Optimal design of green and resilient supply chain

Localisation: CERMICS, École des Ponts, Champs-sur-Marne
Length: 18 months, starting as soon as possible

Context

More and more industrial companies are considering the carbon footprint of their activities as well as the resilience of their logistic scheme against uncertain elements. There are three parts to the global supply chain, each of them with its own set of decisions: upstream supply chain (local or distant supplyer, transports means, multi-sourcing level), manufacturing (size, number and placement of manufacturing units, multi-sourcing level) and downstream supply chain (number and placement of storage units, product affectation to each units).

Academic research will be conducted within CERMICS in close interaction with a small team of researchers working on Operational Research.

Objectives

Currently the design of this three elements is often made independently, with a focus on price, and assuming known deterministic demand. Resilience of the design and environmental impact are rarely taken into account.

We aim at proposing a high level multi-objective model for the design of the supply chain under uncertain demand. After constructing a model of demand, we want to propose algorithms producing Pareto-optimal supply chain along three axes: costs, resilience, environemental impact.

This research is funded by a consortium of 4 large industrial companies. The candidate will have the opportunity to work with the actual data and constraints of these companies.

Skills required

- Good knowledge of mathematical programming (stochastic programming or multi-objective optimization are a plus)

- Good knowledge of probability, statistics or data science

- Strong modeling skills

- Ability to exchange with industrial partners

How to apply ?

Do not hesitate to contact us if you have question. To apply, send CV, motivation letter, recommandation letter or references to vincent.leclere_at_enpc.fr