AUSTRALIAN STEEL INSTITUTE

The Effect of Steel Fabrication on Sustainability

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In this current world where all projects are endeavouring to secure environmental certification, the carbon footprint of structural steel for a project is in demand.

We see EPCM companies requiring fabricators to measure all aspects of energy consumption, including each machine and vehicle, just to produce greenhouse gas emissions data.

There is another way.

World Steel Association (worldsteel) publishes the greenhouse gas emissions levels for steel production and their report entitled 'Steel's contribution to a low carbon future'* quotes "On average, 1.9 tonnes of CO2 are emitted for every tonne of steel produced". Globally the major steel producers are signatories to the worldsteel Sustainable Development Charter and are members of the Climate Action Group. Significant projects are underway to reduce the carbon effect of steelmaking. So the steel production component is being covered. However this is only one step in the structural steel supply chain.

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Obviously the steel production component is the major contributor of greenhouse gas emissions, however the efficiency of the design and fabrication also contributes to the environmental impact of structural steel.

In many structures the downstream processing may be a key factor in determining whether a structural steel or other building system has a lower overall environmental impact. A US study** of the fabrication sector found that the average steel fabrication process can contribute up to 20 percent to the structural steel package portion of the overall steel building frame environmental impact.

The ASI has a group of leading fabricators in the buildings area who have united under the ASI's Environmental Sustainability Charter (ESC) to manage their environmental impacts.

The ASI Charter members have agreed to measure and control the numbers on:

Sustainability in Steel Construction
ASI CHARTER MEMBER

- Steel use vs steel scrapped
- Water use
- Power use
- Waste disposal
- Fuel use
- Consumables
- Gas consumption
- Chemicals use

For each Charter member the data is 'normalised' by dividing by the total steel production over the period and supplied back to each contributor to provide a market sector average.

The ASI Charter members will in the future be able to monitor greenhouse gas emissions per tonne of fabricated steelwork. By having access to this data as a Chartered member, the fabricator will be able to readily and cost-efficiently meet the 'real' needs of EPCMs and clients requiring environmental reporting for their project.

The Environmental Management System being used by ASI fabricators to BS 8555 for SMEs requires continuous improvement programs in environmental efficiency as part of the Green Star™ point qualification for builders using ASI Charter fabricators.

For engineers or architects involved in planning to actively reduce the environmental impact of structural steel, discussing the design with experienced fabricators on material management, scrap production and energy use will result in a more environmentally friendly design.

A list of Environmental Sustainability Charter fabricators can be found at http://ems.steel.org.au/

* Steel's contribution to a low carbon future: worldsteel position paper, World Steel Association, 2010

** Weisenberger, Geoff, 'The fabrication factor', Modern Steel Construction, vol. 18, no. 6, July 2010