



# ACTION PLAN

## Emilia-Romagna

## Part I General Information

<b>Project</b>	Transition Regions Towards Industrial Symbiosis (TRIS)
<b>Partner Organisation</b>	Emilia-Romagna Region
<b>Other Partner Involved (if relevant)</b>	ART-ER
<b>Country</b>	Italy
<b>NUTS2 region</b>	Emilia-Romagna
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## Part II Policy Context

<b>The Action plan aims to impact</b>	<b>Please tick fields that are relevant</b>
Investment for growth and jobs programme	<input type="checkbox"/>
European Territorial Cooperation programme	<input type="checkbox"/>
Other Regional development policy instruments	<input checked="" type="checkbox"/>
<b>Name of the policy instrument addressed</b>	<b>Regional Waste Management Plan</b>

## Part III Details of the action envisaged

### **Introduction**

Business leaders and governments alike are acknowledging that continued long-term value creation requires a new economic model that is less dependent on cheap, easily accessible materials and energy, and that is able to restore and regenerate natural capital. In this sense, a **Circular Economy** (CE, *one that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles*), can be considered a valuable solution to bring both environmental and economic benefits, and it is increasingly recognized as the resource use mechanism that would allow societal and environmental sustainability.

From a single company perspective, the adoption of a Circular business model can, for example, lessen the dependency on scarce inputs, increase operational efficiency, reduce costs of waste management and enable new offerings that attract customers. It's been estimated that the transition to the circular economy could unlock about € 4 trillion of GDP growth worldwide by 2030 (Lacy et al., 2015).

**Industrial Symbiosis (IS)**, one of the application tools of the Circular Economy, is defined as the practice of synergistic exchange of waste, by-products, water, energy, and other materials and services between companies belonging to a more or less extended territorial context. Key conditions for the implementation of Industrial Symbiosis practices are the collaboration between companies, the availability and possibility to use waste materials and the geographical proximity between the actors involved.

The current **regulatory framework** on IS is evolving both at international, national and local level. The EU's Circular Economy Package, adopted in 2018, is the most up-to-date regulatory instrument.

In Italy, the Environmental Law linked to the Stability Law published in December 2015, together with some Decrees of the Ministry of Environment have helped to strengthen the Italian position on various issues concerning IS and CE.

At regional level, the Emilia-Romagna Region has put into practice the principles of the Circular Economy and Industrial Symbiosis with the regional law of 5 October 2015 n.16, the first in Italy relating to these practices. This regulatory tool has been included amongst TRIS good practices. As a law enforcement tool, it is nevertheless worth noting that the Region has also approved the Regional Waste Management Plan, that includes useful tools to reach Law 16/2015 goals.

#### European Union regulatory framework

- Resource Efficient Europe flagship initiative - Europe 2020 Strategy (2010)
- A stronger European industry for growth and economic recovery Communication (2012)
- EU Action Plan for the Circular Economy (2015)
- EU Circular Economy Package (2018)

#### Italian national-[leg] laws

- Environmental Law linked to the Stability Law (2015)
- Decree of the Ministry of Environment "Criteria on identification of byproducts" (2016)
- Ministry of Environment and Ministry of Economic Development "Circular Economy Indicators" (2017)

#### Emilia-Romagna Region laws and policies

- Regional law of 5 October 2015 n.16 on Circular Economy and Waste Management
- Regional Waste Management Plan (2016)

The [Regional Law 16/2015 on the Circular Economy](#) introduces a series of tools. Among these:

- Various measures aim to strengthen the [separate collection, management](#) and [reuse](#) of urban waste, whose flows can cross with the needs of by-products or waste of some production sectors.
- With regard to the involvement of key stakeholders, a participatory process has been activated through the "[Permanent Forum for the Circular Economy](#)".
- [4 Supply Chain Agreements](#) (Large Scale Retailing; Plastics; Electronic Waste; Sport Events), were signed on a voluntary basis with the various stakeholders.

During TRIS Phase I activities, focusing on the regional level, several **experiences** have been mapped, either in progress or already carried out, which implement or go in the direction of promoting Industrial Symbiosis, both by institutional bodies and by the various regional stakeholders. Among these, the Emilia-Romagna Region launched the "[Permanent coordination for byproducts](#)" and drew up the Regional by-product list, that can be joined on a voluntary basis by all regional enterprises complying with the relevant legal requirements.

Other **good practices** identified in the regional context relate to specific industrial sectors or single production chains. Among these:

- The "[Green - Industrial Symbiosis](#)" project (2013-2014), developed by Unioncamere Emilia-Romagna and ART-ER between 2013 and 2014, with the technical coordination of ENEA, aimed at creating synergies and collaborations between companies and industrial research laboratories to facilitate the first local practices of IS.
- The "[Food Crossing District](#)" project has put into practice innovative experiments on the reuse and valorisation of tomato and wheat industry waste.
- In the [Roveri Industrial Area](#) in Bologna, an integrated project has been launched as a "demonstrator" on the themes of the Circular Economy and Industrial Symbiosis, which aims to involve those who reside in the area.
- Some experiences were also carried out in the context of the regional [Ceramic Industrial District](#), such as the reuse of zirconium waste in the production of ceramic glazes.

**European Projects** have also been launched:

- The [Interreg "CESME"](#) (Circular Economy for SMEs) project aims to promote SMEs' access to the

Circular Economy. In particular, the project aims to address and improve the effectiveness of policy instruments in order to support SMEs in the process of changing from traditional production methods to green and circular innovation.

- The [Climate KIC "Surplus Mail"](#) project, launched in January 2017, aims to analyze the feasibility of a new business model, aligned with the European strategies on Circular Economy and Industrial Symbiosis, based on a cloud platform for the exchange of industrial surpluses.

The presence of **online platforms** is also a key condition to facilitate the matching of supply and demand of waste and by-products between companies. Among these, the main one, at national level, is the [ENEA National Platform on Industrial Symbiosis](#), developed with the funds of the Food Crossing District project. Currently, the Platform gathers 166 companies, 13 of which are based in the Emilia-Romagna region. Registered companies have so far uploaded 2604 resources to the platform, generating a total of 1923 symbiosis.

Starting from December 2016, as part of the TRIS project, the first 5 workshops of the Local IS Lab, a regional network of stakeholders oriented to share ongoing experiences, identify constraints and opportunities and generate new ideas for action on Industrial Symbiosis, were held.



Within this engagement platform and in other contexts of dialogue at interregional level (study visits, peer review visits, staff exchanges), various ideas have been developed in order to step up to higher level in terms of relevance, effectiveness and integration of existing experiences. In summary, the possible identified **directions for improvement** for Emilia-Romagna are the following:

1. Promotion of knowledge and information on Industrial Symbiosis.
2. Strengthening connections between actors at regional level.
3. Information and technical support to companies.
4. Development and use of databases and knowledge platforms.
5. Training, research and experimentation.
6. Supporting regulatory and fiscal instruments.

To support the actions included in the TRIS Action Plan, a **SWOT analysis** was performed on the regional context on IS, taking into account, in addition to the contents of the introductory chapters, also what emerged in the moments of interaction and co-design carried out within the IS Lab. The results of the SWOT analysis carried out indicate that the transition to circular production and Industrial Symbiosis models in Emilia-Romagna is favored by the presence of a developed and diversified industrial manufacturing ecosystem, but is at the same time hindered by contextual regulatory and technical constraints, and also by lack of technical expertise and willingness to innovate and change. The present opportunities, which concern aspects of global and European evolution in line with Industrial Symbiosis, but also concrete commercial and operational advantages, must take into account the difficulty in putting these innovations into practice in terms of time, investment costs, as well as technical limits related to

waste and by-product flows.

Building on these elements, **Emilia-Romagna Action Plan** includes 4 lines of action:

1. Improving market opportunities for plastic secondary raw materials in Emilia-Romagna, including both the contributions from industrial residues and post consume materials.
2. Implementation of regional industrial symbiosis/circular economy (IS/CE) projects involving the 5 productive sectors identified in the Emilia-Romagna Smart Specialization Strategy
3. Awareness raising amongst regional stakeholders:
  - promoting tools of the regional Circular Economy Law: two meetings will be organized in cooperation with Regional Business Associations to support the activities of the permanent coordination table on byproducts
  - one event will be organized to promote IS within Research 2Business 2019
4. Influencing National policies on Industrial Symbiosis.

**Action 1: Improving secondary raw materials and byproducts market uptake in the plastic sector**

<p><b>The background</b></p>	<p>During TRIS Peer Review in Budapest in February 2018, the EU Plastic Strategy was discussed as a priority for the European Circular Economy strategy. This strategy will be implemented by actions at national level. In Hungary, for example a “Conciliation forum for plastics strategy” has been activated as illustrated by the National Ministry of Agriculture during the Peer Review meeting. Additionally, during the interactive workshop, plastic was one of the sectors identified as priorities for the development of end of waste criteria. As practical example of IS within the plastic sector, the Green Pipes from recycled plastic good practice from Sweden showed an innovative use of automotive recycled plastic.</p> <p>In Emilia-Romagna, the Regional waste management plan encouraged specific actions and projects to promote recycling and recovery and reduce waste production. In Italy and also in Emilia-Romagna, plastic waste is a critical issue in the waste management system, especially after the closure of the Chinese market.</p> <p>To overcome these difficulties, Emilia-Romagna intends to involve market players in the identification of actions to increase the use of plastic waste as by-products, improve recycling, favor the market for recovered raw materials in order to close the circle downstream of separate waste collection, according to approaches of industrial symbiosis; to date, in fact, one of the major problems is finding a market destination for the materials resulting from the selection and recycling phases. Detailed knowledge on material flows and on regional plant system is essential to plan efficient strategies aimed at reducing waste production and increasing recycling.</p>
<p><b>Action</b></p>	<p>As preparatory activity for this action, during phase I, an analysis was carried out on the plastic material flows in Emilia-Romagna including both the contributions from industrial byproducts and post consume materials.</p> <p>Based on this analysis, the qualitative and quantitative availability of secondary raw materials and industrial waste will be quantified to improve the secondary market for raw materials and by-products at regional level. Additionally, a number of case studies will be identified in order to understand the success factors and elements for replicability.</p> <p>Collected information will be shared with business association so as to show the market opportunities for new business initiatives.</p>
<p><b>Players involved</b></p>	<ul style="list-style-type: none"> <li>• Emilia-Romagna Region: coordinating the action</li> <li>• University of Bologna: identifying and interviewing selected companies, collecting and analyzing data</li> <li>• Business sector: companies involved by university and Emilia-Romagna region</li> </ul>
<p><b>Timeframes</b></p>	<p>2018-2020</p>
<p><b>Cost</b></p>	<p>6 keur</p>
<p><b>Funding source</b></p>	<p>Emilia-Romagna Region and University of Bologna own resources</p>

## Action 2: Regional Industrial Symbiosis/Circular Economy projects

<b>The background</b>	<p>After having studied the Good Practices in the UK “TRIS affects UK Policy through ESIF funding for Sustainable Urban Development (SUD)” (priority area 4 and 6), and the “BASIS Initiative” (Priority Area 6) and ARLI (Priority Area 1) representing programmes and projects financed with ERDF funds and including IS, we learned about the CRKKL project in Sweden during the Staff Exchange in June 2018 which is also based on ERDF funds. Since the policy instrument we are targeting (RWMP) does not include financial resources to R&amp;D, these experiences inspired us to influence ERDF funding in Emilia-Romagna towards the objectives of the Regional Waste Management Plan on reduction of industrial waste production.</p> <p>This action aims at influencing the Strategic Objectives of the revised Smart Specialization strategy of the Emilia-Romagna Region by including IS/Circular Economy as topics. This strategy shapes the remaining ERDF funding opportunities for research and innovation (Axis 1) within the 2014-2020 programming period.</p>
<b>Action</b>	<p>In 2018: as preparatory activity for the action, TRIS partner ART-ER brought Industrial Symbiosis and Circular Economy using the examples of TRIS partners at the discussion table of the Smart Specialization Strategy of Emilia-Romagna region. This action was carried out by ART-ER using own resources. As a result, Industrial Symbiosis and Circular Economy were included amongst the topics of the new call (Axis 1, Action 1.2.2) for strategic research projects.</p> <p>In 2019: communication of the official approval of strategic research projects in march and implementation by regional research laboratories and companies. Projects will last 24 months.</p>
<b>Players involved</b>	<ul style="list-style-type: none"> <li>• ART-ER: influenced the process by coordinating the action and preparing an initial assessment of the level of implementation of the regional smart specialization strategy. In particular, ART-ER steered the discussion within Clust-ER associations on Industrial Symbiosis/Circular Economy aspects.</li> <li>• Emilia-Romagna Clust-ER associations: associations between companies and research laboratories which developed the content of the update of the S3.</li> <li>• Emilia-Romagna HTN Network: a network of 84 laboratories and innovation centers who will implement the ERDF projects.</li> <li>• Business sector: companies involved in the ERDF funded projects.</li> </ul>
<b>Timeframes</b>	2018-2021
<b>Cost</b>	30 k€ staff costs, 10 k€ direct costs
<b>Funding source</b>	ART-ER (ex ASTER) own resources

### Action 3: Awareness raising on IS amongst regional stakeholders

<b>The background</b>	<p>All across TRIS interregional learning activities, and in particular during the Peer Review held in Budapest in February 2018, it became clear how important are open communication and trust aspects in order to facilitate the uptake of industrial symbiosis. This was one of the outcomes of the interactive session of Day 1 of the Peer Review visit.</p> <p>These aspects were also recognized as main enabling factor to IS by the members of the regional IS Lab in Emilia-Romagna. The Circular Economy Law of Emilia-Romagna (L.R. 16/2015) has been presented and discussed as best practice within TRIS project during the partner meeting in Bologna in September 2017, and shared as good practice in TRIS good practice database. Emilia-Romagna Region collected positive feedback about the initiative from all project partners. The exchange of expertise within TRIS interregional learning gave evidence that the Regional Permanent Coordination Table on Byproducts is a strength of the Region, provided that it is familiar to companies. The Regional Permanent Coordination Table on Byproducts is one of the tools foreseen by the Regional Circular Economy Law (L.R. 16/2015).Based on the feedback from interregional partners, it appeared necessary to improve the communication strategy of this tool amongst regional stakeholders.</p>
<b>Action</b>	<p>The action aims at increasing the awareness of the business sector on the function of the Permanent Coordination Table of Byproducts.</p> <p>This will be realized by two meetings (one per year), organized in cooperation with Regional Business Associations together with regional universities and research laboratories.</p> <p>Participants will gain knowledge about the value chains identified by the Byproducts Coordination Table and about the methodology to propose a new value chain. This will allow them to implement industrial symbiosis in practice taking advantage of the existing Regional Byproducts List or by presenting a new byproduct value chain to be discussed at the Coordination Table.</p> <p>In addition, the organization of a dedicated event within “Research to Business” 2019 exhibition in cooperation with the Regional Sustainability Observatory, chaired by the University of Bologna, will provide an update on regulatory aspects and on initiatives taking place in the region.</p>
<b>Players involved</b>	<ul style="list-style-type: none"> <li>• Emilia-Romagna Region and ART-ER: meeting organization, Emilia-Romagna region provides updates from the activity of the Permanent Coordination Tables</li> <li>• Regional business associations will support the identification of targeted companies to be invited to the meeting</li> <li>• Regional Sustainability Observatory: event organizer, providing content on the business perspective</li> </ul>
<b>Timeframes</b>	2019 – 2020
<b>Cost</b>	5 keur (ART-ER), 2 keur (RER)
<b>Funding source</b>	-Own resources



## Action 4: Influencing National Policies on Industrial Symbiosis

<p><b>The background</b></p>	<p>During the Peer Review held in Budapest, the national policy instruments connected to IS implementation in Hungary were presented including both incentives and funding as well as waste and landfill regulation at national levels. During TRIS Interregional workshop in Hungary, we learnt that a National Circular Economy Platform has been established.</p> <p>Based on this systemic vision, TRIS partners in Emilia-Romagna connected to national networks aiming at influencing the national policy on industrial symbiosis and circular economy. The participation to such platforms was possible because of the involvement of ENEA, ICESP and SUN platform coordinator, in TRIS Local IS Lab.</p> <p>The Italian Circular Economy Stakeholder Platform (ICESP) brings together stakeholders active in the broad field of the circular economy in Italy. ICESP, promoted by ENEA, is a mirror platform of the European Circular Economy Stakeholder Platform.</p> <p>In order to support the Circular Economy Action Plan initiatives, the European Commission has launched the European Circular Economy Stakeholder Platform - ECESP.</p> <p>The Symbiosis User Network (SUN) platform, coordinated by ENEA, groups all Italian stakeholders operating on Industrial Symbiosis.</p>
<p><b>Action</b></p>	<p>The Emilia-Romagna Region is amongst the founders of ICESP to represent regional institutions, and participates to these working groups:</p> <ul style="list-style-type: none"> <li>• Research and ecoinnovation, awareness raising and education</li> <li>• Policy and governance tools</li> <li>• Cities and regions.</li> </ul> <p>Within ICESP, the Emilia-Romagna region is currently involving other Italian regional administrations in the attempt to influence national policies on “End of Waste”.</p> <p>ART-ER coordinates SUN working group on policy instruments and participates in working group on good practices.</p> <p>Results from working groups will be shared in yearly meetings of the platform members and in open access reports.</p>
<p><b>Players involved</b></p>	<ul style="list-style-type: none"> <li>• Emilia-Romagna Region and ART-ER participate to the working groups bringing in the interregional learnings from TRIS.</li> <li>• ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development is a member of the ECESP. In this context, ENEA, will promote ICESP and represent “The Italian way for circular economy”.</li> </ul>
<p><b>Timeframes</b></p>	<p>2019-2021</p>
<p><b>Cost</b></p>	<p>3 keur (RER) 1keur (ART-ER)</p>
<p><b>Funding source</b></p>	<p>Own funding</p>

## References

- Chertow M.R. (2000), Industrial symbiosis: literature and taxonomy, Annual review of energy and the environment, vol. 25, n. 1, pp. 313-337.
- Chertow M.R., Ashton S.A., Espinosa J.C. (2008), Industrial symbiosis in Puerto Rico: Environmentally related agglomeration economies, Regional Studies, vol. 42, n. 10, pp. 1299-1312.
- Disposizioni in materia ambientale per promuovere misure di green economy. L. 28 dicembre 2015, n. 22.
- EEA (2017). Circular by design. Products in the circular economy.
- Ellen MacArthur Foundation (2012), Towards the Circular Economy: Economic and business rationale for an accelerated transition.
- European Commission (2015). Closing the loop - An EU action plan for the Circular Economy.
- Lacy et al. (2015). Waste to Wealth. The Circular Economy Advantage.
- MATTM (2016). Regolamento recante criteri indicativi per agevolare la dimostrazione della sussistenza dei requisiti per la qualifica dei residui di produzione come sottoprodotti e non come rifiuti. D.M. 13 ottobre 2016, n. 264.
- MATTM e Mise (2018). Economia Circolare ed uso efficiente delle risorse. Indicatori per la misurazione dell'Economia Circolare.
- Ministero dello Sviluppo Economico (2017). Verso un modello di Economia Circolare per l'Italia.
- Official Journal of the European Union (2018). L 150, 14 June 2018.

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