



As with any large industrial and manufacturing operations, that are often located in areas of the developing world, the steel industry can be an important contributor to economic growth. However, it can also give rise to a number of significant negative impacts upon social conditions, living environment and working conditions for employees and communities.

Steel is used in construction in a variety of ways, but its main use is for structural purposes when supplied as section, plate, sheet, pipe, bar and rod, or engineering steel. The type of steel used with the construction process varies upon design, use and application. Other significant uses of steel are for internal finishes and external cladding. Within the UK the majority of FHE buildings, and particularly the larger buildings, are likely to be constructed with a steel rather than a concrete or timber frame.

The issues

Production from newly mined materials

Steel is made using iron ore, limestone and coke. Iron ore and limestone come from open-cast mines and coke from coal – sourced from deep or surface mines. These are combined and heated by the coke in a blast furnace; the limestone combines with unwanted materials in the ore to form slag (which is removed) leaving only the iron which provides a principal material for steel making. The iron from the smelter is put in a “converter” where it is heated with scrap metals or sponge iron in the presence of oxygen to produce liquid steel. This is poured through a “continuous caster” to create solid slabs which are taken to a hot strip mill, where they are reduced in thickness by rolling to create “strip.” This hot-rolled product can be packaged and sent to a customer if no further processing is required. The next stage is the cold-rolling process, where the coils pass through rolling mills which reduce the strip's thickness so as to meet very fine tolerances.



Production from recycled materials

All steel contains some recycled materials but steel made wholly from recycled iron and steel does not need to use iron ore, limestone or coke and so does not depend upon mining or smelting. It also uses considerably less energy. Overall steel made from recycled materials therefore has considerable environmental and some social benefits – these are discussed in the last section of the data sheet.

Poverty issues in steel manufacture

The major impacts of steel manufacture include the following:

- Impacts from mining Iron ore, limestone and coal
- Sponge iron plants
- Smelting and steel making

Impacts from mining Iron ore, limestone and coal

Many traditional livelihoods can't be sustained when mining of iron ore, limestone and coal arrives. Forests and communal grazing and hunting grounds are destroyed and communities lose a vital source of free products such as grazing, food, and wood for fuel and construction.

Mining often causes high sediment loads in rivers, which threatens wildlife, fish stocks important for local fishermen and the quality of drinking water used by communities downstream. Mining does provide new jobs, but inevitably those who are better off find it easier to secure them. An authoritative study on the impacts of mining in India concluded that it had “done little for the development of the mineral bearing regions of the country” (CSE 2009).

Sponge iron plants

Because of the extent of demand and the relatively simple process, sponge iron plants are being set up by small operators who fail to implement necessary environmental and social measures. Consequently many plants are responsible for heavy pollution which contaminates water, damages vegetation, reduces agricultural yields, kills cattle, and damages human health.

Smelting and steel making

There are three impact areas that have been investigated and are increasingly being addressed by both governmental agencies and the producers. They remain areas that require a strong commitment from steel producers to improve their performance.

- The size of the processing plant and method of land acquisition – results in reduction of land available for agriculture. (It has been alleged that the Orissa government has forcibly allotted about 430 acres of land acquired from local villagers unwilling to sell their land, from the total 4,000 acres required for the project.)
- Atmospheric pollution from the gases produced in the process – results in contamination of agricultural produce and negatively impacts health. (The most important sources of industrial emissions include steel works and foundries. Key observations of damage including evidence of visible injury were recorded).
- Management of waste streams and disposal of contaminants – results in contamination of land and groundwater supplies.

Possible solutions

Recycled source materials

Using significant amounts of recycled steel requires fewer raw materials and so reduces the impacts associated with mining for steel production. For example, using one tonne of recycled steel in place of steel derived from iron ore saves approximately 1.5 tonnes of iron ore, 0.5 tonnes of coal and between 70 - 80% of the CO₂ emissions. However, sourcing such steel can be difficult because suppliers won't provide information about the amount of recycled content in their products. Despite these difficulties, universities and colleges should use their purchasing power to source products with high percentages of recycled materials.

Best practice for steel made from newly mined materials

There is no clear label or system which indicates the policy and practice of steel companies with regard to poverty and issues. However, there are a number of initiatives which indicate the engagement of banks on the issue and also approaches towards demonstrating progressive practice.

Extractive Industries Transparency Initiative (EITI)

The EITI is a coalition of governments, companies and civil society groups, investors and international organisations which aims to strengthen the governance of extractive activities (including oil and gas). The EITI recognises that the extraction and utilisation of natural resources can provide a powerful driver for reducing poverty and driving growth and seeks to improve transparency and accountability. The EITI has a flexible methodology which signatory companies are required to follow and report against. In addition, the "EITI Rules" establish a methodology for compliance by countries where extractive activities take place.

The Voluntary Principles on Security and Human Rights (VPs)

Established in 2000, the VPs involve a range of governments and companies which operate in the extractives and energy sectors. Based upon a shared recognition of the importance of human rights and corporate social responsibility, members have developed a set of operating principles which seek to promote and protect human rights throughout the world.

UN Norms – Human Rights and the Rights of Indigenous Peoples

The United Nations has produced two sets of standards, referred to as "Norms", these are the "UN Human Rights Norms for Business" and the "UN Declaration on the Rights of Indigenous Peoples".

RECOMMENDATIONS

Recommendations

Use suppliers that can demonstrate a commitment to the following throughout their supply chain:

- ⊙ *Supplying products with a high percentage of recycled steel.*
- ⊙ *Supply from companies which are signatories of the EITI.*
- ⊙ *Supply from companies which are signatories of the Voluntary Principles on Security and Human Rights and the UN Norms.*
- ⊙ *Active engagement of the supply chain in minimising social and environmental issues.*

REFERENCES/FURTHER INFORMATION

CSE - Centre for Science and the Environment New Delhi (2009), Rich Lands, Poor People; Is Sustainable Mining Possible? Download at: www.cseindia.org/programme/industry/pdf/miningpub.pdf

Extractives Industry Transparency Initiative: www.eitransparency.org

Voluntary Principles on Security + Human Rights: www.voluntaryprinciples.org

UN Norms – information on these can be found at: www.business-humanrights.org/Documents/UNNorms

This sheet is part of a series of 14 on different commodities written for EAUC's Promoting Poverty Aware Procurement project to enable universities and colleges to be more aware of poverty issues when they make procurement decisions. For more information about the project visit www.eauc.org.uk/promoting_poverty_aware_procurement_on_campus



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