Parliamentary & Scientific Committee

Bringing Science and Parliament Together

Making things sustainably – What is sustainable making?

Professor Mark Jolly, Cranfield University, started by reminding the meeting that the resources of this planet are finite. Thus, with an increasing global population, demand will increase and will become unsustainable. So, instead of a linear production model of make, sell, use and dispose, we need a circular model of make, sell, use, re-use, repair, re-purpose and eventually recycle. In order to achieve this, we will need long term sustainability strategies – both nationally and globally – and this is the challenge.

Professor Claire Davis, Warwick Manufacturing Group, considered the issue of steel manufacturing in the UK and globally. The traditional method for making steel by the use of blast furnaces with iron ore and coke produces very large amount of carbon dioxide. This is of particular concern as developing countries have an ever-increasing need for steel for construction, rail, automotive and energy needs. Whereas consideration can be given to carbon capture and storage, this is clearly a long-term aim as it is not currently available and required significant capital investment. The alternative in an effort to produce 'green steel' is to move production to recycled steel scrap.

Currently we are importing 7.9m tons of steel annually but exporting 8.7m tons of scrap steel. This is in addition to the steel being manufactured in the UK. The alternative means of production, recycling the scrap, produces significant less carbon dioxide. However, most recycled steel includes many imperfections of other metals and plastics and removing these makes the process more expensive.

That said, with aluminium the recycling process is better organised as the value of scrap aluminium is significantly higher than that of steel. Presently we are only producing 50,000 tons of aluminium but exporting ten times that as scrap. To remove transportation costs, both financial and environmental, we need to improve our aluminium recycling.

Professor Jeremy Frey, University of Southampton, advised the meeting that there is a clear case for using digital technologies to develop and improve the circular economy. He explained the significant dangers of merely considering only one item of data – namely carbon dioxide production. We, as a country, are outsourcing to the rest of the world large amount of carbon dioxide production. We are not considering as part of the sustainability data set the environmental impact of construction of items such as motor vehicles, separate from the environmental impact when used. There is a danger that we confuse correlation and causality. Jeremy concluded by saying that the narrative around the data and processes is at least as important as the data sets themselves and that effective communication is essential.

Nick Pearson, Rolls Royce, stressed that sustainable ambition was an important quality and one that we can use to inspire other nations. He explained that there were three pillars to sustainability; the 'environment which involve sustainable actions with integrity, facts and data as a backbone; secondly, 'social transformation' through community-based action and targeted investment; thirdly, 'economic' as we need a clear definition of the UK's ambition and a road map for industry and investors showing how to achieve this.

If we are to secure the investment required there are a number of elements that industry and government need to put in place. First is to decide what it is we intend to make; at the moment our resources are spread too thinly for solid economic growth. Secondly, we need systems in place to ensure we have the skills, and in sufficient quantity, to achieve the growth. Thirdly we need to have systems of certification for recycled materials, so we know the history and quality of what is being supplied. This will increase trust by manufacturers in recycled items and provide a better flow for the circular economy. Also, in the long term there will be a need for society to consider the concept of ownership. We only use our cars 7% of the time, washing machines 10% if the time. Service provision, both nationally and globally, could make a profound contribution to sustainability.

John Slater