

Results

Among the main results achieved during the program, we highlight the following:

- Comparative analysis on the efficiency of different treatment technologies for sludge and industrial waste. Among these technologies, sludge cells and bio-digestion chambers.
- Identification of the origins of sludge in Chile's central regions (Metro, V, and VI): volume, traits, seasonality, and composition among other.
- Comparison of the alternatives for sludge management. Identification of the most efficient treatment option as a complementary system to the current disposal process in sanitary landfills.
- Identifying potential commercial uses for sludge under proper environmental, social and economical guidelines.
- Composting, biodegradation, and permeability trials with sludge originated in four different industries; poultry, pork, paper, and fish farming.

Conclusions

- The composting trials showed a great potential for sludge from the poultry and salmon farming industries. They produce a stable type of humus as good as the sludge coming from residential urban waste waters. The potential market for the sludge is agriculture, parks, green areas, nurseries, and eroded areas. In all of the trials, the sludge was able to be bio-dried, which could be used as bio-fuel under the current local conditions.
- The biodegradation trials allowed to confirm the profitability of the sale of electrical energy. It is possible to profit from projects contemplating the use of sludge from industrial waste produced in the poultry and fish farming industries. Another source is the sludge coming from the primary rotary filters found in industrial pork waste treatment plants. Still, the most profitable sludge comes from the poultry and fish farming industries due to their high potential of the biogas produced. This material is rich in protein and fat.
- Treatment plant sludge could be the right material to close or re-insert areas impacted by untreated solid or liquid disposed waste.
- The combination of two or more treatment alternatives can be the solution for a particular problem.
- There is a need to treat sludge, but there is not a legislation regulating this. The regulation will have to follow the innovation of the treatment plants and its processes.
- The application of a successful foreign experience without analysis could be disastrous. Thus, we have to develop our own experience even as a pilot program.
- The answer for the sustainable treatment of sludge is based on research and development.
- A way to go forward on the implementation process is to create work groups integrated by universities, sludge producers, fiscal institutions, government organizations, and service providers. These groups should analyze current sludge deposits and other areas affected by the disposal of sludge.

Alliances / Cooperation

During the project duration we established important alliances with waste treatment-related Swedish research centers and companies.

- Swedish Environmental Research Institute (IVL) www.ivl.se
- Borlänge Energi www.borlange-energi.se
- FALU Energy and Water www.fev.se
- Fortum www.fortum.se
- Hammarby Sjöstad www.hammarbysjostad.se
- Compost Plant TUNA Hastberg
- Dala Hazardous Waste Plant
- Kvarnsveden Paper Plant -STORA ENSO www.storaenso.com
- A.S. Borlänge Treatment Plant www.borlange-energi.se
- Fagelmyra Treatment Plant www.borlange-energi.se
- SRV Plant www.srvatervinning.se