LEGISLATIVE ASSEMBLY
FOR THE AUSTRALIAN CAPITAL TERRITORY

STANDING COMMITTEE ON ENVIRONMENT, CLIMATE CHANGE AND BIODIVERSITY
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Submission Cover Sheet

Inquiry into the waste management of absorbent hygiene products

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INQUIRY INTO THE WASTE MANAGEMENT OF ABSORBENT HYGIENE PRODUCTS

Kimberly-Clark Australia welcomes the opportunity to provide a submission in response to the ACT Standing Committee on Environment, Climate Change and Biodiversity's inquiry into the waste management of absorbent hygiene products (AHPs).

EXECUTIVE SUMMARY

As one of the largest producers of nappies, adult incontinence products and period products in Australia, through the Huggies, Depend, U by Kotex and Poise brands, Kimberly-Clark is committed to finding recycling solutions for these products that support the ACT Government's goal of transitioning to a circular economy.

While there is a desire in Australia from manufacturers of AHPs, including Kimberly-Clark, to address Australia's waste, there has been limited understanding and infrastructure from both industry and government of the options available to implement recycling programs. In 2021, with support from the South Australian Government, Kimberly-Clark conducted a feasibility study on disposable nappy recycling in Australia. On the back of that study, in July 2022 we began a nappy recycling trial in South Australia with our key partners: Australia's national science agency, CSIRO, South Australia's largest composter, Peats Soils and Garden Supplies, Solo Resource Recovery and early learning and care provider G8 Education. We are now also working with APR plastics to test the recycling of the recovered plastic in our nappies using pyrolysis.

The model we are using is the first of its kind in Australia, similar to a model successfully implemented in Canada for the past 20 years. It presents an exciting opportunity for both Kimberly-Clark and the broader community, and we hope that, when proven, this model will be able to be rolled out nation-wide. The potential of this trial should not be understated. Disposable nappies are both a crucial household item for millions of Australian families, but also present significant problems with approximately 1.5 billion nappies ending up in landfills nationally each year, accounting for approximately 4.4% of landfill mass. By moving forward on this nappy recycling trial, we believe we will be able to make meaningful change on a significant waste issue for Australia.

There currently exists several challenges in order to find a solution for nappy waste management, and AHP waste management more broadly. However, there are also several opportunities the ACT Government could unlock to address this problem with existing technology that could divert nappy waste from landfill. This submission outlines several collection and technology options available to the ACT Government to work in partnership with Kimberly-Clark and the broader nappy industry that can be implemented to process disposable nappies and divert waste from landfill.

RECOMMENDATIONS FOR NAPPY RECYCLING

Recommendation 1: Commercial collection combined with anerobic digestion represents a low-cost option to test the viability of diverting nappy waste from landfill in Australia.

Recommendation 2: Kimberly-Clark supports the ACT Government's goal of zero waste to landfill. As industry will be a key partner in any waste reduction activity, Kimberly-Clark would recommend undertaking an industry and science-based informed regulatory review process in the ACT to identify where legislative or regulatory barriers may exist.

Recommendation 3: Kimberly-Clark calls on the Government to provide further financial contributions to upgrade waste management infrastructure and further support for co-investment grants that support the sector to invest in research and development for waste management programs for absorbent hygiene products.

Recommendation 4: Kimberly-Clark sees education as a key enabler to support the community and industry in making informed decisions about how they choose to dispose of their nappies. Any approach to waste management for nappies explored by the Committee should consider education as a pillar of success.

ABOUT KIMBERLY-CLARK

Kimberly-Clark is a one of the largest manufacturers and providers of essential hygiene products globally including iconic brands such as Kleenex, U by Kotex, Huggies, Poise, Depend and VIVA. Kimberly-Clark has been in Australia for close to 100 years (since 1926), employing approximately 800 people across Australia and New Zealand.

A significant portion of our Australian workforce is located at our paper manufacturing facility in Millicent, South Australia. Our paper mill at Millicent is our major producer of Kleenex and Scott toilet and facial tissue, and VIVA and Scott paper towel products. With close to 400 employees, the Mill is also the largest single employer in the south-east region of South Australia. In 2020, the Mill celebrated 60 years of production and throughout this time environmental sustainability and reducing our footprint has always been a key focus for us.

Our Huggies nappies are the most popular nappy brand in Australia with 59% market share. They are made up of approximately 40% pulp and 60% plastic (about half of which contains superabsorbent polymer). We are working hard to reduce this plastic content and in 2021 alone, we reduced 232 tonnes of plastic across our nappies.

We are committed to reducing our impact on the planet and are investing in research and development for new products to replace current plastic ingredients with more environmentally friendly options. Kimberly-Clark is committed to the 2025 National Packaging Targets and is on track to deliver, and in some cases go beyond the targets. For example, we are set to achieve 40% recycled content in plastic packaging by 2030, ahead of the National Packaging Target of 20% by 2025.

AHP USES, WASTE AND ENVIRONMENTAL IMPACTS

a. Nappy waste

An estimated 95% of babies wear disposable nappies which are discarded after a single use. As a result, Australia disposes up to 1.5 billion nappies per year. There is currently a large demand for disposable nappies and no viable substitute. While Kimberly-Clark is trialling a nappy recycling program, there is currently no widely available recycling solution. Instead, nappies are sent to landfill where they produce greenhouse gas emissions, are a source of pathogens and are slow to break down, with estimates of up to 500 years.

In Australia, data for 2019 shows municipal solid waste comprises 4.4 per cent of disposable nappies in landfill. Globally, disposable nappies and other hygiene products typically account for between 1.5 - 6.3 per cent of municipal solid waste.

a. Single use vs reusable nappy types

Disposable nappies are a non-negotiable for most families across Australia and the ACT with 95% of babies wearing disposable nappies each day. Further, there remains a high importance of maintaining widespread access to disposable nappies across the childhood, aged care and disability sectors. While reusable nappies are readily available and produce less waste than the disposable nappy types, there are a number of disadvantages and challenges that make these only suitable for a small group of families. Changing, washing and cleaning reusable nappies requires significantly more time and resources than disposable nappies. They are also not convenient when traveling. Disposable nappies are also more hygienic than non-disposable nappies and help prevent the spread of illnesses such as gastroenteritis.

b. Incontinence products

Today, more than 4.8 million Australians live with some form of incontinence, a widespread condition with increasing prevalence across health, aged care, and disability services. Incontinence can have a significant impact on a person's physical and emotional health, leading to loss of confidence which affects their ability to interact in everyday life. An individual's experience with incontinence will vary greatly depending on their personal circumstances, which is why a range of incontinence products are essential for both the individual and or their carer to ensure they receive the best care.

Disposable incontinence products have a much higher absorbency rate, designed to move fluid away from the user and lock it into the absorbent core. This means the user can wear them for longer periods of time, without fear of leakage and their skin will also be kept dry and healthy. Whereas reusable incontinence products don't currently use superabsorbent material, so any fluid absorbed into the product is available to be released back to the skin of the user, which is not suitable for individuals with limited mobility or who might be managing moderate to heavy incontinence.

This is especially pertinent in assisted living or in home-based settings, where there's a higher prevalence of individuals experiencing incontinence and who require assisted care. Caring for individuals in these settings is both complex and time intensive, which is why a range of product offerings, specialised management and disposal systems are required for carers and health services to ensure every patient's needs are met appropriately.

c. Sanitary products

An individual's preference in period care products and management is highly personal and will likely differ throughout the various stages of their menstrual cycle, which is why providing a wide range of product options for an individual to choose from based on their specific needs is so incredibly important.

Given reusable products are relatively new to period care, at a category level, they do not always perform to the same level as disposables in terms of fluid absorbency and dryness. It's also important to consider that there are additional socio-economic costs related to reusable period products, including higher upfront cost, which can exacerbate issues of period poverty, there's currently a lack of access to safe and reliable washing facilities, as well as various of cultural and social barriers for users.

OPPORTUNITIES AND CHALLENGES FOR WASTE MINIMISATION

The ACT has a vision of becoming the first jurisdiction in the world to achieve the ambitious goal of no waste to landfill. The ACT has already achieved a significant reduction of its waste sent to landfill from nearly 60 per cent of total waste in 1995-96 to below 30 per cent by the mid-2000s[1]. Over time the ACT has seen an increased focus on avoiding waste generation, landfilling, resource efficiency and transitioning from a liner economy to a circular economy. The circular economy is endorsed by the Government's *ACT Waste Management Strategy 2011-2025*. Through the Strategy, the ACT Government set ambitious Territory targets to generate less waste, a cleaner environment and drive towards 90 per cent resource recovery. However, it appears that the ACT's resource recovery rate has plateaued and some of the targets are unlikely to be achieved under business-as-usual management practices. As such, the Territory is looking at a program of work to foster innovative and best-practice waste management practices guided by circular economy principles.

The ACT Government's City Services provide general waste collection weekly and recycling and green bins are collected on alternate fortnights. The ACT also has a Food Organics and Garden Organics (FOGO) collection pilot servicing around 5,000 households in Belconnen, Bruce, Cook and Macquarie. The FOGO bins are collected each week and processed into compost at the Mugga Land Resource Management Centre.

The current Materials Recovery Facility's (MRF) in the ACT, including the Mugga Centre and the Mitchell Resource Management Centre are unable to recycle soiled nappies and incontinence products and there are no current processing or recycling options for disposable nappies in the ACT. This waste stream is currently disposed of in landfill.

Kimberly-Clark and other industry players are working to develop more sustainable nappies by using more sustainable materials, however Kimberly-Clark will only be able to transition to a fully plastic-free product when there is a fit-for-purpose material to replace the absorbent core in a nappy. Currently, there is a lack of existing materials that are suitable options for Kimberly-Clark to replace the absorbent core of the nappies with a biodegradable or compostable alternative. The absorbent core is currently made of a super absorbent polymer (SAP) which becomes a gel when liquid is added. It can contain up to 30 times its own weight. The core also contains fluff pulp (cellulose) which absorbs liquid and provides volume and strength.

While traditionally AHPs have been near impossible to recycle, utilising existing technologies with new processes is indicating that this issue can be overcome. Kimberly-Clark is currently trialling a circular economy approach in South Australia for the recovery of resources from disposable nappies worn by children and there are a number of exciting technology options that are both available in Australia and suitable to process nappy waste in a sustainable manner. These technology and collection options canvassed in the following section.

In order to successfully tackle the problem of nappy waste, and AHP waste more broadly, any program will require collaboration of all stakeholders in the waste stream, not just on the

[1] ACT Government submission to Standing Committee on Industry, Innovation, Science and Resources Inquiry into Australia's Waste Management and Recycling Industries. January 2020. Accessed here: https://www.aph.gov.au/DocumentStore.ashx?id=7d555f8e-393c-4fd5-acce-e97e7d28cf24&subId=679155

manufacturing side. This includes the waste sector, state/territory and local governments and consumers to drive the actions required to successfully address nappy waste.

CASE STUDY – THE NAPPY LOOP TRIAL

Kimberly-Clark is leading a nappy recycling trial that could be Australia's answer to the 1.5 billion disposable nappies that end up in landfill each year. There are approximately 300,000 babies born in Australia every year and about 95% of them wear disposable nappies. The trial represents a major step forward for reducing plastic waste in the nappy industry as a single disposable nappy can take 500 years to decompose while one newborn alone goes through 8-10 nappies per day.

The Nappy Loop trial in South Australia, which is the first of its kind in Australia, uses anaerobic digestion to turn used Huggies nappies into nutrient-rich compost. The process also produces bioenergy that is captured and used to power the recycling process.

The Nappy Loop team is being led by Kimberly-Clark Australia, the maker of Huggies nappies, along with Australia's national science agency, CSIRO, South Australia's largest composter, Peats Soils and Garden Supplies, Solo Resource Recovery, and early learning and care provider G8 Education. Together, the team has been trialling the recovery and recycling of used disposable Huggies nappies since early July, and early results are indicating success.

The Nappy Loop trial has adopted a B2B model, with Solo collecting used Huggies nappies from G8 Education's Welly Road Early Learning Centre in Mount Barker and delivering them to the Peats composting facility for processing. Utilising anaerobic digestion, the organic material in the used nappies is transformed into nutrient-rich compost whilst the plastic components are separated and evaluated for future recycled products. In addition, the anaerobic digestion process creates bioenergy which is captured and used to power the Peats composting facility.

Since July 2022, we have collected and recycled approximately 2 tonnes of disposable nappies, with The Nappy Loop team now exploring the opportunity to scale the program in South Australia and nationally. This includes partnering with APR Plastics to test the recycling of the recovered plastic from the nappies using pyrolysis, with the aim of having results available in early 2023.

IMPLMENTING INNOVATIVE WASTE MANAGEMENT SOLUTIONS

If the ACT Government wishes to undertake a significant nappy (as well as other absorbent hygiene products) recycling activity there will be a number of factors that will need to be considered. There are lessons that can be taken from activity being undertaken in other jurisdictions regarding how a nappy recycling activity could be effective. Questions that need to be considered are:

- Collection methodology
- Availability within jurisdiction of relevant technology
- Regulatory barriers
- Communicating to households to ensure low contamination in process.

Suffice to say, if the ACT Government were to commit to a widescale nappy recycling activity none of the above issues are insurmountable and in fact industry partners, such as Kimberly-Clark, have recent experience in how to successfully roll this activity out both in Australia and globally too. Below we discuss these various options and would be pleased to engage with the Committee and ACT Government further if requested.

1. Collection points

Currently, nappies and other AHPs are disposed of in the waste bin. This is collected weekly and contributes to municipal solid waste (MSW), and then sent to landfill. There are a range of alternative collection points outlined below:

Household FOGO bin

Incorporating nappies into a household FOGO scheme presents a number of benefits including that it connects with existing infrastructure and addresses the highest proportion of nappy waste, households. The ACT already has a FOGO trial in place which would likely mean there would be no additional collection fees as a contractor is already in place collecting FOGO and FOGO infrastructure in the ACT is already established. In the future, Kimberly-Clark believes there could be an opportunity to open up FOGO collection to additional items such as AHPs, just like the City of Toronto has been doing for the past 20 years, utilising anaerobic digestion technology. The result is nutrient-rich compost[2].

However, the FOGO approach would require a shift to weekly collection of FOGO, where collection is currently fortnightly. Currently, nappies are disposed of in the general waste bin. This is collected weekly and contributed to municipal solid waste. Based on research conducted by the CSIRO for Kimberly-Clark, when local councils in NSW wished to implement FOGO bins and switch from a weekly for fortnightly pick up of general waste, there was significant household 'push back' from families that use nappies who were upset about the shift from weekly to fortnightly collection due to the odour of nappy waste in bins.

Household recycled bin

Collecting nappy waste from residential waste would target most of the nappy waste in ACT. The option of using a household recycled bin as a collection point also provides the advantage that it leverages existing infrastructure (household recyclable bin) and transport logistics. This method has also been proven to work for soft plastics collection and the technology the processes nappies may be suitable for soft plastics.

For nappy waste, a residential collection system that combines with the recycling bin waste collected from households could be applied. A fundamental pre-requisite would be the partnership of the MRF operator as they are responsible for picking and processing the nappies that enter their facility. They are also managing the risk of bag breakages and potential contamination with other recyclable materials.

Strategic Location - Smart Bin

There is an option for the ACT Government, in collaboration with industry, to develop propriety knowledge on a smart bin type for nappy waste collection. The bin could be strategically located in urban areas which would divert nappy waste from landfill and the household red bin. The smart bin would also be able to offer compaction of up to 90% which reduces collection frequency. There are a number of international examples of smart bins for nappy collection, including in The Netherlands, France and Indonesia. Options for the location of nappy waste smart bin collections includes supermarket car-parks, petrol stations or outside multi-unit dwellings.

There are no current smart bin examples for nappies tested in Australia, although there are examples of smart bins that can be tested for nappy waste. There also exists a high establishment cost of this option, including infrastructure and software applications development. A risk with smart

[2] https://www.toronto.ca/services-payments/recycling-organics-garbage/houses/what-goes-in-my-green-bin/#:~:text=The%20City's%20Green%20Bin%20program,to%20feed%20and%20nourish%20soil.

bins is that there can be potential contamination with other waste materials unless smart access is added.

Commercial - Childcare Centres

Another collection option is to leverage existing commercial collection infrastructure for the collection of nappy waste. An advantage of this option is there is the potential for staff to be trained in the separation of nappy waste from other general waste which will result in limited contamination.

Using a commercial collection point, like a childcare centre, also has the benefit that it connects with existing infrastructure. Waste would also be able to be well separated with minimal risk of contamination, pending collaboration with staff and provider. This collection point would also present an option to advertise to parents, encouraging them to bring sorted nappy waste for inclusion in waste management.

However, this option doesn't address the greatest source of child nappy waste which is residential homes and requires staff education and time to source separate nappies into a single bin for collection.

2. Technology options

Based on research conducted for Kimberly-Clark, there are several pathways available that divert material from landfill. If the ACT Government wishes to implement a solution to nappy waste in the short-medium term, it would need to consider whether these technologies are readily available in Australia and in ACT. This section provides an overview of several of these technologies which already have a presence in Australia.

Anaerobic digestion

Anaerobic digestion is a process through which bacteria breaks down organic matter—such as wastewater biosolids, and food waste —in the absence of oxygen. In anaerobic digestion systems waste steams with high content of organic matter (kitchen waste, animal manure, food packaging) are combined and transformed to biogas that can be used to make heat and electricity.

Anaerobic digestion systems are variable in their scale, from home set ups to those that can manage city wide organic waste. They have gained use by farms, food processing facilities and wastewater treatment plants across Australia where anaerobic digestion is part of the processing of human waste.

A recent life cycle assessment of the anaerobic co-digestion of used disposable nappies with waste food material was conducted in Greece[3]. Disposable nappies comprised 8% of the mixture and it was diluted with water. The biogas was burned to heat water in a boiler, the separated plastics were recycled, the digestate used as fertilizer and the separated SAP was used as adsorbent. The study found a positive environmental impact compared to disposal options that consisted of landfill and incineration of nappies.

While anerobic digestion technologies exist in Australia, the anerobic digestion of disposable waste nappies has only been tested for the first time as part of Kimberly-Clark's trial in Australia. However, prior to this anerobic digestions had been shown to be successful in laboratory conditions and in a trial in Toronto, Canada.

[3] Zagklis, D., Tsigkou, K., Tsafrakidou, P., Zafiri, C., & Kornaros, M. (2021). Life cycle assessment of the anaerobic co-digestion of used disposable nappies and expired food products. *Journal of Cleaner Production*, *304*. https://doi.org/10.1016/j.jclepro.2021.127118

Advanced recycling

There are a number of advanced recycling options including pyrolysis, gasification and hydrothermal processing. These processes all create valuable products such as gas, heat or oils and destroy the pathogens from the nappy waste in the process. However, there is a high capital investment required in these technology options and currently no existing infrastructure in the ACT that we are aware of. The high moisture content in nappies also means they need drying before these processes can commence.

Waste to Energy

Waste to energy technologies refers to a range of technologies that convert waste into electricity, heat or fuel. Technologies vary depending on the source material, processing technologies and type of output or energy produced. Australia's renewable energy agency (ARENA) has invested $98 million into 25 WtE projects. The majority are for the production of biofuel from agricultural waste, and wastewater.

In June 2021, a partnership was announced between the City of West Torrens, Dryclone Australia, and Greenhill Energy and Peats Soil and Garden Supplies. This partnership is to explore the potential to dry, process and implement gasification technology to process MSW, including nappies, which produces hydrogen. However, the project is still in its early stages.

3. Regulatory issues

In our experience with waste management, we have - in the past - found that there can be regulatory and legislative frameworks that are inhibitors to undertaking the kind of activity that the ACT Government has indicated it aspires to. There can be issues with definition of compostable waste, how waste is to be treated and whether certain waste can be transformed from one form to another. Reviewing and removing these regulatory barriers is a critical activity to meeting the Government's aspirations. However, it should not be undertaken without industry input. Ultimately activities of this kind are only successful where there is significant industry input, as it will be industry which will be undertaking the bulk of the activity. Without that input, Government can create unworkable frameworks that only serve to make the underlying Government aspiration more, not less, difficult to achieve.