

# Contino® vs. Adult Diapers – Greenhouse Gas/Landfill Impacts

*Contino® is a more sustainable approach to adult male urinary incontinence with an estimated reduction of greenhouse gas emissions by a factor of 5 to 1 and a reduction of landfill waste by a factor of 2,160 to 1 per Contino user/year. A sustainable solution for urinary incontinence, a chronic and complex medical condition that effects 1 in 4 men over 40 in the US<sup>i</sup>, is critical given the negative environmental impacts of disposable diapers<sup>ii</sup>.*

Below is a comparison of the environmental impact of one year's use of Contino & one year's use of Adult Diapers (i.e., 4 additional diapers/day) and the estimated greenhouse gas emissions and volume disposed in landfills using the following assumptions and information:

- Diapers in landfills take up to 500 years to degrade, creating methane and other toxic gases in the process<sup>iii</sup>;
- Methane has a Global Warming Potential (**GWP**) (over 100 years) of 27.9, meaning that a leak of one ton of methane is equivalent to emitting 27.9 tons of carbon dioxide<sup>iv</sup>;
- The largest sources of methane emissions from human activities in the United States are oil and gas systems, livestock enteric fermentation, and landfills<sup>v</sup>;
- One kilogram of kitchen waste yields 0.3m<sup>3</sup> of biogas if well digested<sup>vi</sup>;
- 1kg of methane is equivalent to emitting 25kg of CO<sub>2</sub>e<sup>vii</sup>;
- On average a Contino user reduces their diaper use by four diapers/day; and
- Based on the actual results from the Contino Foundational Study the average reduction in urine leakage was 70%<sup>viii</sup>.

Based on the above the estimated greenhouse gas emissions and volume of waste disposed into landfills for each user over a one-year period are the following:

## With Contino

- Urine not disposed in a toilet is collected and disposed in a landfill is: 43.8 kg of urine;
- Methane produced from 43.8 kg of urine:  $43.8 \text{ kg} \times 0.3 \text{ m}^3/\text{kg} = 13.14 \text{ m}^3$ ;
- The methane produced in kg (based on natural gas):  $13.14 \text{ m}^3 \times 0.7112 \text{ kg}/\text{m}^3 = 9.35\text{kg}$ ;
- CO<sub>2</sub>e emissions from 9.35 kg of methane:  $9.35 \text{ kg} \times 25 \text{ kg CO}_2\text{e}/\text{kg methane} = 233.75 \text{ kg CO}_2\text{e per year}$ ; and
- Estimated volume of one year's use of Contino product disposed in landfills is: 228.6 ml. Please note, this is so small the estimated greenhouse emissions are negligible; and
- Therefore, the greenhouse gas emissions of disposal of the urine, while using Contino, not disposed of in a toilet from one year's use are approximately 233.75 kg CO<sub>2</sub>e, which is equivalent to the volume of a single 8-ounce cup.

## With Adult diapers

- Assuming that all urine is collected and disposed of in a landfill is: 147.24 kg of urine;
- Methane produced from 147.24 kg of urine:  $147.24 \text{ kg} \times 0.3 \text{ m}^3/\text{kg} = 44.17 \text{ m}^3$ ; and
- The methane produced in kg (based on natural gas):  $44.17 \text{ m}^3 \times 0.7112 \text{ kg}/\text{m}^3 = 31.42\text{kg}$ ;
- CO<sub>2</sub>e emissions from 31.42kg of methane:  $31.42\text{kg} \times 25 \text{ kg CO}_2\text{e}/\text{kg methane} = 785.5 \text{ kg CO}_2\text{e}$ ;

- Therefore, the greenhouse gas emissions of disposal of urine with adult diapers for one year of use are approximately 785.5 kg CO<sub>2</sub>e;
- Estimated volume of one year's use of adult diapers disposed in landfills is: 523,029 ml, which has an equivalent volume of 2,160 8-ounce cups; and
- Therefore, the greenhouse gas emissions of disposal of four incremental diapers from one year's use are approximately 389.40 kg CO<sub>2</sub>e.

## Conclusion

The estimated CO<sub>2</sub> release generated from urine disposed into a landfill for a one-year period is 785.5 kg and the estimated release of CO<sub>2</sub> from disposal of four adult diapers/day into landfills is 389.40 kg for an aggregate CO<sub>2</sub> release of 1,174.90 kg/diaper user/year.

In contrast, the estimated CO<sub>2</sub> release generated from urine disposed in a landfill and assumed not disposed in a toilet, for a one year period is 233.75 kg/Contino user/year. **Please note** greenhouse gas emissions related to a Contino user entirely relate to urine assumed not to be disposed into a toilet. We believe our estimated urine loss reduction of 70% is conservative as Contino users can experience a 90% or more reduction in urine over the long term. However, for purposes of these estimates we used the results from our published Foundational Study (i.e., 70% urine reduction), which included successful and unsuccessful participants.

In summary, this analysis estimates that Contino user over a one-year period when compared with an adult diaper users will reduce greenhouse gas emissions by a factor of 5 to 1 and will reduce landfill waste by a factor 2,160 to 1. Both of which highlight the environmental impact of disposable diapers and the importance of sustainability<sup>ix</sup>.

<sup>i</sup> "Urinary Incontinence is Common Among Men Over 40, Survey Says." The Wall Street Journal, Urology Care Foundation, 24 Jan. 2017. <https://www.wsj.com/articles/urinary-incontinence-is-common-often-treatable-but-hard-to-discuss-11574046180>

<sup>ii</sup> "Disposable Diapers Add Millions of Tons of Waste to Landfills Each Year, According To EPA Report." Baby Tooshy, 31 Dec. 2016, <https://www.prnewswire.com/news-releases/disposable-diapers-add-millions-of-tons-of-waste-to-landfills-each-year-according-to-epa-report-300384344.html>

<sup>iii</sup> " Disposable Diapers Add Millions of Tons of Waste to Landfills Each Year, According To EPA Report." Baby Tooshy, 31 Dec. 2016, <https://www.prnewswire.com/news-releases/disposable-diapers-add-millions-of-tons-of-waste-to-landfills-each-year-according-to-epa-report-300384344.html>

<sup>iv</sup> Environmental Defense Fund. "Understanding Global Warming Potentials." Environmental Defense Fund, n.d., [https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#:~:text=Methane%20\(CH4\)%20is%20estimated,is%20reflected%20in%20the%20GWP.](https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#:~:text=Methane%20(CH4)%20is%20estimated,is%20reflected%20in%20the%20GWP.)

<sup>v</sup> Environmental Protection Agency. "Methane Emissions." Environmental Protection Agency, n.d., <https://www.epa.gov/gmi/importance-methane>

<sup>vi</sup> The International Journal of Engineering and Science (IJES), "Conversion of Kitchen Waste Into Biogas" Ogur, E. O. & Mbatia, S., <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

<sup>vii</sup> The International Journal of Engineering and Science (IJES), "Conversion of Kitchen Waste Into Biogas" Ogur, E. O. & Mbatia, S., <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

<sup>viii</sup> Contino "The Contino Urethral Insert in the Treatment of Male Stress Urinary Incontinence." Dr. D. Elterman & Dr. R Casey, Canadian Urology Journal, vol. 14, Issue 6 (Suppl2), June 2020, pp. S59-S60. <https://cuaj.ca/index.php/journal/article/view/6732/4463>

<sup>ix</sup> "Disposable Diapers Add Millions of Tons of Waste to Landfills Each Year, According To EPA Report." Baby Tooshy, 31 Dec. 2016, <https://www.prnewswire.com/news-releases/disposable-diapers-add-millions-of-tons-of-waste-to-landfills-each-year-according-to-epa-report-300384344.html>