SUSTAINABILITY AND BAUXITE DEPOSITS

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1. Abstract

Sustainability plays a growing role in the development of (future) projects in the mining and minerals industry, including the Bauxite and Alumina industry. The relationship between sustainability criteria and structures, and their applicability to our industry is not always clear. In addition it may appear sometimes that the implementation of sustainability criteria for new projects affects project economics negatively.

This paper provides a background on sustainability in the mining and minerals industry, and explores the relationships between sustainability and quality criteria for bauxite deposits.

2. Sustainability in Mining & Minerals

2.1 Sustainable Development: “People, Planet, Profit, Governance”

The Global Mining Initiative (GMI) led by companies making up the mining and minerals working group of the World Business Council for Sustainable Development (WBCSD – incl. Alcoa, Rio Tinto, BHP Billiton, Vale, Hydro, and Vedanta Resources) commissioned the independent Mining, Minerals and Sustainable Development (MMSD) project [1]. This project was conducted by the International Institute for Environment and Development (IIED) between 2000 and 2002. In the Executive Summary of the 2002 MMSD report “Breaking New Ground” it is stated [2] that “One of the greatest challenges facing the world today is integrating economic activity with environmental integrity, social concerns, and effective governance systems. The goal of that integration can be seen as ‘sustainable development’. In the context of the minerals sector, the goal should be to maximize the contribution to the well-being of the current generation in a way that ensures an equitable distribution of its costs and benefits, without reducing the potential for future generations to meet their own needs”.

This builds on the most widely accepted definition of sustainable development by the World Commission on Environment and Development (1987 Brundtland Commission): “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. The four dimensions of sustainable development thus identified are [2]:

- **Social** sphere sometimes referred to as the “People” aspect.
- **Environmental** sphere (“Planet” aspect).
- **Economic** sphere (“Profit” aspect).
- **Governance** sphere providing the setting for the other three aspects (the three “pillars” of sustainable development).

In summary sustainable development involves integrating and meeting economic, social, and environmental goals [2]. In their 2012 report MMSD+10 (“Reflecting on a decade of mining and sustainable development”), the IIED mentions that “MMSD helped companies understand that sustainable development is about balancing the needs of society, the environment and economics, in the context of good governance” [3]. The Australian Minerals Industry’s Framework for Sustainable Development (“Enduring Value”) defines Sustainable Development in the mining and metals sector to mean that “investments in minerals projects should be financially profitable, technically appropriate, environmentally sound and socially responsible”.

Prompted by GMI the board of the metals industry’s representative organization, the International Council on Metals and the Environment agreed in 2001 to broaden its mandate and transform itself into the International Council on Mining and Metals (ICMM). Currently ICMM members include 22 mining and metals companies (e.g. Hydro, Rio Tinto, BHP Billiton, and Vale) and 34 national and regional mining associations and global commodity associations (e.g. International Aluminium Institute, and the Minerals Council of Australia). ICMM developed the Sustainable Development Framework consisting of the following three elements which member companies are required to implement (refer website www.icmm.com):

- **Commitments**: 10 principles for sustainable development based on the issues identified in the MMSD project and benchmarked against several leading international standards.
- **Public reporting**: performance reporting against the 10 principles in accordance with the guidelines of the Global Reporting Initiative (GRI) (refer section 2.2).
- **Independent Assurance**: providing third-party verification against 5 aspects that a company is meeting its commitments to the 10 principles.

**Figure 1** – Sustainability Organizations and Connections

Figure 1 shows the connections between the above mentioned councils, committees and sustainability related facets.

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2.2 **Sustainability Reporting Guidelines – Mining & Metals Sector Supplement**

The GRI Reporting Guidelines – now in their third generation (G3) – are intended to serve as a generally accepted framework for reporting on an organization’s economic, environmental, and social performance [4]. They are used by many aluminium industry majors as standard for sustainability reporting although they are applicable to organizations of any size, type, sector or geographic region. ICMM members are committed to reporting against the Mining and Metals Sector Supplement (MMSS). The mining and metals sector in this context includes exploration, mining and primary metal processing (incl. refining, smelting, recycling and basic fabrication) and covers the project life cycle from development through operational lifetime to closure and post-closure. The Guidelines consist of Reporting Principles and Guidance, and Standard Disclosures (incl. Performance Indicators) broken down as follows:

1. **Part 1 Reporting Principles and Guidance** with three main elements of the reporting process:
   - Defining Report Content;
   - Reporting Principles for Defining Quality; and
   - Reporting Guidance for Boundary Setting.

2. **Part 2 Standard Disclosures** specifying the base content that should appear in a sustainability report with disclosures on the following topics:
   - **Strategy and Profile** setting the overall context for understanding organizational performance such as strategy, profile, and governance;
   - **Management Approach** covering how an organization addresses a given set of topics in order to provide context for understanding performance in a specific area;
   - **Performance Indicators** providing comparable information on the economic, environmental, and social performance of the organization.

Disclosures on Management Approach and Performance Indicators cover the following aspects:


Figure 3 shows the GRI Sustainability performance indicators broken down into major sub-indicators for a Bauxite Mine & Alumina project (refer [4] for more details).

2.3 **Sustainability Development Goals**


In the report “corporate sustainability” is described as meaning the delivery of long-term value in financial (“profit”), environmental (“planet”), social (“people”), and ethical (“good governance”) terms. In order to reach WBCSD’s vision for 2050, actions are required on many fronts, the most critical changes occurring in terms of:

- **Carbon & Resources**: Halve the CO\(_2\) emissions from 2005 levels; Double agricultural output by 2050; Increase resource and material efficiency 4-10 fold; halt deforestation.
- **Costs**: Incorporate costs of carbon, water and major ecosystem services.
- **Consumption**: Change consumption patterns to more sustainable lifestyles.

In March 2013 a joint UN Global Compact – WBCSD report to the high-level panel of the post-2015 UN Development Agenda was presented which included the following thoughts by business leaders in relation to the possible scope and nature of Sustainable Development Goals (SDG’s) [6]:

- SDG’s should reflect and balance the three pillars of sustainable development – economic, environmental, social – while also being global in applying to all nations.