26th World Gas Conference

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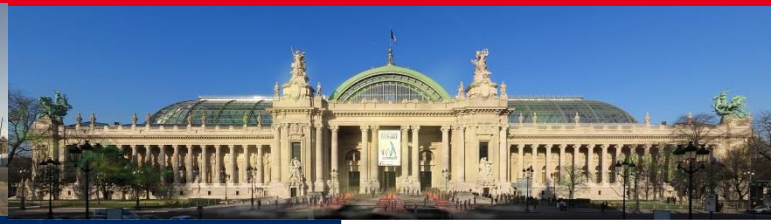

Life Cycle Assessment as a Decision Support Tool within ENGIE and the French Gas Association

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WGCPARIS2015
WORLD GAS CONFERENCE

The Environment is Impacted by ENGIE's Activity
ENGIE's Activity is Impacted by the Environment

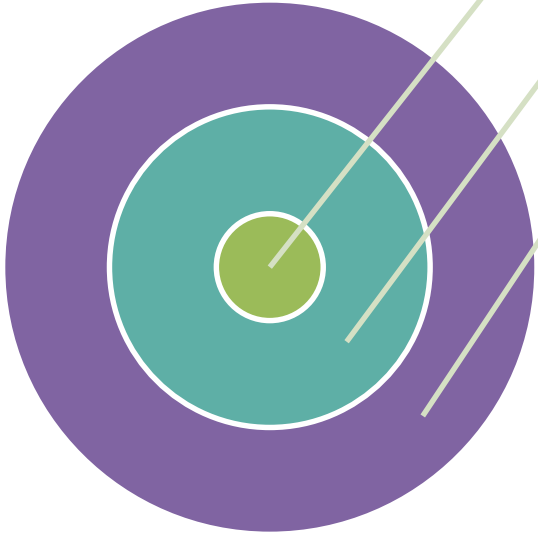
Local and Global Environment

Air, water, soil, resources, stakeholders

Accounting for impacts on and of the environment implies to **modify strategies**

→ There is a **need for adapted relevant tools** to assess such impacts

Evolution of technologies and environmental concerns calls for new methodological developments



Site level

Local Environment

Global Environment

Do new technologies have better environmental footprints than conventional technologies ? (Power to Gas, LNG as fuel)

What are the impacts of our activities on water resources ?
What actions may be done for sites in high water stress ?

How do our activities contribute to natural resources depletion ?
What are the impacts on climate change of new energy pathways (Shale gas)

All ENGIE BUs and Corporate Functions need support to assess their interactions with the environment

- Strategy & Corporate Policy
- Research & Development
- Business development
- Marketing
- Operations
- Communication & Reporting

LCA can answer several needs at different levels of ENGIE

- **Benchmark**
- **Assess technological building blocks**
- **Identify best practices**
- **Anticipate potential environmental issues**
- **Monitor environmental performances of ENGIE**
- **Communicate with internal and external stakeholders**

Life Cycle Assessment amongst environmental impact assessment methodologies

LCA :
a relevant **multicriteria method** to assess environmental impacts of a product or a service **along its whole life cycle**

- Several methods exist that are used to assess interactions between ENGIE's activities and their environment.
- LCA is one of the **most internationally recognized** and is still evolving to take into account new environmental concerns and issues related to new technologies.

LCA is used as a Decision Support Tool by the Group for 4 main Purposes

1. Design & Operate — R&D projects…

2. Anticipate & Manage — Optimization of operation and new activities…

3. Benchmark & Lobbying — Comparison of technologies, fuels to help legislators…

4. Design of new offers — Added value in offers…

LCA is a relevant tool to support the natural gas industry towards lower environmental impacts

- LCA can be used to **identify** which actions are needed and which are most relevant.

- LCA can be used to **quantify** the environmental efficiency of **action plans**.

Contribution of the gas industry to fight against climate change and for sustainable development

LCA supported the formulation of this initiative

9 actions identified for voluntary initiatives

1. Reduce the GHG emissions linked to the natural gas transmission network
2. Reduce the emissions of LNG terminals
3. Assess the option of CCS and associated development means
4. Help developing new efficient technologies highlighting environmental & energetic performances of natural gas
5. Encourage the electricity producers to substitute coal by natural gas for electricity generation
6. Develop natural gas as an alternative fuel
7. Develop waste and biomass methanisation together with local stakeholders and the agricultural sector
8. Encourage the development of Power to Gas
9. Promote the development of « clean cooking equipments for all » using butane, propane or biogas from micro-methanisation