency and the circular economy. It discusses the business opportunities arising from these and the drivers supporting resource efficiency in SMEs and in the regions. It also describes obstacles that prevent SMEs from taking a more resource-efficient approach and explains why it is important for regions to promote resource efficiency in SMEs.

2.1. Concepts of resource efficiency and a circular economy

The term resource is used in many different ways and with many different meanings, examples being financial, human and natural resources. For the purpose of this guidebook, this term refers to all natural resources used in the production processes or in the delivery of services, e.g. renewable and non-renewable primary resources, energy resources, water and soil.

Therefore, resource efficiency is not solely focused on the amount of resources being consumed, but on the effective usage of these natural resources, which is linked to the economic benefits derived and the environmental impact.

Resource efficiency is the relationship between product output and resource input. It characterises how efficiently resources are used to create economic value.

Resource-efficient production includes all the possible measures designed to improve the input-output ratio of natural resources and it reduces the negative ecological impact often resulting from production processes.

How is the circular economy linked to resource efficiency?

The world’s population is expected to reach the 8 billion mark by 2030, giving rise to more middle-class consumer consumption patterns and habits. This rising demand on resources, on food and on the energy supply will increase the strain already being felt by companies, societies and the environment.
New approaches to overcome linear production and consumption models are thus needed to help with the transition towards a circular economy. Developing a circular economy is key to achieving the overall objectives of resource efficiency. A circular economy can be a strong decoupling force decreasing the consumption of scarce and finite resources.

A circular economy keeps products, components and materials at their highest utility and value, which means, for instance, turning waste into a resource. In a circular economy, waste is minimised. The focus is shifted away from using and throwing away to reusing, repairing, refurbishing and recycling existing materials and products.

Another way of realising this switch would be to implement the concept of industrial symbiosis, which is an innovative process allowing businesses to make use of the waste companies produce, by turning it into valuable resources for their own production processes (see example 4.3.1.).

The path towards a circular economy also requires an effective design, which would fit into the various material cycles. As a result, materials would flow in such a way as to keep the utility and value continuing for as long as possible, thereby ensuring, to a large extent, a reduction in waste.

The following illustration shows the different phases of a circular economy:

**Definition of resource decoupling:** reduction of the resources used to create a unit of GDP
Each and every one of these phases offer opportunities for SMEs to save on costs and resources, create jobs and reduce waste and emissions. In an ideal circular economy, no resources would escape from this tight circle as their by-products and the waste generated can be reused either as inputs for a new company or as products to be reused or remanufactured.

The circular economy provides new opportunities for innovations across all fields, including product design, service and business models, and products. The following table contains an overview of the different elements found in a circular economy, with innovation seen as a necessary element throughout the entire value chain and across all fields. A brief introduction to new business models will be provided in the next section.

**Table 1: Illustrative elements of a circular economy**

- reducing the quantity of materials required to deliver a particular service (lightweighting)
- lengthening products’ useful life (durability)
- reducing the use of energy and materials in production and use phases (efficiency)
- reducing the use of materials that are hazardous or difficult to recycle in products and production processes (substitution)
- creating markets for secondary raw materials (recyclates) (based on standards, with public procurement playing a role)
- designing products that are easier to maintain, repair, upgrade, remanufacture or recycle (eco-design)
- developing the necessary services for consumers in this regard (maintenance/repair services, etc.)
- incentivising and supporting waste reduction and correct separation by consumers
- incentivising separation and collection systems that minimise the costs of recycling and reuse
- facilitating the clustering of activities to prevent by-products from becoming wastes (industrial symbiosis)
- encouraging wider and better consumer choice through renting, lending or sharing services as an alternative to owning products, while safeguarding consumer interests (in terms of costs, protection, information, contract terms, insurance etc.)


However, it is not only companies that should be singled out as needing to change their processes, because a shift towards a circular economy also implies that society and governments need to strike out in new and innovative directions, thereby leading to changes in ways of thinking, which in turn leads to the breaking of old habits and also to overcoming traditionally held views.

Moreover, regions play an integral part in this transition. Resource-efficient SMEs are often more competitive and innovative and help strengthen their regions. By actively supporting this transition, regions can now profit from this sustainable growth which will last and lead to higher regional GDP, more jobs being created and measures being adopted that provide greater resilience to external shocks, so as to counter rising prices for raw materials (for more examples see chapter 2.4).
2.2. Business opportunities arising from and drivers for a resource-efficient and circular economy

As suppliers of products and services and as process innovators, SMEs can be providers of specific expertise and act as drivers of resource efficiency. They are also an important point of intersection for the transfer of research-oriented results back into businesses. This offers SMEs a large variety of business opportunities.

There is a growing understanding in SMEs that the availability and the exploitation of raw material resources and their rising prices pose a threat to economic growth, the environment and political stability. For SMEs, this means that the direct costs of resources and energy will increase over time. In recent years, 75 % of European businesses have experienced an increase in material costs.¹

The following figures illustrate the potential benefits of increased resource efficiency in SMEs:

- Different analyses² agree that European manufacturing firms spend an average of 40 % of their total costs on raw materials. By adding costs for energy and water, it amounts to more than 50 %. For some resource-intensive industry sectors, the costs reach higher levels. These figures are twice as high as what companies spend on wages and salaries.
- Labour productivity has increased twice as much as material productivity.³
- The waste of resources accounts for up to 4 % of a company’s annual turnover.⁴
- A German study found that SMEs can save, on average, 20 % of their material costs through investment in technical modernisation and in more efficient production.⁵
- A study from the UK estimated that low-cost changes could save companies in the UK EUR 7.7 billion per annum.⁶
- In total this adds up to an overall savings potential of EUR 630 billion per year in the European Union,⁷ with the potential to boost the EU’s GDP by up to 3.9 %.⁸

This demonstrates that improvements made to production, with the aim of reducing or replacing the use of scarce resources, should not only be viewed as an environmental factor. They also help to reduce costs and strengthen the ability of SMEs to remain competitive, in particular in view of global markets.

The environmental industries also proved more stable during the financial and economic crisis than anticipated. According to a study,⁹ throughout all of the EU Member States, the rate of growth in the eco-industry sectors was found to be much higher than in other sectors during the financial and economic crisis. This not only had a stabilising effect, but it was found to be a driver for growth in Europe, in particular in the Member States hardest hit by the crisis. In Italy and Portugal, nominal GDP stagnated between 2008 and 2012, whereas the eco-industries grew by between 5 % and 9.4 %.

Placing resource efficiency at the core of the corporate strategy and making products more resource efficient can lead to higher social acceptance for a company, with the subsequent marketing effect. It can even attract committed qualified employees.

¹ Flash Eurobarometer 315, Attitudes of European entrepreneurs towards eco-innovation, 2011.
² e.g. VDI ZRE and Europe Innova.
³ Deutsches Ressourceneffizienzprogramm (German Resource Efficiency Programme), 2015.
⁵ Study for the conception of a programme to increase material efficiency in SMEs, 2005 (Studie zur Konzeption eines Programms für die Steigerung der Materialeffizienz in mittelständischen Unternehmen, 2005, Arthur D. Little GmbH, Fraunhofer-Institut für System- und Innovationsforschung, Wuppertal Institut, www.demea.de).
⁸ Towards the Circular Economy: Economic and business rationale for an accelerated transition (2012), Ellen MacArthur Foundation.
Fields of application for resource efficiency in SMEs

A typical SME usually starts becoming more resource efficient by improving the efficiency of its production process. However, to fully exploit the business potential, resource efficiency measures should be implemented across all company departments. The fields of application for resource efficiency in a business are described in the following table:

Table 2: Fields of application for resource efficiency

<table>
<thead>
<tr>
<th>Field of application</th>
<th>Measures to be implemented in the business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Strategy and Planning</td>
<td>Long-term corporate policy&lt;br&gt;Strategy for resource-efficient technologies, products and services and for resource management</td>
</tr>
<tr>
<td>Investment and Financing</td>
<td>Investing in technologies, research and production</td>
</tr>
<tr>
<td>Human Resources</td>
<td>Developing competences and qualifications</td>
</tr>
<tr>
<td>Products and Services</td>
<td>Improving existing products and/or services&lt;br&gt;Developing resource-efficient products and/or services and their design</td>
</tr>
<tr>
<td>Production</td>
<td>Optimising/developing resource-efficient production processes</td>
</tr>
<tr>
<td>Operational Management</td>
<td>Identifying and prioritising the cost optimisation by saving resources</td>
</tr>
<tr>
<td>Marketing and Communication</td>
<td>Informing customers&lt;br&gt;Identifying and tracking products&lt;br&gt;Environmental/sustainability report</td>
</tr>
</tbody>
</table>


Innovating business models

The path towards a circular economy provides new opportunities for innovation across fields such as product design, service and business models, and products. More and more SMEs are following this trend and examining how they can place sustainability at the core of their business models by, e.g. reducing their material input, reducing packaging and improving logistics. Innovative organisational concepts and new business models can have an economic and an ecological impact. These models aim to move away from linear production and consumption models towards a more circular model, based on the idea of substituting ownership of products for sustainable usage. This occurs when sharing, reusing, cutting out wastage or recovering the value from products, and when more sustainable materials and technologies are used. This shift is seen as having direct implications for the development of efficient and effective take-back systems, new sales strategies and for new designs that generate
more durable products, facilitating disassembly and the refurbishment and exchange of spare parts.

These models can lead to a number of benefits, such as higher revenues per customer, lower costs of goods, improved operating profits, greater resilience to external changes or shocks and higher brand values.

The fields for business model innovations can include:10

• Value proposition — the products and services offered reduce the customer cost of ownership and provide additional value, e.g. through the design. This model works in the consumer sector and equally well for the B2B sectors.
• Operating model — this model reduces costs and risks in the supply chain by moving towards a circular product and resource management system in the entire company.
• Markets and revenue model — companies incentivise a new or changed customer behaviour (e.g. giving a discount on the price for new products when customers return old ones for recycling).

Innovating the business model begins by checking the status quo of the company and thinking outside the box. SMEs must in essence understand how they can best position themselves to counter risks and exploit opportunities.

The circular economy has the potential to create new markets, which respond to new consumption patterns, which are moving away from the traditional ownership of things and instead towards using, reusing and sharing of products.

Drivers that promote the application of resource efficiency measures in SMEs

The following section describes the drivers that trigger and promote the adoption of resource-efficient approaches in SMEs. The list does not claim to be exhaustive but tries to give an overview of the main aspects to be taken into consideration.

It is important to become familiar with these drivers in order to understand the economic, environmental and societal benefits that they can help to create. Regions can develop targeted measures, which promote and sustain particular drivers and allocate public funds towards the aspects that need public support in order to be fully effective.

1. Resource efficiency saves costs

• 40 % of total costs is spent on raw materials. A company that wants to cut costs must therefore consider using efficient material inputs.
• Resource efficiency is not only positive for the environment but also important for staying competitive.
• Material costs represent an increasing proportion of total costs of production, and this is expected to continue to rise in the near future, which puts pressure on SMEs to implement resource-efficiency measures. Indeed, this is reflected in the increasing number of SMEs taking action.11

2. Resource efficiency reduces risks and raw material dependencies

• SMEs can reduce the risks associated with expected future scarcities (uncertainties about the availability of raw materials) and from higher prices of raw materials and other resources needed for production.
• SMEs can prevent the risks caused by environmental pollution, especially in the management of hazardous waste, in order to avoid high costs, to repair the damages caused and to avoid a bad reputation.

3. Desire and will of the management to improve resource efficiency and sustainability

• Management naturally has the intention (resulting from their own firm convictions and knowledge) to minimise emissions and to reduce the company’s environmental footprint.
• Companies that have sustainability at the core of their corporate strategy can benefit

11 Flash Eurobarometer 381 SMEs, Resource Efficiency and Green Markets, 2013.
from a positive image and gain access to new markets.

4. Resource efficiency is the driver for the whole business model
   - Companies developing new business models pick up on changes in consumer demand and behaviour.
   - SMEs can gain a first-mover advantage by using a new business model: as first on the market, they can increase their market share, find new customers and gain access to new markets with higher profit margins.
   - Companies can remain or become attractive employers.

5. Price of resource-efficient products and services is lower
   - Savings from resource-efficiency measures can open up channels to new markets or protect existing markets, if green and efficient alternatives can be sold more cheaply than conventional products, and if the cost-saving effects from resource-efficiency measures are passed on to the customer.

6. Good examples from other SMEs
   - Entrepreneurs trust other entrepreneurs.
   - Sharing experiences through word-of-mouth can boost the adoption of resource-efficiency measures.

7. No-cost or low-cost measures
   - No-cost or low-cost measures can produce a “quick win” for SMEs.
   - Changing the mind-set in SMEs through these “quick wins” can boost the implementation of resource efficiency.

8. Rising demand for more environmentally friendly products
   - Rising demand offers an opportunity for SMEs to enter new market niches.
   - A company’s stance on sustainable products can improve their reputation.

2.3. The main barriers to resource efficiency in SMEs

Despite the obvious advantages, the potential of resource-efficient production still remains largely untapped. Several obstacles are still hindering improvements in resource efficiency. The following list presents an overview of the main barriers that need to be overcome when implementing eco-innovative and resource-efficiency measures in SMEs. Please note that this list is not intended to be exhaustive as these barriers often differ from region to region.

1. Lack of knowledge, information and competencies in SMEs
   - The difficulty found in implementing resource-efficiency goals in SMEs is particular to the character of SMEs.
   - SMEs are often not fully aware of the potential long-term advantages of resource efficiency and do not possess the necessary information.
   - Resource efficiency is often regarded as an additional cost and not as an investment in the future of the company.
   - SMEs are often not aware of their real material and energy consumption.
   - The impact of material- and energy-saving measures related to their operations is not measured.
   - The workforce is not trained in recognising opportunities for resource efficiency.

2. Financing
   - SMEs experience difficulties in accessing capital.
   - Banks and other financial institutions perceive resource efficiency often only as “environmental protection” measures and not as a profitable investment in the long run.
   - SMEs often do not have the same financial buffer as bigger companies to finance resource-efficiency measures.
3. Investment costs hinder the adoption of new technologies

- The production of resource-efficient products becomes more expensive (e.g. electric cars in comparison to conventional cars).
- New production processes also require retraining of staff, new certificates etc.
- The length of time before SMEs can profit from the economies-of-scale or receive a return on their investment is difficult to calculate.
- Companies risk getting stuck in a niche market with a new and more resource-efficient product.

4. SMEs are not familiar with the services and advice available

- Several institutions, such as chambers of commerce, business institutions and governments are already offering services to SMEs to improve their resource efficiency, but these services are often not well-known and not sufficiently publicised.
- There is a lack of external consultants with specialised skills in resource- and energy-efficiency management for SMEs (this is believed to be a crucial obstacle by the European Association of Craft, Small and Medium-Sized Enterprises, UEAPME12).

5. Persistent consumer habits

- The necessary behaviour change can only be achieved over longer periods of time.
- Companies offering services around the whole life cycle of a product need a critical mass of customers, which is difficult to achieve: people still feel more attached to ownership of products.
- Costs of resources is a topic only discussed by a minority of society.
- People tend not to want to see direct linkages between their actions and the environmental impact.

6. Lack of willingness to adopt and use new technologies in SMEs

- Corporate environmental policy often does not go beyond meeting environmental regulations.
- According to a survey conducted by the German Centre for Resource Efficiency (VDI ZRE), six out of ten German SMEs admit to contending with resource-efficiency issues, but only three out of ten are directly addressing them.
- Administrative and legal procedures are often seen as being too complex and as a barrier to implementing resource-efficiency measures.
- SMEs do not necessarily view resource efficiency and resource scarcity as main issues for the future of their businesses.
- Smaller SMEs in particular are not innovative enough.

7. Political debate and most political initiatives do not give sufficient attention to resource efficiency and circular economy

- Insufficient political attention is given to the issue and to the potential of resource efficiency.
- The fact that energy and resource efficiency go hand in hand is not addressed.

Chapter 5 will show how managing authorities can help overcome these obstacles with the right set of targeted measures, as part of a comprehensive framework including companies, stakeholders and other forms of interaction with a multiplier effect.

2.4. Why should regions support resource efficiency in SMEs?

An estimated 23 million SMEs in the EU account for over 99.8 % of all registered companies, which makes SMEs the main driving force behind the economic growth, innovation, employment and social integration in regions. However, they often shy away from making the effort to discover and exploit the opportunities.

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12 UEAPME Position on the Green Action Plan for SMEs complementing the replies to the Commission’s consultation 2013.
offered by resource efficiency. To achieve the European and national objectives on material and energy saving, new instruments and policy measures need to be developed, in order to allow SMEs in particular to fully exploit this potential.

*Regions are in a leading role in supporting resource efficiency*

Regions can play a leading role in the planning and implementation of resource-efficiency policies for the following reasons:

1. Regions are closer to the demands and challenges faced by their SMEs when applying resource-efficiency measures. This proximity allows them to develop a detailed understanding of SMEs individual needs, and to design tailor-made programmes and measures for support.

2. As the home of clusters, technology centres and business incubators, regions provide the “ecosystem” needed to promote innovation, sustainable development and growth. Regional authorities also have experience in developing and implementing regional economic and innovative policies, e.g. by improving their Research and Innovation Strategy for Smart Specialisation (RIS3) (see recommendation 2 in chapter 5). They also have a better understanding of the regional environmental challenges and strengths, e.g. in renewable energy (see example 4.3.3).

3. Regions have a deeper understanding of the financial situation of their regional SMEs. This puts them in a favourable position for developing more demand-oriented financial instruments.

The financial positioning of SMEs often differs from region to region. Evidence shows that in more financially stable regions, SMEs frequently achieve higher equity returns on their investments. These regions require different solutions than do regions with less financially robust SMEs.

The examples taken from the Low Carbon Innovation Fund (see example 4.2.1) and KredEx (see example 4.2.2) show how financial instruments boost regional companies’ investment in resource efficiency and benefit the entire regional economy.

4. Regions can use instruments under their responsibility, such as public procurement, local and regional economic development strategies and measures, regional environmental protection and energy policies and programmes, to push resource efficiency in their area.

Local and regional authorities also have specific competences with respect to standards such as, for example, those on buildings or waste management, which offer numerous possibilities to push forward resource efficiency.

5. Regions know which regional stakeholders should be mobilised to reach particular target groups in the most efficient way. Networks that can reach out to SMEs with the right information and manage to convince them to take the required action can often be more effective at a regional level than at a national level.

The advantages of networks to exchange waste and resources, such as in the projects Smile:-) (see example 4.3.2) and Industrial Symbiosis (see example 4.3.1), is clearly felt at a regional level, in the form of shorter transport routes, sound knowledge of SMEs’ needs and what they can offer, and better collaboration between regional companies.

Other good examples of these particular networks are found in chapter 4.1, in particular 4.1.2 *Efficiency Region Bergisches Land*.

Regions can profit from more resource-efficient SMEs:

- more innovative and more competitive SMEs, which offer more jobs,
- higher tax income,
- a regional economy that is future-oriented, more resilient and less dependent on imports of natural resources.
Helping SME's to take advantage of resource efficiency — how the European Structural and Investment Funds can help

3.1. A brief introduction to the European Structural and Investment Funds

Cohesion policy is the EU’s main investment instrument in the 2014-2020 programming period for achieving the Europe 2020 goals, namely creating growth and jobs, combating climate change and energy dependence, strengthening energy and resource efficiency and reducing poverty and social exclusion. The five European Structural and Investment Funds (ESI Funds) support the EU’s political priorities:

The European Regional Development Fund (ERDF)
The European Social Fund (ESF)
The European Agricultural Fund for Rural Development (EAFRD)
The European Maritime and Fisheries Fund
The Cohesion Fund

For a comprehensive overview of planned investment per Member State, by theme and by fund, please go to https://cohesiondata.ec.europa.eu/. The website also includes links to all the ESI Funds.

3.2. Opportunities offered by the ESI Funds to promote resource efficiency

In the 2014–2020 programming period, several thematic objectives of the ESI Funds offer opportunities to support resource efficiency. Actions can be promoted which encourage a shift to a low-carbon economy, greater resource efficiency, sustainable transport, the development of a circular economy and environmental protection.

These objectives are also linked to efforts to promote appropriate investment to stimulate economic growth and job creation.

European Regional Development Fund (ERDF)

The ERDF generally aims to strengthen economic, social and territorial cohesion in the European Union by correcting the imbalances that exist between the regions. The fund provides significant support to regions and their SMEs in order to help them boost their

The following table provides an overview of investment priorities and specific objectives related to SMEs and resource efficiency.

<table>
<thead>
<tr>
<th>Investment Priority</th>
<th>Specific Objective</th>
<th>Potential Measures/Projects</th>
</tr>
</thead>
</table>
| N° 1: strengthening research, technological development and innovation | (a) strengthening research and innovation (R&I) infrastructure and capacities to develop R&I excellence, and promoting centres of competence, in particular those of European interest; (b) promoting business investment in R&I, developing links and synergies between businesses, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies; | • support centres for resource efficiency  
• research centres for eco-innovation and resource efficiency  
• research projects in SMEs  
• joint projects between research institutes and SMEs  
• technology transfer from research institutes to SMEs  
• support for clusters                                                                                                                                                                                                                                                                            |
| N° 3: improving the competitiveness of SMEs                   | (b) developing and implementing new business models for SMEs, in particular with regard to internationalisation; (c) supporting the creation and the extension of advanced capacities for product and service development; (d) supporting the capacity of SMEs to grow in regional, national and international markets, and to engage in innovation processes; | • promotion of new business models (“use not own”)  
• support for international networking  
• support for SMEs to allow them to implement resource efficiency (e.g. advice and network projects, vouchers, industrial symbiosis)  
• market development activities  
• investment grant programmes  
• financial instruments                                                                                                                                                                                                                                                                                                                                  |
<table>
<thead>
<tr>
<th>No 4: supporting the shift towards a low-carbon economy in all sectors</th>
<th>(b) promoting energy efficiency and renewable-energy use in businesses; (f) promoting research and innovation in, and adoption of, low-carbon technologies; (g) promoting the use of high-efficiency co-generation of heat and power based on useful heat demand;</th>
<th>The specific objectives already indicate the possible measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>No 6: preserving and protecting the environment and promoting resource efficiency</td>
<td>(a) investing in the waste sector to meet the requirements of the Union’s environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements; (f) promoting innovative technologies to improve environmental protection and resource efficiency in the waste sector, water sector and with regard to soil, or to reduce air pollution; (g) supporting industrial transition towards a resource-efficient economy, promoting green growth, eco-innovation and environmental performance management in the public and private sectors;</td>
<td>* promoting research activities, joint projects between research and SMEs * investments by SMEs in these sectors * all activities supporting resource efficiency and circular economy: promotion of e.g. advice, investment and networks</td>
</tr>
<tr>
<td>No 8: promoting sustainable and quality employment and supporting labour mobility</td>
<td>(a) supporting the development of business incubators and investment support for self-employment, micro-enterprises and business creation</td>
<td>* small-scale measures for micro-enterprises * support to businesses or start-ups trying out new business models</td>
</tr>
<tr>
<td>No 10: investing in education, training and vocational training for skills and lifelong learning by developing education and training infrastructure</td>
<td></td>
<td>* investment in education and training for resource efficiency</td>
</tr>
</tbody>
</table>

**Cohesion Fund**\(^{14}\)

The Cohesion Fund is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90% of the EU average. For the 2014–2020 period, the countries covered by the Cohesion Fund are Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.

The Cohesion Fund can support projects related to energy or transport, providing they clearly benefit the environment in terms of energy efficiency, use of renewable energy, developing rail transport, supporting intermodality or strengthening public transport.

Table 4: Investment Priorities and Specific Objectives CF

<table>
<thead>
<tr>
<th>Investment Priority</th>
<th>Specific Objective</th>
<th>Potential Measures/Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>No 4: supporting the shift towards a low-carbon economy in all sectors</td>
<td>(ii) promoting energy efficiency and renewable-energy use in enterprises; (vi) promoting the use of high-efficiency co-generation of heat and power based on useful</td>
<td>The specific objectives already indicate the possible measures</td>
</tr>
</tbody>
</table>

No 6: preserving and protecting the environment and promoting resource efficiency | (a) investing in the waste sector to meet the requirements of the Union’s environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements; | • promoting research activities, joint projects between research and SMEs • investments by SMEs in these sectors |

European Social Fund (ESF)15
The ESF is the European Union’s main financial instrument for investing in education, training and employment, for the promotion of social inclusion and for combating poverty. The main objective of the ESF is to contribute to economic, social and territorial cohesion in the EU.

Table 5: Investment Priorities and Specific Objectives ESF

<table>
<thead>
<tr>
<th>Investment Priority</th>
<th>Specific Objective</th>
<th>Potential Measures/Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>No 8: promoting sustainable and quality employment and supporting labour mobility</td>
<td>(iii) self-employment, entrepreneurship and business creation including innovative micro-, small and medium-sized enterprises; (v) adaptation of workers, businesses and entrepreneurs to change;</td>
<td>• promoting creation of innovative, resource-efficient businesses • training the workforce in resource efficiency, enabling workers to recognise the chances available to their company through resource efficiency</td>
</tr>
</tbody>
</table>

No 10: investing in education, training and vocational training for skills and lifelong learning by developing education and training infrastructure | (iii) improving equal access to lifelong learning for all age groups in formal, non-formal and informal settings, improving the knowledge, skills and competences of the workforce, and promoting flexible learning pathways including through career guidance and validation of acquired competences; | • training the workforce in resource efficiency, teaching workers to recognise chances available to their company through resource efficiency |

The European Agricultural Fund for Rural Development (EAFRD)\textsuperscript{16}

This Fund finances Member States' rural development programmes. It has a four-axis structure focused on:

1. improved competitiveness for farming and forestry;
2. protection of the environment and the countryside;
3. a better quality of life and diversification of the rural economy;
4. LEADER\textsuperscript{17}, a methodology introducing funding opportunities for locally based approaches to rural development.

One of the main priorities of the EAFRD for 2014-2020 is the promotion of resource efficiency and support for a shift towards a low-carbon and climate-resilient economy in agriculture, food and the forestry sectors.

Table 6: EU and Focus Areas of the EAFRD

<table>
<thead>
<tr>
<th>EU priority</th>
<th>Focus areas</th>
</tr>
</thead>
</table>
| No 5: promoting resource efficiency and supporting the shift towards a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors | • increasing efficiency in water use by agriculture  
• increasing efficiency in energy use in agriculture and food processing.  
• facilitating the supply and use of renewable sources of energy, by-products, wastes, residues and other non-food raw materials for the bio-economy  
• reducing nitrous oxide and methane emissions from agriculture  
• promoting carbon sequestration in agriculture and forestry |

Provision is also made within LEADER for local action groups to develop projects for greater resource efficiency in their rural businesses and in rural areas.

The European Maritime and Fisheries Fund (EMFF)\textsuperscript{18}

The Fund supports the common fisheries policy through measures to adapt the EU fishing fleet, to promote aquaculture, inland fishing and sustainable development of fishing areas.

It is focused on five priority areas:

1. measures to adapt the EU fishing fleet;
2. aquaculture, inland fishing, processing and marketing;
3. collective action;
4. sustainable development of fishing areas;
5. technical assistance.

The EMFF thematic objective number 6 “preserving and protecting the environment and promoting resource efficiency” calls for a resource-efficiency policy and supports environmentally sustainable, resource-efficient, competitive fisheries and the aquaculture industry to make this business more green, economically viable and competitive, while at the same time providing EU consumers with healthy and highly nutritional products.

The Fund also promotes eco-innovation with the aim of reducing the impact of fishing on the marine environment, in particular through the use of more selective tools and equipment.

European Territorial Cooperation (ETC) is an important goal of the EU cohesion policy. Under the ERDF, ETC promotes cross-border, transnational and interregional cooperation under 11 thematic objectives. Concepts for additional resource efficiency in SMEs can also be developed and modelled within the transnational or cross-border cooperation programmes (see examples 4.1.3, 4.1.6 and 4.3.4).

The Interreg Europe programme provides regions with the opportunity to share their experiences and draw up action plans to implement measures that support resource efficiency. Several of the new transnational cooperation programmes for the period 2014-2020, have selected investment priorities and specific objectives that encompass cooperation projects on resource efficiency. The eligibility of resource-efficiency measures in cross-border programmes for the period 2014-2020 must be checked against the rules of the respective cooperation programme.

3.3. Synergies with other EU programmes (Horizon 2020, COSME, Erasmus+ and LIFE)

The ESI Funds are mainly managed and implemented at national and regional levels whilst Horizon 2020 and other EU research, innovation, environment and education programmes are centrally managed by the European Commission and aim to support transnational projects. The programmes have different objectives, leading to the funding of different types of actions.

It is possible to create synergies between the ESI Funds and other EU funds, such as Horizon 2020, COSME, Erasmus+ and LIFE, which also support resource efficiency. The aim of coordination between the funds is to achieve greater impact and efficiency.19

Synergies can be achieved through:

- bringing together Horizon 2020 or other European programmes and financing from ESI Funds in the same project (whether this be a single action or a group of coordinated actions/operations, providing there is no double-funding of the same expenditure item), with a view to achieving greater impact and efficiency;
- successive projects that build on one another;
- parallel projects that complement one another;
- using ESI Funds programmes to support high quality project proposals from Horizon 2020 or other centrally managed programmes that could not be funded due to exhaustion of the available budget under these programmes.

The possible synergies with each funding programme are listed below:

Horizon 2020

Horizon 2020 supports the implementation of the Innovation Union, a Europe 2020 flagship initiative designed to secure Europe’s global competitiveness. The Research and Innovation Framework Programme is part of the drive to create new growth and jobs in Europe.

The programme has three main priorities:
1. Excellence in Science
2. Industrial Leadership
3. Tackling Societal Challenges

Examples of potential synergies:

- developing upstream actions to prepare regional players to participate in Horizon 2020, e.g. using ESI Funds for capacity building and obtaining qualifications, strengthening the research and innovation infrastructure related to resource efficiency and providing seed money for developing competitive Horizon 2020 projects designed to improving resource efficiency;
- developing downstream actions to exploit the results obtained from Horizon 2020

projects including by publicising the results in the markets, e.g. supporting SMEs to invest in new products and services developed in Horizon 2020 projects;
• making use of the results from research projects for improving regional policies, policy actions, measures and programmes co-financed by ESI Funds;
• having funds available the whole way along the innovation cycle. Research pilots are the proof of the technical feasibility of prototypes and can be funded under Horizon 2020, while the launching of products, the scaling-up of production processes and the commercialisation can be supported under the ESI Funds. Managing authorities could, *inter alia*, support projects funded by the Horizon 2020 SME Instrument in Phase 1 with grants or financial instruments which build on the results;
• financial intermediaries can, in cooperation with their respective regions, provide loans and guarantees for resource-efficiency investment in SMEs by using funds from the specific objective under “Access to risk finance” from Horizon 2020 to complement grant programmes.

EU programme for the Competitiveness of Enterprises and SMEs (COSME)\(^{21}\)

With a budget of EUR 2.3 billion for the period 2014-2020, COSME supports SMEs in the following areas:
• facilitating access to finance;
• supporting internationalisation and access to markets;
• creating an environment favourable to competitiveness; and
• encouraging an entrepreneurial culture.
To facilitate access to finance, COSME provides guarantees and counter-guarantees to financial institutions (e.g. guarantee societies, banks and leasing companies) through the Loan Guarantee Facility, so that they can provide more loan and lease finance to SMEs. Through the Equity Facility for Growth, the programme provides risk capital to equity funds investing in SMEs mainly in the expansion and growth-stage phases.

COSME also supports the Enterprise Europe Network, which consists of over 600 offices in more than 50 countries, which help SMEs to find business and technology partners, understand EU legislation and access EU financing. Helping SMEs improve their resource efficiency is part of its activities.

Examples of potential synergies:
• programmes combining grants provided from the ESI Funds for SMEs to commercialise their resource-efficient products and loans or equity with COSME funds through regional or national financial intermediaries for projects that have a clear market or a fast return on investment, e.g. by saving resources;
• setting up joint initiatives with the Enterprise Europe Network that combine regional measures to improve resource efficiency with the internationalisation of SMEs;
• continuing pilot projects with the Enterprise Europe Network (see example 4.1.4) or transferring the results of these specific actions for resource efficiency to other regions.

Erasmus+\(^{22}\)

Erasmus+ is the programme for education, training, youth and sport. It supports three main types of activities:
1. Learning mobility for individuals
2. Cooperation for innovation and the exchange of good practices through partnerships and IT platforms
3. Support for policy reforms in Member States

Resource efficiency can be supported under Erasmus+ by the Knowledge Alliances and the Sector Skills Alliances.

The Knowledge Alliances aim to strengthen Europe’s innovation capacity and to promote innovation in higher education, business and the broader socioeconomic environment. They intend to achieve one or more of the following aims:


1. developing new, innovative and multidisciplinary approaches to teaching and learning;
2. stimulating entrepreneurship and improving the entrepreneurial skills of higher education teaching staff and the staff of businesses; and
3. facilitating the exchange, flow and co-creation of knowledge.

The Sector Skills Alliances are transnational projects that support the design and delivery of joint vocational training curricula to improve the skills in one or more professional fields. One of the eligible sectors under this action is “environmental technologies” (eco-innovation).

The tools and methods that are developed and tested successfully under Erasmus+ could be mainstreamed through the ESI Funds to maximise their social and economic impact.

Examples of potential synergies:
• Some of the results from the Knowledge Alliances, such as new approaches to teaching engineers and environmental officers at SMEs, and the new methods for implementing resource-efficiency measures in a company, can be transferred to ESF-funded programmes to develop competences in SMEs. The lack of competences remains one of the main barriers to developing greater resource efficiency in SMEs.
• Mobility projects that give young workers and entrepreneurs the opportunity to learn more about resource-efficiency projects funded under Erasmus+ can also be mainstreamed into projects financed by the ESI Funds related to qualifications, exchanges and mobility.

**LIFE 2014-2020**

LIFE 2014-2020 has two sub-programmes:
• environment and resource efficiency; and
• climate action.

The programme promotes the implementation and integration of the environment and climate objectives into policies adopted by the Member States, and these objectives should be used as catalysts for improvements in national policies.

LIFE 2014-2020 supports four distinct project types:
• traditional projects: best practice, innovation and demonstration projects, dissemination/information projects and governance projects (similar to the LIFE+ programme for the period 2007-2013);
• integrated projects: projects designed to support the implementation of plans on a larger territorial scale and of strategies required by EU legislation in the areas of nature, water, waste and air;
• preparatory projects: projects identified by the Commission as meeting specific needs relating to the implementation and development of EU environmental and climate policy and related legislation;
• capacity building projects: financial support for activities required to increase Member States' capacity, with a view to allowing more effective participation in LIFE.

Examples of potential synergies:
• LIFE projects, in particular integrated projects, can be used to experiment with and implement new business models for resource and energy efficiency, including establishing resource-efficiency practices in SMEs, by focusing on the environmental impact, durability, reuse, repair and recycling of their products and processes. Projects can also support the implementation of the circular economy concept. LIFE+ (2007-2013) had already funded several regional projects on industrial symbiosis.

These integrated projects take place on a larger scale (regional, multiregional or national) and include components of replication and innovation. Other funds such as the ESI Funds can be mobilised for the broader and more sustainable application and mainstreaming of solutions developed and tested under LIFE projects.

### 3.4. Financial Instruments for Resource Efficiency

EU financing is available for start-ups, entrepreneurs and companies of any size
and in any sector. A wide range of financing is available: business loans, microfinance, guarantees, venture capital, equity and other risk-bearing mechanisms. Every year the EU supports more than 200,000 businesses. Financial instruments can be an optimal supplement to grants, in particular for those investments that have a larger positive impact on costs and a fast return on investment. Financial instruments can be combined with technical support and advice, interest rate subsidies or guaranteed fee subsidies within the same projects or programmes.

The decision to provide EU financing will be made by local financial institutions such as banks, venture capitalists and angel investors.

Financial instruments allow money to be recycled and reinvested instead of being spent once, as is the case for a grant. Financial instruments can also help to leverage private investor co-investment, attract additional capital from financial institutions, maximise the impact of public money and encourage financially sustainable investment. Financial instruments showed themselves to be particularly valuable during the financial crisis when mainstream banks ceased lending to SMEs.

Innovative financial instruments can support the shift towards a circular economy. Investment in resource efficiency is well suited to repayable and revolving financial instruments.

Financial instruments are no longer limited to specific objectives but can be implemented within all funds and across all priorities. The regulations also contain clear rules allowing financial instruments to be combined more effectively with other forms of support, in particular grants, as this further incentivises the creation of well-tailored assistance schemes that can meet the specific needs of Member States or regions. Financial instruments can be set up with the support of ESI Funds and other EU funding sources, such as LIFE, and in cooperation with and through support from the European Investment Bank (EIB).


There are some innovative financing instruments available that are co-financed by EU funds and that mainly target energy efficiency. In addition to the regional examples described in chapter 4, the following are two further EU instruments:

The Private Finance for Energy Efficiency (PF4EE) instrument is a joint agreement between the EIB and the European Commission which aims to address the limited access to adequate and affordable commercial financing for investment in energy efficiency.

This instrument targets projects which support the implementation of the National Energy Efficiency Action Plans and other energy-efficiency programmes being implemented by Member States. It has the following objectives:

- make lending for energy-efficiency measures a more sustainable activity within European financial institutions; consider the energy-efficiency sector as a distinct market segment;
- increase the availability of debt financing for eligible energy-efficiency investments.

The PF4EE Instrument will combine a portfolio-based credit risk protection with long-term financing from the EIB. The instrument will also provide expert support services for financial institutions, inter alia, for developing their understanding of the fundamentals of energy-efficiency investments, identifying eligible energy-efficiency investments and creating suitable energy-efficiency financial products. It is managed by the EIB and funded by the Programme for the Environment and Climate Action (LIFE programme). PF4EE operates through financial institutions, which act as intermediaries. (See http://www.eib.org/products/blending/pf4ee/index.htm?lang=en.)

The European Energy Efficiency Fund (EEEF) is a public-private partnership launched by the European Commission and financed by the EIB and the Cassa Depositi e Prestiti SpA of Italy. It is managed by the Deutsche Bank and aims to support the goals of the European Union in
order to promote a more sustainable energy market and climate protection in the Member States.

The final beneficiaries of EEEF are the city, local and regional authorities and the public and private entities who act on behalf of specific authorities. For utilities, for instance, this would include public transport providers, social housing associations and energy service companies.

The EEEF can make direct investments in energy-efficiency projects or renewable energies or can invest in financial institutions.

For more information see http://www.eeef.eu.
Examples of Good Practice

This chapter aims to provide inspiration for regions by showing interesting examples of resource-efficiency related projects implemented by a wide array of actors. These projects have been implemented at national or regional level, by Member States, regions, research institutes, universities, NGOs, business organisations and other bodies.

The projects described in this guidebook are meant to give decision-makers, managing authorities of the ESI Funds and implementing authorities food for thought, i.e. the intention is not that the projects are copied “as are” but rather used as models for the development of projects that address the specific needs in the Member State or region concerned. Please note that measures proposed for financing from the ESI Funds need to comply with the relevant provisions pertaining to the ESI Funds regulations and to the co-financing rules for specific operational programmes.

Projects were selected according to their contribution to:
- helping regions overcome barriers to greater resource efficiency in SMEs;
- strengthening and promoting particular drivers that will steer the transition towards a green economy;
- inspiring regions to implement their own projects using ESI Funds.

Selected examples are divided into thematic sections:
- Creating a positive environment for resource efficiency
- Financial support
- Networks and clusters
- Advice and training

4.1. Creating a positive environment for resource efficiency and for the development of new markets

The projects and measures presented in this section are designed to create a positive environment for SMEs that are looking at the business potential related to implementing resource-efficiency measures in companies.
The action taken by the regions demonstrates how new markets can be further developed for SMEs with new ideas for business models. The projects also include citizens and consumers, in order to unlock the potential of resource efficiency at a regional and local level and to help businesses overcome traditional consumer habits.

These projects help regions to steer awareness away from purely energy-based issues towards greater resource efficiency by adopting a holistic approach.

4.1.1. Clean Green Business Growth, Denmark

Clean Green Business Growth was launched in December 2009 as a public-private partnership with 21 partners, co-financed by ERDF funds. It is now a self-financed project being run under CLEAN, Denmark’s leading cleantech cluster involving more than seven local authorities and a number of private partners and businesses. The project is targeted at small businesses and in particular master craftspeople, who are being retrained in customer segments, using holistic approaches to energy-saving renovations and developing individual business ideas targeted at niche energy markets.

CLEAN took inspiration from the EU Directive on energy efficiency, which encourages public authorities and private businesses to focus on measures that improve energy efficiency by helping to achieve the EU goal of creating three million new green jobs by 2020.

This is mainly achieved by:

- educating master craftspeople to focus on business development, cross-professional networking, marketing and gaining new knowledge of energy-efficient solutions designed for private, public and industrial buildings;
- influencing the private-homeowner market through hands-on locally based projects, namely energy fairs, energy evening classes and smaller energy events;
- involving potential partners in demonstration projects;
- partner matching and networking for the development of new energy projects;
- focusing on scaling-up easily adaptable concepts for other regions in Denmark and abroad; and
- maintaining constant and continuous close networking between partners.

Clean Green Business Growth has created 165 new green jobs in energy efficiency in the buildings sector during the first three years and generated a 29% increase in income for its member craftspeople with a total turnover of EUR 14 million. This bottom-up approach has led to a marked increase in profits for their partners. Green Business Growth has set goals for both green jobs and CO₂ reduction for 2017 (creating 700 new green jobs and saving 12,000 tonnes of CO₂ in 6,000 households).

This approach has now been tested and refined and is available for other cities, local authorities or businesses to adopt. It is estimated that the scaling-up of this concept for use across Denmark could mean a potential 6,000 jobs being created across the country over three years.

**Key Message:** Energy efficiency can create jobs and increase turnover in crafts

**Location/Region:** South Denmark, Denmark

**Funding Source:** ERDF 2007-2013

**Budget and Funding:** EUR 1,566,400, ERDF funding EUR 768,500

**More Information:** [http://www.groenerhvervsvaekst.dk/](http://www.groenerhvervsvaekst.dk/)

4.1.2. Efficiency Region Bergisches Land

The region Bergisches Land in North Rhine-Westphalia set up the network “Efficiency Region Bergisches Land” as a collaboration between the traditional industry cities of Wuppertal, Remscheid and Solingen with companies, energy suppliers and scientific institutions from the area.
The objective of this initiative is to improve resource efficiency in the city triangle, and to support the innovation capacity and competitiveness of the regional economy by linking the regional economy, scientific institutions and local authorities.

The partners aspire to establish the Bergisches Land region as a reference for resource efficiency under the label “New Efficiency” (Neue Effizienz).

They also help with launching projects, organising workshops and working groups and assisting with events planning and the facilitation of international networks, alongside the initiative’s main themes of production and products, efficient buildings and infrastructure and education and qualifications. The network acts as a “one-stop shop” for companies for any questions related to resource efficiency. The partners also provide support to companies applying for public funding.

Furthermore, this network is a platform for interdisciplinary discussions and mutual learning and it allows regional SMEs to participate in the rapidly developing green market segments.

One of the network’s key projects is the implementation of the Ökoprofit initiative (see example 4.4.4.) in the region.

The “Central Europe Reuse and Repair Centres and Networks” was designed to change this by promoting the development of reuse and repair centres to reduce waste and benefit the environment. This project aimed to set up effective structures in order to make reuse accessible and more attractive to the public and to government authorities. It equips partners and local authorities to promote the reuse of a variety of common products by providing essential tools and knowledge, and it also provides a transnational platform for their communication needs.

National and regional authorities can take advantage of a toolbox consisting of quality standards, guidelines, accreditation procedures, manuals, strategies and good practice examples. Particular emphasis is placed on areas such as communication, the allocation of roles and responsibilities between participating actors in reuse networks, and the building of customer acceptance and trust.

The transnational cooperation platform on reusable products, also developed by CERREC, includes a good practice database designed to help local and regional authorities to identify ways of setting up their own projects.

By encouraging the reuse of old products such as electronic equipment, textiles and furniture, CERREC produces beneficial results which fall into the three pillars of sustainability:

- environmental benefits such as waste reduction and energy and resource efficiency, by extending product lifetimes;
- economic benefits such as the creation of green jobs within the reuse value chain. In the short term, it is estimated that CERREC will create between five and ten jobs in each participating country from the implementation of this project. In the mid to long-term, this figure is estimated to rise to more than 50 jobs per country;
- social benefits, such as providing affordable and high quality goods to people, particularly those with lower incomes.

4.1.3. CERREC — Reducing waste through the reuse and repair of old products

Old but reusable things often end up as waste. The Interreg IVB project CERREC

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**Key Message:** Resource efficiency is a location factor

**Location/Region:** Bergisches Land, North Rhine-Westphalia, Germany

**Funding Source:** ERDF 2007-2013

**Budget and Funding:** EUR 2 100 000, ERDF funding EUR 1 050 000

**More Information:** [http://www.neue-effizienz.de](http://www.neue-effizienz.de)
**Key Message:** Reuse of old products reduces waste and creates jobs

**Location/Region:** Several regions in Central Europe

**Funding Source:** Interreg IVB Central Europe

**Budget and Funding:** EUR 2 898 000, Interreg funding EUR 2 269 000

**More Information:** [http://www.cerrec.eu](http://www.cerrec.eu)

4.1.4. Promote eco-design by SME manufacturers — Enterprise Europe Network

The European Commission ran a specific action “to promote eco-design by SME manufacturers” through the Enterprise Europe Network (EEN). Eco-design is an approach to designing a product that gives special consideration to the environmental impact products have during their entire lifespan. The EEN partners implemented five projects.

Legislation, such as the Eco-design Directives, and customer needs related to environmental and chemical compounds both have an impact on companies’ products. These projects aimed to help small and medium-size manufacturers to comply with environmental legislation, whilst at the same time increasing their competitive advantage.

Two of the five projects are described briefly below:

**ELEEN 2.0**

This project was run by the EEN partners in France, Greece, Latvia, Portugal and Sweden. It analysed how SMEs are affected by new environmental legislation and gave proposals for action. This was sometimes followed by subsidised assistance when actions were implemented and/or for more in-depth analyses. The project had also provided personalised services to over 800 industrial SMEs by the end of 2014.

**EDECON**

The EDECON project was designed to improve the integration of eco-design in the construction and building materials sectors, from design and development through to the implementation phase. It targeted both SMEs that produce and manufacture components used in construction and building materials, and also entire building projects, covering all their stages from architectural design to construction.

**Key Message:** Eco-design improves the use of resources

**Location/Region:** Several regions in Europe

**Funding Source:** Competitiveness and Innovation Framework Programme (CIP) 2007-2013


4.1.5. Cradle to Cradle (C2C) — the Dutch region of Venlo moving towards a circular economy

The Venlo region, located in the south-east of the Netherlands, adopted the Cradle to Cradle (C2C) model on a regional scale. C2C is based on the principle of sustainable manufacturing and complete recycling in the construction and production processes. Through the active involvement of the population, businesses and local authorities, the Venlo region has transformed itself into an innovative platform for a new circular economy, with safe and healthy products.

The region is supported by the Cradle to Cradle Products Innovation Institute, which opened its first European product-certification training centre in Venlo in 2012. The centre is part of an initiative to provide product designers and manufacturers with a continuously improved performance standard to guide eco-manufacturing, eco-design and the creation of safe and healthy products. The Institute’s aim is to provide support to businesses developing new products, and to create a platform
to encourage European companies to become more familiar with the benefits and process of Cradle to Cradle product certification. The city of Venlo adopted the Cradle to Cradle Certified Product Standard. Many large companies in the region have got on board with the initiative and changed their production processes to include more recycling, resource efficiency and the reuse of waste. Venlo also hosts and partly funds the C2C ExpoLAB, which provides consultancy services, workshops and project support.

The Venlo region developed a number of initiatives to test the C2C concept, including the following:

- The city of Venlo built a new City Hall as a state-of-the-art example of C2C design for its residents and businesses.
- The C2C showroom, located in the innovative Innovatoren building, hosts meetings and workshops in rooms with C2C certified furniture, natural light, and monitoring of humidity and CO₂ levels.
- C2C Education: Venlo and C2C ExpoLAB together launched the world’s first C2C Master’s course, and offer students other education activities related to the circular economy.
- Greenport Venlo supports networking of the agro-industry, logistics, manufacturing and sustainable tourism operations with C2C as a key principle.
- Venlo GreenPark, a state-of-the-art business park houses innovative businesses in buildings that have C2C architectural design.

C2C has become the main organising principle for the development of the Venlo region and has been successful in supporting private demand. It is seen as a transferable economic model with the potential to improve cooperation between all regional actors, including local governments, industry, civil society organisations and NGOs, universities and educational institutions and the general public.

Key Message: Local experimentation with the C2C approach can be successful and can be applied in other regions

Location/Region: City of Venlo and Venlo Region, Netherlands

Funding Source: Local and regional funds

More Information:
http://www.innovationseeds.eu/
http://www.c2cexpolab.eu/en/

4.1.6. Resource Efficiency in Lower Bavaria and Upper Austria

Lower Bavaria and Upper Austria are known for their technology hubs, which include a high percentage of manufacturing companies. Both regions have identified a need for more action to raise awareness about resource efficiency and to support companies already on the path to achieving greater resource efficiency in their production. This is the reason for the cross-border project.

Firstly, data was collected on the situation with regard to resource efficiency in companies in both regions. Secondly, good practices and potential for greater resource efficiency in businesses were successfully identified. These combined insights were discussed during expert workshops designed to develop industry-specific solutions and establish cross-border cooperation between all interested companies concerned.

These measures covered the entire value chain from procurement and the efficiency of production through to recycling and the potential for a circular economy.

The University of Landshut, Germany, together with Profactor, an Austrian private research company, implemented this project in close cooperation with four regional clusters.
The survey polls and workshops carried out as part of this project indicated that a large number of companies in the border regions have already implemented resource-efficiency projects, but that there remains significant potential to achieve more.

The project also demonstrated that cooperation continues to play an increasing role in exploiting this potential, with resource efficiency becoming more important for the border regions.

**Key Message:** A cross-border approach to supporting SMEs in the implementation of resource-efficiency measures can make a significant contribution to strengthening the border regions.

**Location/Region:** Lower Bavaria and Upper Austria

**Funding Source:** Interreg IVA

**Budget and Funding:** EUR 671 000, funding EUR 402 000

**More Information:** [http://ressourceneffizienz.at/](http://ressourceneffizienz.at/)

### 4.2. Financial Incentives

Financing is one of the main barriers affecting the successful implementation of resource-efficiency measures. SMEs often experience difficulties in accessing private capital and do not always have the financial resources necessary to invest using their own means.

The following projects aim at overcoming these problems by offering tailor-made financial support schemes for SMEs targeted at innovation and investment in resource efficiency.

The projects range from green innovation vouchers with small grants for external services, to larger grants for investment and innovation projects, to financial instruments such as loans and equity for SMEs.

#### 4.2.1. Low Carbon Innovation Fund (LCIF)

(United Kingdom)

The Low Carbon Innovation Fund (LCIF) makes early-stage equity investments in SMEs in the East of England (in return for a stake in that company). The Fund was launched in September 2010 and runs until the end of December 2015. It operates from a base of EUR 25.3 million provided by the ERDF, which was then matched by EUR 21 million of private sector investment, generating a total of EUR 61.7 million of investment.

The fund can invest in companies that are:

- developing low-carbon products or components; or
- selling services to support carbon reduction; and that contribute to carbon reduction through a focus on resource efficiency, process efficiency and waste reduction. The minimum investment from LCIF is GBP 10 000 (approximately EUR 14 000) and the maximum is GBP 1 million (approximately EUR 1.4 million) and must always be invested alongside private co-investment (e.g. business angels, high net worth individuals, other funds or trade investors). LCIF cannot invest more than 50 % of the total amount companies are seeking.

Companies can get a second round of LCIF investment as follow-on funding. LCIF does not accept grants as co-investment. Grants can be used a source of financing alongside LCIF investment.

**Syrinix, a SME financed by the LCIF**

Based in Norwich, Syrinix is a young SME that has developed sophisticated sensor and signal processing devices for monitoring water trunk mains. The development of the company has been supported by equity funding of EUR 1 million from the Low Carbon Innovation Fund (LCIF).

Syrinix launched TrunkMinder in 2010. This is a smart water pipeline monitoring system that uses sensors placed at 500-750 metre intervals along pipeline systems. These sensors
detect tiny leaks and then transmit automatic alerts directly to the relevant utilities, enabling them to repair leaks before pipes burst or any more water is lost. Water utilities across the UK are already making use of this smart monitoring system and are saving millions in time, labour and resources. Trunk Minder provides infrastructure managers with key notifications on locations with leaks — with accuracy of within metres —, an early warning system to prevent catastrophic mains failures, and instantaneous burst alerts.

Over the past two years Syrinix has become a leading expert in water-sector infrastructure-management technology and conducts business with utility companies in Australia, the United States, the Middle East and the Far East.

### Key Message: Equity funds can boost the development of SMEs through innovative and high-yielding investments

**Location/Region:** East of England, United Kingdom

**Funding Source:** ERDF

**Budget and Funding:** EUR 61,700,000, funding from ERDF EUR 25,300,000

**More Information:** [www.lowcarbonfund.co.uk](http://www.lowcarbonfund.co.uk)

### 4.2.2. KredEx — Loan Fund for improving Energy Efficiency in Apartment Buildings

The Estonian public financing institution, KredEx, in 2009 became the first European financial institution to launch a revolving loan fund for improving energy efficiency in apartment buildings. Receiving EUR 17 million from the ERDF, the EUR 49 million KredEx fund supported renovations in 18,281 apartments covering a total of 1,189,398 m². An energy saving of over 36 % is expected.

In 2010, KredEx also launched a grant scheme allowing eligible apartment buildings to obtain up to 35 % of the cost of building renovations.

The fund was administered to multi-apartment housing associations via two commercial banks, Swedbank and SEB Bank. Loan conditions included an average fixed interest rate of 4.01 % for the first 10 years and with maximum payback periods of 20 years. In 2012, the average loan was estimated at EUR 129,865. The fund has now been fully used.

The idea of a revolving fund scheme to tackle energy inefficiency was inspired by the Central Bank of Germany (KfW), KredEx's counterpart. KredEx was keen to support the renovation of energy inefficient multi-apartment complexes in Estonia because 75 % of the population live in such buildings. The Estonian Ministry of Economic Affairs and Communications, responsible for housing, and the Council of Europe Development Bank (CEB) were involved in developing the loan scheme.

When the fund was first launched, it was still a relatively new proposition, but during the new funding period, managing authorities were encouraged to invest more ESIF funding into revolving instruments.

According to KredEx, one of the most important funding outcomes was the stimulation of markets for financial product. Swedbank and SEB now offer long-term payback loans for the renovation of multi-apartment buildings that have received a KredEx grant with similar loan conditions.

### Key Message: Funds co-financed by ERDF can stimulate the market for financial products

**Location/Region:** Estonia

**Funding Source:** ERDF equity, CEB loan

**Budget and Funding:** EUR 49,000,000, ERDF funding of EUR 17,000,000, CEB loan of EUR 28,800,000

4.2.3. “Leading Industries” Competition, North Rhine-Westphalia, Germany

The Federal German State of North Rhine-Westphalia has a long tradition as a centre for industry and energy. The leading industry competition in the area “Energy and environmental economy” (one of eight leading industry branches) aims to promote the strengths identified in the regional smart specialisation strategy.

The objectives of the competition are:
• to promote technological, economic and social innovations;
• to interlink players along the value chain;
• to open up new markets;
• to profile North Rhine-Westphalia as an economic centre for these branches;
• to increase competitiveness; and
• to create and save employment.

The competition is funded under Thematic Objective 3 of the ERDF — to increase the competitiveness of SMEs — and has three pillars:

1. Energy production, energy transport and energy storage
2. Material and energy efficiency
3. Environmental technologies

North Rhine-Westphalia has used calls or competitions during the last funding period as a way of increasing the effectiveness and efficiency of the ERDF programme, with high quality innovative projects.

The competition addresses resource efficiency in production processes and all phases of the life cycle of a product. The main fields for projects are:
• material- and energy-efficient production;
• the circular economy;
• sustainable and environmentally friendly products; and
• sustainable management of raw materials.

Companies, universities and research institutions, and cultural institutions are allowed to submit projects. Joint projects proposed by companies, research institutions or universities take priority in the selection process and should cover the complete value chain. The objectives of the research activities must be market-oriented and include marketable products.

Key Message: Targeted competitions can raise the effectiveness and efficiency of ERDF programmes through high quality innovative projects

Location/Region: North Rhine-Westphalia, Germany

Funding Source: ERDF 2014-2020

Budget and Funding: Total budget depending on the projects, ERDF funding of EUR 40 000 000

More Information (only in German): http://www.efre.nrw.de/0_2_Aktuelles/2014_11_17_Start_Energie_Umweltwirtschaft/index.php

4.2.4. Resource Efficient Scotland SME Loans, United Kingdom

The Resource Efficient Scotland SME Loan scheme is part of the programme for Resource Efficient Scotland (see example 4.4.5) and aims to support SMEs looking to reduce their costs through more efficient usage of energy, material resources and water. It provides businesses with interest-free loans from GBP 1 000 to GBP 100 000, to be invested in a variety of measures, including efficient boilers, more efficient plant/machinery and a range of renewable-energy technologies.

The scheme was launched in 2008 and is funded by the Scottish government.

Before the loan is granted, companies receive support through Resource Efficient Scotland which provides a qualifying report. The main objective is helping SMEs to save money on their energy bills and reduce their carbon emissions. So far, more than 500 loans, worth
over GBP 14 million, have been provided to SMEs. Demand for loans is increasing year on year. Loans for energy-efficiency measures have to be repaid within four years, and loans for other measures within eight years. Repayments go back into the scheme and go towards future loans.

**Key Message:** The right financial instrument can trigger a demand for resource-efficiency measures

**Location/Region:** Scotland, United Kingdom

**Funding Source:** National Funding

**Budget and Funding:** Revolving budget

**More Information:**
http://www.energysavingtrust.org.uk/scotland/businesses/getting-support/sme-loan-scheme

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4.2.5. Green Innovation Vouchers in Valencia Region, Spain

Green Innovation Vouchers are based on the idea of innovation vouchers that exist in many European regions. Innovation vouchers are awarded as grants that do not need to be paid back by the recipient.

SMEs in Valencia are generally small and many are not able to implement complex innovation projects for resource efficiency due to a lack of expertise. With the green innovation voucher, a company can buy access to technical expertise.

The Network of Technological Institutes of the Valencia (REDIT) played a key role in designing and implementing this pilot scheme. The entire approval process took less than six weeks, from the launch of the call until the final decision. REDIT was given authority by the regional government of Valencia to award the vouchers to companies.

A total of 25 vouchers were granted to companies, mainly in the two areas of energy savings and water treatment. They covered 100 % of external service costs of up to EUR 10 000.

An example of a SME grant for a Green Innovation Voucher

An SME involved in the organic coating industry used external expertise to investigate how to reduce the amount of waste they were producing. This company generated 35 tonnes of hazardous sludge per year. The analysis proved that by installing a sludge-dryer system, half of the water found in the sludge could be reused. This represented significant savings in the areas of waste treatment and water consumption. The voucher was also used to analyse their equipment, with experts suggesting more efficient equipment in order to reduce over-spraying during the coating process.

**Key Message:** Involving the right intermediary for SMEs strengthens the chances of success and acceptance of the scheme

**Location/Region:** Valencia Region, Spain

**Funding Source:** CIP 2007–2013

**More Information:**
http://www.greenovate-europe.eu

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4.3. Networks and Clusters

Regional networks can help SMEs understand the potential and long-term advantages of improvements in resource efficiency and identify who is responsible for offering them resource-efficiency services and advice.

The projects in this chapter bring SMEs together, increase awareness and provide assistance in order to overcome the barriers to resource efficiency faced by SMEs.

4.3.1. Industrial Symbiosis, United Kingdom and other countries

Industrial Symbiosis is an innovative process that allows businesses to reuse waste streams or under-utilised resources produced by another company as by-products. Industrial symbiosis was first implemented as a pilot project in Scotland and in parts of England and has since been transferred to several other countries, regions and cities within Europe.
Besides facilitating the exchange of materials, industrial symbiosis has a holistic approach that includes water and energy, innovation, knowledge transfer, logistics, under-utilised assets and job creation.

The programme offers “matching” workshops, facilitated by experts, to help companies make the link between what they need and what they have to offer. A database makes all the offers available for all interested businesses. Following the workshops, experts continue working with these companies until cooperation has been finalised.

The industrial symbiosis projects are being implemented by various actors from different countries. Some of these projects have been launched by private companies, others by the regions or chambers of commerce. Some were financed by EU funds (ERDF and LIFE) and others from national and private sources.

ECOREG — Industrial Symbiosis in Romania

ECOREG aimed to test the concept of industrial symbiosis within a governmental programme in Romania. The project was financed through the LIFE+ Programme and implemented in the county of Suceava in north-east Romania.

The ECOREG project made use of the methodology that had been tested and implemented in the UK. This was then adapted by Romanian partners to meet their national specifications.

A series of workshops took place in the region with companies from different sectors. Each participant filled in a “HAVE” form detailing the resources no longer useful for his/her activity: waste, by-products, excess production capacities, space etc.

The participants also filled in a “WANT” form on the resources needed for their activities: materials, energy, technology, space etc.

All these forms were then circulated amongst the participants. Some companies expressed an interest that matched a supply with a need for a particular resource available, forming “symbiotic relations” or connections, named “synergies”.

After these recruitment workshops, technical visits were organised at the companies that showed the most promising symbiotic potential. The ECOREG project team discussed specific options for progress and the best ways to implement the synergies identified with the managers. Technical issues such as measurements and laboratory analyses were also discussed and decided upon.

The project was accompanied by extensive communication to raise awareness and increase interest among regional companies.

Over 200 businesses participated in this project. A total of 114 synergies were formed, involving over 530 000 tonnes of waste (including 500 000 tonnes of wood waste). Around 2 500 forest hectares were preserved through the replacement of wood raw materials with wood waste.

In total, the project saved more than 130 000 tonnes of CO₂ emissions.

Key Message: Industrial symbiosis is a scheme easily transferred to all European regions and offers tremendous business potential for SMEs

Location/Region: Suceava, Romania
Funding Source: LIFE+
Budget and Funding: EUR 880 700, funding of EUR 365 500

Contact details can be found on the website

4.3.2. SMILE:-) Resource Exchange, Ireland

SMILE Resource Exchange is a free service for businesses in Ireland encouraging the exchange of resources between members in order to save money, reduce waste from going to landfill and develop new business opportunities. Potential exchanges are identified through free networking events, an online exchange facility and
support teams that assist throughout the process. SMILE Resource Exchange is a partnership involving several public bodies in Ireland.

The premise behind the SMILE network is that one business’s waste or unused resource could become another business’s raw material, resulting in a mutually beneficial relationship that reduces both operating or disposal costs and procurement costs. Examples of items and products offered are plastics, timber, cardboard, paper and pallets. All items offered are either for free or priced at below the market value.

Businesses can identify resources they would like to exchange such as reusable items, by-products and surplus products at SMILE networking exchange events and through their website.

A typical SMILE Resource Exchange event will offer:
- formal facilitated networking opportunities;
- informal networking at coffee breaks and lunchtime;
- presentations by businesses who have already benefited from such business practices;
- post event support in developing matches between businesses.

The facilitated networking will require businesses to complete “I have to give” and “I want to get” cards. These cards will be collected from each table by a facilitator who will then assess the cards and work with the businesses at the table to see if any matches or exchanges can be made. Each business will have a chance to visit different tables to hear the opportunities presented by the other businesses attending. Matches between businesses will be made at the event and also through subsequent analysis of the information provided after the event.

Key Message: A network of like-minded companies is a chance for small SMEs with limited funds to save resources

Location/Region: Ireland

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Funding Source: ERDF and regional funds
Budget and Funding: EUR 819 000, ERDF funding of EUR 93 000


4.3.3. ECO WORLD STYRIA, GreenTech Valley, Austria

Winner of the RegioStars Award 2012 for Intelligent Growth

The cleantech cluster ECO WORLD STYRIA was founded in 2005 to specialise in energy and environmental engineering and develop a “Green Tech Valley” of internationally comparable standard in the Austrian province of Styria. It seeks to increase the international competitiveness of the region through innovation in the area of green technologies and to generate economic growth.

The province has a long tradition in the cleantech sector. ECO WORLD STYRIA plays an important role in the implementation of economic policy in Styria and is financially supported by the ERDF and the regional government.

The cluster was set up as a public-private partnership and is driven by a research-industry-government cooperation model designed to take eco-innovation to a higher level. Together with its strategic partners, ECO WORLD STYRIA provides a support structure that facilitates sustainable growth for its cluster clients in the areas of biomass, solar energy, waste as a resource, and water.

The region of Styria is now home to more than 170 cleantech companies, of which 15 are world technology leaders in their fields. These companies have an average growth rate of 19 % per year — nearly double the worldwide cleantech market growth rate of 10 % per year.

Cleantech revenues generated by these businesses have risen to EUR 3.1 billion in 2010, equivalent to 9 % of the Gross Regional Product, compared to 5 % in 2005, and Styria
now has one of the highest concentrations worldwide of top class clean technology companies within an hour’s drive.

As a result, this world-class cluster has also attracted several big companies, who have moved their headquarters to Styria. Since the beginning of the project, eco-innovative companies have generated 5,000 new jobs, increasing their staff on average by over 10% per year.

The cluster has implemented several instruments to focus on trends and market developments in the cleantech sector and to bring together customers, researchers and companies to assist the businesses in developing new technologies and services.

**Key Message:** The targeted support of cleantech companies can make a region highly innovative in environmental and resource-efficiency technologies and products

**Location/Region:** Styria, Austria

**Funding Source:** ERDF 2007-2013

**Budget and Funding:** Approximately EUR 3,000,000 for 5 years, funding of EUR 880,000, of which EUR 444,000 from the ERDF

**More Information:** [http://www.eco.at](http://www.eco.at)

### 4.3.4. Project R4R — European Chemical Regions for Resource Efficiency

Accelerating innovation can help the chemical industry to switch to biorenewable feedstocks, improve the efficiency of its processes, and recycle its waste materials. Implementing these developments could mean that, by 2030, the chemical industry could potentially: cut its CO₂ footprint by 50%; reduce its energy consumption by 30%; and reduce its use of raw materials by 20%.

Funded by the FP7 Regions of Knowledge Programme and launched in 2012, the main objective of the Regions4Resource (R4R) project is to improve regional and international collaboration on resource efficiency and eco-innovation throughout the chemical and process industry.

By carrying out an analysis of the six regions concerned, the R4R project provided the basis for exchange of knowledge on successful collaboration in three fields: alternative feedstocks, resource-efficient processes and recycling of waste streams. Based on this analysis, the project aligned future regional and European Joint Action Plans and innovation roadmaps in an effort to accelerate innovation in resource efficiency. The project also created a set of proven tools, practices and examples for other European regions and sectors to apply in the future.

Cooperation of this type between research institutes, industries and regions can also be promoted as a way of meeting the specific challenges of other resource- and energy-intensive sectors.

**Key Message:** International cooperation can accelerate innovation and improve the application of resource efficiency

**Location/Region:** Sweden, Netherlands, Spain, Poland, Italy, Belgium, Germany

**Funding Source:** 7th Regional Framework Programme

**Budget and Funding:** EUR 2,700,000, funding of EUR 2,580,000

**More Information:** [http://www.regions4resource.eu](http://www.regions4resource.eu)

### 4.3.5. GREEN VENTURES, Germany

In 1998, the Chamber of Commerce in Potsdam (IHK Potsdam) ran its first business conference entitled GREEN VENTURES. GREEN VENTURES opens up international markets and fosters worldwide cooperation tailor-made for SMEs active in the field of resource efficiency. The project was initially funded under the Community Initiative SME.
Since 1998 this event has been attended by 4 500 companies from 115 countries. Originally conceived as a platform for German-Scandinavian cooperation, GREEN VENTURES has become Germany’s largest partnership forum for environmental and energy technology companies. The forum offers a programme of carefully planned and organised bilateral talks between companies from Germany and abroad interested in cooperation.

Partner countries from Europe, Latin America, the USA and the Arab Gulf States attend in the forum. GREEN VENTURES has also been held in Shanghai, with the support of the EU’s Asia-Invest programme, and at Italy’s biggest energy and environment fair Ecomondo in Rimini. Sao Paulo, Rio de Janeiro, Saudi Arabia and the UK have also hosted the forum.

The Green Ventures partnership forum is aimed in particular at companies working in the following areas:

- water, air and soil;
- energy and construction; and
- recycling and regenerative materials.

Any company interested in attending the event can do so. Managing authorities could support the active participation of SMEs at events such as this one to help them combine their internationalisation strategies with resource efficiency.

4.4. Advice and Training

Advice and training are essential elements for implementing regional resource-efficiency strategies. SMEs in particular often do not value resource efficiency and resource scarcity as critical for the future of their business plans. SMEs may not even be aware of the real costs of materials and energy consumption.

The projects in this chapter show the importance of external advice and training for the identification and implementation of resource-efficiency measures.

4.4.1. VDI Centre for Resource Efficiency, Germany

The VDI Centre for Resource Efficiency (VDI ZRE) was launched in 2009 as a cooperative project by the Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU) and the VDI Association of German Engineers. The VDI ZRE serves as an interface between business and science, pools knowledge gained from theory and practice and organises knowledge transfer for resource-efficient management. It works in the interest of the environment and businesses.

The VDI ZRE offers tools and instruments to help businesses implement measures for better resource efficiency. It depends on experts from different disciplines who address objectives in the use of materials and energy consumption from different perspectives. The VDI ZRE makes its expertise widely available to SMEs, free of charge. It gives industry-specific and practically oriented advice. Industrial production and the construction industry are its thematic priorities.

VDI ZRE also develops scientifically substantiated guidelines on resource efficiency for SMEs. The guidelines describe current general practices and set standards that serve to guide engineers in their daily work. The goal is to clearly define resource efficiency and to render it as measurable as possible. Thus, these guidelines explain, inter alia, the methodological basis used for assessing resource efficiency and identify the strategies that lead to success.

Key Message: GREEN VENTURES combines resource efficiency and internationalisation

Location/Region: Potsdam, Germany, and other locations

Funding Source: ERDF

Budget and Funding: EUR 80 000 plus internal staff costs per event, funding EUR 60 000 Euros

One of the tools VDI ZRE offers is the “Basic Module Resource Check”. Companies answer several general questions about their operational procedures and receive a detailed evaluation report with preliminary indications of how resources could be used more efficiently. In addition, more detailed checklists will help detect further potential for saving on resources.

For an industry-specific, in-depth analysis, VDI ZRE has developed the Resource Check modules that are designed particularly for key technologies in the manufacturing industry. The range of check modules available is constantly being improved and extended.

Additionally, the resource centre provides information on funding programmes and establishes contacts with consultants and networks to exchange experience. Furthermore, it also offers standardised professional training on resource efficiency to company staff, during which they are shown methods to analyse and optimise resource-efficiency potential and to implement resource-efficiency projects.

**Key Message:** The Centre for resource efficiency provides comprehensive expertise and organises networking to help SMEs realise savings potential.

**Location/Region:** Germany

**Funding Source:** Own financing

**More Information:**
www.vdi-zre.de/ressourcenchecks

SüssOberflächentechnik, an SME supported by VDI ZRE

SüssOberflächentechnik, based in Wetzlar in Hessen, Germany, exports components for the car industry, sanitary, medical and electrical engineering sectors among others. The company specialises in galvanic coatings and makes decorative and coating surfaces for specialised requests.

The company aims to make continuous improvements to their production methods in order to protect the environment and minimise production costs. With support from VDI ZRE, SüssOberflächentechnik was able to make yearly savings of EUR 20,000 and, in addition, to increase the quality of their products by recovering acid from the anodising bath method. This investment was paid off after only two years.

Additionally, by applying intelligent process engineering the company was able to make significant savings on water and energy use. For example, the heat recovered saved 90% of their water intake and 25% of their energy output.

This concept of an integrated environmental protection system is also transferable to other industry sectors.

**Key Message:** Low-cost resource-efficiency measures may have a huge economic potential.

**Location/Region:** Hessen, Germany

**Funding Source:** Own financing

**More Information:**

4.4.2. Motiva Material Efficiency Audit Tools for Companies, Finland

Motiva is a government owned expert company and a forerunner in promoting efficient and sustainable use of energy and materials. Their services are used by public administration, businesses, communities and consumers. They provide companies, the public sector and consumers across the country with information and expert services that help them to make resource-efficient and sustainable choices.

The Material Efficiency Centre was established in Motiva in 2008 with the aim of becoming a recognised and independent national coordinator and an information source and networker in the field of material efficiency. It sets up and
coordinates interactive networks among material-efficiency professionals and acts as a data and knowledge centre.

Motiva promotes material efficiency by emphasising the importance of being proactive and of adapting early. The best results in material efficiency are achieved by influencing early planning and promoting design that takes the environment into account. In an optimal situation, the whole value chain will benefit from the consideration given to the whole life cycle of a product during product development.

The centre also develops and implements material-efficiency audit and analysis tools for companies and aims to create a widely accepted and widely used audit model for all industry sectors.

The material audit aims to identify potential resource (material and energy) savings in production processes and consists of:

- systematic evaluation of the flow of materials in production (material balance of factory and processes);
- tracing direct and indirect costs related to use of materials;
- identification of points for improvement;
- proposals for concrete actions to achieve these improvements;
- estimate of benefits and feasibility of and savings offered by the suggested actions;
- possible recommendations for further examination and activities; and
- consideration of environmental aspects of production and materials.

On the basis of the material audit, a well-focused action plan for the companies is generated with clearly defined cost-saving measures.

Results of the programme to date:

- 15 Material Audit projects have been launched with total savings potential of EUR 11 million (based on ISO 1405124).
- Extensive training of new expert companies focusing on resource efficiency has resulted in positive interest in the national Material Audit Programme.
- The material audit also gives further insight into industrial symbiosis and product design capabilities for the companies.

### Key Message

**A material audit is the best starting point for resource-efficiency measures.**

Consideration of material efficiency from as early as the design stage achieves the best results.

**Location/Region:** Finland

**Funding Source:** National funding

**Budget and Funding:** EUR 200 000 for managing the programme plus approximately EUR 30 000 per audit, funded from national sources


The audit methodology has been developed and tested with some Finnish pilot companies such as LumonOy:

**LumonOy**

LumonOy manufactures, sells and installs balcony façade products and glazed terraces. The main raw materials are aluminium and toughened or laminated glass. The main factory is in Finland, with subsidiaries in several other countries. The company has approximately 600 employees.

The company was subject to a material audit that covered raw materials, utilities and energy commodities and labour costs. The material balance focused particularly on the material flows in the production of glass and aluminium profile packages for Lumon’s main products.

Savings were identified in optimising glass production through more detailed analysis of wastage and by reducing the waste of saving...
aluminium profiles. The company was able to save almost EUR 800 000 per year through the measures implemented. The audit results were used to create a more accurate system for monitoring wastage and served as a basis for investment calculations.

The enthusiastic involvement of management and staff in the workshops and regular information briefings of the preliminary results were key for the successful conclusion of the project. A total of 68 proposals were developed for action and most of the ideas came from staff.

Key Message: The involvement of staff can make a significant contribution to developing greater resource efficiency in companies

Location/Region: Finland

Funding Source: Own funding


4.4.3. ENWORKS — Helping SMEs save scarce resources and become more competitive, United Kingdom

Winner of the RegioStars Award 2013 for Sustainable Growth

ENWORKS is an environmental support service funded by the ERDF that helps thousands of businesses in the North-West of England use scarce resources more efficiently, reduce their carbon emissions and become more profitable, competitive and sustainable. Before ENWORKS was set up, access to environmental advice for businesses in the region was fragmented, with a number of small-scale projects being run with little transfer of knowledge from one local project to the next.

The key goals are:

• improve the competitiveness and productivity of SMEs in the North-West of England by reducing their exposure to environmental risks and improving their resource efficiency;
• improve the region’s skills and knowledge on environmental management;
• demonstrate that environmental practice is profitable.

ENWORKS takes a holistic approach and offers support across a wide range of issues, from managing environmental risk through to the rewards of reducing energy, water and material usage and improving waste management. The service addresses a broad spectrum of issues that businesses face today, including: eco-design, process efficiency, sustainable procurement, carbon footprinting and climate change adaptation. Support is tailored to meet the circumstances of the business concerned. ENWORKS will typically undertake individual on-site reviews to identify environmental risks and resource-efficiency improvements and then provide solutions on how those risks could be addressed through simple, no-cost and low-cost actions and support the implementation of these improvements.

Companies have free access to the ENWORKS Online Resource Efficiency Toolkit, which is a custom-built piece of software that helps managers to understand, prioritise, track and assess their improvements in resource efficiency and their cost savings. ENWORKS also organises training and networking events, and provides regular e-bulletins and online resources, including business case studies, to assist with knowledge and skills transfer into SMEs.

The key to the success of ENWORKS is their strong partnership structure which includes a wide range of stakeholders, in particular regional businesses.

Through the last two EU-supported programmes, ENWORKS has helped SMEs identify GBP 79 million of annual cost savings through resource efficiency, of which GBP 13 million have so far been implemented. These improvements have saved over 47 000 tonnes of CO₂ emissions, 413 000 m³ of water and 9 300 tonnes of materials to date. In addition, environmental improvements have created or safeguarded over 960 jobs, and over GBP 113 million in sales.
4.4.4. ÖKOPROFIT, Austria

ÖKOPROFIT uses an approach based on cooperation between local government and local companies, with the goal of reducing emissions and costs and saving natural resources. It was developed in 1991 in Graz, Austria, by the Environmental Office of the City of Graz and the Graz University of Technology.

Under the motto “help to help themselves”, this programme consists of joint workshops for 10-15 production and service companies and offers individual advice on different topics. Training allows SMEs to discover their saving potential and to learn about how to implement measures. At the end of the programme year, SMEs are audited and awarded the label “ÖKOPROFIT Company”.

The ÖKOPROFIT-CLUB is a network of accredited SMEs. Regular workshops are held during which they exchange experiences and update their knowledge. The companies also receive support in identifying and implementing new measures.

In the first 20 years of the programme, participating companies were able to save, inter alia, 16.87 million litres of fuel and oil, 480 583 mw/h electricity, 177 331 tonnes of waste and 2.2 million tonnes of CO₂.

The city of Graz has issued 19 countries on four continents with licences for this concept.

More than 5 000 companies have participated worldwide in ÖKOPROFIT or ECOPROFIT projects. This demonstrates that this programme can be easily applied to all cities and regions.

In some European regions the introduction of ÖKOPROFIT was supported by ERDF funds.

4.4.5. Resource Efficient Scotland, United Kingdom

The Resource Efficient Scotland programme, run by Zero Waste Scotland, provides support to businesses, third sector and public sector organisations, to help them reduce costs through improved energy, material-resource and water efficiency. This holistic approach to low-carbon transition ultimately aims to help both businesses and public sector organisations to reduce their emissions, save money and increase their competitiveness. Establishing the concept of resource efficiency within the public sector in Scotland will make a significant contribution to the Scottish government meeting its objectives.

Resource Efficient Scotland offers free advice and technical support and also promotes the
sharing of best practices, creation of networks and use of new technologies.

Launched in April 2013, the programme has already engaged with 33 000 organisations, helping to identify and implement millions of euros in savings.

The programme has three key components:

• A Scotland-wide integrated advice and support service: this “one-stop-shop” service provides practical technical advice and offers support to all businesses and public sector organisations with regard to waste and material-resource use, and energy and water efficiency. It focuses on the implementation of resource-efficiency measures, including advice on access to finance.

• Resource Efficient Scotland: the service provides sector-focused activities tailored to meet the specific needs of business and the public sector across Scotland, in order to deliver resource-efficiency savings.

• An integrated business and public sector intelligence strand: this supports the whole programme activity including through monitoring and evaluation that leads to the continual development and improvement of the Resource Efficient Scotland programme.

Key Message: A “one-stop-shop” approach with free services encourages SMEs to make use of advice

Location/Region: Scotland, United Kingdom
Funding Source: Regional funding

4.4.6. EURL3A — Knowledge Alliance

One of the biggest challenges involved in reaching the European climate objectives is to create a sustainable and Near Zero Emission (NZE) built environment. Both the educational and the business sectors face the challenge of an ever-decreasing number of graduates having studied “technical” subjects and mismatches between the skills graduates have and the requirements of the business sector.

The EURL3A project aims to tackle these issues by improving technical education and making education more efficient and more attractive by using a dynamic combination of practice and theory created by the “Real Life Learning Lab Concept”.

In Real Life Learning Labs, multidisciplinary teams of students and young entrepreneurs work, under the mentorship of professionals from universities and industry, on assignments designed by the business sector relating to the development of new businesses. The idea of the Real Life Learning Labs is to integrate the classroom into a professional environment, where learning and teaching is combined with practical work experience and exposure to current industry needs.

The EURL3A project developed this concept in three European countries (Slovenia, the Netherlands and the Czech Republic) and intends to launch a European network of Real Life Learning Lab Alliances.

The expected results include:

• more engineers who are better educated and trained on relevant technologies and competencies for the sustainable NZE built environment;

• support for businesses in developing and innovating products and services for the markets of the future;

• an easy accessible network of knowledge and research capacity at European level, including an exchange and mobility programme to support business growth; and

• a contribution to speeding up the transition to a sustainable NZE built environment, taking into account economic growth at a European level.
Key Message: Developing the competences needed to reach the climate objectives requires joint efforts on the part of universities and industry

Location/Region: Slovenia, the Netherlands and the Czech Republic

Funding Source: Erasmus+

Budget and Funding: EUR 528,398 Euros, funding EUR 343,459

More Information: http://www.eurl3a.eu/

4.4.7. FEE Bat — Training Initiative in the Building Sector, France

FEE Bat is a public-private partnership run by the French government involving several associations and private companies, including from the energy sector.

Craftspeople are often the first source of information for homeowners. Customers wanting to reduce costs ask for advice on all aspects including heating, insulation and ventilation. FEE Bat provides master craftspeople and their employees with training to increase their knowledge of energy-oriented refurbishment and provides networking opportunities. The training course allows craftspeople to offer their customers an energy analysis and integrated solutions for their energy improvements.

Training courses are adapted to different groups such as workers, craftspeople, master craftspeople, managers and technical staff.

More than 48,000 participants from across craft sectors have so far been successfully trained. The satisfaction among participants remains high. Several companies have joined forces to offer integrated solutions to their clients.

This programme will continue with further funding from the French government.

Key Message: Lifelong learning to equip workers and craftspeople with new skills is a responsibility shared by employers, employees and local government authorities

Location/Region: France

Funding Source: National funding

This chapter aims to provide recommendations to those taking decisions on the ESI Funds at regional and local level on how to improve the competitiveness of SMEs and allow them to exploit business opportunities in green markets through a better and more efficient use of resources.

SMEs and larger-sized companies benefit greatly when they become more resource efficient. Although the role of the entire private sector is fundamental for transitioning towards a circular economy, there is still a need for intervention by the public sector, in order to provide appropriate frameworks for the private sector and ensure equal opportunities.

The recommendations were developed from:
• analysis of good examples, their success factors and conclusions that were drawn from the projects; and
• conclusions as to how to overcome barriers and promote the drivers of greater resource efficiency.

The recommendations are presented following the structure of the good practice examples in chapter 4, starting with general recommendations and followed by thematic recommendations.

General Policy Recommendations

Recommendation 1: Analyse your regional context, including drivers of and barriers to resource efficiency

Analysis of the regional framework is a precondition for the successful implementation of resource-efficiency measures for SMEs. The drivers of and barriers to the implementation of resource efficiency must be taken into account when carrying out this analysis. There is no “one size fits all” solution for all regions. Regions are confronted with diverse challenges unique to them.

Some guiding questions for the analysis could be:
• What are the main drivers and barriers to more resource efficiency in SMEs in your region?
• What is the current situation with regard to SMEs? What support do they need to be able to implement resource efficiency measures? Are they aware of the costs related to their production processes? Do they have the necessary knowledge and competences?
• What are the existing regional assets and existing regional potential for boosting resource efficiency in SMEs?
• What is the regional expertise and knowledge, e.g. in research and innovation and in the field of resource and energy efficiency?
• What are the competitive advantages of the regional industries, clusters and SMEs with regard to resource efficiency? Is there a leading industry or cluster in the region that has significant potential to improve its resource efficiency?
• Is there a dynamic environment for entrepreneurship and business development in the region in general but in particular in industries where resource costs account for a large proportion of total costs?

Recommendation 2: From the analysis of the region’s potential for resource efficiency, formulate your vision and strategy right through to the design of concrete measures to undertake

This would ensure that resource efficiency measures play an important role in the formulation and implementation of several specific objectives, as outlined in chapter 3.2.

Examples of “leading industries” from North Rhine-Westphalia (see good example 4.2.3) and GreenTech Valley from Styria (see good example 4.3.3) demonstrate successful approaches for developing industries and clusters from regional strengths.

Some regions in Europe have combined smart and sustainable growth with their regional Research and Innovation Strategies for Smart Specialisation (RIS3)25.

Recommendation 3: Ensure the involvement and participation of regional stakeholders

Regions are tasked with tackling complex challenges to create the right comprehensive policy mix, as previously described. They should avoid acting alone and rushing into action.

It is crucial to involve a wide range of active stakeholders, including national, regional and local government, local businesses, NGOs, social enterprises, universities, research institutions and business support centres and economic development agencies in order to develop, implement and communicate successful regional strategies that support resource efficiency.

Regions should make use of active agents from these institutions who are well-known, widely accepted, trusted and able to provide specific services and add value. Chambers of commerce or trade, public or semi-public bodies such as the regional development agencies or economic development boards often enjoy greater trust among SMEs. The Enterprise Europe Network (EEN) can also be a valuable partner in boosting SMEs’ awareness of resource efficiency and in supporting measures to promote internationalisation.

Who the correct and most important stakeholders actually are might differ from region to region, depending on the challenges, objectives and constraints.

These stakeholders can have different roles and tasks during the various stages of this process when developing and implementing regional resource-efficiency strategies. The following table provides an overview of when and for which particular objective stakeholders from regions can be involved.

---

Table 7: Role of regional stakeholders

<table>
<thead>
<tr>
<th>Objective</th>
<th>Stakeholders</th>
<th>For what purpose?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of the regional context</td>
<td>All stakeholders to identify their positions, objectives and the possible contributions they can make Universities for scientific support</td>
<td>During the whole process of the analysis and development of the strategy</td>
</tr>
<tr>
<td>Creating the right environment</td>
<td>Depending on the particular topic, in particular business organisations, universities, local governments, NGOs, economic development agencies</td>
<td>Stakeholders can support policy development with their specific inputs and support the implementation, e.g. communication campaigns; universities can strengthen technology transfer</td>
</tr>
<tr>
<td>Financial instruments</td>
<td>Business organisations, banks, e.g. regional or national development banks</td>
<td>For the development of instruments and support schemes Banks for the implementation of support schemes (decisions on granting of credits), also for providing national co-financing</td>
</tr>
<tr>
<td>Networks and clusters</td>
<td>Business organisations, universities, local governments, NGOs, economic development agencies</td>
<td>For building up networks, but also for the management (creates ownership among actors from networks and clusters)</td>
</tr>
<tr>
<td>Advice and training</td>
<td>Business organisations, NGOs, economic development agencies, universities</td>
<td>For policy development (as they know the needs of target groups) and the design and implementation of projects</td>
</tr>
</tbody>
</table>

The project FEE Bat (see good example 4.4.7.) is a public-private partnership between several partners. The French government gathered all the relevant actors together in order to reach the target groups in the best possible way. At a regional level, the project Clean Green Business Growth (see good example 4.1.1.) demonstrated the success of wider partnerships.

Create the right environment for resource efficiency

Recommendation 4: Create the right environment for resource efficiency in your region

Innovation in resource efficiency and for a circular economy needs, in the same way as any innovation system, a functioning ecosystem, if it is to lead to success. Therefore, regions should introduce an efficient policy mix to create a better environment for resource efficiency. This includes measures and support schemes all along the entire value chain of a product, from research through to the use of waste to ensure the most favourable framework conditions.

Regions can choose from a complete set of instruments to create a policy mix that provides the best support to SMEs and stimulates demand for resource-efficient products and services.
Initiatives can include research, technology transfer, design, advice and training, new business models, setting up networks, clusters, platforms and competence centres, energy management, logistics and investment incentives.

This kind of action should be supported by the following measures, which help to create beneficial frameworks in which SMEs can exploit the market opportunities that result from resource efficiency:

- regulations and standards, e.g. in eco-design, that support the application of resource efficiency;
- use of green public procurement, including pre-commercial procurement for greater eco-efficiency in the public sector;
- support the application of labels and certifications for resource-efficient products and services such as EMAS; and
- target customers to explain the advantages of and stimulate private demand for resource-efficient products and new services such as “use not own” and repair, reuse and recycling of products.

Financial Incentives

**Recommendation 5: Offer attractive and simple financial incentive schemes**

Suitable financial schemes can contribute to accelerating the evolution towards greater resource efficiency. The importance of public support is a consequence of the current scarcity of financial resources in SMEs.

Research and investment costs for new production processes or materials represent significant barriers to SMEs becoming involved (see chapter 2.3.). At the same time, existing programmes often demand a lot of SMEs that have very limited resources for writing applications, implementing measures and reporting.

According to the 2015 Flash Eurobarometer, a large majority of SMEs (87 %) are carrying out at least one action with the aim of becoming more resource efficient and also plan to do more. However, the proportion of their annual turnover that they manage to invest in resource efficiency measures is slowly decreasing. The same survey discovered that only 19% of SMEs got external support for their actions and, of those, only 30% received public support. It can therefore be assumed that the right set of funding schemes can give the right stimulus to SMEs to increase their investment in resource-efficiency measures.

In order to make programmes to promote resource efficiency effective, it is important to give particular attention to the following aspects:

- **Programmes must be SME-oriented and easily accessible.** Complex procedures should be avoided and fast application and approval procedure implemented. SMEs need simple and pragmatic solutions. The scheme must contribute to improved competitiveness and reduce costs. Thus one task is cutting red tape.

- **Incentives should be market-oriented, have practical relevance for SMEs and consider their particular interest.** Market-oriented schemes can help SMEs to pick up on emerging trends so as to enter markets as forerunners and avoid struggling as latecomers for limited market share.

- **Programmes must be appealing to the customer (the SMEs) and not to government authorities.**

- **Programmes should provide the adequate scheme for the problem addressed**

Not every incentive is the right one for every problem an SME needs to solve.

1. As a starting point for improving resource efficiency and realising “quick wins”, a green innovation voucher might be the best instrument (see good example 4.2.5).
2. Managing authorities can provide grants to stimulate the implementation of the more risky research projects or investment in innovative new technologies that are not fully tested (see good example 4.2.3).
3. Finally, financial instruments (such as loans and equity) are suitable for projects with a potentially high and fast return on their investment (see good examples 4.2.1, 4.2.2 and 4.2.4).
Private banks often face difficulties when financing investment in resource efficiency in SMEs. This is because:

- capital requirements are rising;
- benefits for SMEs are not clearly predictable; and
- banks have no tools and insufficient knowledge to assess the impact of the investment.

A programme from public and private sources that part-finances loans for resource and energy efficiency can help banks to share these risks and provide finance for more resource-efficiency measures needed in SMEs.

The experiences both from Estonia (see good example 4.2.2) and the United Kingdom (see good examples 4.2.1 and 4.2.4) demonstrate that low or no interest loans and equity can boost investment designed to save resources.

**Networked**

**Recommendation 6: Support networking and exchange**

Cooperation among networks can play a pivotal role in helping to accelerate the diffusion and capitalisation of resource-efficient technologies and processes. Networks are able to improve resource efficiency in business-to-business relations. Many SMEs have discovered that learning about the experience of other companies can speed up the development of their own business.

This exchange of practices can stimulate change in both companies and can help them save time and money by learning from each other’s mistakes. Resource efficiency offers plenty of scope for cooperation, as SMEs often have shared objectives.

Networking and exchange can be supported by setting up regional networks of SMEs, as has been demonstrated by industrial symbiosis platforms (see good example 4.3.1) and the project Smile;-) (see good example 4.3.2) or by focusing on resource efficiency in regional clusters (see good example 4.3.3).

Networking can be strengthened as part of regional internationalisation efforts. SMEs can be encouraged and financially supported to take part in specialised fairs and exchange or “matchmaking” events, such as Green Ventures (see good example 4.3.5) or to join the European-wide platform to connect SMEs and research institutions, GreenEcoNet www.greeneconet.eu.

Besides being suppliers, SMEs also play an important role as customers to large companies. ESI Funds can support projects that facilitate business partnering or mentoring.

Networks often need facilitators and moderators, such as chambers of commerce, associations, regional development agencies and cluster organisations. Regions are encouraged to create open spaces to allow and motivate dedicated people to interact and to build up networks.

**Advice and Training**

**Recommendation 7: Provide advice, coaching and information to SMEs**

SMEs are often not aware of their resource-efficiency potential and lack the knowledge needed to identify their own actual material and energy consumption. This is one of the main barriers to greater resource-efficiency measures in SMEs (see chapter 2.3.). External advice can raise awareness amongst SMEs of how to fully exploit their potential for resource efficiency, stimulate investment in clean and resource-efficient new technologies and help SMEs save costs.

The Ökoprofit concept (see good example 4.4.4) shows that SME owners and employees can learn how to detect potential for further improvement.

The most promising way of providing advice and training is a comprehensive consultancy approach including technical and operational checks, with the aim of saving materials, water and energy. The examples from VDI Zentrum Ressourceneffizienz (see good example 4.4.1) and Motiva (see good example 4.4.2) demonstrate how companies can benefit from external expertise.
To date, despite these opportunities, advice was only accessed by a small number of SMEs. As a consequence, regions should not only provide adequately and widely accepted advisory services, but more action also needs to be taken to motivate SMEs to participate in programmes. The project ENWORKS (see good example 4.4.3) proves that a holistic approach, when offered as a way of supporting a wide range of issues, encourages SMEs to make use of advice and coaching services.

An important aspect for SMEs is the proximity and accessibility of the services and also the trust they have in the institutions that promote or offer these services. This means that regions should use trusted regional partners and multiplicators to improve the acceptance level of efficiency consulting. The Enterprise Europe Network (EEN) can also be a valuable partner for boosting SMEs’ awareness of resource efficiency (see good example 4.1.4).

Regions should consider a few aspects when promoting resource efficiency in SMEs:
• emphasise the economic arguments and not just the environmental or geopolitical aspects;
• choose the right communication channels to reach SMEs (specialist trade fairs, professional journals, events etc.);
• highlight examples of good practice from other SMEs.

The combination of financial incentives and sound coaching measures can provide an effective way of minimising risks, especially when financial incentives are given in the form of a loan. The success of Resource Efficient SME Loans in Scotland (see good example 4.2.4.) is evidence of the effectiveness of such combined support schemes.

When these schemes are offered, consideration should be given to the high level of trust needed between the SME and the consultant. The external consultants receive full insight into the business operations of a company and learn company secrets. Not all SMEs react well when their financial incentives are disclosed during obligatory assignments undertaken by external consultants unknown to them.

A further possibility to investigate is the idea of a specific innovation assistant to promote resource efficiency in SMEs, helping them to become more aware of their potential to save resources. The innovation assistant for resource efficiency would be a highly qualified expert employed in the company (e.g. a graduate from a university, bringing his/her up-to-date knowledge into the company) who helps to identify potential to save resources and to find and implement the right solutions. This assistant will also build on the internal knowledge of the staff and management of the SME and provide support with innovation in this area. A programme co-financed by ESI Funds can grant staff costs for a certain time period, e.g. two years.

Recommendation 8: Broaden the knowledge base and develop competences in research institutions, companies and consultancies

A resource-efficient economy will require the focus of existing jobs to be reoriented and will lead to new job profiles being created. SMEs in particular can struggle to offer lifelong learning and further qualification for their employees. To ease this transition, regions should take the necessary action to support SMEs and their staff.

Only with skilled personnel will SMEs be able to fully exploit the potential of resource efficiency. The good examples presented in this guide demonstrate the importance of qualified staff for developing new ideas to save on resources and become more competitive.

The requirements for personnel are constantly changing due to faster innovation cycles. Lifelong learning and qualification can secure jobs, create new ones, help companies remain innovative and guarantee the correct response to changing customer demands.

Securing skilled personnel is a wide-ranging task involving many players, in particular in the light of changing demographics. It ranges from apprenticeships to providing further training, and should involve the participation of the older workforce, in order to benefit from their vast experience and qualifications.
Managing authorities can set up specific support schemes for any of the areas mentioned above, with co-financing from the European Social Fund (ESF).

Regions should also establish partnerships with institutions for further education, chambers of crafts and commerce and other associations, in order to ensure adequate, use-oriented, effective and easily accessible qualification measures (see good example 4.4.7).

Improving resource efficiency is a process of continuous improvement. This makes regional universities crucial partners for implementing the concept of a circular economy. Applied research in technologies that can save resources and costs and can be easily adopted by SMEs are an important part of a regional strategy. Universities should be encouraged to contribute in this way.

The competition for ERDF funded projects launched in North Rhine-Westphalia (see good example 4.2.3.) shows how regions can promote the knowledge base and encourage cooperation between SMEs and research institutions on joint projects.

Thematic Objective 1 from the ERDF regulation offers manifold opportunities for supporting research activities in research institutions and also SMEs.

Projects funded by Horizon 2020 can be another way of promoting greater cooperation between research institutions and SMEs.

‘Do’s and ‘Don’t’s for the successful implementation of resource-efficiency measures in SMEs

Table 8: ‘Do’s and ‘Don’t’s

<table>
<thead>
<tr>
<th>‘Do’s</th>
<th>‘Don’ts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adopt a holistic approach to a circular economy</td>
<td>Implement a narrow approach only focusing e.g. on single measures</td>
</tr>
<tr>
<td>Highlight the economic benefit of resource efficiency</td>
<td>Focus exclusively on the environmental benefits of resource efficiency</td>
</tr>
<tr>
<td>Analyse good practices and adapt them to regional needs</td>
<td>Copy-and-paste good practices that seem to fit</td>
</tr>
<tr>
<td>Develop SME-oriented support schemes that are easily accessible</td>
<td>Develop support schemes that are too complicated for SMEs</td>
</tr>
<tr>
<td>Develop integrated programmes including on energy, resource efficiency and innovation</td>
<td>Develop sectoral programmes, one for each topic</td>
</tr>
<tr>
<td>Develop support schemes for advice and investment</td>
<td>Focus purely on programmes granting investment</td>
</tr>
<tr>
<td>Provide support for all SMEs (start-ups, businesses in the growth phase, and established SMEs)</td>
<td>Neglect some target groups</td>
</tr>
<tr>
<td>Follow own regional strengths</td>
<td>Follow trends without reflection</td>
</tr>
<tr>
<td>Communicate the potential of resource and energy efficiency</td>
<td>Restrict communication solely for the benefit of energy efficiency</td>
</tr>
<tr>
<td>Choose the right regional and, if relevant, national partners</td>
<td>Act alone without broader support</td>
</tr>
</tbody>
</table>
What is an SME?

“SME” stands for small and medium-sized enterprise — as defined in EU law (Commission Recommendation 2003/361/EC).

The main factors determining whether a company is an SME are:
1. the number of employees; and
2. either the turnover or the balance sheet total.

The following ceilings apply to individual firms only. A firm that is part of a larger grouping may also need to include employee/turnover/balance sheet data from that grouping.

<table>
<thead>
<tr>
<th>Company category</th>
<th>Employees</th>
<th>Turnover</th>
<th>Balance sheet total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium-sized</td>
<td>&lt; 250</td>
<td>≤ EUR 50 m</td>
<td>≤ EUR 43 m</td>
</tr>
<tr>
<td>Small</td>
<td>&lt; 50</td>
<td>≤ EUR 10 m</td>
<td>≤ EUR 10 m</td>
</tr>
<tr>
<td>Micro</td>
<td>&lt; 10</td>
<td>≤ EUR 2 m</td>
<td>≤ EUR 2 m</td>
</tr>
</tbody>
</table>

Sources

Web links: EU-level initiatives to support resource efficiency

Green Action Plan

Resource Efficiency
http://ec.europa.eu/environment/resource_efficiency/index_en.htm

Circular Economy

Roadmap to a more resource efficient Europe
http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

Eco-innovation Action Plan
http://ec.europa.eu/environment/ecoap/index_en.htm

Environmental Compliance Assistance Programme for SMEs
http://ec.europa.eu/environment/sme/index_en.htm

Cohesion policy support to SME Competitiveness

Green Employment Initiative — Tapping into the job creation potential of the green economy
http://ec.europa.eu/environment/ecoap/index_en.htm

Resource Efficiency Opportunities in the Building Sector
http://ec.europa.eu/environment/eussd/buildings.htm

European Innovation Partnership on Raw Materials

Online Resource Efficiency Platform (OREP)
http://ec.europa.eu/environment/resource_efficiency/

Other Weblinks

The Small Business Act for Europe:


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Greenovate Europe, Guide to resource efficiency in manufacturing, 2012

National Industrial Symbiosis Programme, The pathway to a low carbon sustainable economy, 2009

UEAPME, position on the Green Action Plan for SMEs complementing the replies to the Commission’s consultation, December 2013

VDI Zentrum Ressourceneffizienz, Competitive Advantage: Resource Efficiency (Definitions, Basics, Facts and Examples), second edition 2014


Manifesto of the European Resource Efficiency Platform (EREP)

The objective of the European Resource Efficiency Platform is to provide high-level guidance to the European Commission, Member States and private actors on the transition to a more resource-efficient economy.

In its manifesto published in 2014, it expressed the view that a circular and resilient economy should be achieved in a socially inclusive and responsible way by:

1. Encouraging innovation and accelerating public and private investment in resource-efficient technologies, systems and skills, also in SMEs, through a dynamic and predictable political, economic and
regulatory framework, a supportive financial system and sustainable growth enhancing resource-efficient priorities in public expenditure and procurement.

2. Implementing, using and adopting smart regulation, standards and codes of conduct that a) create a level playing field, b) reward front-runners and c) accelerate the transition, and d) take into account the social and international implications of our actions.

3. Abolishing environmentally harmful subsidies and tax-breaks that waste public money on obsolete practices, taking care to address affordability for people whose incomes are hardest-pressed. Shifting the tax burden away from jobs to encourage resource efficiency, and using taxes and charges to stimulate innovation and development of a job-rich, socially cohesive, resource-efficient and climate-resilient economy.

4. Creating better market conditions for products and services that have lower impacts across their life cycles, and that are durable, repairable and recyclable, progressively taking the worst performing products off the market; inspiring sustainable life-styles by informing and incentivising consumers, using the latest insights into behavioural economics and information technology, and encouraging sustainable sourcing, new business models and the use of waste as raw materials.

5. Integrating current and future resource scarcities and vulnerabilities more coherently into wider policy areas, at national, European and global level, such as in the fields of transport, food, water and construction.

6. Providing clear signals to all economic actors by adopting policy goals to achieve a resource-efficient economy and society by 2020, setting targets that give a clear direction and indicators to measure progress relating to the use of land, material, water and greenhouse gas emissions, as well as biodiversity. Such indicators must go beyond conventional measures of economic activity, help guide the decisions of all actors, and assist public authorities in timely action. All organisations above a meaningful size and impact must be held accountable to measure and report key non-financial progress indicators on a comparable basis.

http://ec.europa.eu/environment/resource_efficiency/re_platform/index_en.htm
Notes
Guidebook Series How to support SME Policy from Structural Funds

Improving Resource Efficiency in SMEs