



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

HORIZON 2020

Work programme topics addressed:

WASTE-1-2014: Moving towards a circular economy through industrial symbiosis

Type of action: Innovation action.

Starting date: 01/09/2015

Duration in months: 54

Project Number: 642154

Project acronym: FISSAC

FISSAC Coordination team:

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Project overview

FISSAC represents a **new paradigm built on an innovative industrial symbiosis model** towards a zero waste approach in the resource intensive industries of the construction extended value chain, tackling harmonized technological and non-technological requirements, leading to materials **closed-loops processes** and **moving to a circular economy**.

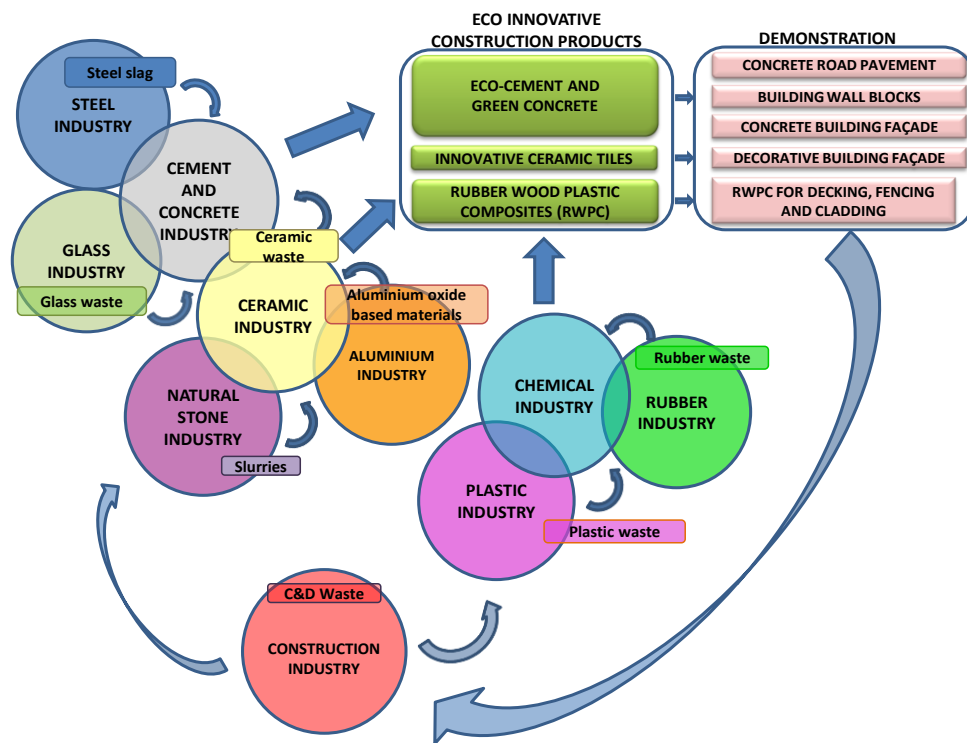
The **new model**, supported by a **methodology** and a **software platform**, will be applied in a **feasible scenario** as a demonstrator of industrial symbiosis synergies between industries (steel, aluminum, natural stone, chemical and demolition and construction sectors) and stakeholders in the extended construction value chain. It will guide how to overcome technical barriers (transformations and adaptations of industrial and recycling processes) and non technical barriers (social and cultural, legislative/regulatory, economic, organizational) as well as standardization concerns to implement and replicate industrial symbiosis in a local/regional dimension.



Project overview

The innovative model will be applied based on the three sustainability pillars: **environmental** and **economic** (with a life cycle approach) and **social** (taking into account stakeholder engagement and impact on society).

The overall objective of FISSAC project is to develop and demonstrate a **new paradigm built on an innovative industrial symbiosis model** towards a zero waste approach in the resource intensive industries of the construction value chain, tackling harmonized technological and non technological requirements, leading to **material closed-loop processes** and moving to a **circular economy**.



FISSAC Industrial Symbiosis Framework

Objectives

SPECIFIC OBJECTIVES. Scientific and technical objectives.

- A. New Industrial Symbiosis Model definition
- B. Innovative technological and non-technological processes to transform waste into valuable secondary raw materials
- C. Product eco-design and certification
- D. Demonstration of processes and products at pre-industrial scale
- E. Demonstration at industrial scale and real application
- F. Model definition for Industrial Symbiosis
- G. Industrial Symbiosis replicability and social issues
- H. Exploitation
- I. Dissemination

FISSAC Consortium

FISSAC Consortium is composed by 26 partners from 9 countries: 8 Member States, and Turkey.

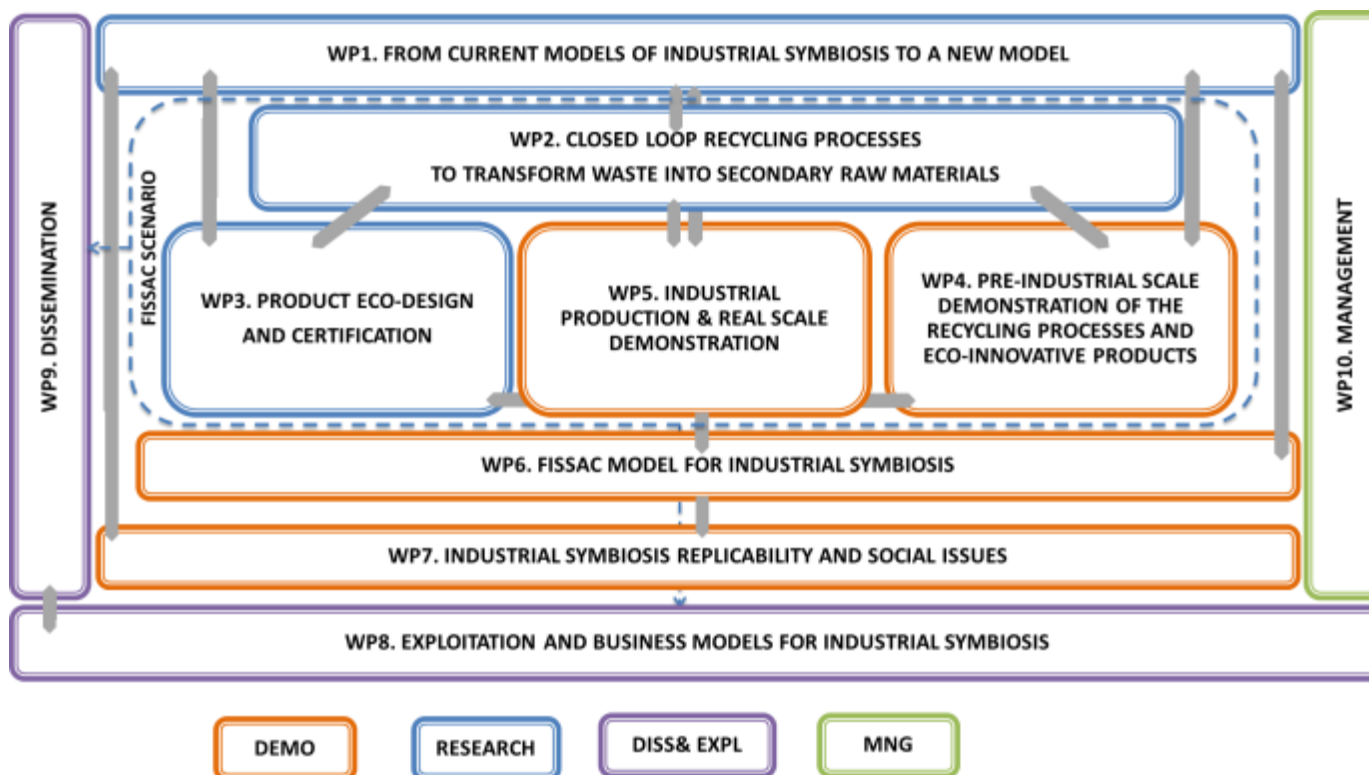
The consortium as a whole covers all the necessary roles for such an Innovation project (close to market project). Is a complementary combination between RTD organizations and companies in the proposed technologies, intensive industries (such as cement, non-ferrous, ferrous, glass, chemical), general contractors and engineering in the construction field, technology manufacturers and providers, industrial symbiosis and circular economy and social experts, policy makers, standardization body, providers and costumers of Industrial Symbiosis model.



Figure 6. Consortium Distribution.

Work Plan

To accomplish FISSAC objectives the Project is structured into 10 Work Packages (WPs). These WPs covers the four types of activities: Research and technological development, Demonstration, Management and Dissemination and Exploitation.



Expected outcomes of the project

FISSAC will demonstrate the **applicability of the new industrial symbiosis model** as well as the effectiveness of the innovative processes, services and products at different levels:

- **Manufacturing processes**, with the following targets:
 - Demonstration of closed loop recycling processes to transform waste into valuable acceptable secondary raw materials.
 - Demonstration of the manufacturing processes of the novel products at industrial scale.
- **Product validation**, with the following targets:
 - Demonstration of the eco-design of eco-innovative construction products (new Eco-Cement and Green Concrete, innovative ceramic tiles and Rubber Wood Plastic Composites) in pre-industrial processes under a life cycle approach.
 - Demonstration at real scale in different case studies of the application and technical performance of eco-innovative construction products.
- **FISSAC model**, with the following targets:
 - Demonstration of the software platform.
 - Replicability assessment of the model through living lab concept (as a user-centered, open-innovation ecosystem, often operating in a territorial context).

Impact

- **Environmental impact :**
 - Beyond 15% reduction of waste generation .
 - Beyond 12% gains in productivity for waste treatment.
 - Beyond 20% in energy efficiency and associated GHG savings
- **Market, industrial and economic Impact**
 - FISSAC contributes to greener technologies deployment in SPIRE industries and in the construction sector value chain, as well as to the green job generation.

Industries considered in FISSAC (cement, ceramics, glass, chemicals, engineering, non-ferrous metals steel) represent an important part of the industries within SPIRE and a major part of the manufacturing base in Europe (EU27).
- **Social Impact:**
 - Employment. Using resources more efficiently, in a circular economy context will also bring new growth and job opportunities.
 - Social behavior and citizen involvement: Transition Management will be used as a tool for facilitating knowledge diffusion, protection and up scaling of technological and social innovations. Living Labs concepts will be set up in order to gather stakeholders to define common visions; share knowledge; develop prototypes; facilitate the innovation process and further encourage more sustainable behaviour across the sector.

Synergies and leverage opportunities

- **Cross-sectoral synergies.** Stakeholders include research, academia, as well as industry, at European and national level.
 - **WASTE 1-2014 projects** under the Horizon 2020
 - Engagement of **major industrial sectors**
 - Other actors – finance, governments, etc.
- Working close to markets and industry with real solutions