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# Editorial

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Earlier this year, Resources Minister Martin Ferguson announced the federal government's intention to repeal the *National Radioactive Waste Management Act 2005* (Cwlth). The proposed National Radioactive Waste Management Bill, yet to be passed in the Senate, is merely a "cynical rebranding", says Dave Sweeney, nuclear-free campaigner for the Australian Conservation Foundation. "Labor's recycled law fails to restore procedural fairness and appeal rights, suspends the application of key indigenous and environmental protections and overrides all Commonwealth, state and territory laws that might delay or frustrate the opening of a waste dump," he says (p.4). His recommendations for a responsible approach to radioactive waste management include minimisation or halting of radioactive waste production, above-ground storage at or near the site of waste production and halting of plans for a radioactive waste dump at Muckaty Station.

Disposal, not storage, is considered the ultimate radioactive waste solution by the international community, according to Geoff Williams and Stuart Woollett of the Australian Radiation Protection and Nuclear Safety Agency (p.9): "A fundamental safety principle of the [International Atomic Energy Agency] is that the problem of dealing with radioactive waste should not be passed on to future generations," they write. Furthermore, "a robust national and international safety regime is in place to ensure that all phases in the lifecycle of radioactive waste can be performed safely and securely".

Carbon-intensive industries such as fossil fuel power stations and their link to anthropogenic climate change are equally topical. Colin Scholes of the Cooperative Research Centre for Greenhouse Gas Technologies discusses the techniques underpinning carbon capture and storage (CCS; p.14). "CCS has the advantage that

the technology can be relatively rapidly implemented [but] in particular the capture or separation component ... is believed to be costly, and therefore the majority of research on CCS is focused on reducing this cost safely," he says. CCS using semi-permeable membranes to concentrate the carbon has a lower capture cost than "stripping out" carbon dioxide from waste gases by bubbling them through a solvent and then separating them from solution. Research into membrane development is currently underway, as are industrial trials.

On the domestic front are many wastes in waiting. Ruth Hessey of the Total Environment Centre talks about the hazardous chemicals in our televisions (p.18). Sending them to landfill, she says, is not only an environmental and public health issue but a waste of resources. "Amid the excitement generated by a new phase of digital media in Australia, the Digital Switchover has been organised without parallel planning for an appropriate recycling scheme for discarded analogue televisions," she warns.

Gillian Kearney at NetWaste (p.20) encourages us to see the resource value in tyres that are no longer useful for their original purpose. Reuse is preferable to recycling in the waste hierarchy, she says, and "the size and structure of tyres does make them useful items in certain applications including erosion control, crash barriers, retaining walls and artificial reefs". The market for recycling tyres faces high costs due to the chemical stability of rubber and the requirement of heat to reprocess them.

Helen Lewis of the Australian Battery Recycling Initiative discusses another problematic waste product: batteries (p.24). She quotes a journal article noting that "... batteries and appliances are a potential source of cadmium, nickel, zinc, lead and mercury in landfill leachate". The wide variety of chemistries

of various batteries adds complexity and expense to their sorting and processing. Several recycling and recovery initiatives are underway in Australia.

Peter Bitto of CMA EcoCycle discusses the implications of fluorescent light disposal to landfill (p.28). “Researchers are just beginning to quantify and understand how much mercury is emitted to the atmosphere from landfills,” he says. “Each year in Australia we generate 50–70 million units of mercury-containing lighting waste. More than 90% of such waste goes into our municipal landfills, contributing over 20,000 metric tonnes per year of mercury-contaminated waste into the environment.”

The mining and minerals sector generates waste on a large scale. Michele Rosano of Curtin University discusses resource synergies as a way to reduce wastes and emissions (p.30). “These concern the capture, recovery and reuse of previously discarded by-products (materials, energy and water) from one industrial operation by other, traditionally separate, industries operating in their close proximity,” she explains. The Kwinana Industrial Area in Western Australia is one example of such synergies, and development and implementation initiatives there have given valuable insight into issues such as regulation, risk and confidentiality.

Sydney has a problem with animal, plant and food waste, according to Ian Cohen of the NSW Greens (p.35). Sydney residents send two million tonnes of this putrescible waste to landfill each year. “We should be converting the ... [methane from] putrescible waste generated by Sydney-siders each year into green electricity and sending none of it to landfill,” he writes. However, present facilities to do this lack the capacity to deal with the large amounts being produced.

“Reducing waste from hospitals is ... not only a sound financial proposition, particularly in light of the increasing price of oil and thus oil-based products such as plastics, but also it can lead to significant mitigation of greenhouse gases,” says Forbes McGain of the Western Hospital in Melbourne (p.37). This type of waste is increasing because of more packaging and a preference for “single-use” items. There is also a perception that personnel handling medical waste of any kind are at greater risk, although studies have shown that contaminated sharps are the only medical waste associated with infectious transmission. McGain concludes: “There are excellent Australian and

international examples of greater recycling of hospital waste, but much remains to be achieved”.

Irrigated agriculture consultant Max Thomas explains why recycling of treated wastewater as a water management strategy is not a simple matter (p.40). The location of crops or gardens, their nutrient tolerances, and local soil and rainfall are some of the factors to be considered. “Damage to property and land including corrosion, soil salinity, groundwater pollution and other environmental problems are all possible (unintended) consequences of using recycled water indiscriminately, as distinct from its use on selected sites with skilled management supported by regular monitoring,” he says. An additional consideration is the significant expense and energy required to treat wastewater to a level suitable for use on parks and gardens.

Efficiently managing wastewater containing nutrients and organic matter is key to the sustainability of the farming and food-processing industries, says Andrew Ward of the South Australian Research and Development Institute (p.41). The biosystem he is developing uses high-nutrient wastewater to grow algae that can be used for aquaculture. At a later stage, “the water is clean enough to be reused on the farm for irrigation purposes or for wash-down purposes”.

Jason Du of the University of South Australia is squeezing water out of waste from a very thirsty industry: mining (p.45). “The current mechanical raking process [used during mineral tailings processing] only breaks the honeycomb [tailings structure] into a smaller closed structure, which is why the thickener underflow still traps a significant amount of water. After identifying the problem, I introduced ultrasonic vibration to collapse this closed, self-supporting structure and achieve a much denser sediment so water can escape.” The resultant water can then be reused in processing.

Sue Clarke of NetWaste showcases some of the art that has emerged from the Waste to Art initiative (p.47). Annually, communities in central and western NSW create art from domestic waste, with the artworks of local competition winners displayed at a regional exhibition. A travelling photographic exhibition of selected works serves as a “reminder to everyone that we all have to take some responsibility for the 21 million tonnes of waste created in Australia each year”.