FISSAC

FOSTERING INDUSTRIAL SYMBIOSIS FOR A SUSTAINABLE RESOURCE INTENSIVE INDUSTRY ACROSS THE EXTENDED CONSTRUCTION VALUE CHAIN

# Social strategies for FISSAC: Strategies for social engagement and acceptance

## Executive summary

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D1.7: Strategies for social engagement and acceptance
WP 1, T 1.5

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*Industrial Symbiosis is an emerging concept with a multitude of benefits for companies, communities, and the local environment.*

It can be a very powerful and important strategic approach to promoting sustainability in the European Union. For this reason, the FISSAC project is highly relevant, bringing together a wide range of partners and countries.

Industrial Symbiosis (IS) can be initiated by a public authority, private firm, or association. Research to date rarely focuses on the **interactions between** the highly predominant **technical** aspect of industrial symbiosis **and non-technical aspects** (including social engagement and acceptance), despite this being a key element of success of an IS project.

*Beyond the technical feasibility of the exchanges, social elements also play a crucial role in the development of Industrial Symbiosis networks.*

Therefore understanding of such elements is essential for the further development of IS. Hence, FISSAC partners have developed a **stakeholder engagement strategy**, which establishes the objectives of stakeholder engagement and indicates how the involvement of stakeholders will be achieved at each stage of the project. A five-step approach is used:

1. Develop a vision
2. Map stakeholders
3. Prepare for the engagement
4. Engage stakeholders
5. Monitoring and evaluation

There is a real diversity of tasks (over 20) and a wide range of countries and partners that are dealing with social acceptance and engagement in FISSAC. The aim of this deliverable D1.7 is to highlight the importance of non-technical and social aspects of IS as a key for achieving successful Industrial Symbiosis projects. In line with FISSAC deliverables D1.1 "*Stakeholders network set up*", D1.2 "*Identification of best practices and lessons learnt in Industrial Symbiosis*", and D1.4 "*Social strategies for FISSAC: Definition of target social groups*", this report will prepare the deliverable D10.5 "*Report of social engagement and acceptance*" foreseen at the end of the project. The objectives of D10.5 are to **identify the main elements related to social engagement and acceptance in industrial symbiosis projects**.

**Social engagement** refers to one's degree of participation in a community or society. Key elements of social engagement include (Prohaska et al, 2012)):

- Activity: doing something
- Interaction: at least two people need to be involved in this activity
- Social exchange: the activity involves giving or receiving something from others
- Lack of compulsion: there is no outside force obliging individuals to engage in the activity.

A general definition of **social acceptance**, which was adopted in this report, is "a favourable or positive response (including attitude, intention, behaviour, and — where appropriate — use) relating to proposed or in situ technology or social technical system by members of a given social unit (country or region, community or town and household, organisation)" (Upham, 2015). Social acceptance can be influenced by a very wide range of factors, including project and product characteristics, perception of the distribution of costs and benefits, and degree of public participation.

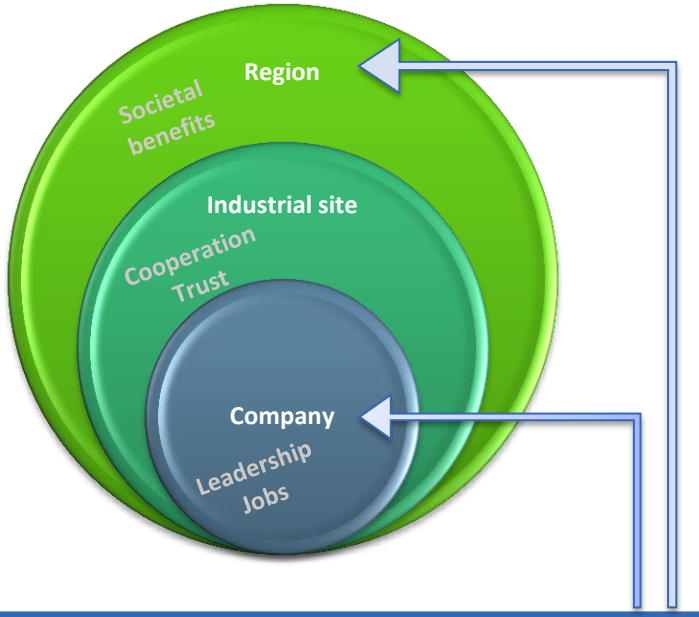
Industrial symbiosis supports a number of the United Nations **Sustainable Developments Goals** (SDGs). A successful sustainable development agenda requires partnerships between governments, the private sector and civil society. The same applies to an industrial symbiosis project. Moreover, social innovations can be developed and implemented in any sector of society [like industrial symbiosis] and may take any organizational form.

The project counts on the insight and advice from experts on social issues, namely the **Social Advisory Board.** These experts are not members of the Consortium, but are regularly involved in the project. The Social Advisory Board will support FISSAC partners specifically regarding the progress on social aspects of their tasks.

The members of the Social Advisory Board are:

- Fredrik Björk, Malmö University (Sweden)
- Teresa Domenech, University College London (United Kingdom)
- Elisabeth Ekener Petersen, KTH Royal Institute of Technology (Sweden)
- Marta Zaragoza Domingo, Cresalida (Spain)

Social acceptance levels




Final deliverable

with 3 foci

D10.5 Report of social engagement and acceptance

Companies | Public Authorities | End-users

FISSAC Actions to implement stakeholder engagement

### Information and resources

- 08/16 - Task 1.4 - Identification and development of IS indicators for quantifying the social dimension of IS initiatives
- 02/16 - Task 2.1 - Definition of technical requirements of secondary raw materials
- 02/16 - Task 2.4 - Overcoming non-technological barriers
- 02/17 - Task 3.1 - Evaluation of the proposed processes and value chain to ensure their environmental and economic sustainability
- 02/20 - Task 3.5 - Environmental Technology Verification
- 02/20 - Task 7.2 - Analysis of the condition of the various represented industries to detect technological and non-technological drivers and barriers
- 02/20 - Task 7.3 - Evaluation of the replicability of the model

### Concrete actions with stakeholders

- 05/17 - Task 3.2 - Eco-design of cost-effective products
- 08/10 - Task 5.1 - Project Design of the constructive solutions
- 02/20 - Task 5.5 - Sustainability assessment of the solutions: LCA and LCC of real case studies
- 02/20 - Task 7.1 - Establishment of a Living Lab for replicating the FISSAC model
- 02/20 - Task 8.1 - Management of intellectual property rights
- 02/20 - Task 9.2 - Dissemination Plan deployment

### Co-construction process

- 02/16 - Task 1.1 - Stakeholders network and analysis of 60 practical cases
- 02/17 - Task 1.6 - Paving the way to FISSAC Industrial Symbiosis Model: Methodology and Software Platform
- 02/20 - Task 6.3 - Monitoring and evaluation of results with the platform, including real-scale test and compilation of the FISSAC life-cycle inventory (LCI) Database
- 02/20 - Task 6.4 - Definition of the final version of FISSAC Industrial Symbiosis Methodology
- 02/20 - Task 6.5 - Definition and validation of FISSAC model
- 02/20 - Task 8.3 - New business models for industrial symbiosis towards a circular economy
- 02/20 - Task 8.4 - Business Plan outline

Project funded by the European Union

# Illustration of the social engagement and acceptance tasks in FISSAC

***Analysis of 3 projects***

The FISSAC project previously analysed best practices and lessons learnt in Industrial Symbiosis (D1.2). Among them, three case studies were selected and studied to assess their social dimension, key actors, and engagement strategies.

**Cooperation | Manresa en symbiosis (Spain)** – Industrial Symbiosis with various materials

The first industrial symbiosis project in Catalonia was implemented in Manresa, a municipality specially designed to be the promoter of the action. The objective is to demonstrate the viability of a methodology and a digital tool to be replicated elsewhere. It is a cooperative approach to exchange resources supported by a trusted third party.

**MA**

**Platform for governance | Flanders' Materials Programme (Belgium)** – Regulations, plans, R&D programmes

Flanders' Materials Programme is a public-private initiative run by OVAM, the public waste & materials agency in the Flanders region of Belgium. It combines ambitious long-term vision development, experimental pilot projects, policy-relevant research and concrete priority actions on the basis of an iterative road mapping process in order to accelerate the transition to a circular economy.

**FMP**

**Leadership | Iskenderun Bay (Turkey)** – Industrial Symbiosis with various materials

The concept was to carry out an IS approach with both economic and environmental returns by establishing collaboration between companies in the Iskenderun Bay region. With the experience gained from this local application, it was considered as the basis of the development of a national IS programme by increasing resource efficiency rendering low-carbon economy and sustainability policies.

**IBR**

## SWOT – Strengths, Weaknesses, Opportunities, and Threats

### Company level

Industrial Symbiosis (IS) projects are an opportunity for companies to become **more competitive** and to uphold their productivity by implementing an efficient resource management [MA, FMP]. At first, it is a concrete way to promote circular economy **awareness** in business as well as in society [MA, IBR].

Implementing an IS project could be easier if **large companies** are involved [MA]. Moreover, the concept of IS is difficult to introduce in **small SMEs** [MA, FMP]. SMEs face the strongest barriers: they can experience a patriarchal and authoritarian culture, little innovative, vertical communication and a human resource management based on functions instead of competences making them move away from the net and cooperative work. Considering all of this, work with these companies must be based on dynamics that not only focus on technical goals, but also try to make them aware of new approaches, values, behaviours, and competences needed to participate in IS projects. This will help them be competitive in the new economic and social paradigm.

Every company **involved in the project** needs to participate in workshops to identify possible synergies [MA, FMP]. A vision in the **top management** helps to accelerate the implication of the company [IBR].

### Industrial site level

Industrial networks can be strengthened thanks to the IS project oriented by a highly motivated [MA] **Advisory/Steering committee**, which watches out for the complementarity between the pillars [FMP].

The number and **diversity of sectors** involved [IBR] increase the effectiveness of the IS network. However, difficulties can occur when they act as autonomous bodies, guided by needs, demands, and priorities within their sector [FMP].

**Trust** (in other companies, in technical experts…) is key [IBR], especially for the collection of data from industries/businesses [MA].

**Finance** for the participatory process and for the implementation of synergies is necessary [IBR].

The need for innovation sometimes comes at the expense of **up-scaling** [FMP].

Project funded by the European Union

### Regional level

Thanks to IS projects, great potential for a **cross-sectorial cooperation** can be realised in large industrial regions [IBR, FMP] and external **investments** can be attracted [IBR]. One objective is that the economic activity generated also has further **social benefits** with the creation of new businesses and (retention of) **jobs** [MA, IBR]. A consequence could be the improvement of work conditions and public health [IBR].

Strong **public authorities' commitment** is a strength [MA, FMP]. Public authority is not merely perceived as a governmental institute, whose main objectives are to regulate or control, but also as a partner and facilitator [FMP]. National strategies/policies supporting IS measures [ISB] and collaboration between politicians from different bodies [MA] facilitate the implementation of IS projects.

IS is generally a public-private cooperation. For the continuation of the IS programme, it is essential that **the financial means** (public and private) meet its ambition [FMP, IBR].

The **multistakeholder approach** is essential — a meeting place for policy makers, researchers and entrepreneurs [FMP] — with high benefits for both, companies and public authority [MA]. Administrative capacity [MA] creates the pre-condition for making innovation happen in the public sector and thus to play a role of bridging actor.

A **multi-disciplinary approach** [FMP] gives a broad insight into obstacles and enablers in all fields: legislation, practices, business and finances… This approach requires intensive time investment, which should not be underestimated [FMP]. Bringing shared responsibility into practice remains a difficult exercise [FMP].

**Public pressure** on companies to take concrete measures on resource/waste management/raw materials saving is an incentive to implement actions due to obvious local environmental problems [IBR].

However, as **the social innovation**, necessary to realise the transition to circular economy, is less visible, it is not easy to implicate consumers and civil society organisations [FMP]. **Raising awareness** and disseminating information on circular economy should involve civil society organisation, consumers, schools, professional associations, ... [FMP]

Concerns about **climate change** and sustainable development mobilise a broad movement of civil society organisation and concerned citizens. The concept of **circular economy** is born out of a similar concern. Linking both issues could boost the interest for circular economy and at the same time reinforce the social aspects linked to it.

## Questionnaire

To go deeper in the analysis of the three cases, the partners answered a range of questions and their responses were consolidated.

### At the company level

A charismatic visionary leader is not always present [ISB, FMP, MA] even if the **manager and the management team** play an important role in the transition towards a circular economy. More complex management is essential with higher flexibility and knowledge sharing [FMP].

The routines or structural organisation of the company could require slight modifications due to the implementation of IS synergies [ISB]. However, it is mainly a question of "**Culture**". Transition to a circular economy requires an acceptance and adoption of the circular economy principles throughout the entire company [FMP]. It necessitates a change of attitude on different levels: strategic, financial, legal, and commercial.

Some new **skills/competences** could be needed and mobilized to implement the synergies related to IS. Specific skills related to symbiosis projects very much depend on the sector and the cooperation over different phases of the value chain [FMP].

However, some key competences surface at all levels:

- Openness for information sharing
- Co-creation and cooperation
- Knowledge on the composition and development of products
- Managing a diversity of tasks
- Applying innovative management tools to make the transition to circular economy

Additional qualities related to new IS projects are out-of-the-box thinking, ability to work autonomously, and perseverance [FMP]. Internal expert in resource efficiency do not seem to exist in the three cases analysed even if a shared external resource managers could facilitate the implementation of synergies [MA].

Most of the industrial symbiosis implementations need an intermediate waste/resource processing (or treatment) step. Adding that step required more labour force, which in turn **increased employment** [ISB]. Cooperation between sectors and over different phases of the value chain will have an impact on existing jobs. They will become more complex, involve more cooperation and co-creation [FMP].

New jobs are to be expected in:

- Design
- Innovation and product development
- Disassembling
- Administrative handling of new service contracts
- Resource scout
- Information manager

### At the industrial site level

An IS project needs to be coordinated. An **implementing agency / facilitator / independent matchmaking institute** is often a key actor for coordinating the implementation of possible synergies [MA, FMP, ISB]. It could be either public or private, but the facilitator needs to provide the necessary guarantees to act autonomous and independent [FMP]. On the long run, it should evolve to a private-public funding mechanism.

Various **methods to identify possible synergies** can be used:

- Site/company visits to companies [ISB, FMP]
- "Synergy Workshops" which gather various companies for creating synergies [MA, FMP, ISB]
- Use of a web ICT platform [MA]
- Online template and database [FMP]
- On demand of a specific sector: address specific questions hindering symbiosis [FMP]

The culture of **industrial secrecy** is an important barrier in most of the cases. Sometimes competitor companies come together in order to discuss possible synergies among other companies [ISB]. Companies are not used to sharing information and it is challenging to make them understand the benefits of such a thing [MA].

As every type of project, some reasons can delay an IS project. Particularly:

- Regulatory issues [MA, FMP, ISB]
- Lack of trust in other companies, in technical experts, etc. [ISB, FMP]
- Lack of information about industries and difficulties to collect quality data [MA, FMP]
- Lack of vision in the top management of the companies [ISB]
- Lack of interest or commitment of the companies [MA]
- Lack of finance [ISB] / funding mechanism [FMP]
- Access to public tenders for secondary raw materials, residual waste or recycled materials [FMP]
- External product standards do not always take in to account the possible use of secondary raw materials, waste, or recycled materials [FMP]
- Customer behaviour: trust in new products [FMP]
- Need for (new) technological solutions for side-stream valorisation [FMP]

Partners of IS projects do not often discuss the **social benefits and gender issues**, for example during workshops around synergies. Economic and environmental benefits are underlined primarily [ISB]. For the industry, the main drivers for symbiosis are sustainability, cost reduction, and economic competition. When promoting IS, emphasis is also put on environmental impact and to a lesser degree on potential job opportunities/creation [FMP].

To evaluate the various impacts of an IS project, facilitators could implement a **dashboard** of industrial symbiosis: at-a-glance views of Key Performance Indicators relevant to the industrial symbiosis project.

### At the regional level

**Public authorities** could take the lead or not, participate or not. However, their presence in the project events (synergy workshops, dissemination events, trainings…) motivates the companies [ISB]. In some cases, the municipality offers its local companies a service to identify synergies, improving, at the same time, internal competitiveness through circular economy concepts. Central Government and supra-municipal public entities could also help finance the project [MA]. The public sector is also an essential actor as policy maker, creating a long-term vision for the transition to a circular economy, guaranteeing that different policy instruments point in the same direction, and creating a legal framework and (financial) incentives supportive of a transition to circular economy [FMP].

From the point of view of a **multi-stakeholder approach**, **communication** is the key action of an IS project. It has to be done from the beginning, before contacting companies. Furthermore, it has to be coordinated (different dissemination actors involved) in order to maximize repercussion in companies [MA]. The stakeholders could also be reached via face-to-face meetings before and during the project. For example, R&D institutions need to take part in IS measures between firms. Governmental institutions need to support implementation with regulatory measures [ISB]. The project team could approach each stakeholder showing the potential benefits of the project to the individual stakeholder [MA, ISB].

An **Advisory Committee** is a common practice to engage various types of stakeholders. It could include a ministry, development agency, the chamber of commerce, universities, technological centres, and civil society.

No **power games or local conflicts** were identified in the three analysed cases.

No clear evidence exists that **consumers** are ready to buy products made of secondary materials [ISB]. The procurement policy of the government can have a favourable effect on their use and their market [FMP].