Main objectives
- Study the impact of the three pillars of sustainability on both strategic and tactical supply chain decisions
- Derive strategies towards a more sustainable supply chain

Motivation
- Supply chain sustainability policy definition constitutes a major challenge.
- Most literature focuses only on the economic and environmental pillars of sustainability. Literature on the social pillar is very infrequent, mainly due to lack of data and quantifiable indicators.
- EC funding for 2014-2020: Up to €376 billion for fostering growth and promoting job creation in the less developed European regions
- The complexity of the problem requires the use of powerful decision support tools that can incorporate a high number of variables and offer easier and faster visualization of the impacts of sustainability policies.

ToBloOM – Triple Bottom Line Optimization Modelling - is proposed to fill this gap.

Case-study

Figure 1: Conceptual framework.

Figure 2: Case-study network representation.

Table 1: ToBloOM’s inputs and outputs.

Table 2: Decisions’ results summary.

Conclusions
The developed and presented tool provided support for decisions to be taken both internal and external to the company and at several levels of the supply chain. Specifically it allowed to:
- Understand the connections between the different supply chain activities and because of that obtain a better combined performance across the supply chain. This would not be possible if we were only considering the commonly published location-allocation supply chain decisions.
- Understand the impact of these decisions on the three pillars of sustainability and from there derive potential strategies that can reduce the trade-offs between these pillars.
- Identify environmental sustainability hotspots and prioritize actions to reduce the environmental impact of the supply chain activities (not shown).
- Explore socially responsible alternatives without compromising either the economic performance of the company or the potential funding bodies (not shown).
- Derive potential improvement strategies and study its impact across supply chain activities as well as on the three pillars of sustainability (not shown).
- Design and plan a supply chain capable of accommodating parameters’ uncertainty (e.g. market penetration) through a stochastic approach (not shown).

It was concluded that changes in optimization objectives return significantly different strategic and tactical decisions. The importance of an integrated framework was demonstrated – allows a better performance across the supply chain.

Design and planning of sustainable supply chains
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