BLUEPRINTS FOR INDUSTRIAL SYMBIOSIS (IS) DETECTION – CHEMICAL SECTOR

Challenge
How to overcome confidential issues when sharing data & results in and across process sectors?

Solution – sector blueprint
– typical process industry sites (refinery, steam cracking, chemicals)
– systematic methodology to produce blueprints
– 3 profiles summarising the material, thermal and electrical needs of a given industrial sector
– data anonymisation techniques (Parerto approach, aggregation, anonymisation factor) ensure data confidentiality while keeping the realistic nature of the blueprint
– customisable MILP models for identifying and optimising the best IS connections between process sectors

Case study - Heat integration between a refinery and a District Heating Network (DHN)

Methodology
- use of refinery [1] and DHN [2] blueprints
- thermal energy profiles (level 2 – pinch curves)
- refinery capacity = 35’000 t/d, city = 10’000 inhabitants in zone 5 [2]
- objective function: maximise heat integration

Results
→ DHN’s energy consumption reduced by 50% when integrated with the refinery
→ next step: include OPEX and CAPEX

Conclusion
The use of blueprints is a powerful tool for overcoming the burden of industrial data confidentiality. They provide an easy and clear solution for industries to share data and learnings that can lead to better practices, operation optimisation and even new businesses. The case of heat integration between a refinery and a DHN demonstrates that blueprints can be used for the identification and evaluation of new IS opportunities.

Contact
helene.cervo@ugent.be
Universiteit Gent @ugent
Ghent University