

Module based design and manufacturing drives re-localisation

One major change brought about by the rise in energy prices was the shift to module based product design and manufacturing. On the face of it, the change was minor, but it required a major shift in attitude. Our reporter talks to Jeff Handy, from the PORENA manufacturing and distribution unit.

Many people still don't see the difference between module based manufacturing before and after the energy shortages – can you explain?

In module based manufacturing final assembly is done by one local unit which is not owned by the brand, and the product goes straight from manufacturing to the customer. The other main difference is that the product always goes back to the factory. It is never scrapped. So products' life time is far longer.

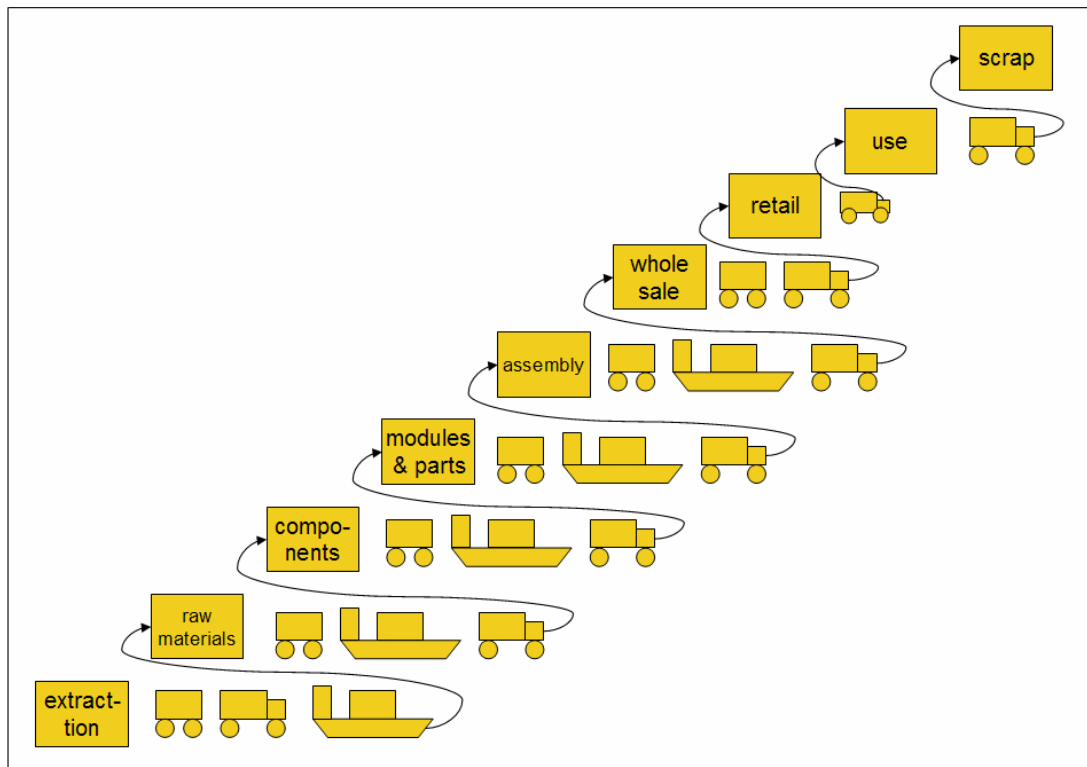
The other difference – and this is what gets some people – is that each product actually has more material in it. This is because

there is more redundancy in each module used to make up the product.

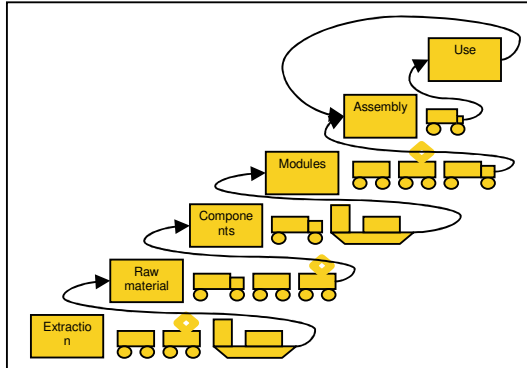
Thanks. Can we start by reviewing the shortcomings of design and manufacturing for retail before the energy price hikes?

As fossil fuel production plateau'd, the average number of steps to get a product to the customer was seven. Each step was energy consuming, and the transport between steps started to get impossibly expensive. And the average usage life time of a product was short, much shorter than its MTBF – mean time between failure. The amount of scrap was incredible, much too much to be taken care of effectively. The average amount of material converted to waste was 30 kg for every 1kg of product. That meant – with a product life time of 3 years – a total of 31 kg of waste for 3 year's service. The question became: how do you provide people with good quality products, ones that can be updated as well, without many manufacturing and transport steps and waste creation?

The first thing to do is eliminate the last step ... the retail trade. Getting your goods



straight from manufacturing eliminates transport, warehousing, retail space, etc. It also makes sure you manufacture exactly what the customer wants ... no unwanted products sitting on the shelf.



The next step to eliminate was scrapping. Components – and we are talking everything from furniture to TVs – all have different life times and uses. For example: when people scrapped their VCRs for DVDs 80% of the components were similar. So this was solved by designing products for update. You just took the product back to the manufacturer to get it updated, upgraded, mended, whatever.

This ties together with the third step, dematerializing of brands. The brand as we knew it evolved into being a pure design company – and I don't mean just physical design, but technical as well. The dematerialized company provided manufacturing instructions to an assembly company, which was local. Consumers ordered their product, and the assembly shop put it together based on designs by the brand. The components were mostly standard with a small percentage of custom parts.

This paved the way for the fourth step: eliminating the shipping of finished goods. All that is shipped is modules to be put together locally. The assembly is carried out in the same organization that takes care of service and upgrading. So you would find at least one assembly and service shop at each town.

So how much more effective is module based manufacturing?

We estimate there is a 30% reduction in energy intensity in the whole system, without counting the average lifetime of the product is extended from 2 to 12 or even 20.

Perhaps you could go over the main features and benefits of the system again for listeners?

Sure, let's see...

- One local assembly shop;** gives economies of scale for assembly and recycling, and closeness to the customer.
- Brand as design.** Allows companies to concentrate on their particular Brand values and look and feel - using global competence to reach a pinnacle of excellence whilst giving them global reach.
- Standard modules;** These modules actually allow for more variation and product variants, which are often endless.
- Return to local shop.** The benefit is no scrap, 100% recycling, a long lifetime which is energy effective, and no mass transport of goods.
- Long product lifetime.** This reduces the overall ecological footprint of the use of the product over its full lifetime.

This Report from the future is an extract from the second book in the Inventing for the Sustainable planet series soon to be available as an e-book from <http://avbp.net/html/porena.html>