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Submission to the DCCEEW on the proposed national framework for recycled content traceability

RecycledContentTraceability@dcceew.gov.au

Dear Sir/Madam

Introduction

The [Sustainable Materials Research and Technology \(SMaRT\) Centre](#) at the University of New South Wales Sydney (UNSW) is pleased to provide this submission in relation to the consultation for the DCCEEW proposed [national framework for recycled content traceability](#).

This submission is on behalf of Professor Veena Sahajwalla and the UNSW SMaRT Centre. She and her respective SMaRT Centre teams have particular expertise in materials science and engineering, especially in relation to helping to reduce waste through recycling science and innovative manufacturing technologies. This includes research and development expertise across a wide range of wastes and recycling processes to help overcome the current limitations in domestic capability in this area by using these wastes as new manufacturing resources, while also reducing the many negative environmental impacts of these waste types and virgin mining.

We have a track record in collaborating with industry sectors and businesses to research and develop innovative, 'circular' solutions that reuse and reform waste into value-added materials and products that align manufacturing and recycling, creating localised supply chains and enhancing sovereign capability.

The new Commonwealth Government and its agencies are to be applauded for their work to address energy, waste, recycling and manufacturing challenges, and in particular for producing this consultation paper outlining considerations for the implementation of a proposed national framework for recycled content traceability.

It is essential we strive to develop a circular economy – or many localised circular economies – in which we keep materials in use for as long as possible and use these recovered materials to establish new business supply chains, in order to better ensure we use “waste as a resource” to build the components and infrastructure needed to electrify our communities. So, such an approach would help to create new jobs, along with other economic, social and environmental benefits.

Some emerging technologies and capabilities are available to reform much of the valuable materials contained in many of the “hard to recycle” waste types not subject to traditional waste and recycling processes, such as electronic waste (e-waste) and PV waste, into new products and manufacturing feedstock needed to create a truly viable, long terms and sustainable clean energy industry. This means local SMEs using these emerging capabilities can become part of new supply chains and help develop 'green manufacturing' capability by

adopting solutions like those developed by the UNSW SMaRT Centre, such as our decentralised [MICROfactorie™ Technology solutions](#) for creating value from waste. This approach would drive local and regional solutions for hi-tech waste recycling and manufacturing, especially in capturing metals and other essential materials from waste, reforming them into high value materials to help obviate the need for mining, transportation and processing of natural resources which collectively create negative environmental, economic and social impacts.

Primary response

Proposed national framework for recycled content traceability

We support the model outlined in the discussion paper. The primary reason for this support is because there must be a start to standardise recycling content for manufacturing purposes.

However, we do not believe a voluntary, industry-led process will achieve the desired goals of the scheme. This has been the experience with various product stewardship schemes which have been unable to deliver the rates of recycling and resource recovery needed.

We believe a joint industry and government framework – but with clear regulatory guides and incentives – would help avoid inevitable delays and a lack of industry uptake. The proposed model of a single scheme administrator for the recently proposed e-waste and PV waste product stewardship, or something similar, would be generate a more optimal outcome.

This proposed framework is rightly ambitious and involves various “moving parts”. Voluntary take-up without a stronger incentive, such as a regulation, would result in a piecemeal outcome with varying results and outcomes. The voluntary, industry led Red Cycle scheme comes to mind.

The paper alludes to some of the European work in this area which is back by regulation. We would encourage the department to take a close look at this model, and any other similar ones, including the best aspects of Australia’s food traceability regime, to bolster the current framework.

While we fully support the intent, in terms of application we believe there is a conflict between the stated approach that the “framework is proposed to be technology-agnostic, outcomes-focused and initially voluntary” and the stated objective of it being “industry-led interoperable traceability systems in use across recycled content supply chains providing accessible, accurate and harmonised recycled content data that drives greater use of recycled content in Australia”.

A lot of criticism has been aired in recent times in relation to so called “green washing” in relation to ESG reporting. A key reason for this is due to the fact that there is a lack of regulatory definition and requirements with such reporting. Both carrot and stick are needed to unify stakeholders to make meaningful and importantly, consistent and collective change.

If adopted standards are not enforced in some way past experience is there will be little harmonisation and uptake. We appreciate the proposal is ambitious in its longer term stated principles, and there are cost impacts for compliance, but given the importance of society needing to rapidly start to use waste as a resource, this could be an opportunity for Australia to take a far more proactive position to be a global leader in recycled content integrity, leading to greater manufacturing opportunities.

With respect to the table outlining the proposed data elements for recycled content traceability, we believe the recycled content should all be “required”, as to the proposed “optional” setting. As a result, we recommend that recycled content traceability be mandatory for everyone over time.

Beyond these constructive suggestions of ours, we strongly support the many other aspects proposed as part of the framework.

Other issues to consider

Barriers for industry to adopt a circular economy principles

The main barrier currently is that there is little commercial or regulatory incentive for industry to adopt circular economy capabilities. As mentioned in our introduction, using waste as a resource must be a central aspect of any framework to develop a circular economy, especially for a clean energy future. Companies also generally base their supply chains on the fundamental economic principles of lowest cost and maximum convenience (or efficiency).

For instance, the metals and materials in spent battery are already in refined form. Recycling can reduce the pressure on mineral processing and also create an export opportunity by supplying battery grade materials to overseas markets. Requiring a portion of recycled content in products such as these by both manufacturers and importers would quickly advance objectives around traceability.

With the growth in electric vehicles, wind turbines, domestic solar systems, and so many batteries needed including for the huge range of electronic devices such as phones and computers, innovative recycling and remanufacturing of e- and PV waste in particular should play a role in any approach with respect to traceability, product stewardship and developing a circular economy.

[Australian Bureau of Statistics' latest waste estimate figures](#) show the Australian economy domestically generated 539,000 tonnes of e-waste in 2019, with more than 50% going to landfill and only 17.4% being claimed as recycled but much of this goes offshore where outcomes are unknown, yet it is classified as ‘recycled’. The [Australian Government Implementation](#) of the [National Waste Policy Action Plan](#), announced on 12 September 2022, presents seven national targets to guide investment and national efforts to avoid waste and improve resource recovery to 2030 and targeted 80% average resource recovery rate from all waste streams, but these targets will never be achieved without government action including mandatory traceability obligations.

Traceability requires building resilient and circular supply chains

In any effective traceability and product stewardship scheme, the greatest opportunity for Australia is at the end portion of supply chains where we could create a high-tech recycling industry to provide processed-ready (and environmentally sustainable) feedstock to manufacture the components and infrastructure needed to have a viable clean energy industry, and at any site including rural and regional to capture the full value of harnessing recovered materials.

In comparison with other developed countries, Australia is lagging in recycling and aligning recycling with manufacturing. For instance, Australia's battery recycling rate of around 6 to 7% compares to a rate in Europe of around 50%. China and South Korea combined make up 20% of the world's waste battery recycling effort. This means Australia is being left behind, and this lost value could be between AUD \$4,400 and \$17,200/ton of batteries. It's the same story for e- and PV waste.

In much of the dialogue around sovereign capability and manufacturing, using waste as a resource is either a missing aspect or it does not play a central role. For our clean energy industry, high-tech e-waste and PV recycling enabling these complex waste stream items to be taken back to their individual input materials so they can be used over again and again, should be central to the vision of creating a clean energy industry.

Many of the commodities and critical materials needed for this electrification are being subject to record prices and supply constraint issues, but ironically society throws away many of these materials in the forms of e-waste and solar PV waste.

How the traceability framework could fit into the bigger picture

Building sovereign capability when left to the market alone will not achieve the stated national priority goals. A collaborative model needs to be adopted so industry has government regulatory and funding support a traceability framework implementation. The same applies for industry working with researchers to do the R&D work needed to build their capability. Mapping and planning of critical infrastructure is also central to managing the immediate challenges facing adoption of greater sustainability practices. Government and industry have a role to play in planning and implementing adaptive and sustainable infrastructure and related components (like for storage), with recycled content also to be used as feedstock, which can facilitate the transition towards circular economy goals, as highlighted by the framework consultation paper, and many other key Australian Government strategies, actions plans and objectives.

By way of example, the Senate Environment and Communications References Committee Inquiry into Waste and Recycling Report 2018 found the importance of investment in infrastructure for the collection and processing of recycled material and diverting waste from landfill. It said, "this infrastructure is needed both to enable regions to participate in recycling programs and to reduce contamination rates, and the report noted evidence that "to reduce the contamination rate of recyclable materials, investment in material recovery facilities (MRFs) is required".

That report also highlighted the benefit of the MICROfactorie™ concept.

Furthermore, the Waste Ban Response Strategy released March 2020 added weight (p16) to the argument of centralised support for new and innovative processes and infrastructure, saying “significant challenge raised in industry consultation is the ability for businesses to secure investment for facilities and equipment upgrades, and to develop and test new technologies for creating value-added products from waste”. It went on: “Governments have a role to play in ensuring that viable proposals from start-ups and small and medium enterprises receive the support they need to scale up, achieve commercialisation, and compete in the open market. Support offered could involve access to test facilities, expert knowledge, and seed funding for cross-sectoral approaches to solving waste challenges. *All governments opportunity: Investigate opportunities for regional micro-factories, to enable regional and remote areas to process locally generated waste resources into useful value-added products for community benefit.*”

Commercialisation of such technology / infrastructure will be slower than needed if left to market forces alone. Incentives from governments (regulatory and financial, in conjunction with product stewardship) will accelerate greater take up and rollout of existing capability across the value-chain. A circular economy – or many localised circular economies – need a strong guiding hand including a range of standards, targets, incentives and funding support.

There are around 100 Material Recovery Facilities (MRFs) operating in Australia which separate out the different materials for recycling. Among them, for example, only a few are able to recycle some e-waste.

In conclusion

The proposed framework is an excellent first step in tackling the challenges of identifying and using recycled content in manufacturing. Many of the materials needed for clean energy equipment and future electrification components are subject to supply and price constraints and we are landfilling waste containing many of the valuable materials needed to manufacture these items. According to the [2021 E-Product Stewardship in Australia Evidence Report](#), “valuable materials like copper, silver and silicon can be extracted for high-value use in industries such as electric vehicle batteries” but unfortunately there is almost no recycling or recovery of these materials taking place because of a lack of capability. This is mainly due to obstacles such as cost, time and a lack of a collaboration ecosystem between industry partners and researchers, and importantly a lack of regulatory incentive. Addressing this gap should be an important part of any proposed scheme.

Incentives, targets and stronger regulation together will enable a greater uptake of innovation by industry and the waste and recycling sectors and for the transition to more rapidly take place to truly achieve a circular economy.

Businesses and organisations generally rely on traditional supply chains where recycled content and materials are usually not part of the system. We need to ensure alternative solutions to current common supply chain practices adopt new and local supply chains that incorporate the use of resources made from our waste resources. Given the severe effects

on global supply chains from COVID-19 impacts, the future of manufacturing lies in scalable, decentralised technologies that will enable communities to produce many of the products, materials and resources they need locally by using resources largely derived from local materials that are unwanted or thought of as waste.

Technologies such as MICROfactories™ can enable the lateral integration of different industrial sectors to achieve various stated goals in issues paper, by recovering and reforming so-called waste materials to create new and localised supply chains, materials and products, offering economic and environmental benefits including new, skilled jobs.

The science and technology we already have available can now make it possible for a complicated waste stream to produce value-added materials which can then feed back into local manufacturing or to different industrial supply chains for manufacturing products to electrify our nation. This proposed emerging model will profoundly disrupt today's centralised, vertically integrated model of production, where, for instance, a single material or part available only from an overseas supplier can disrupt the manufacturing process.

Yours sincerely



Stuart Snell

Head of Strategy, Stakeholders and Communication

UNSW SMaRT Centre

s.snell@unsw.edu.au

0416 650 906

For and on behalf of:-

Scientia Professor Veena Sahajwalla

Director, UNSW SMaRT Centre