SPORE

Spent Oil Regeneration
Technology Selection DSS

The paramount recommendation from all relevant environmental meetings is that the sooner various ways and means for collecting and regenerating waste oils are considered, the less acute would be one of the major preoccupations deriving from apprehensions about our physical environment.

If further motivation for action regarding the waste stream in question is needed, one can recall the often quoted motto of "Reduce, Recycle and Re-use" In that case, one may relate that:

- As much as seven litres of oil can be recovered from ten litres of used oil.
- Waste oil regeneration is cost-effective, (in this case: energy-efficient), since less energy is required to produce a barrel of regenerated base stock than to produce base stock from crude oil.
- These measures fit eminently nicely into any overall waste management strategy that would be adopted in the future.

To help our target beneficiaries (investors, environmentalists, policy makers, technologists, etc. from the developing world) to catch up with Europe and USA regarding waste oil management, we have developed the repository of the best available technologies for waste oil regeneration, together with the decision support tool for the assessment and selection of the most suitable technology to regenerate particular waste oil, taking into account the type of dirt present in it and the specific needs and preferences of various stakeholders.

The **SPORE** (**Sp**ent **O**il **Re**generation Technology Selection) application is used to provide support for Multi-Criteria Analysis using the PROMETHEE II and ELECTRE III algorithms.

SPORE configuration and data entry process encompasses several tasks:

- **Entering available technologies and their descriptions.** Initially, technologies are classified to two broad categories - technologies for producing lubricants/base oil and technologies for producing marketable fuel. New technologies can easily be entered, while those that have become obsolete could easily be cancelled.
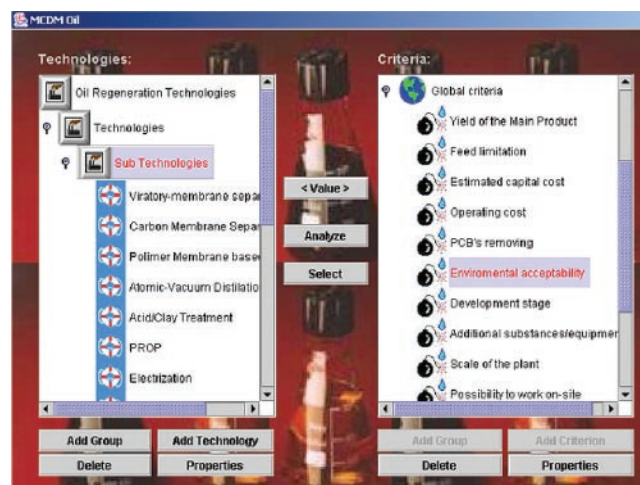
- **Entering criteria to be considered simultaneously.** SPORE initially uses different technical, environmental and financial criteria (yield of the main product, quality of the product, feed limitation, stream factor, development stage, scalability of the plant, possibility to work on site, additional equipment/substances, capability of PCB removing, existence of solid wastes, by-products, capital cost, operating cost). It is extremely easy to add new criteria.
- **Setting weights of chosen criteria and selecting the type of preference function**. Not all the stakeholders are equally interested in the criteria listed above. Investors are more interested in capital cost than the environmental acceptability of certain technology, while the local community and/or the environmentalists have exactly the opposite viewpoint. Therefore, the system enables its user to select the subset of the criteria offered by the system to be taken into account in particular MCDM session, as well as to put the relative weights to the chosen criteria that best reflect their specific preferences.

Technical information

SPORE has been developed using Java 2 Platform, Enterprise Edition, three-tier architecture and Open Source database, Integrated Development Environment and Application Server.

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