



Technosind S.r.l.

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1. The society

Technosind s.r.l. is a company founded in 1990 in order to coordinate the research and development activities, mainly in the field of treatments and recovery of raw and innovative materials and in the field of renewable energy. It is registered in the National Register of Researches with the code 60281C94.

Almost all of the company's turnover comes from research and development activities commissioned by private companies and public authority.

The company constantly collaborates with the University of Rome "La Sapienza" and with ESCO innovative companies (G.e.A. s.r.l., Green Promotion s.r.l., GA ENERGY S.p.A) mainly in the field of energy storage and nano technologies.

2. Mission and activity

The main activity of the company is to develop and optimize chemical processes starting from the laboratory scale up to the industrial one.

Within of the projects it deals with, it mainly develops the following activities:

- Coordination of research and development activities;
- Drawing up of experimental plans;
- Statistical analysis of data;
- Fluid-dynamic modeling and analysis;
- Scale-up from the laboratory to the pilot scale;
- Design of pilot plants (up to full industrial scale);
- Industrial experimentation;
- Analysis of technical and economic feasibility.

Following are some of the activities carried out by Technosind s.r.l.:

- Customer: **Eco Recycling s.r.l.**
 - *Technical scientific collaboration within the "Nanohydro" project with the following tasks: assistance in design, interpretation of tests and drafting of the user manual for the experimental apparatus.*
 - *Research of the main technologies for the realization of the unit operations of the lithium-based battery recycling project and the 3D design of the main components of the prototype within the "LiBat" project*
 - *Fluidodynamic analysis of the reactor as part of the "Photolife" and "Hyrypam" projects*
- Customer: **Eco One s.r.l.**
 - *Development of algal growth models (micro algae) and scientific technical collaboration activities in the context of the 2013 micro algae application projects for bio-oil production.*
- Customer: **Nova System s.r.l.**

- *Technical scientific collaboration within the "Nanohydro" project;*
 - *Basic design of the experimental unit control system for the electrochemical deposition of nanoparticles, assistance in system assembly and start-up;*
 - *Interpretation of experimental data (on model provided by NSR) and adaptation of the system design based on experimental results;*
 - *Final project and start-up.*
- **Customer: Eco Power s.r.l.**
 - *Analysis and criticality of the syngas washing system with high pressure water mist;*
 - *Design assistance and industrial experimentation of a prototype water / syngas exchanger for large flow rates;*
 - *Collection and analysis of data for determining the exchange coefficients.*
- **Customer: IRISAT s.r.l.**
 - *Technical-scientific collaboration, as part of the WIMP-XX project: realization of numerical simulations on thermal degradation of biomass, modeling of both TAR dynamics from cracking formation and secondary filtration, measurement of SYNGAS produced calorific value;*
 - *Verification of treatment and recovery processes.*
- **Customer: INDECO s.r.l.**
 - *Process and executive design of a plant for the treatment of 1500 tons / y of photovoltaic panels at the end of their life;*
 - *Design of a plant for the treatment of 2000-5000 tons / y of PCBs.*
- **Customer: Renova s.r.l.**
 - *Design Pilot plant necessary for the optimization of the processes for the production of Syngas according to the type of power supply used and adaptation of the existing system;*
 - *Analysis of the characteristics of the pyrogasification process for the production of electrical energy and related design of the pilot plant for the conduct of a feasibility study aimed at the subsequent industrialization of production. Assistance for the definition of the plant and process layout;*
 - *Technical-scientific collaboration in the analysis of the control of the gasification process variables: temperature, pressure and flow. Realization of the training material.*
- **Customer: G.e.A s.r.l.**
 - *Collaboration in research concerning the synthesis of Sabatier (CO₂ methanation with H₂);*
 - *Collaboration in research involving the accumulation of energy through the use of cascade heat pumps and heat storage in molten salts.*
- **Customer: Attitude S.a.S**
 - *Due diligence related to photovoltaic systems (setting up the account).*

- Customer: **Consorzio Biosud Ricerche Taranto**
 - *Assistance in the coordination of research and development of a project for the industrial production of 2-naphthalenesulfonic acid b-naphthol.*
- Customer: **Carbochimica S.p.A. Livorno**
 - *Assistance in the coordination of research and development of a project for the treatment of naphthalene sulfur derivative;*
 - *Assistance and coordination of industrial research in the biodesulfuration project.*
- Customer: **Progemisa S.p.A. Cagliari**
 - *Production of sugar from beet, analysis of treatment and recovery of waste;*
 - *Design of a new pilot plant for the leaching of quartz sand.*
- Customer: **Ingegneria Ambientale s.r.l.**
 - *Process analysis of the platform for the treatment of industrial waste in Gela (Sicily);*
 - *Process analysis of the platform for the treatment of industrial waste from Vigazzuolo (VC).*
- Customer: **C.S.M. S.p.A. Roma**
 - *Development of the process for hydrometallurgical production of pure FeO from minerals containing P and S, planning of experiments interpretation of results, flow-sheeting process, optimization of the process and technical-economic evaluation.*
- Customer: **Mining S.p.A. Roma**
 - *Process and plant for crystallization of rock salt;*
 - *Development of the process for the biohydrometallurgical extraction of refractory gold, experiment planning, interpretation of results, process flow sheet, process optimization and technical-economic evaluation.*
- Customer: **S.I.V. S.p.A. - Società Italiana Vetro San Salvo CH**
 - *Planning of industrial experimentation;*
 - *Statistical evaluation of industrial data.*
- Customer: **ITM-CNR Roma**
 - *Design of a pilot plant for the leaching of quartz sand;*
 - *Design and analysis of iron removal experiments from quartz and feldspar sand (grinding, magnetic separation, gravimetric separation, flotation, leaching, mixing, extraction).*
- Customer: **PROCTER&GAMBLE Italia S.p.A. Roma**
 - *Development of chemical engineering software.*

- Customer: **Seico s.r.l.**
 - Assistance, P&I and design of a plant for the industrial treatment of quartz sand;
 - Process study for the production of gold and manganeseiferous products from marginal and residual minerals.
- Customer: **I.L.R. S.p.A. Sinalunga**
 - Assistance in the co-ordination of research and development of PRECLAYR BRITE-EURAM-project

3. European Projects

The skills of Technosind s.r.l. are documented by the wide and qualified international experience having successfully collaborated on important projects funded by the European community:

- **HP-MOSES**: Technosind is a partner of this project (05/2017-10/2017) (call: H2020-SMEInst-2016-2017) funded by the European Union within the Horizon 2020 program. This aims to study and optimize a process of accumulation of thermo-electric energy that can be adapted in optimal way to the load curve of the electrical distribution. The main objective of the proposal is the technical and economic feasibility analysis of a large-scale (50-1000MW) molten salt energy storage system based on solar assisted high temperature heat pumps (HP-MOSES).
https://cordis.europa.eu/project/rcn/210406_en.html
- **EUREKA E3895 LILIEX**: the project (36 months) was funded by MIUR (Ministry of Education, University and Research) and concerns the development of innovative separation technologies for the removal and recovery of metals from urban and industrial waste (for example, fly ash from incineration of RSU, WEEE, foundry residues, catalytic converters, etc.). The project will include the following steps: waste characterisation, model development, experiment planning, analysis of experimental data, selection of solvent for leaching and extraction and optimal flow sheet synthesis, development of a general methodology. Technosind contributed to the project with experiment planning and software development.
<http://www.eurekanetwork.org/project/id/3895> ???
- **AITEKIN COOP-CT-2003-506667**: the outcome of the project was a prototype plug flow reactor with the necessary hardware to carry out temperature scanning kinetic experiments and the Artificial intelligence (AI) based software necessary to identify the kinetic mechanism and to design the industrial scale reactor and its control system with limited human involvement.
Technosind was the lead company (coordinator) of the European project (FP6 sixth framework program) in which he coordinated large structures such as Polimeri Europa (ENI), UOP (UK). As part of this project, he received the highest rating from the EU

commission (good to excellent project) for the activities carried out.
https://cordis.europa.eu/result/rcn/51589_en.html

- **MEWLIFE**: is a project funded by the European Union within the Life + program. The main focus of this project is to demonstrate at pilot scale the efficiency of an innovating route for producing biomass for nutraceuticals and bio-polymer applications and simultaneously co-depurating an agro-food. MEWLIFE project aims to demonstrate the environmental benefit and economic feasibility of an innovative approach to produce microalgal biomass in an integrated phototrophic and heterotrophic cultivation system using pre-concentrated olive oil wastewaters (OMWW) as carbon source for growing algae, thus contributing to waste reuse and valorization. In this project, Technosind takes care of the basic process design (BPD) and the technical-economic evaluation.