By the Numbers

It has taken a long time, but we are finally beginning to see progress in carbon footprint calculations. Two of the leading press manufacturers are now calculating their carbon footprints accurately and accountably. More importantly they appear to be doing so with some consistency. Heidelberg and HP Indigo each have invested substantial sums into this work, and are using their numbers as the basis for offsetting so that they can deliver carbon neutral presses to their customers.

This work is extremely complex and expensive to do. It requires specialist knowledge and experience with environmental science. Fortunately both Heidelberg and HP Indigo recognise this and are making the necessary human resource investments. For instance, all HP Indigo facilities and Heidelberg manufacturing plants are ISO 14001 accredited. In all industries the need for investment into environmental knowledge can only get more urgent.

But it is especially important in the printing industry where printing companies have been driving carbon footprints steadily lower for many years. Without certified numbers calculated in a consistent fashion for their capital equipment, printers cannot measure the carbon footprint of their businesses or the products they produce. Without consistency in methods and reference data sets, the industry’s collective effort is handicapped.

The Same But Different

One of the hardest parts of calculating the carbon footprint of print media is the availability and reliability of data. Heidelberg and HP Indigo have each approached the problem from their own perspectives, but have conducted their work following some common principles. Both, for instance, work as much as they can with primary data. This is data that can be directly collected at the source of the emissions. Both have sourced their secondary data from the EcoInvent database for emissions factors.

Heidelberg and HP Indigo both want to offset all of the carbon footprints of their presses, starting with each machine’s Bill of Materials, ie the raw materials required to build the press. They are both calculating emissions cradle-to-gate, which means that the calculations include all materials and processes required to build the press. The cradle to gate model is supposed to take into account absolutely everything necessary to build a machine. This includes raw materials, freight of raw materials to the factory, sub assemblies, energy, media (paper, plastics and so on) waste generated during manufacture, consumables used in the manufacturing process, freight materials and final press assembly, right up to the point when the press is packed and ready for shipping.

Perhaps the most significant commonality in the approach of Heidelberg and HP Indigo is their use of the EcoInvent database. This is the world’s leading database of generic Life Cycle Inventory (LCI) data. Now at version 2.2, the EcoInvent data is a list of over 4000 LCI datasets. These datasets cover a range of industries but the bits of interest to the printing industry are energy supply, transport, chemicals, materials, packaging materials, ICT and electronics. The data has been compiled by world renowned research organisations and consultants. The data belongs to the Swiss Centre for Life Cycle Inventories and is available in the curiously named EcoSpold format. Based on XML, this format has become the most widely used and complete format for LCI data exchange.

To purchase EcoInvent data costs €2500 for the first year for a single user. The data is available either direct from
EcoInvent or through resellers, such as Pré Consultants, the Belgian developers of SimaPro or GABI a German developer. Both of these companies bundle the EcoInvent license with their software, which is designed for modelling systems and products from a life cycle perspective.

The EcoInvent data provides a common reference point for the Heidelberg and HP Indigo studies, which means that both companies are using common data as the basis for their calculations. This is important because it provides the printing industry as a whole with a common point of origin from which to build up data sets, so over time carbon footprinting studies should become more comparable.

It should be kept in mind however that comparison is not recommended by environmental standards boffins, because carbon footprinting is still so very nascent. Comparison is only possible with like for like carbon footprinting studies, and rarely are carbon footprinting studies identical in every respect. And differences in any carbon footprinting study mean that the studies should be evaluated independently, rather than in comparison. Carbon footprint values are complex and cannot be treated in the same way as dots per inch or metres per minute.

The differences between Heidelberg and HP Indigo’s approaches will inevitably have influenced the two companies’ calculations. HP Indigo includes, for instance, the office energy required for the R&D of the particular press under study. But HP Indigo doesn’t include the transport of the press to the customer site.

Heidelberg does rough material assessments of supplied materials and has developed its own calculation method in compliance with ISO 14040/14044 for Life Cycle Analysis (LCA). Its programme has been certified by TUV Sud, an international technical services company that provides auditing and certification services. Heidelberg uses the GABI calculating in conjunction with EcoInvent datasets and according to Harold Woerner: “Heidelberg is at its heart an environmentally friendly company”.

HP Indigo has preferred to follow PAS 2050, the publicly available specification that is the forerunner of ISO/DIS 14067. PAS 2050 and ISO/DIS 14067 are framework methodologies for calculating the carbon footprint of products and services. That Heidelberg and HP Indigo appear to be taking different directions with respect to the standards they are following, is not worrisome since ISO/DIS 14067 follows the principles of ISO 14040/14044.

HP Indigo has been busy with this project since 2009 and has six people working on it. They prefer to use existing software rather than to develop their own calculation tools. SimaPro provides the LCA model while the impact of raw materials and consumables is calculated based on EcoInvent Software. This information is available to customers who request it. According to Yossi Rosen, Environmental Leadership Program Manager for HP’s Graphic Solutions Business: “All materials information is based on our Pro-E cad system, MFG-Pro (E-Rip system) and HP Smartbuy system.”

There are other differences too. Heidelberg does a bespoke calculation for every press leaving its factories, because no two machines are the same. They vary in their electronics, the number of units, and features. HP Indigo on the other hand does not have to contend with so many variables and can do a single calculation for each press model in its programme. Carbon footprinting studies have been done for the HP Indigo 7600, the ws6600, and the w7250. These presses have differences in weights because of the variations in the amounts of materials used in their construction. However the types of raw materials are similar across models.
Sharing

As more companies start calculating the carbon footprints of their products, it becomes tempting for competitors to boast about their achievements. However, communication of carbon footprint is not the same as communicating engine speed or colour gamuts. There are several standard forms that carbon footprinting studies can take, depending on the purpose of the communication.

But despite the existence of these standard forms for communicating carbon footprints, environmental scientists are reluctant to encourage labelling and claims about carbon footprints. The science is so young and relatively untested that fair comparisons are not easy to make because these calculations involve so many factors.

Also, the carbon footprint is only one dimension of environmental impact, which means that these values could be misrepresented. However, as much as possible companies such as Heidelberg and HP Indigo want to communicate their numbers, even if it is just to demonstrate performance improvements. The values are of course the basis on which carbon credits are worked out and paid.

Offsets

Heidelberg’s offset payments are going to Project Togo in West Africa, a project to bring trees, water, sanitation and education to remote villages in the country. So, for instance, Heidelberg expects the offset from its stand at drupa, which produced nearly 7000 metric tonnes of CO₂ to provide a well. Heidelberg is also working with CarbonFix, a nonprofit German organisation established to develop forestation projects. CarbonFix has defined a standard set of criteria for sustainable forest management and CO₂ fixation. CarbonFix is also contributing to Project Togo to reforest over 1,000 hectares of land. Around 90 percent of the funds Heidelberg invests in these programmes reaches target benefactors.

With its offset funds HP Indigo has set up and manages its own local scheme, which complies with the Israeli government’s climate change mitigation programme. The cost of carbon credits is used to purchase and install solar panels. These panels are provided to poor households in villages in the area surrounding HP Indigo’s factory in southern Israel.

Heidelberg and HP Indigo are making some very bold investments despite the harsh economic climate. They are breaking ground for the printing industry and this will encourage other companies to invest in similar programmes. This is the beginning of an important transition for the media industry, not just for print. Heidelberg and HP Indigo should be lauded for their efforts. They push the industry forward towards an environmentally accountable and sustainable future.

– Laurel Brunner

HP Indigo’s core environmental team have been working on the carbon footprints of Indigo presses since 2009.

Verdigris

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