



Sustainable development assessment tools dedicated to territorial collectivities

GDF SUEZ Research and Innovation Division expertise

6th International Conference of Territorial Intelligence - Besançon
September 2008, 17th

Amélie BONARD

GDF SUEZ Research and Innovation expertise on sustainable development assessment tools

Life Cycle Assessment

Material and Energy Flow Analysis

Ecological Footprint

Carbone Balance

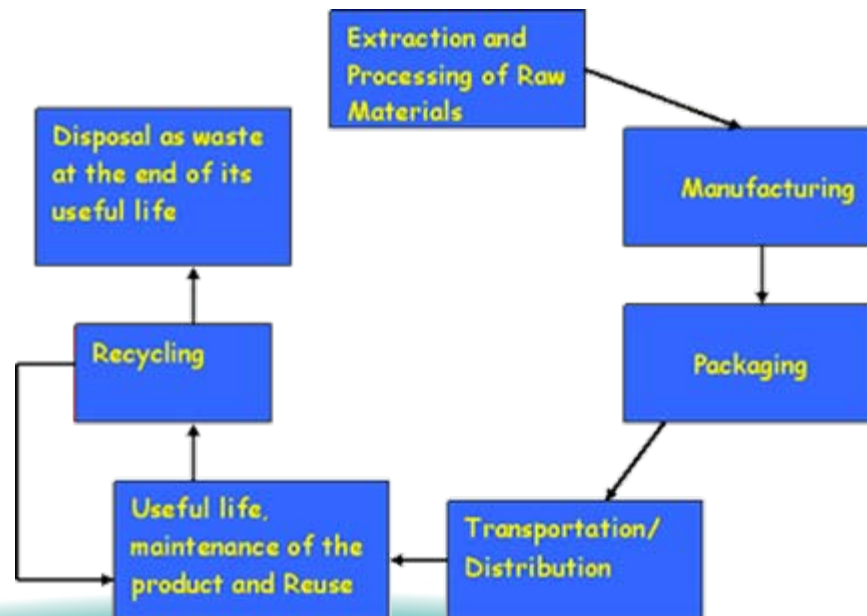
Life Cycle Assessment

A tool to assess the potential environmental impacts of products systems or services at all stages in their life cycle

- from extraction of resources
- through the production and use of the product
- to reuse, recycling or final disposal

The procedures of life cycle assessment (LCA) are part of the ISO 14000 environmental management standards (ISO 14040:2006 and 14044:2006)

*Life cycle assessment stages :
from "cradle to grave"*



Life Cycle Assessment

Advantages

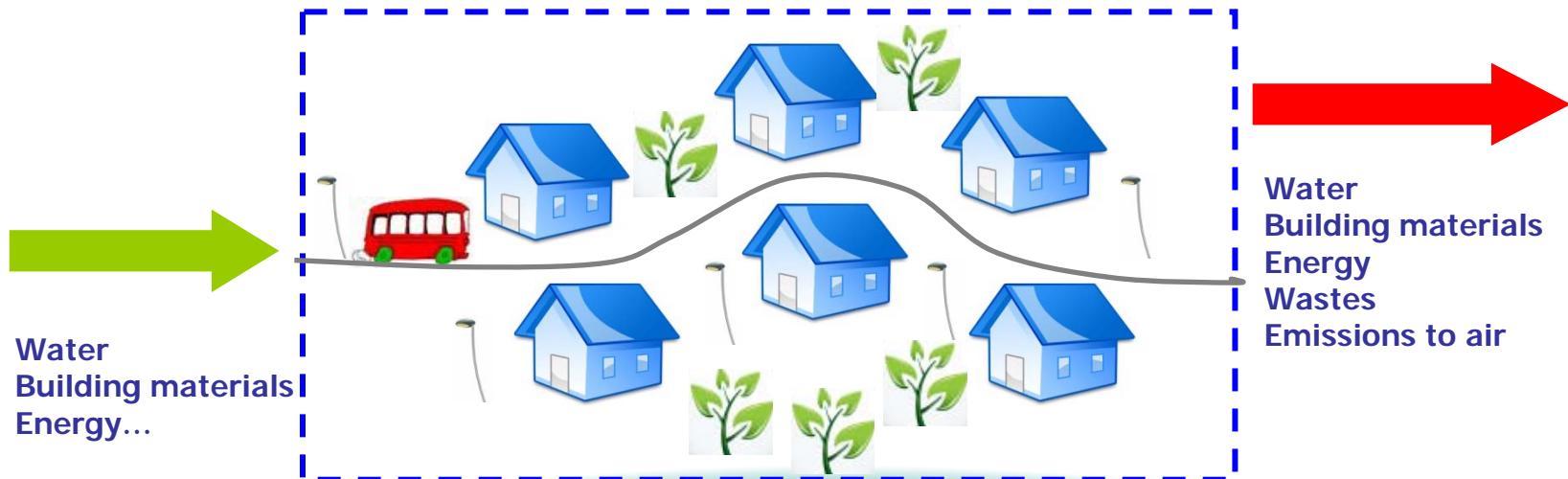
- A scientific approach
- A standardized tool, taking into account the environmental impacts as a whole
- A study that is not focused only on greenhouse gases

Initially, a tool dedicated to products and services

- GDF SUEZ examples : Whole European gas chain ; biogas ; hydrogen production

Now, new versions for buildings and city districts

- An innovative and interesting approach for city districts



Material and Energy Flow Analysis

Material and Energy Flow Analysis is a tool to count the flows that enter or get out of a territory (defined by its boundary)

- By type of activities (industry, transport, service, household)
- By type of flows (energy, water, building materials, plastics, metals, textile, paper and board, wood and foodstuffs)



Material and Energy Flow Analysis

Advantages

- A scientific approach
- A tool recognized at a European level
- A tool used to optimize resource use and to lower emissions associated
- A study that is not focused only on greenhouse gases

Initially, a tool dedicated to countries

- Available for many European countries (Denmark, Germany, Italy, United Kingdom...)

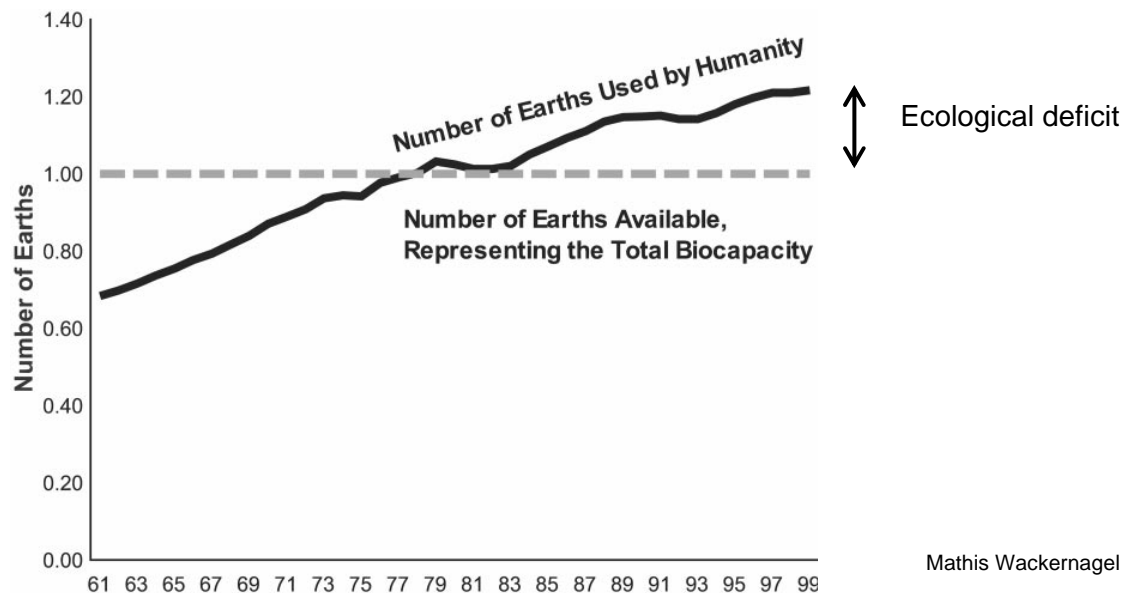
Now, new versions for regions and cities

- GDF SUEZ example : Lille City

Ecological Footprint

A measure of human demand on the Earth's ecosystems and natural resources
- It compares human consumption of natural resources (= ecological footprint) with planet Earth's ecological capacity to regenerate them (= biocapacity)

An estimation of the number of planet Earths it would take to support humanity if everybody lived a given lifestyle



Mathis Wackernagel *et al.*, 2002

Ecological Footprint

Advantages

- A tool dedicated to increase public awareness of sustainable development
- A useful tool for communication

A tool dedicated to the whole planet, countries, cities, buildings, individuals

GDF SUEZ example

- Calculation of the ecological footprint of a tertiary building (suburb of paris)

Carbon balance (Bilan Carbone ®)

A tool proposed by ADEME (the French Environment and Energy Management Agency) in 2002-2003

A focus on greenhouse gases emissions

- Results expressed in ton of carbon equivalent

Two different versions

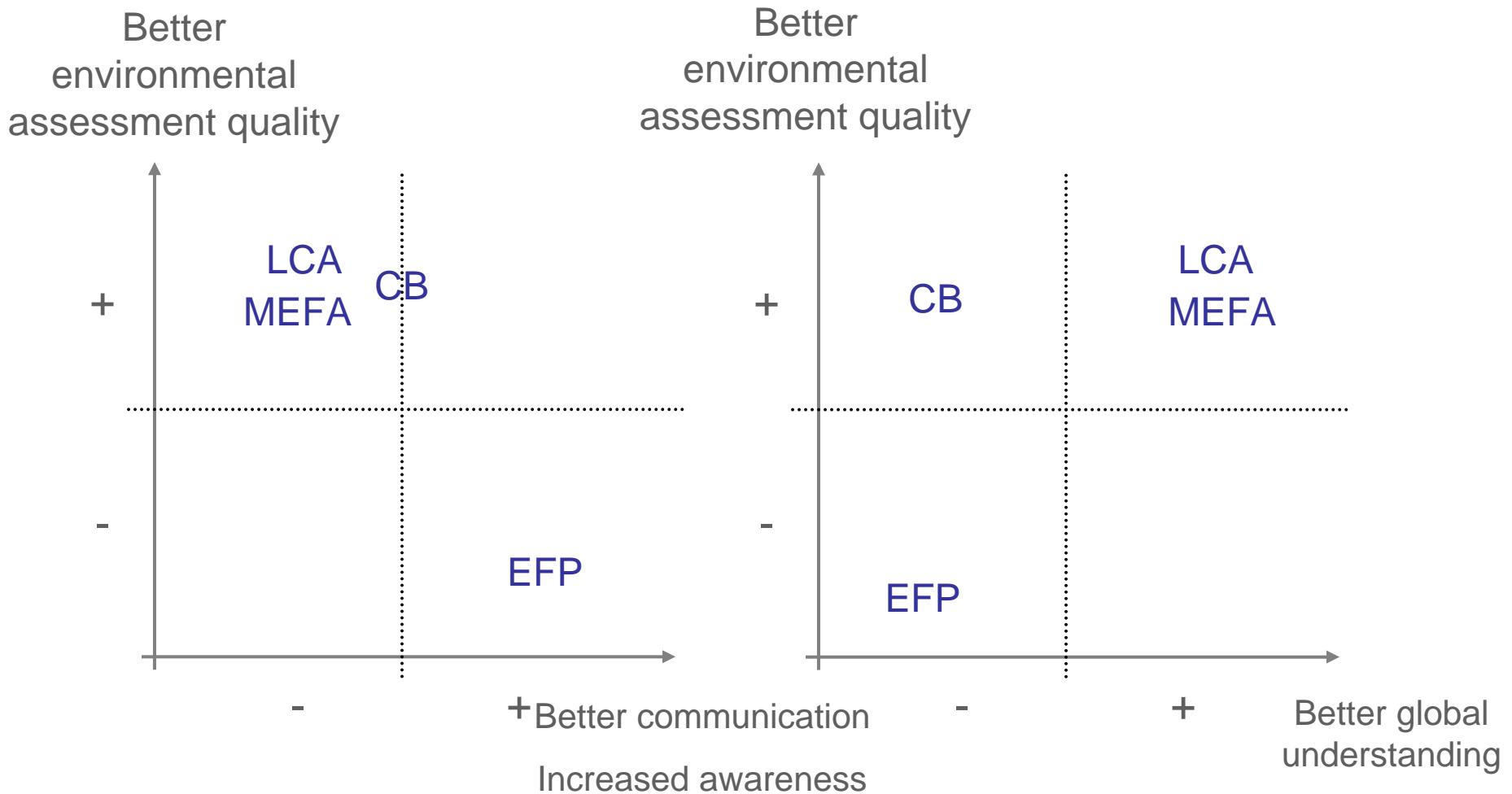
- Industrial or office activities (2003-2004)

- Local authorities (2007)

GDF SUEZ expertise

- Carbon balance emission factors used in MEFA projects

Assessment tools for what purposes ?



Material and Energy Flow Analysis project Example of Lille City

Description of the project

Studied territory

Methodology

Results

Recommendations to optimize resources consumption

Lessons for future sustainability assessment projects with local authorities

Description of the project

An ambitious R&D project with three objectives

- Count the flows that enter or get out of Lille City
- Optimize resource use and resource efficiency at a local level
- Involve local stakeholders (local chambers, urban development agencies, businesses, associations...)

Three partners

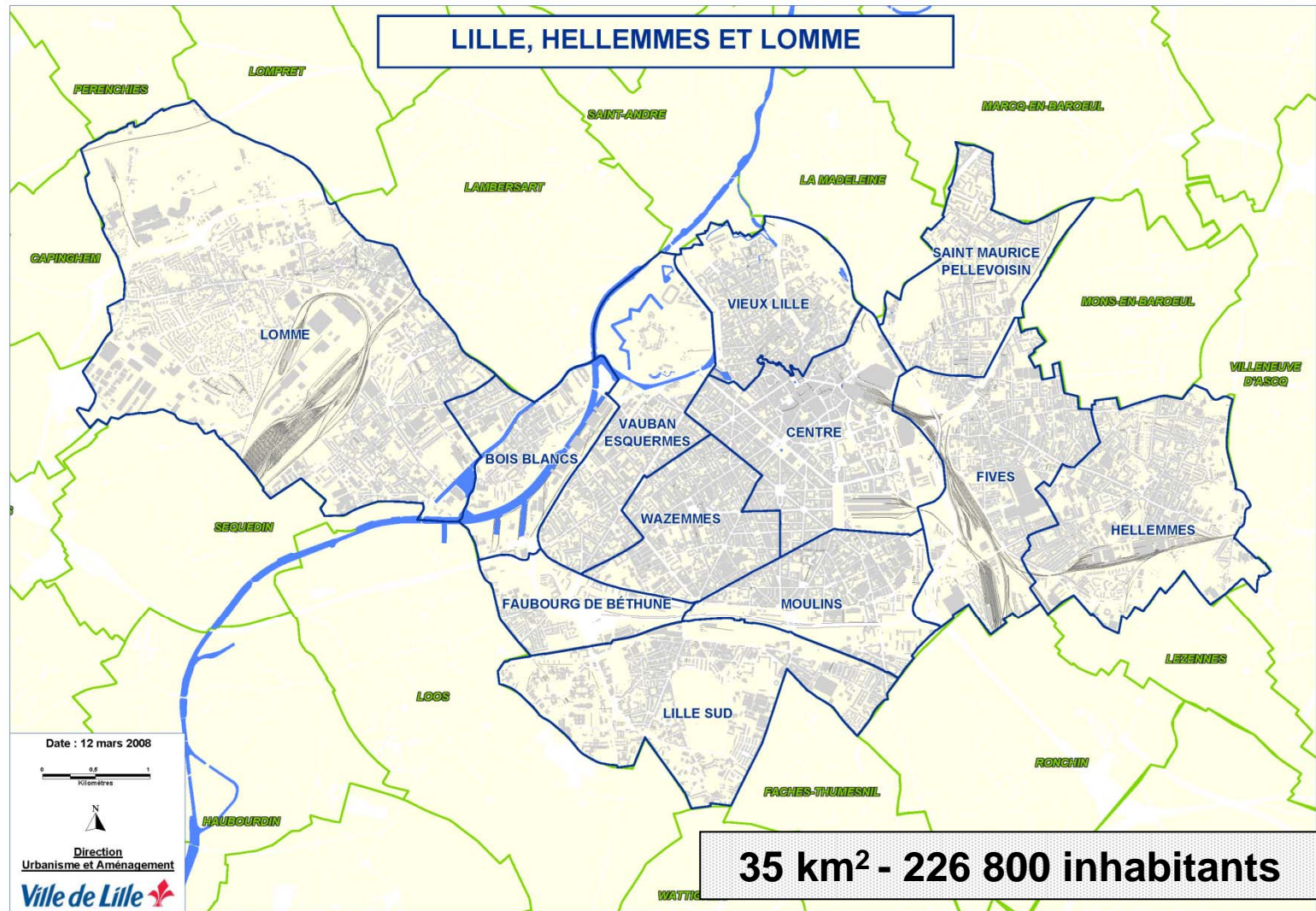
- GDF SUEZ Research and Innovation Division
- Lille City
- Auxilia association

Financial support

- The Regional Authority (Région Nord Pas-de-Calais)
- The French Agency for Environment and Energy Management (ADEME)
- The Water Agency Artois Picardie

Period : June 2005 – December 2007

Studied territory



Methodology

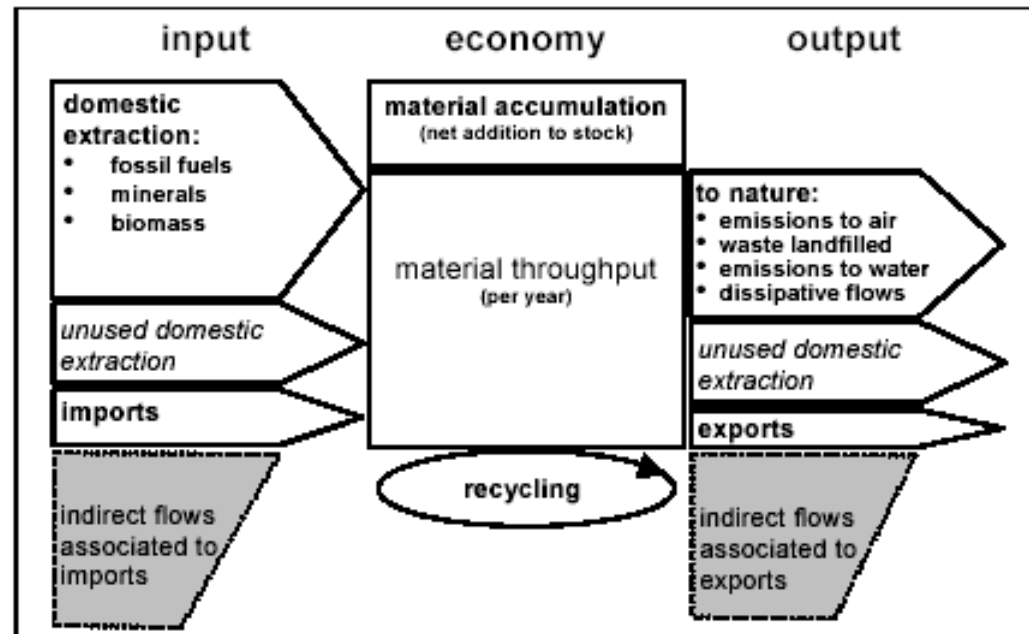
A reference methodology

- EUROSTAT guide (Statistical Office of the European Communities, 2001)

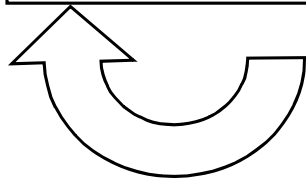
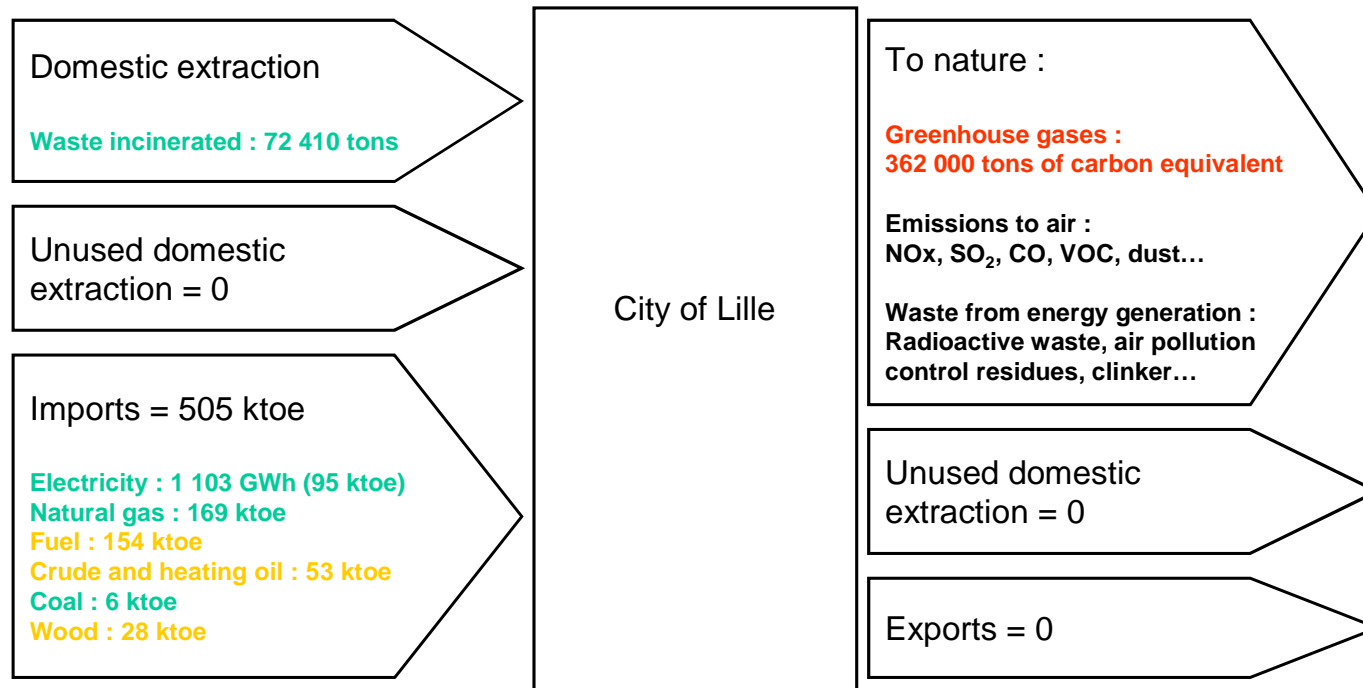
A methodology quite simple

- 4 types of inputs and outputs considered
- Can be adapted depending on the context

A methodology that had to be adapted to local level



Results : example of the energy balance



Recycling
(Electricity sold to EDF)

Waste incinerated : 2,4 ktoe
Natural gas cogeneration : 17 ktoe

* Year 2005

* Energy consumption (sum of imports and recycling) of 524 ktoe

* toe : ton of oil equivalent

* Very small proportion of energy produced by the city (less than 4%)

* Greenhouse gases have been quantified using emission factors proposed by ADEME

Recommendations to optimize Lille City resources consumption

Energy

- Increasing local energy generation (energy recovery from waste incineration, electricity production by CHP plants...)
- Energy savings

Building materials

- Encouraging a building demolition policy

New fields of recycling wastes

- Textile as an insulating material



Results of this work support Lille City in managing the territory resources on a better way and in implementing its sustainable policy

Lessons for future sustainability projects with local authorities

MEFA : a useful tool for sustainable development projects

- Energy and material flow data
- Recommendations for future sustainable development projects

Key success factors

- Strong political support
- Involvement of local stakeholders (local chambers, urban development agencies, businesses, associations...)
- Flow data collection

Conclusion

GDF SUEZ expertise on sustainable development assessment tools

- An opportunity for GDF SUEZ to support local authorities in their sustainable development projects

GDF SUEZ Research and Innovation future works

- Development of new hybrid assessment tools dedicated to different types of territory (cities, regions, city districts, industrial or business park...) combining the advantages of the existing and new tools

GDF SUEZ



Thank you for your attention...

Contact : amelie.bonard@gdfsuez.com

