



Interests and limits of environmental analysis softwares

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Context

The rarefaction of raw-materials and the objectives of reduction of greenhouse effects gases are major stakes to be taken into account during the design stages of road projects, whether it is for new infrastructures or for the maintenance of the existing roads. To quantify the effects of these projects, softwares mentioned as "eco-comparators" were developed and allow analysing the impacts. Eco-comparators are decision-making tools for the project-manager.

Environmental analysis indicators

- Economy of resources, energy consumption (tons or cubic meters)
- Energy consumption (Mégajoules)
- Greenhouse effect (equivalent kg CO2)
- Eutrophication (equivalent kg PO4)
- Acidification (equivalent kg SO2)
- Tropospheric ozone (equivalent kg ethylene)
- Toxicity, ecotoxicity (equivalent kg 1,4 DCB)

Use at different stages of the road project



Limits

Durability design, degree of precision on coating temperature, moisture content, density...

Comparison of equivalent road techniques

- Comparison of base layers designed with 2 types of bituminous concrete:
 - ➔ Class 3 bituminous concrete (modulus 9 GPa)
 - ➔ Class 4 bituminous concrete (modulus 11 GPa)
 - ➔ Plant at 38 km

	Ressources	GWP	Energy	Water	AP	EI	PCPOP	EP	TP
Class 3 16 cm	8 303	300e3	6,14e6	174	803	54	373	42 796	2,27e6
Class 4 13 cm	6 305	240e3	4,85e6	136	650	44	299	33 839	1,83e6



Comparison of maintenance scenarios

The reference solution is a 6 cm bituminous concrete with 90 kg/m² of reshaping. As a comparison, the following techniques allowing the reshaping of strongly deformed roads were studied:

- a gravel emulsion (90 kg/m³)
- an emulsion treatment of in place materials

For each technique, two types of wearing courses (a two-layers coating and a cold bituminous concrete) were compared.

