Running on empty?

Linda Hancock highlights the complex effects of new sustainability technologies

New 'disruptive' sustainability technology has the potential to reduce carbon emissions and divert harmful climate change impacts related to the dominant global reliance on fossil fuels for transportation and energy. The key question is how new technology can mediate transitions to a low carbon economy for both developed and developing countries whilst balancing ethics and equity considerations.

The picture is always more complicated than it seems. New battery energy storage technology is key to reducing automotive fossil fuel pollution and to storage back-up for intermittent solar and wind power alternative energy generation. Research teams internationally are refining the chemistry, capacity and density of new batteries, using nano technology and new chemistry.

Any new technology also raises ethical, human rights and product life cycle issues. Chain of supply and ethical procurement at extractive/production, manufacturing, consumer use and end of product are a necessary part of the analysis. It is here that voluntary corporate CSR sustainability reporting is frequently limited, where corporations signing on to voluntary frameworks like the GRI (Global Reporting Index) can cherry-pick the reporting criteria to optimise reputation and omit full product life cycle sustainability disclosure.

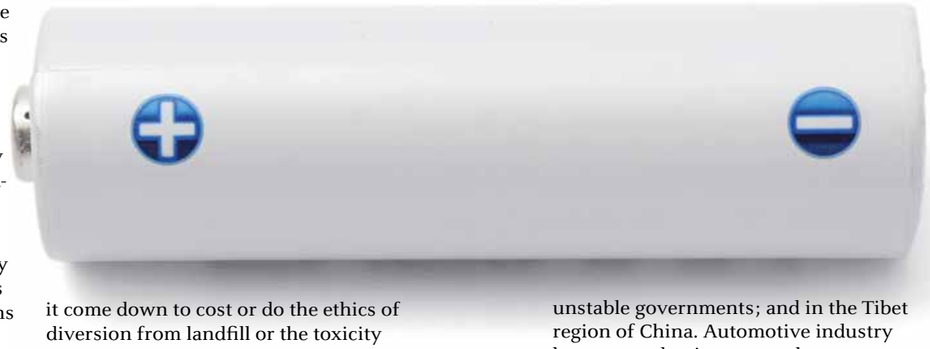
The May 2015 Responsible Business Summit Asia promised delegates the opportunity via 'cutting edge debates', to discover how 'to generate profits through embedded sustainability strategy and community engagement'. The speaker line-up participants include Apple, investment banks, auditing firms, palm oil, clothing and footwear manufacturers, NGOs and the hotel industry.

Apple was recently slammed in a BBC documentary Apple's Broken Promises, on undercover exposure of work conditions in Indonesian mines supplying tin used in its smartphones and Chinese factories manufacturing them. Illegal tin miners on Bangka Island in Indonesia, working in dangerous life-threatening, unregulated conditions, disclosed they sell tin illegally to Apple's suppliers, Refined Bangka Tin and Nurianah.

Herein lies a common problem in supply chain analysis that prompts questioning of the ethics and reportage emanating from corporate boardrooms and the governance, regulatory and public policy issues this raises both nationally and internationally. Should we be moving towards more binding corporate disclosure and transparency requirements and perhaps international legal agreements?

Initially designed for small hand-held devices, the lithium-ion (Li-ion) battery has been refined by car manufacturers and is now embedded in business plans and manufacturing production lines. Initial concerns about energy capacity for everyday commuter use have been addressed. The energy capability of electric and hybrid battery cars has been lauded as a sustainability initiative with potential to reduce fossil fuel emissions. Although distance still precludes electric car rural travel in countries like Australia and Canada with long-distance travel needs, battery-powered cars have been embraced for city travel. Re-charge stations now have a visible presence in cities like Paris and London. There of course remains scepticism about real emission reduction if coal-fired power is used to re-charge car batteries – known as 'the rebound effect'. Moreover, consumer concerns about battery re-cycling still have some currency and the component parts of new battery technology are also in need of life-cycle and chain of supply analysis.

In the automotive field, questions include what arrangements are in place to regulate re-cycling of Li-ion batteries? Batteries may contain toxic materials or materials that should be recycled and diverted from landfill. How can manufacturers be made responsible for end-of-life management costs? Does EPG (Extended Producer Responsibility, which holds manufacturers responsible for collecting and recycling their waste products), hold a key to this? If so, what legal mechanisms and enforcement machinery could ensure manufacturers meet performance targets? Does



it come down to cost or do the ethics of diversion from landfill or the toxicity of component parts, trump costly recycling?

Typically, national regulation is lacking as for example in the US, where some states like Minnesota (which requires manufacturers to recover 90 per cent of nickel-cadmium and small sealed lead acid batteries in waste), have double the low national collection rate of rechargeable batteries (10–12 per cent) reported by the Product Stewardship Institute for 2010 under voluntary collection programs (Nash and Bosso, 2013). The failure of e-waste public policy provisions is leading to increased pressure for producer take-back and safe recycling.

Recycling of Li-ion batteries in hybrid and electric cars may drive new recycling initiatives as batteries are typically sold in-product, along with the car, facilitating recovery and a feedback loop to the manufacturer. But the uncertainties of battery science are a barrier to investment in recycling plant.

Another concern is the continuing future supply of affordable lithium, as new generation cars will account for an estimated 7 per cent of global transport by 2020 (Kumar, 2013) and demand will rise exponentially if lithium-ion batteries are used for wind power storage requiring more grunt. As Kumar argues, global supplies of lithium are concentrated in South Americas's ABC (Argentina, Bolivia and Chile) in a region historically associated with conflict and unstable governments; and in the Tibet region of China. Automotive industry battery production currently accounts for about 25 per cent of lithium demand projected to increase to about 40 per cent (and will increasingly compete with pharmaceuticals, construction and ceramics and glass industries as well as alternative energy storage). Issues of scale may result in depletion of finite resources and raise further questions of supply ethics and intergenerational and geopolitical equity.

In any event, lithium is a relatively small and less costly battery component than cobalt and copper, which have been overlooked. Lithium is not regarded as a conflict mineral but tantalum (the main component in battery micro capacitors), tungsten, tin and gold are. The issue of 'blood diamonds' over a decade ago linked sourcing of diamonds from conflict zones in Liberia, Sierra Leone, Democratic Republic of Congo (DRC) and Cote d'Ivoire, where revenue contributed directly to financing oppressive non-democratic regimes, resulting in the Kimberley process of international diamond certification.

The debate around what is and is not a conflict mineral is blurred, as small quantities of minerals mined in artisan mines adjacent to conflict zones can and have easily found their way into 'conflict-free smelters'. What is more to the point, is that minerals which may not strictly be regarded as 'conflict minerals', like cobalt, used in new-generation batteries, may involve ethical sourcing issues related to human rights, labour standards and environmental impact as well as supply (an estimated 50 per cent of cobalt comes from the DRC). A central issue is the extent to which producers, policies and regulatory frameworks have kept pace with changing science and the need for broadened ethical supply chain and product life-cycle transparency, monitoring and regulation.

Some national governments have attempted corporate regulation which may have some piecemeal reach in regulating corporate global operations on various dimensions. The Singapore Stock Exchange CSR Disclosure requirements, India Companies Act 2013, the EU regulations on electronic waste, and the US Dodd-Frank Act (section 1502), may directly or indirectly affect business practices and reporting. But extractive industry corporate interests have been active in lobbying for voluntary codes and initiatives undertaken by the OECD, UN and EU. What seems to be the lone legislative initiative, the US Dodd-Frank Act, requires US companies to disclose use of conflict minerals sourced from the DRC or its neighbours, but litigation has challenged whether this applies to specific product linked disclosure and the jury is out on the effectiveness of the Act which in any event does not apply internationally and may have detrimental unintended consequences (Seay, 2012).

The lithium-ion battery is a bridge to the potential for electric cars to reduce fossil fuel emissions and to provide much needed backup storage for wind and solar energy generation. But its reliance on copper and cobalt has been largely overlooked in debates on conflict minerals and the focus on re-cycling, availability and pricing of lithium. This points to the need to broaden regulation and policy from voluntary industry self-regulated codes to transparency on uncomfortable issues like human rights, labour standards and environmental impact in addition to the seepage issues that undermine the effectiveness of conflict mineral regulation and broader debates on fossil fuel energy and intergenerational equity. A key initiative would be to encourage technology that does not depend on lithium, copper or cobalt and that has emancipatory impacts for energy and transport for poor and developing countries and real application in building disaster resilience for vulnerable communities. Although it is more suited to stationary batteries at present, the newly developing sodium battery has potential for emancipatory impacts that overcome the reliance on cobalt.

References

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