PROMOTION OF SYMBIOTIC NETWORKS FOR INDUSTRIAL WASTE THROUGH THE USE OF A DEVELOPED PLATFORM

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Industrial Symbiosis

The sharing of services, utility, by-product resources and waste among industries in order to add value, reduce costs and improve the environment

What can a platform do towards industrial symbiosis?

- Identifies opportunities of waste to become a resource.
- Uncovers the barriers for implementing waste exchanges and waste utilization.
- Provides substantial information on available waste types and quantities for exchange.
- Facilitates communication amongst million of industries and SMEs.
- Promotes resource efficiency.
Building the data for the platform...
Waste Categorisation

- Waste Statistics
  Regulation 574/2004/EC
- List of Waste
  Decision 2002/532/EC
- Usual Terminology
Waste Categorisation

Waste Statistics I

LEVEL 1

13 Solidified stabilised or vitrified waste
12 Mineral wastes
11 Common sludges
10 Mixed ordinary wastes
09 Animal and vegetal wastes
08 Discarded equipment
07 Non-metallic wastes
06 Metallic wastes
05 Health care and biological wastes
03 Other chemical wastes
02 Chemical preparation wastes
01 Chemical compound wastes

Regulation 574/2004
Waste Categorisation

Waste Statistics II

LEVEL 3

06.11 Ferrous metal waste and scrap

06.31 Mixed metallic packaging

06.32 Other mixed metallic wastes

LEVEL 2

06.1 Ferrous metal waste and scrap

06.21 Waste precious metal

06.23 Other waste aluminium

06.24 Copper waste

06.25 Lead waste

06.26 Other metal wastes

LEVEL 1

06 Metallic wastes

06.3 Mixed metal wastes

Waste Statistics
**Waste Categorisation**

**List of Waste**

**Decision 2002/532/EC**

- **01 WASTES RESULTING FROM EXPLORATION, MINING, DREDGING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS**
- **02 WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOR PREPARATION**
- **03 WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD**
- **04 WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES**
- **05 WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL**
- **06 WASTES FROM INORGANIC CHEMICAL PROCESSES**
- **07 WASTES FROM ORGANIC CHEMICAL PROCESSES**
- **08 WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE OF COATINGS (PAINTS, VARNISHES), ADHESIVES, SEALANTS AND PRINTING INKS**
- **09 WASTES FROM THE PHOTOGRAPHIC INDUSTRY**
- **10 WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL**
- **11 WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE OF INORGANIC CHEMICAL PRODUCTS**
- **12 WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE OF ORGANIC CHEMICAL PRODUCTS**
- **13 WASTES FROM CHEMICAL RESEARCH AND DEVELOPMENT**
- **14 WASTES FROM CHEMICAL INVESTIGATION**
- **15 WASTES FROM CHEMICAL ANALYSIS**
- **16 WASTES FROM CHEMICAL TESTING**
- **17 WASTES FROM CHEMICAL ENGINEERING, MACHINERY AND INDUSTRIAL USE**
- **18 WASTES FROM CHEMICAL MANUFACTURE, FORMULATION, SUPPLY AND USE OF COATINGS (PAINTS, VARNISHES), ADHESIVES, SEALANTS AND PRINTING INKS**
- **19 WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS & THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND INDUSTRIAL USE**
- **20 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR) INCLUDING SEPARATELY COLLECTED FRACTIONS**
- **21 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR) INCLUDING SEPARATELY COLLECTED FRACTIONS**
- **22 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR) INCLUDING SEPARATELY COLLECTED FRACTIONS**
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**LEVEL 1**
Waste Categorisation

**Industrial Terminology**

**LEVEL 1**

- 10. **Manufacture of food products**
- 11. **Manufacture of beverages**
- 12. **Manufacture of tobacco products**
- 13. **Manufacture of textiles**
- 14. **Manufacture of wearing apparel**
- 15. **Manufacture of leather and related products**
- ......................
- 31. **Manufacture of furniture**
- 32. **Other manufacturing**

**LEVEL 2**

- 10.1 **Meat**
- 10.2 **Fish**
- 10.3 **Fruits & Veggies**
- 10.4 **Oils & Fats**
- 10.5 **Dairy**
- 10.6 **Grain mill starchy products**
- 10.7 **Bakery**
- 10.8 **Other**
- 10.9 **Animal feeds**

**Usual Terminology**

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The Industrial Symbiosis

Knowledge Graph...
A graph is an abstract representation of a set of objects where some pairs are connected by links.

Object (Vertex, Node)

Link (Edge, Arc, Relationship)
Industrial Symbiosis Platform

What does a graph look like?
The graph is populated with:

- Waste categories
- Feedstock categories
- Resources (Waste and Feedstock)
- Industries
- People
- Synergies between companies
- …
The matching algorithm is evaluated against the data in the graph and takes into account:

- Relationships between the graph nodes
- *Distance* between nodes
- Physical Distance between Companies
- Quantities (required and available)
- Rate of waste production
- ...

**Industrial Symbiosis Platform**

**Finding Resource matches**

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The platform...
BECOME A MEMBER OF OUR COMMUNITY

THIS IS WHAT YOUR BUSINESS NEEDS

REGISTER TODAY!

Participate
Put your Organization, Sites and Resources on the map

Save time
Save time locating resources and checking for compatibility and availability

Get smarter
Get insights on ways to improve your activities

Register your Organisation
Go through our online process of registering your organisation and look for members of our network nearby.

Categorize your waste
Take advantage of our advanced categorization of waste and resources to make it easy for others to find what you have.

Browse our database
Browse through our database of waste and resources and look for ways to improve your business.

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Add a new Resource

**Step 1: Categorize your waste**

- **Vegetal waste of food preparation and products**
  - 08 Animal and vegetal wastes
  - 09.1 Vegetal waste
  - 09.22 Vegetal waste of food preparation and products
  - 02 Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing
    - 02.01 Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
    - 02.03.01 Materials unsuitable for consumption or processing

- **Other mixed and undifferentiated materials**
  - 13 Mixed ordinary wastes
    - 19.2 Mixed and undifferentiated materials
    - 19.22 Other mixed and undifferentiated materials
  - 02 Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing
    - 02.03 Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
    - 02.03.99 Waste not otherwise specified

*Waste types 3 to 4 of 7 total*
Add a new Resource

**Step 1: Categorize your waste**

**Step 2: Resource Information**

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<td>Processing Cost</td>
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</tbody>
</table>
Industrial Symbiosis Platform

Statistics

Network Statistics

![Graph showing resource quantities per waste type from 2005 to 2015.](chart)

- **Resources** per Waste Type
- Total: 3,581 tonnes

![Map showing the network of organizations.](map)

- **Network of Organizations**

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Industrial Symbiosis Platform
Arsenal of Technologies
THANK YOU!