

# **Black Sea Industrial Symbiosis Platform: an innovative tool for environmental protection and sustainable development in the Black Sea Basin**

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Black Sea Basin is a region that is in continuous development. During the past decades, the management of natural resources and industrial activities, waste generation and disposal, energy efficiency, demand on raw material production have become urgent issues for Black Sea region. At the same time, it is listed as one of those regions that will be heavily affected by the climate change. Adapting to climate change, minimizing environmental degradation but still having a prosperous and resilient economy will encourage the sustainable development in the whole of the Black Sea Basin. Nationwide strategies and measures can only have a limited effect on this development. It is evident that only by regional cooperation and coordination in the Basin on innovative technologies and systems; a solution can be achieved for the mutual benefiting of all basin countries.

The primary aim of this effort is to offer Industrial Symbiosis as an innovative and integrated management approach that contributes to management of the natural resources of the Black Sea Basin effectively, improves the intra-regional trade and local development without generating a negative environmental impact and reduces climate change contributing actions and environmental degradation. Briefly, an Industrial Symbiosis program is an industrial ecosystem where a collective approach is developed to competitive advantage and mutual benefiting through the physical exchange of materials, energy, water and /or by-products, or the shared use of assets, logistics and expertise.

Within this framework, we have chosen four main sectors; manufacturing, logistics, tourism and energy industries in four countries in the Black Sea region; Turkey, Bulgaria, Romania and Moldova. The current production and consumption patterns, existing commercial networks and the dynamics of these four sectors in the aforementioned countries are thoroughly analyzed. Our analysis is supported by a sample data of 320 companies collected via interviews. We optimize the collected data by incorporating environmental impacts and sustainability to see how trade based cooperation in the Black Sea Region can be increased and still the environmental degradation is minimized. The initial results of our analysis show that there is a considerable potential for Industrial Symbiosis to increase intra-regional networking on using each other's know-how, experience, facilities and services in logistics, manufacturing and tourism industries, whereas there are very limited opportunities for energy industry.

Black Sea Industrial Symbiosis Platform (BSISP) was established in 2011, to serve as a common ground for data accumulation and info & know-how exchanges between the four countries of the Basin. It is supported by the database developed to create a platform for opportunities for the region's companies to network and cooperate; online tools are developed like carbon foot-printing and trade networks optimisation to support the abovementioned cooperation and an industrial symbiosis strategy is developed that contributes to the development of strong local economies and strengthen social and cultural interaction between decision-makers, producers, traders and consumer communities in Bulgaria, Turkey, Romania, and Moldova. Each member company of BSISP is free to use these tools for its own benefit. BSISP is a not for profit organisation and participation to BSISP and using the tools of the platform is free.

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