Questions from Chat Box – Materials strategy for the UK automotive sector

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What is the interest in using of AI/ ML to track how effectively the material is recycled in the supply chain?

I think traceability is going to be an increasingly important factor in all aspects of manufacturing, use and end-of-life treatment of products. As we look to mitigate risks around material availability (e.g., critical raw materials, low-carbon materials), along with increasing moves towards extended producer responsibility, and an increasing focus on preventing waste streams entering (and polluting) the environment, we will want to know more about where materials are, and where they end up. The key thing will be to use the information that we collect (including, no doubt, from AI/ML) and use it to make good decisions, e.g., in design, recycling infrastructure planning, etc.

What is the role of repurposing in value retention processes?

While repurposing (reuse in an application different to the originally designed application) is not explicitly mentioned in the value retention framework developed by Nabil Nasr and team, repurposing plays an important role as part of the circular economy. A topical example is that of EV batteries that could be repurposed as part of stationary energy storage systems. Repurposing, like the other value retention activities, extends the useful life of the product and retains the embodied energy/GHGs/labour required to manufacture the product for longer. However, a challenge arises when there is competition for materials, e.g., the rapidly growing demand for lithium-ion batteries, and potential regulatory requirements on recycled content may create pressure to recover end-of-life batteries for material recycling, and concern over liability (e.g., who is responsible for batteries used in applications different to their originally intended application) may also influence repurposing vs. recycling decisions.

Is this data mainly focusing on the exterior of vehicles (metalwork, engine, etc) or is it also looking at the interiors (windows controls, headrests, seats, etc)? – A typical van/bus interior has approximately 60kg of plastic in its volume. By using bio-composites, there is the potential for a 20% weight save which amounts to 12kg. That's a huge amount for very little cost and downside. I've been quite vocal in this area but one of the obstacles is that every panel in the vehicle is quite light/small in isolation and engineers don't readily see how they can play their part. Also, every part could have its own supplier and so the economies of scale may not be apparent. This can all be solved of course by looking at the interior holistically, but it takes the manufacturer to have belief in the technology. This is coming but may not be quick.

In terms of the value retention study, this does include all aspects of the vehicle. While components more suited to remanufacturing would tend to the more complex electro-mechanical components (engine, turbos, ECUs etc.), there is also significant activity in repair and reuse of other components (wing mirrors, doors, seats etc.)

The auto industry uses ISO 10303-242 to retain the value of the digital design but are you aware that ISO 10303-235 in the same STEP series of standards can retain the value of the digital materials information independently from proprietary software to enable the circular re-use or recovery?

I personally was not aware of this standard, so thanks for sharing this information!

Alan - Do you think there is a sufficient and reliable supply of recycled Al and steel in the UK to support your models? - I know of 3 companies in the UK all looking to produce wrought, extruded and ingot aluminium from recyclate. The volume from the packaging and food & drink industry as well as

from recycled vehicles seems to be enough to cater for the entire UK's automotive needs. Regarding steel, the auto industry has enough scrap to provide approximately 50% to the EAF's to contribute to the circular economy

Do you see foresee use of digital product passports as an enabler for decisions regarding remanufacturing, refurbishment etc?

I think it very likely that digital product passports will have a role to play in providing additional data that will enable more evidence-based decisions about remanufacturing, refurbishment (and also repurposing, as above). It will be a challenge to strike the right balance between what data is requested (recognising that this will represent a cost to businesses) and what information is needed to inform decisions, and whether there are opportunities to standardise product passports across a range of different product types. This space is extremely active, including in the area of battery passports, which have recently been introduced into the EU Regulation, and it will be an ongoing challenge to iterate to the best solution.

Is there an opportunity to add the product passport solution to the already existing IMDS linked to ELV?

Quite possibly! I think there will be benefits to exploring where we can develop established practices and systems to maximise the speed of uptake, but always with a view of where we need to take a new approach. A potential limitation of the IMDS is the fact that usage is only free for the supply chain of the IMDS participants – it might be that there will be additional stakeholders that will require access.