

## **ESS 131 Product Design: Introduction to Life Cycle Analysis and Material Flow Analysis**

Each material for production, packaging and distribution needs to be identified (track-back) to its source. Example for the Banana Fibre – the Philippines is the second largest producer of this fibre in the world. One source is the company: OLGAV Corp. located in Sta. Ana Avenue City, Davao City, Davao del Sur Province. You can find suppliers of material and products using the website <http://www.alibaba.com>.

- 1) Prepare a clear drawing like the example provided of the Banana Peel Chair indicating your nature/biodiversity-based source of inspiration for the design together with a suitable manufacturing name. It may be hand drawn using a BLACK PEN ONLY or electronically. You may not use PENCILS and you may not COPY a design. IF YOU HAVE BEEN FOUND TO HAVE COPIED A DESIGN/IDEA YOU WILL GET ZERO MARKS WITH NO OPPORTUNITY FOR A RE-SUBMISSION!**

Using Google identify a location for each raw material or and you will also trace the most efficient route from the production of the raw material or manufactured components to the location of your factory. In general the most efficient transport is either boats or ships (particularly containers), then railroad followed by road transport. Transport by plane is particularly expensive in terms of money and Carbon emissions.

- 2) Identify a location for each raw material or component up to a maximum of five for your product.**

Attempt to optimise your planned routes using shipping or rail-roads for as many kilometres as possible. It is possible to calculate your total carbon cost of your materials transport, however, this is too complex for this exercise. This is similar to the concept of food miles see [http://en.wikipedia.org/wiki/Food\\_miles](http://en.wikipedia.org/wiki/Food_miles).

- 3) Prepare maps showing routes and methods of transport for your materials or components to your factory.**

Identify your sources of water and power to manufacture your product. To do this you need to find more information on the city or town of manufacture. Briefly discuss how you could reduce your carbon emission. Renewable energy like solar or wind is best, while a coal-burning power station is about the worse. Natural gas and Nuclear power are in-between these extremes.

Identify how your factory is designed to optimise use of energy and to minimise its carbon footprint. Use the <http://www.gordonmurraydesign.com/index.php> website and its istream manufacturing (which includes flatpack manufacturing)

- 4) Provide an overview of your manufacturing process and how you would implement your ISO 14000 compliance (see [http://en.wikipedia.org/wiki/ISO\\_14000](http://en.wikipedia.org/wiki/ISO_14000)) which is a system to help organizations and companies to (a) minimize how their operations (processes etc.) negatively affect the environment (i.e. cause adverse changes to air, water, or land); (b) comply with applicable laws, regulations, and other environmentally oriented requirements, and (c) continually improve their environmental compliances.**

Identify where you will source your labour and how you would manage your labour in an ethical framework while also trying to reduce your impact on the environment.

- 5) Locate using a map, where you would source your employment and indicate how your factory could help alleviate local socio-economic conditions.**
- 6) Indicate how you package your product and export it to your target markets. Ensure your packaging uses bio-degradable or re-cycled materials.**

**This is your ESS131 course project ... it counts 50% of the year mark. The other 50% is your test mark. Your year mark counts 50% of the final mark, the other 50% being your Exam mark.**

