



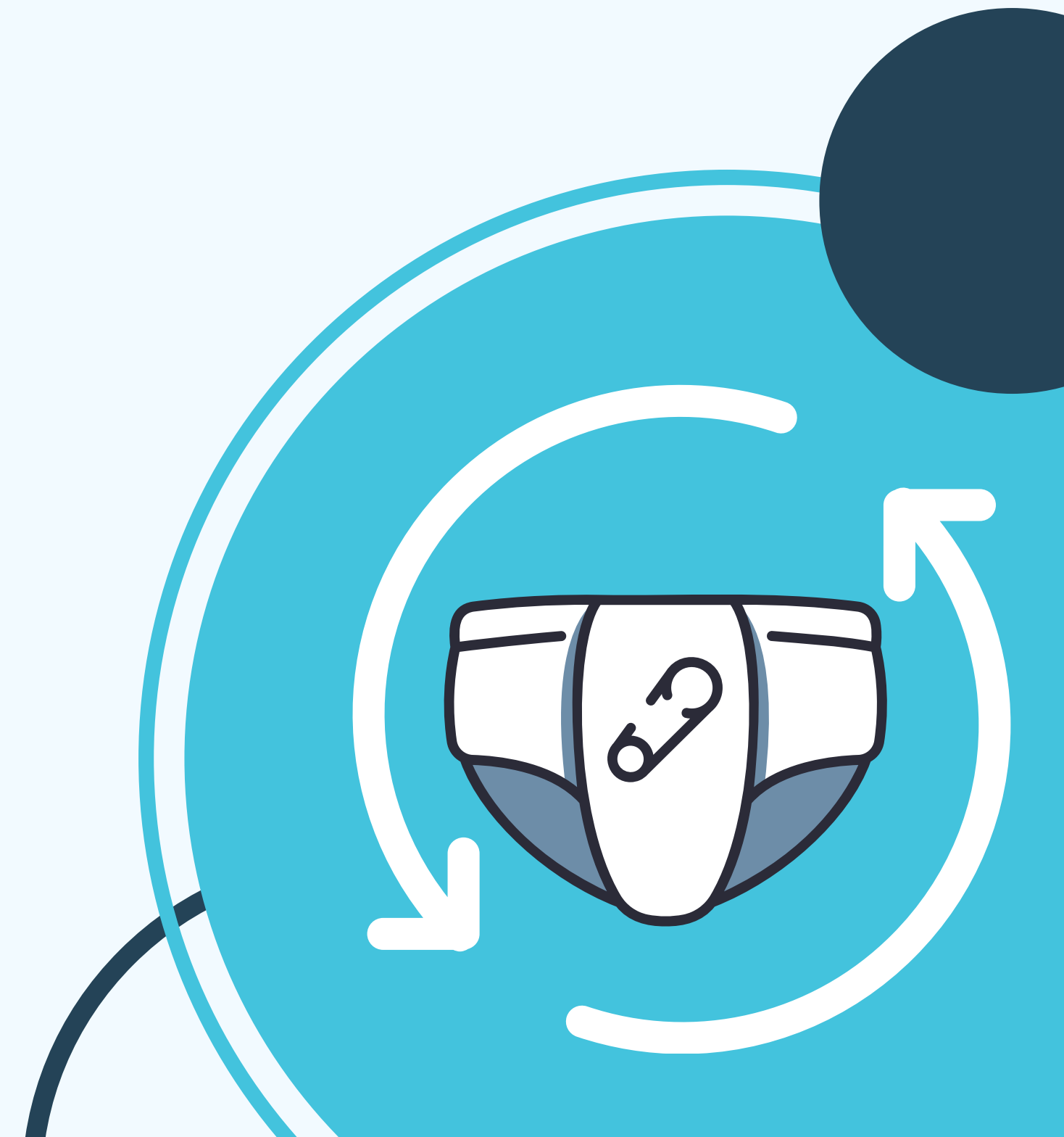
Hackathon: the circular diaper

Team 2 - Di-cycle

DI-CYCLE

The circular diaper

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Diaper Waste

FACTS

6-7 DIAPERS A DAY

each baby



4500 DIAPERS

before they learn to use toilet



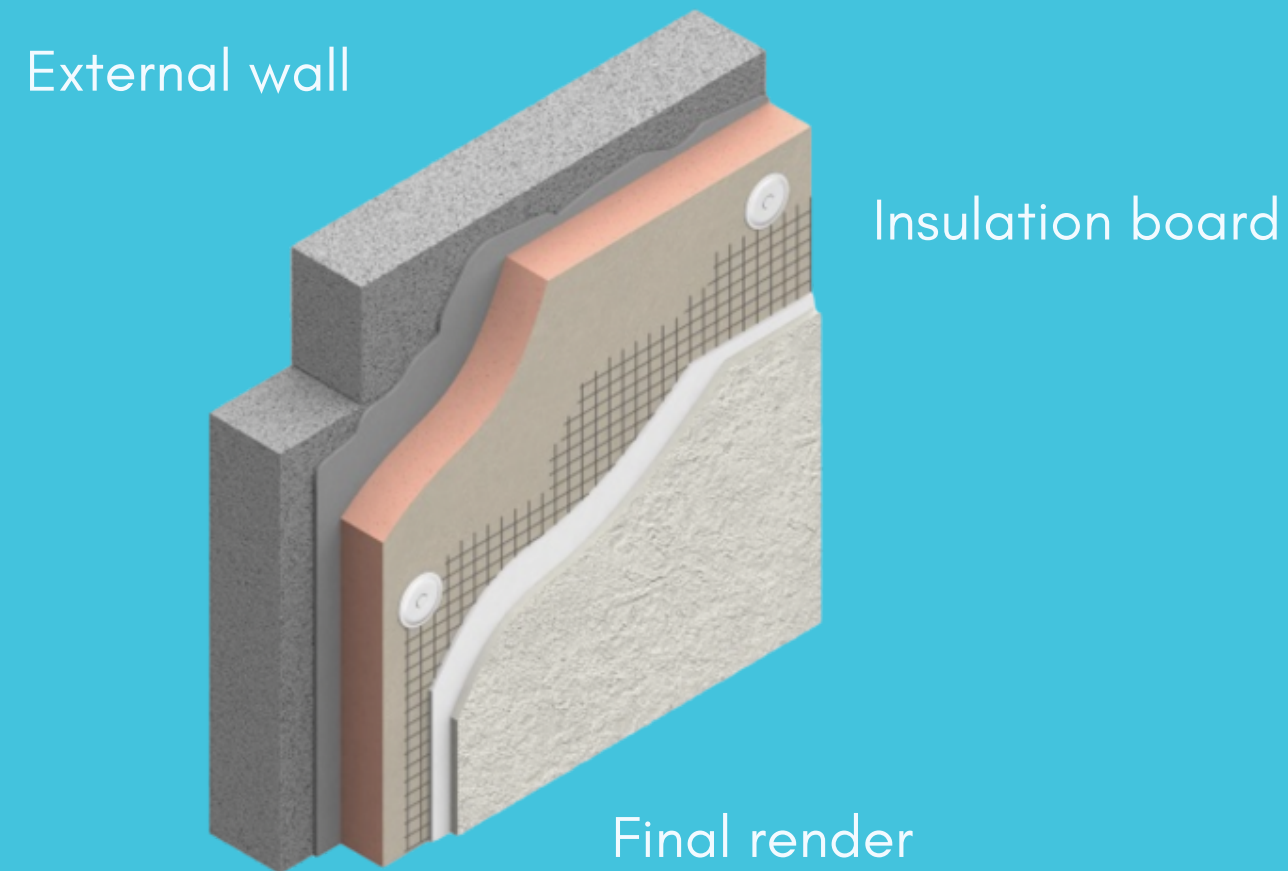
3.5 MILLION TONS

of useful raw materials that end up in
landfill every year



Source: <https://dycle.org/en>

Diapers as Insulation



NEW TREND IN THE BUILDING SECTOR

- Sustainable building materials have gained prominence as the global construction industry's newest trend
- People are more inclined towards buying places with more sustainability documentation

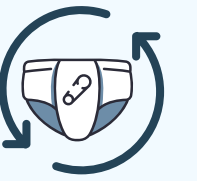
30/40% INCREASE IN THE PRICE OF BUILDING MATERIALS AFTER COVID

- Builders look for cheaper alternatives to polystyrene, glass wall, rock wall or cork
- Governments provide incentives to promote green building practices in the construction sector

POTENTIAL OFFERED BY DIAPERS

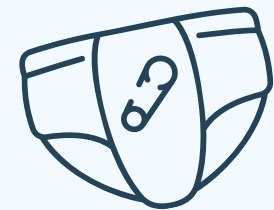
- Cellulose is the primary component of diapers
- It has an average thermal conductivity of about 0.040 W/mK (similar to other materials currently used as insulation such as glass wool and rock wool)





Thermal Conductivity (λ)

A physical quantity that indicates the ability of a material to transmit heat



INSULATING MATERIAL	(λ)
Polystyrene	0.034–0.038 W/mK
Glass wool	0,035 W/mK
Cork	0.036–0.38 W/mk
Cellulose	0.038 - 0.040 W/mK
Hemp	0.039 - 0.040 W/mK
Cellular glass	0,041 W/mK
Rock wool	0.041–0.044 W/mK

THE LOWER THE LAMBDA VALUE,
THE MORE THE MATERIAL EXAMINED IS A GOOD THERMAL INSULATOR



Operation Cycle

A innovative design



In-house
collection using
bins that reduce
odour.
Home Collection
Service.



Smart bins
in neighbourhood
for community.
Vending machine

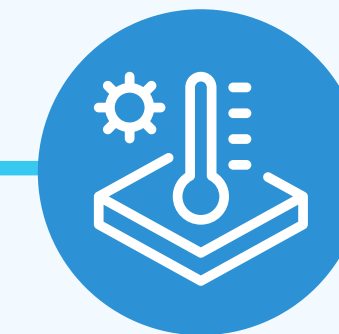


Transportation
Partnership with the
city to collect the
diaper waste with
household wastes.
Pick up from the
common waste
collection facility



Outsource

Sterilization
of the waste into
odourless and
safe to use
material for
construction.
Dehydration using
heat or salt.



Assemble the
sterilized
diapers in
panels which
can be used to
create more
energy efficient
houses.



Use as a
building
materials

Marketing Strategy

PRODUCT

- Diaper post-use management
Smart Bins & Re-purposed Vending machines with brand sponsorship

PRICE

- Cheaper than the stores (Factory to customer)
Direct targeting, higher ROI and ROAS

PLACE

- Berlin
Big cities with baby booms

PROMOTION

- Advertising campaigns: the customer receives coupons for future purchases as incentives.
Build lifelong customer relationships

Advantages for different stakeholders

DIAPER COMPANIES

- Great marketing channel
- Brand awareness
- Direct feedback



MEDICAL WASTE COMPANIES

- New business opportunity
- Diversify their revenue streams



CONSTRUCTION COMPANIES

- Affordable and alternative material
- Flexible and fast orders

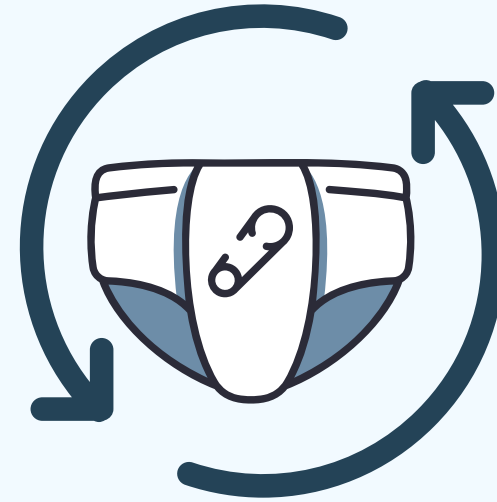
CUSTOMERS

- Solve a diaper disposal problem
- More convenient to purchase
- Increased awareness
- Responsible for the environment

CITIES

- Less waste
- Circular model
- Increase the attractiveness of the city for non-typical demographics

DI-CYCLE



**THANK YOU FOR YOUR
ATTENTION!**

1. Do parents want to recycle used diapers?
2. Feasibility of diaper separation
3. Alternative usage for recycled diapers
4. Would diaper companies pay for the marketing?
5. Cost/Revenue Analysis
6. Application to developing countries

Do parents want to recycle used diapers?

In a Pilot Project done in Amsterdam, 70% of parents said they want to recycle used diapers. 82% of parents would not mind separating diapers from other waste.

Source: https://www.nonwovens-industry.com/contents/view_breaking-news/2019-02-19/pilot-diaper-recycling-program-underway-in-amsterdam/13587

A survey from 2012 showed 94% of parents think they could do more for the environment ("Green Guilt"), 92% of parents are willing to recycle everything that can be recycled. The main themes for improvement are plastic bags, disposable diapers and driving a lot

Source: <https://www.today.com/parents/survey-parents-feel-green-guilt-over-plastic-bags-diapers-718631>

The new generation of parents care more about the environment so there will be a bigger demand for a green solution for used diapers.

SEPARATION OF THE DIFFERENT PARTS OF THE DIAPER

Fater


**a joint venture of Procter & Gamble and Angelini
Group (the manufacturer of Pampers in Italy)**

This machine uses high temperature and steam under pressure to separate human waste from diaper materials. It sterilizes the products and neutralizes the odour. A specific mechanical system separates plastic, cellulose and super absorbent material from each other, and these raw materials are used to produce new materials.

The technology is currently already being used on an industrial scale in Italy.

Source: https://www.nonwovensindustry.com/contents/view_breaking-news/2019-02-19/pilot-diaper-recycling-program-underway-in-amsterdam/

Alternative Projects for recycled diapers

- Waste2Aromatics by Biorizon for commercial production of **bio-aromatics**
 - Fater (P&G and Angelini) for **school benches, school desks and bottle tops**
 - P&G's US manufacturer for **fuel cubes** and **baby wiper case**
 - Environcomps & Huggies in New Zealand for **landscaping soil**
 - Dycle in Berlin for **black soil** and **fruit trees.**
 - Super Faiths in Japan for **clean energy**
 - Unicharm in Japan for **pulp** (paper fluff in disposable diapers)
- 

Would diaper companies pay for the Marketing?

P&G, the owner of Pampers, is the largest advertiser in the world. The company's advertising budget is \$8.2 billion dollars in the year till June 2021 (12% increase from the previous year). The company uses all channels to reach potential customers. P&G has been cutting digital advertising in the past 5 years. Advertising on the bins and vending machines can directly target the user group.

Source: <https://www.campaignasia.com/article/pg-defies-pandemic-with-12-jump-in-annual-adspend/471802>

Pampers partnered with Koala Kare in 2019 to install 5,000 changing tables in Men's washrooms.

Source: <https://www.forbes.com/sites/willburns/2019/06/14/pampers-proves-to-marketers-that-doing-is-m>

Huggies, which is Pampers' biggest competitor, will become the first diaper brand to run a Super Bowl Ad. Huggies will also give away 25,000 "Welcome to the World" new born starter kits as part of their marketing program.

Source: <https://adage.com/article/special-report-super-bowl/huggies-becomes-first-diaper-brand-run-super-bowl-ad/2308276>

THE BINS AND VENDING MACHINES WILL ENABLE BRANDS TO DO MORE
CREATIVE MARKETING PROJECTS

Cost Analysis

Set up of 30 Bins

€400*30 = €12,000

30 Vending Machines: €1500 * 30 = €45,000

Restock and Cleaning Fees

2 hours per machine per week = $15*2*30*52 = 46,800$

Total: 103,800

Selling Diapers in Vending Machines

Factory Price: €2

Retail Price: €6

Vending Machine Price: €4

Profit: €2 per bag

A number of bags of Diapers need to be sold to break even (per machine): $103,800/2/30 = 1730$

Number of babies born in Berlin 2020: 38700

Number of diapers per baby first year on average: 2,000

Number of bags per baby $2000/24 = 84$

Number of babies to break even: $1730 / 84 = 21$

The average birth rate in Berlin is 1.4 per woman $21/1.4 = 15$

In another word, the operation will break even within a year when each vending machine has 15 families using it. Assume they buy diapers from the machine 50% of the time, 30 families is still an easy target to achieve.

To cover 5% of newborn babies in Berlin, each machine needs 46 families to use it.

Profit/Loss:

1%: $387 * 84 * 2 - 57,000(\text{fixed}) - 46,800 = - 38,784$

3%: $1161 * 84 * 2 - 57,000 - 46800 * 2 = 44,448$

5%: $1935 * 84 * 2 - 57000 - 46800 * 3 = 127,680$

Marketing:

Draussenwerber: City Light Front: 200 per surface per month

$200 * 12 * 30 * 2 = 144,000$

Source: <https://www.draussenwerber.de/en/Downloads/Prices.html>

Door to Door Pickup:

Market price: 75

Monthly = $8 * 2 + 20 = 36$ Price for 50

Biweekly = $8 * 2 + 20 * 2 = 56$ Price for 80

