Circularity of WEEE in the Context of Implementation of Jaipur Declaration (2025-2035)

SIDS (Pacific Island Countries) Capacity-Building Training Programme on the Implementation of the Jaipur Declaration on 3R and Circular Economy

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What is E-waste?

- Temperature exchange equipment (refrigerators, freezers, air conditioners, heat pumps).
- Screens, monitors (televisions, monitors, laptops, notebooks, and tablets).
- Lamps (fluorescent lamps, compact fluorescent lamps, high-intensity discharge lamps, and LED lamps).
- Large equipment (washing machines, clothes dryers, dishwashing machines, electric stoves, large printing machines, copying equipment, PV solar panels).
- Small equipment (vacuum cleaners, microwaves, toasters, electric kettles, electric shavers, scales, calculators, radio sets, video cameras, electrical and electronic toys, small electrical and electronic tools, small medical devices, small monitoring and control instruments).
- Small IT and telecommunication equipment (mobile phones, GPS, pocket calculators, routers, personal computers, printers, telephones).

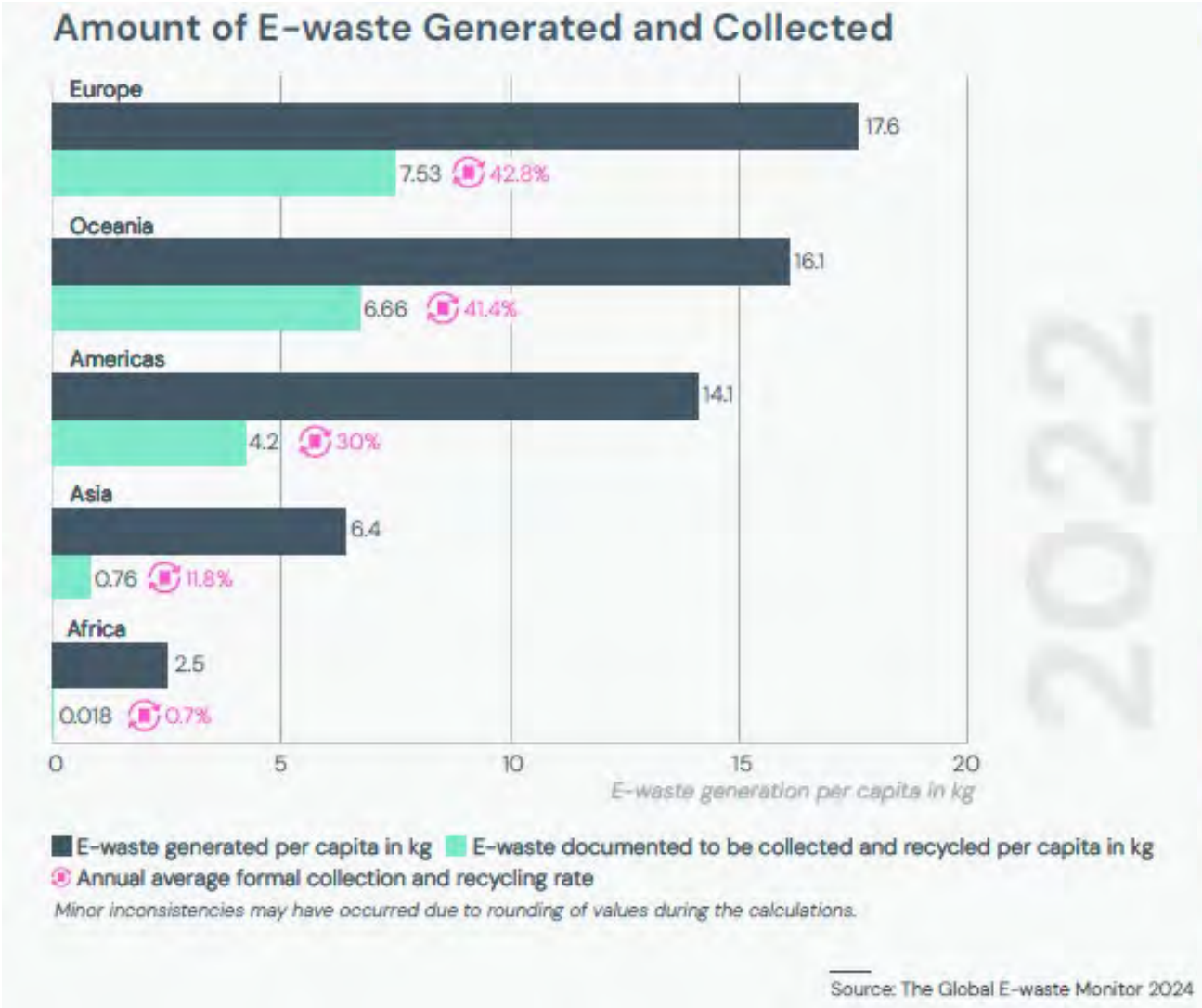
How much E-waste?

Global E-waste Generation

- During 2022, the world generated around 62 million tonnes (Mt) of E-waste – an average of 7.8 kg/capita per year
- Global e-waste generation to reach 111 Mt by 2050
- Only 22% formally collected and recycled
- Asia-pacific region produced the highest amount of e-waste (22.5 Mt or 37% of total)
- The top three Asia-Pacific countries with the highest e-waste generation in absolute quantities are China (12.0 Mt), India (4.1 Mt) and Japan (2.6 Mt)

Source: Global E-waste Monitor 2020/24 (UNU)

Amount of E-waste generated and collected



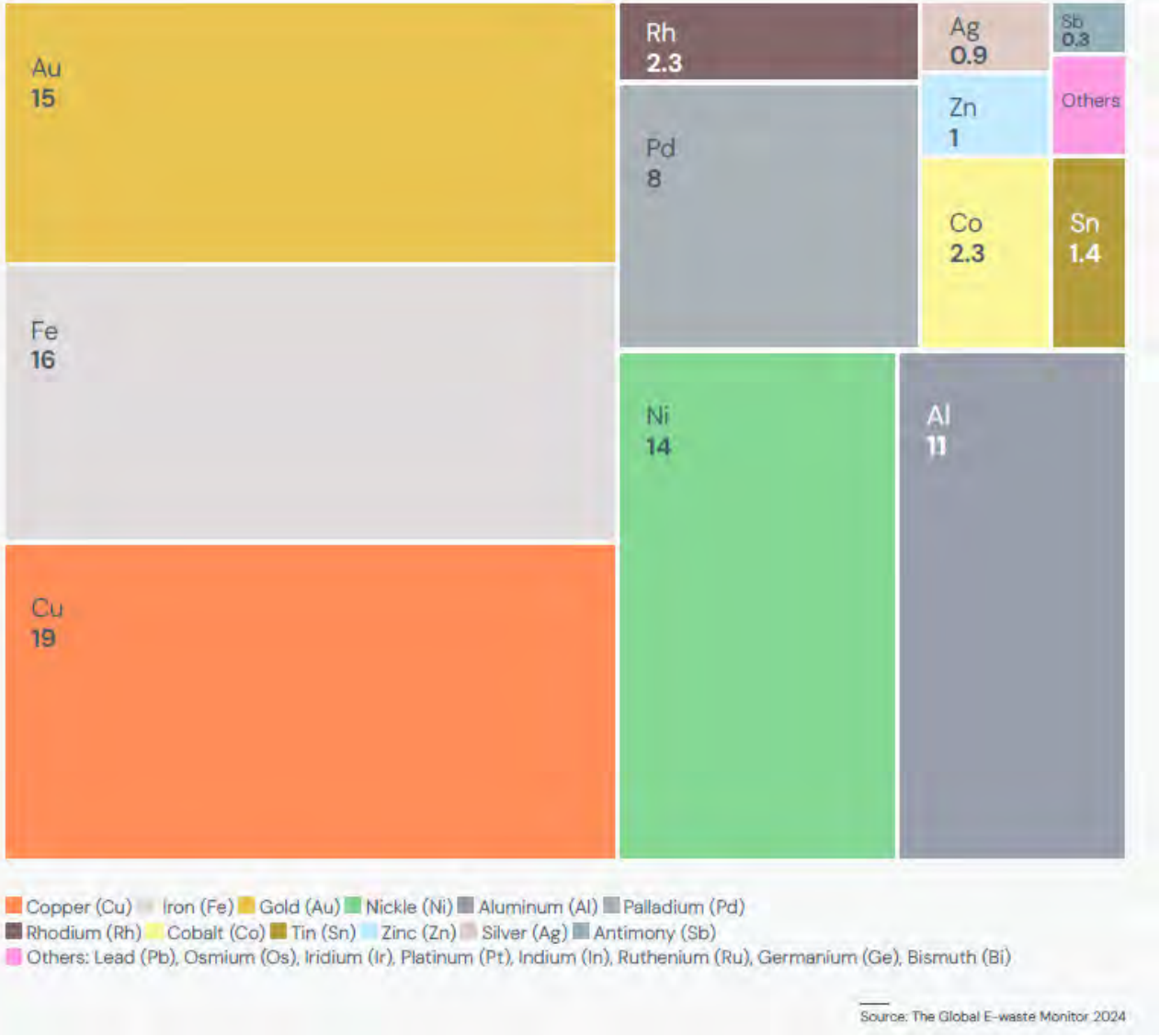
Problems Associated with E-waste

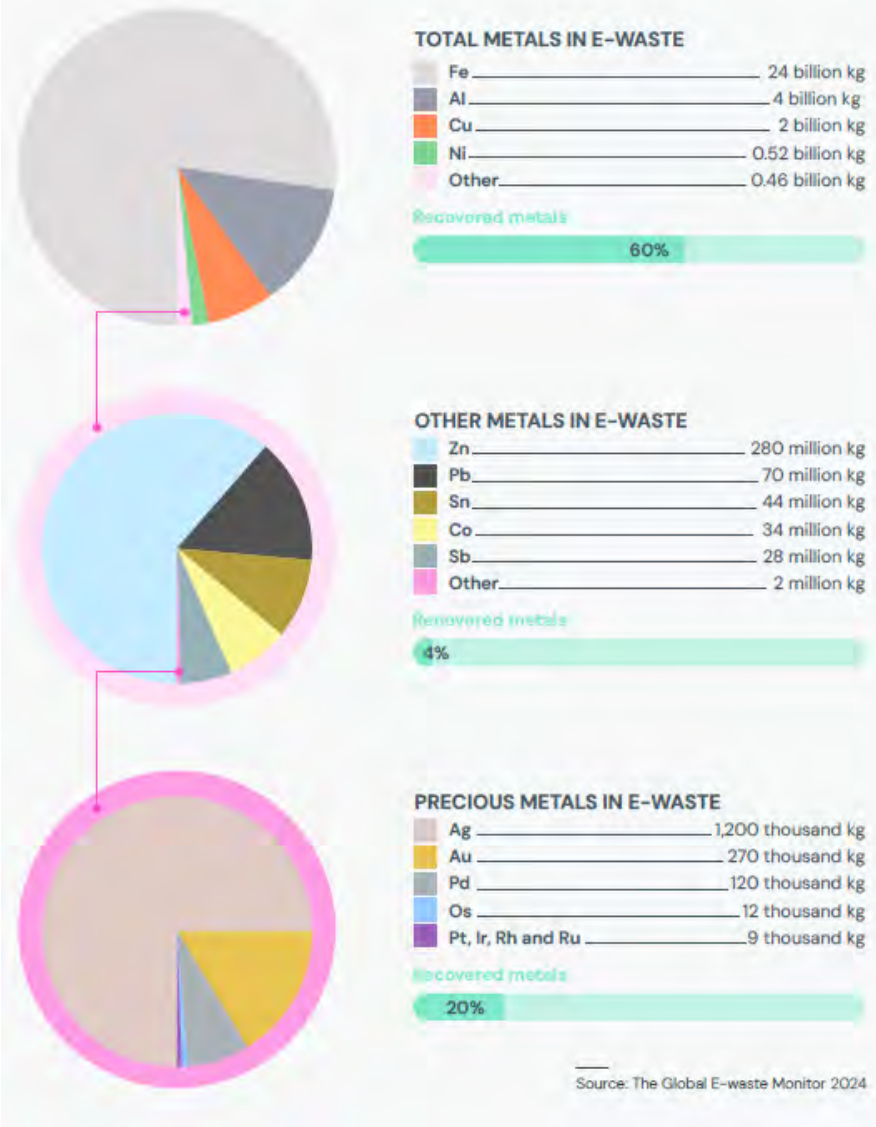
- Dangerous chemicals and metals from E-waste may leach into the environment
- Lead (Pb) - most significant concern
- Lead present in the solders used to make electrical connections on printed wire boards and Cathode Ray Tubes (CRTs)
- Mercury found in laptop computers and discharge lamps.
- Cadmium (found in chip resistors, CRTs)
- Brominated Flame Retardants (BFRs)

Opportunities Associated with E-waste

- One tonne of phone handsets contains 3.5kg of Ag, 340 g Au, 140g of Pd and 130 kg of Cu
- Electronics make up 80% of the world demand for indium (magnetic properties in hard disks), 50% of antimony (flame retardants), 30% of silver (contact, solders), 12% of gold (circuits)
- The value of the metals recovered in e-waste (viable recovery) is estimated at USD 28 billion for all e-waste management routes in 2022. (Balde et.al, 2024)
- The estimated value of the greenhouse gas emissions avoided in E-waste management is USD 23 billion.

Economic value of metal from E-waste in USD billion (2022)





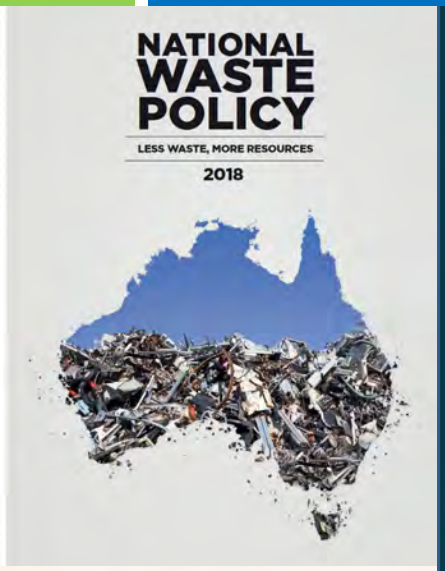
Circularity and E-waste

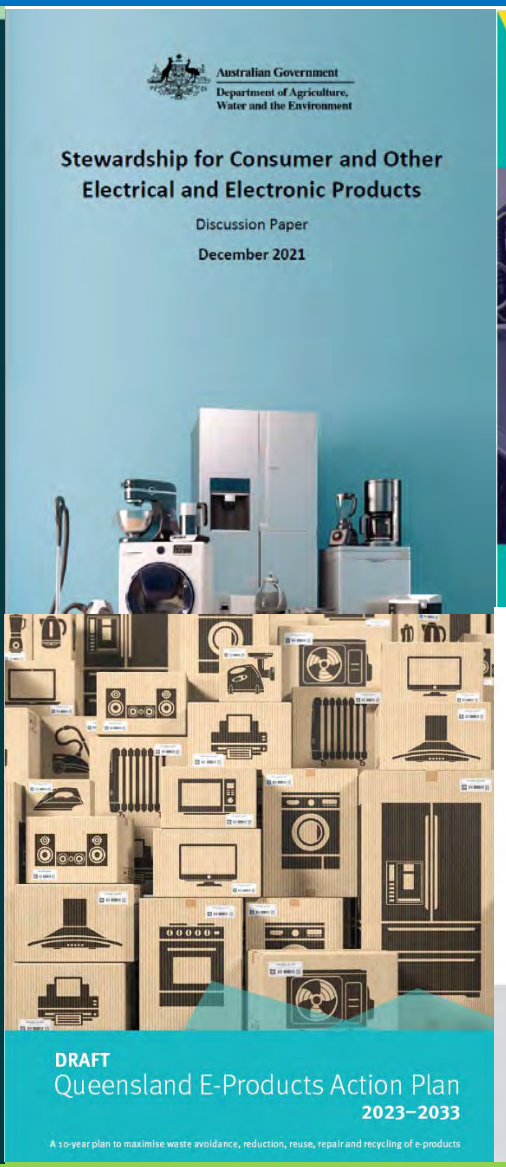
- Reduce and reuse
- Properly recycle with no harmful impacts on environment
- Design and manufacture electronic and electrical products with less toxic material inputs (design for environment)
- Effective product take back schemes towards circularity (Extended Producer Responsibility or EPR) EPR schemes make producers physically or financially responsible for the environmental impacts of their products throughout their life cycle.

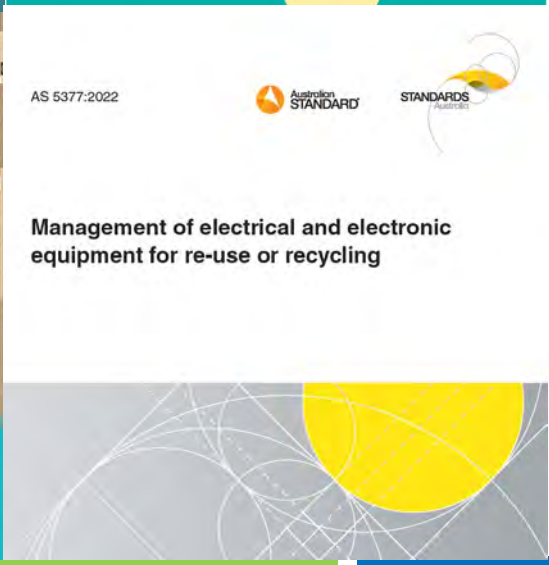
E-Waste in Australia

- Australia has specific e-waste laws and policies, making it unique in the South Pacific.
- **The Australian Waste Policy of 2018** aims to transition the country into a circular economy with defined principles and strategies.
- **The Australian Government Product Stewardship Act of 2011** allows for various approaches, including mandatory, co-regulatory, and voluntary product stewardship.
- **The National Television and Computer Recycling Scheme (NTCRS)** provides free e-waste collection and recycling for individuals and small businesses.
- **Mobile Muster** is an accredited program for recycling mobile phones, administered by the Australian Mobile Telecommunications Association.

E-Waste in Australia…







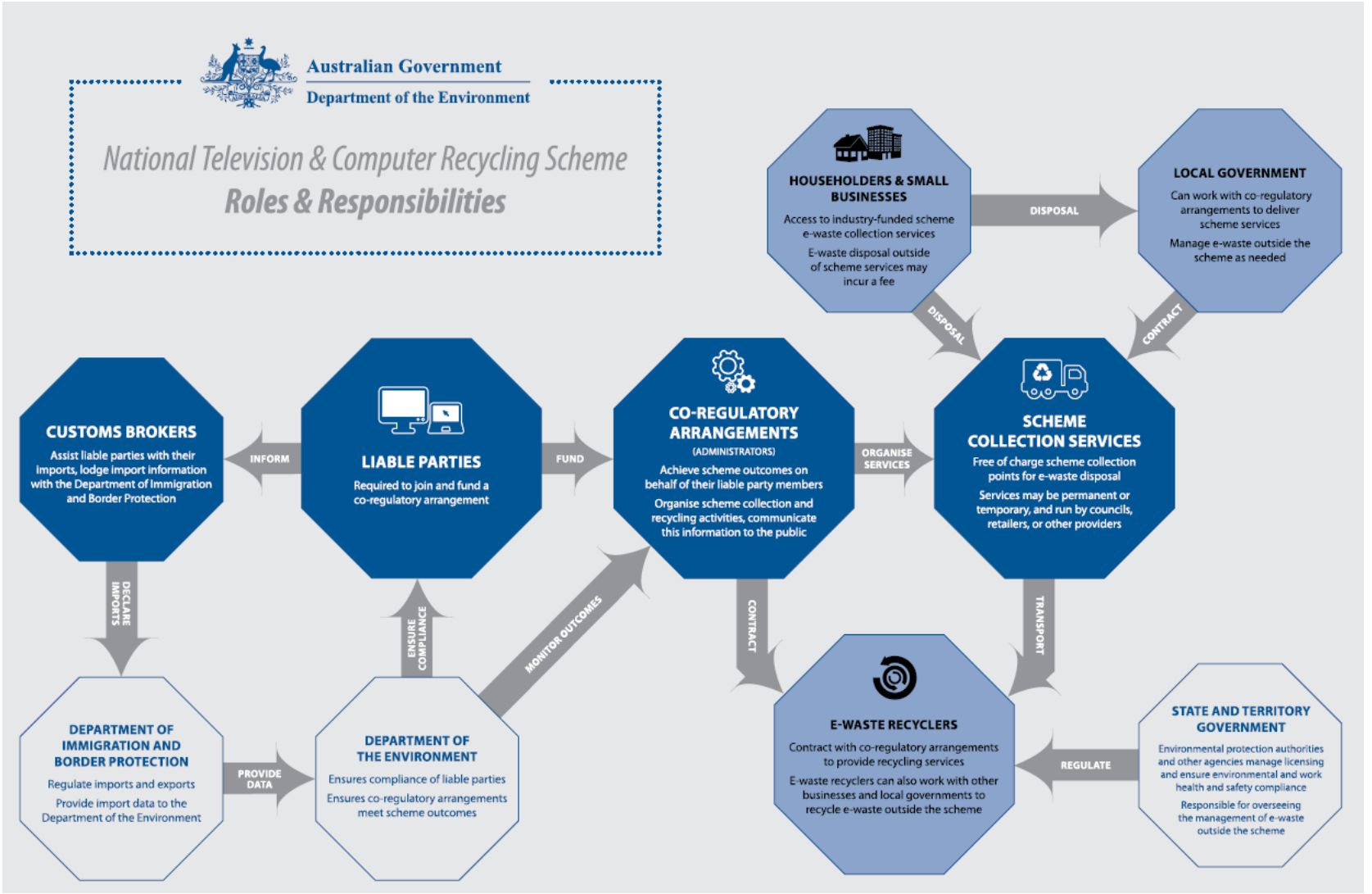
Voluntary Approach

- A voluntary approach is typified as an industry-organized product stewardship scheme for the end-of-life management of a class of products. The scheme is run by industry.
- Australia currently has a number of voluntary schemes for products such as mobile phones (MobileMuster), mercury-containing lamps (FluoroCycle), paint (Paintback) and tyres (Tyre Stewardship Australia).
- Mobile Muster and FluoroCycle are currently accredited schemes under the Act.

Extended Producer Responsibility

- Financial Responsibility (Producers or importers pay for the collection, recycling, and proper disposal of their products after consumer use)
- Product Design (EPR encourages producers to design products with recyclability and waste reduction in mind)
- Collection and Recycling Targets (EPR schemes often set specific targets for collecting and recycling materials to ensure accountability)
- Reporting and Transparency (Producers or importers are required to report on their EPR activities and progress towards meeting targets)
- Legal and Regulatory Framework(EPR is typically enforced through laws and regulations that outline producer obligations)

EPR in Australia



Producer Responsibility Organisations (PROs)

- Under take-back programmes, it could be impractical and not particularly economically feasible for each producer to take back its own products.
- Third party organisations are often formed allowing producers to collectively manage the take-back (and most often arrange for the treatment) of products.
- These organisations are often referred to as Producer Responsibility Organisations (PRO) and can be an effective structure for managing and collecting post-consumer products.

Jaipur Declaration on 3R and Circular Economy

- Cluster III: Sound Material Cycle Society and Resource Recirculation towards Zero Waste and Circular Society
- Goal 9. Minimize demand and pressure on virgin raw materials and avert resource constraints by implementing 3R and circular economy for all waste streams
- Sub Goal 9 (g). Achieve resource efficiency and circularity for waste electrical and electronic equipment (WEEE)
- Sub Goal 9 (j). Achieve resource efficiency and circularity for solar wastes, in particular panels, photovoltaic cells and related equipment
- Sub Goal 9 (k). Achieve circularity for end-of-life batteries

Sub Goal 9 (g). Achieve resource efficiency and circularity for waste electrical and electronic equipment (WEEE)

- Develop and improve national legislation and enforcement to create a robust e-waste management system based on EPR and the “polluter pays” principle.
- Provide adequate resources and financing for environmentally sound e-waste management, including safe collection, segregation, recycling, and disposal.
- Regulate industry to incentivize responsible manufacturing of electronics.
- Promote business models that enable producers and manufacturers of EEE to efficiently coordinate on the collection, reporting, and proper treatment of e-waste, while also encouraging the repair, remanufacture, refurbishment, and preparation for reuse of products.
- Promote policies that support the integration of circularity principles in design, manufacturing, consumption, and finally, the end-of-life management of products
- Promote policies that support the recovery and utilization of secondary raw materials, circular products with longer lifecycles, quality assurance for repair and refurbished products, and advanced recycling technology to extract secondary materials from e-waste.

Sub Goal 9 (g). Achieve resource efficiency and circularity for waste electrical and electronic equipment (WEEE)

- Promote ICT tools to take full advantage of the potential and synergies of the two major revolutions of our time - the circular economy and Industry 4.0
- Mandate separate collection and proper treatment of WEEE, setting targets for both collection and recovery and recycling.
- Strengthen the capacity of formal recycling facilities.
- Develop and establish required market facilities to support resource recovery.
- Develop the necessary infrastructure to encourage networks of recovery and recycling, thereby securing waste streams at economies of scale.
- Promote, where appropriate, sub-regional partnerships for improved resource efficiency and circularity.
- Support business infrastructure for business models that take into account end-of-life recovery options in the design phase
- Eliminate illegal processing of e-waste.
- Formalize the collection and processing of e-waste.

Sub Goal 9 (g). Achieve resource efficiency and circularity for waste electrical and electronic equipment (WEEE)

- Promote an active media and PR campaign to raise public awareness of refurbished products
- Promote eco-labelling schemes and green consumerism
- Launch public awareness campaigns on sustainable lifestyles
- Strengthen regional capacities, following guidance from the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (including the new revised annex of the Basel Convention), other appropriate conventions, and the Sustainable Development Goals (SDGs);

Way Forward

- Well defined national e-waste management strategy based upon circular economy and 3R concepts.
- Such strategy should not only address the environmental and health impacts of e-waste (end-of-pipe) but also look at the reduction of e-waste through green design (up-the-pipe).
- It should also create enabling conditions for relevant stakeholders to develop business and economic opportunities to recover the materials from e-waste.
- The strategy should take into account the financial, institutional, political and social aspects of e-waste management, in particular, incorporating the activities of informal e-waste recycling sector

Way Forward for PICs (Group Exercise)

- What are the key challenges in managing WEEE in PICs?
- What types of e-waste (precious metals, plastics, glass) can be effectively recovered and reused?
- What are suitable circular economy models that can transform PIC's WEEE sector over the next decade?
- How can these models be used to inspire real-world projects, policy recommendations, or effective collaboration between government-private sector-NGOs/communities in Pacific Island Countries?

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