

Stakeholder consultation: What do decision makers in public policy and industry want to know regarding abiotic resource use?

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Abstract There is no agreement on what the issue of concern is regarding resource use. A stakeholder consultation was carried out in order to clarify this issue. The objective was to identify decision contexts in which stakeholders would use an indicator related to resource use, and what such indicator should express. Industry representatives were interested in the short term economic consequences of depleting resources whereas policy makers were more concerned with the robustness and reliability of the indicator over a longer time horizon. Some of the aspects the indicator should cover include availability, effort increase, substitution, and societal value. The stakeholder consultation resulted in the selection of three indicators for mineral resources and two for fossil using different time horizons; the short term perspective prioritises political constraints, the midterm focuses on the increase in effort while the long term focuses on overall availability.

1 Introduction

Lack of consensus on what society understands as resource depletion is a major dilemma in Life Cycle Assessment (LCA). There are several impact assessment methods assessing resource use [1] and yet Berger and Finkbeiner [2] demonstrated lack of correlation between them. This occurs because each method expresses a different indicator which relates to a different problem. Therefore, further clarity on the issues of concern regarding the use of abiotic resources is needed to develop a harmonized life cycle impact assessment (LCIA) method on resource depletion.

The first step towards developing a method is to understand what are the problems associated with extracting and depleting a resource. In order to gain insight into this question a stakeholder consultation was organised involving several groups of

people who could be potentially affected by problems related to resource availability. The objective was to identify what kind of indicators would be really useful in their decision making process. This research is part of the project LC-IMPACT which is funded by the European Union FP7 programme.

2 Stakeholder consultation

A stakeholder consultation process was carried out in order to clarify the Area of Protection (AoP) on resource use. During this process interested parties were invited to share their views on the topic. This included a one-day workshop as well as individual interviews.

The workshop took place on October 4, 2010 in Brussels. Interviews were conducted with industry and policy makers that were underrepresented in the workshop. These interviews also aimed at a bigger coverage of fossil resources expertise.

2.1 Participants

Industry representatives, policy makers, and resource experts were invited to participate in the stakeholder consultation process. Industry and policy attendees will be the users of the indicator, and provide information about the decision contexts in which they would use a resource depletion indicator; whereas experts have the knowledge to inform whether a particular indicator is feasible and if data for the different relevant aspects is available.

The list of attendants of the stakeholder consultation process is presented in Table 1.

Tab.1: Participants of stakeholder consultation process for clarity on the AoP Resource.

Experts	Industry	Policy makers
ASPO International	European Aluminium Foil Association	EC DG Enterprise and Industry
Energy research Centre of the Netherlands	European Association of Mining Industries	EC Joint Research Centre
European Institute for Energy Research	Philips	French Ministry of Environment
Ghent University	Shell	
Lulea University of Technology	Umicore	
Radboud University of Nijmegen		
Raw Materials Group		
Uppsala University		

2.2 Decision contexts and type of indicator

In order to decide what type of indicator is needed for resource depletion, an inventory of situations where a stakeholder would use such an indicator was made. An exercise was performed with the stakeholders by asking them to share with us “their story”. Each attendant was asked to imagine different situations in which they would use certain indicators and what they would like the indicator to express. This was achieved by answering the following questions:

- As a _____
- In order to _____
- I need an indicator that expresses _____

Figure 1 shows an example of the exercise.

"As a corporate sustainability manager, in order to make informed decisions on current and future operations in the company, I need an indicator that expresses the costs of choosing a certain material."

Fig.1: Example of a post-it used for the inventory of decision contexts.

Table 2 shows the different decision contexts that were identified.

Tab.2: Results of decision contexts.

As a:	In order to:
Consumer	- Inform on purchasing choices
Policy maker	- Foresee long-term issues regarding resource depletion - Boost innovation
Industry	- Know the impact of the corporation's operations in resource scarcity - Make informed decisions on existing or future operations - Have resources available at reasonable price

Policy makers expressed their interest to use an indicator that can support new regulations and foster innovation; whereas industry's concern is related to assuring the corporation's profit.

The main findings regarding the type of indicator were:

- **Industry** focuses on the economic consequences of extracting additional resources with a time frame of 5-10 years. This is the average time for a return on investment
- **Policy** focuses on the robustness and reliability of an indicator with a time frame of approximately 50 years. This is because the data quality and data source will be questioned.

3 Consultation on aspects to include in the indicator

In order to steer the methodology development, it is vital to identify which aspects play a key role on resource use. Consequently, in addition to the stakeholder consultation on decision contexts and type of indicator, we took the opportunity to ask experts to identify which important aspects should be taken into account when developing a method for resource use. The following aspects were identified:

- availability
- economic/population growth
- increase on efforts (energy or cost)
- historic data
- recycling
- substitution
- supply risk
- technological improvement (both supply and demand - mining technologies and emerging use of resources, respectively)

- “value” for society

The next step involves verifying whether data is available for each of these aspects with respect to both mineral and fossil use.

3.1 Mineral resources

The following aspects were identified for mineral resources:

- **Costs** determine material choices.
- **Substitution** can be made for some metals but is not viewed as very relevant for this type of resource.
- Changes in demand due to **economic growth** and emerging technologies are relevant although quite difficult to model.
- Most metals can be recycled. However, because recycling is already included in the life cycle inventory stage (LCI), we should be cautious not to double count this aspect by also including it in the LCIA phase.
- **Availability** is considered an important issue, especially taking a long-term perspective. However, considering the average crust availability (as in the CML method [3]) is not eligible because not all crust is nor will be accessible for extraction.
- In order to assess future resource availability/scarcity, **historic** data should be analysed.
- **Global or European** scope is needed.

3.2 Fossil resources

The following aspects were identified for fossil resources:

- It is questionable whether an indicator that expresses fossil resource depletion is useful at all because **climate change** is driving substitution of fossil fuels by alternative sources of energy that cause lower greenhouse gas emissions. In fact stocks are not the limiting factor, climate change is. On the other hand it is seen as very useful to show policy makers what the status on depletion actually is.
- **Energy** requirements are less sensitive to political discussion than costs and besides energy is a big part of the extraction costs.

- Most fossil resources are used for energy production. As of late there are many substitution options for fossil fuels for energy production, such as biofuels or one fossil type for another, e.g. coal to liquids. For this reason, **substitution** is considered a relevant aspect for fossil resources.
- Only a small portion of the oil extracted is used as input for plastic production and the **recyclability** of plastics is also reduced, therefore this is not foreseen as an important aspect.
- **Technology development** for extraction is not perceived as a problem.
- With the **economic growth** of some emerging countries, the use of energy is increasing dramatically so this aspect should be included.
- In order to assess future resource availability/scarcity, **historic** data should be analysed.
- **Global or European** scope is needed.

4 Post consultation decisions

The stakeholder consultation resulted in the selection of three indicators for mineral resources using different time horizons; whereas for fossil resources, only two indicators were identified. The short term perspective prioritises political constraints, the midterm focuses on the increase in effort while the long term focuses on overall availability.

4.1 Mineral resource indicators

For **mineral** resources three indicators were identified for three different time horizons:

- For a short-term perspective (not greater than 5 years), an indicator that expresses availability of minerals depending on political factors.
- An indicator based on the increase in effort, expressed either in energy (as in Eco-indicator 99 [4] and IMPACT 2002+ [5]) or costs (as in the ReCiPe method [6]) as a response to a lower ore grade in a mid-term perspective (5 to 20 years). Recyclability, technology development (on both demand and supply) and economic growth should also be considered in this indicator.

- For a long-term perspective (at least 50 years), a simple resource availability indicator could be useful. It is important to include mining technological improvements and mineral reserves on this time scale.

4.2 Fossil resource indicators

Only two indicators were identified for **fossil** resources. Because mining technological developments for fossil fuels are very fast, no long-term availability problem is expected. Moreover, new regulations to reduce greenhouse gas emissions are increasingly being implemented. These will lead to increased substitution of fossil resources by alternative sources. The two indicators to be developed are:

- For short-term availability, political developments dominate so a resource availability indicator expressing political sensitivity is desired.
- A mid-term indicator that is based on the foreseen shifts in technologies for extracting fossil resources and using alternative sources. As these alternative sources tend to consume more energy and are more expensive, the increase in effort is a good indicator.

5 References

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