



# CLIMATE SOLUTIONS

$$BE_y = \varphi \times (1-f) \times GWP_{CH4} \times \sum_{x=1}^y \sum_j W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1-e^{-kj})$$

## Development of a Zero Waste Management Plan for the REH

$$BE_y = \varphi \times (1-f) \times GWP_{CH4} \times \sum_{x=1}^y \sum_j W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1-e^{-kj})$$

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## Partners for the analysis of current REH waste management practices

- Partners
  - Greenovate! sprl - Waste management, transfer of climate technologies and CO2 accounting
  - Novociclo SA (Brazil) - Advice in Zero Waste Management; Engineering, education, design and marketing of waste management programmes
- With the support of
  - REH Management
  - Cleaning team
  - Zero Waste Europe

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## The Renewable Energy House Brussels: some figures

- Three buildings occupying 2800m<sup>2</sup>
- Head Quarters of 20 European renewable energy and environmental organisations
- Over 100 people workforce
- Central meeting point for stakeholders with meeting facilities of different sizes
- Up to 10000 people participate in meetings and visit the REH as a showcase for renewable energy technologies

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## REH waste management: Point of departure

- Environmentally conscious people with a positive attitude to recycling and waste management
- Basic installations for separation of waste
  - **Bins for batteries and separate collection of general waste, paper and PMD**
- Using mugs for coffee and eating all the leftovers from events catering are also positive waste management practices
- Exclusive use of renewable energy and reinforced energy efficiency policy

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## Zero Waste: No bury, no burn!

*“Zero Waste means designing and managing products and processes to **systematically avoid and eliminate the volume and toxicity of waste and material, conserve and recover all resources, and not burn or bury them.***

*Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health.”*

Zero Waste International Alliance

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## Impact of Zero Waste Management

- Saving natural resources, reducing GHG emissions and energy used to manufacture products:
  - **Recycling aluminum:** saves 95% energy vs. raw material; 1 tin can = 3 hours TV
  - **Recycling paper:** saves 70% energy vs. raw material; 1 recycled ton of paper = 55 eucalypts + 98000 liters water + 2.5tons of CO2 saved
  - **Recycling glass:** saves 30% energy vs. raw material; 1 recycled bottle = 20min power for a computer
  - **Recycling plastic:** saves 90% energy vs. raw material; 1 PET bottle = 3 hours 60 watt light bulb

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## Objectives

- To obtain a sample of waste generated in the REH by taking waste samples on a set of representative days
- To allow extrapolation of waste generation of each category over one year
- To develop a benchmark for the activity plan
- To propose a Zero Waste Management Plan including targets, actions and timeline
- To possibly achieve a Zero Waste certification of the REH by 2015

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## Methodology

- 5 days of waste sampling:
  - Waste generated in the general office area (offices, kitchen, canteens, reception, photocopying rooms, etc.
  - Waste generated through events (LMR, Lounge)
- Collection, separation and weighting
- Divided into: paper & cardboard, glass, cans, Tetrapak, organic waste, non-recyclable,...
- Mini-surveys in the REH and with the main caterers
- Collection of statistics

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# FINDINGS AND ANALYSIS

Office area

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## Waste generated in the office area

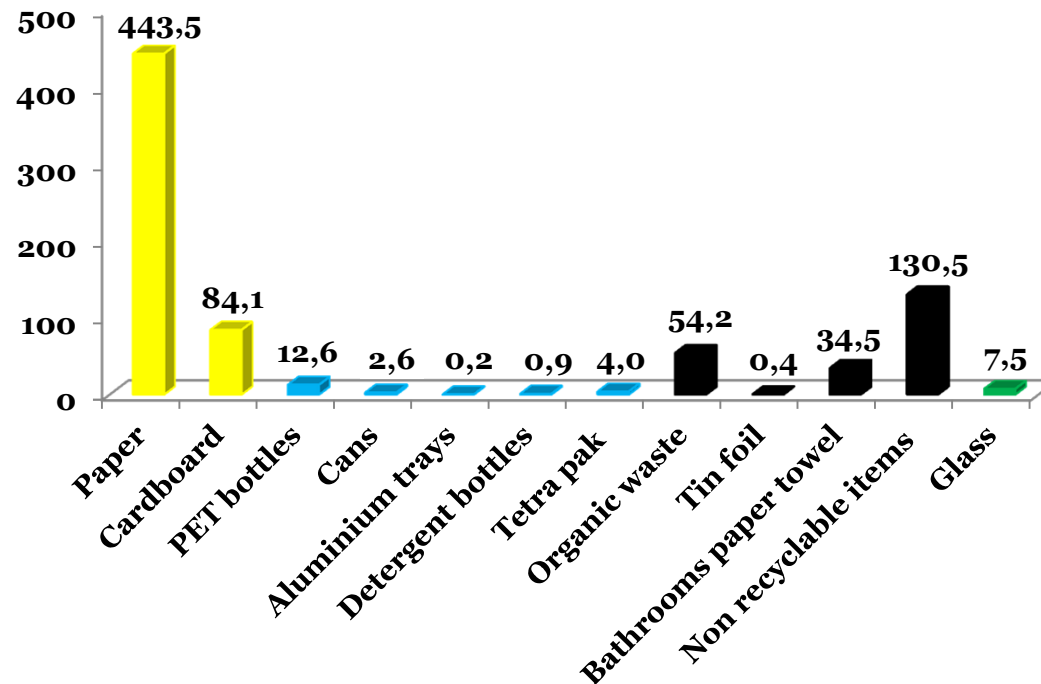
- REH office area has been defined as the offices, reception, photocopy rooms, kitchen, canteen, bathrooms and courtyard

Categories	Waste generated (kg)			
	per week	per day	per month	per year
Paper	109.24	21.85	443.53	5,331.16
Cardboard	20.71	4.14	84.10	1,010.89
PET bottles	3.11	0.62	12.61	151.52
Cans	0.65	0.13	2.62	31.48
Aluminium trays	0.05	0.01	0.20	2.44
Detergent bottles	0.21	0.04	0.87	10.49
Tetra Pak	0.98	0.20	3.98	47.82
Organic waste	13.35	2.67	54.22	651.72
Tin foil	0.11	0.02	0.43	5.12
Bathrooms paper towel	8.50	1.70	34.51	414.80
Non recyclable items	32.14	6.43	130.49	1,568.43
Glass bottles	1.84	0.37	7.47	89.79
<b>Total</b>	<b>190.89</b>	<b>38.18</b>	<b>775.03</b>	<b>9,315.68</b>

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## Waste generated each month

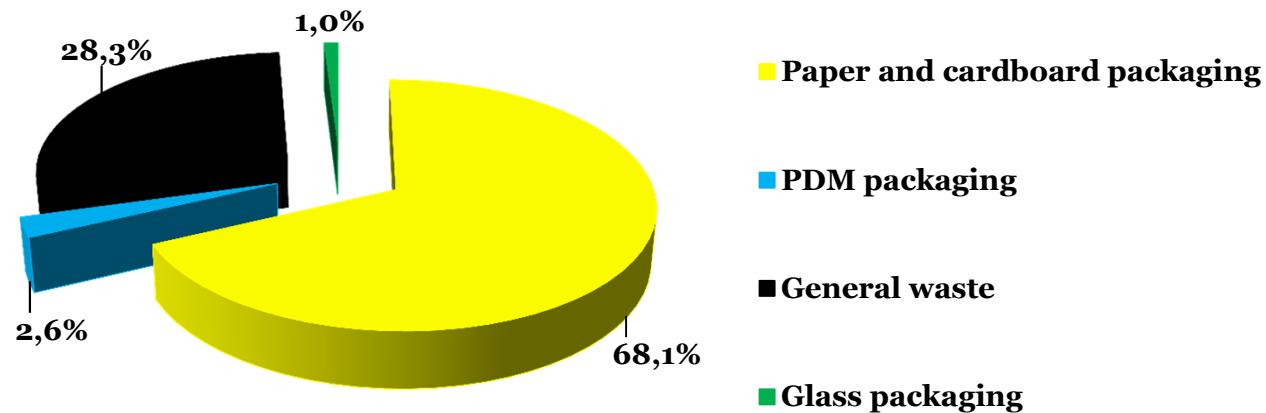
REH office area – waste generation per month (kg)



$$BE_y = \varphi \times (1-f) \times GWP_{CH_4} \times \sum_{j=1}^y \sum_{x=1}^j W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1-e^{-kj})$$

## Distribution of waste

Percentage of each type of waste in case it had been properly discarded



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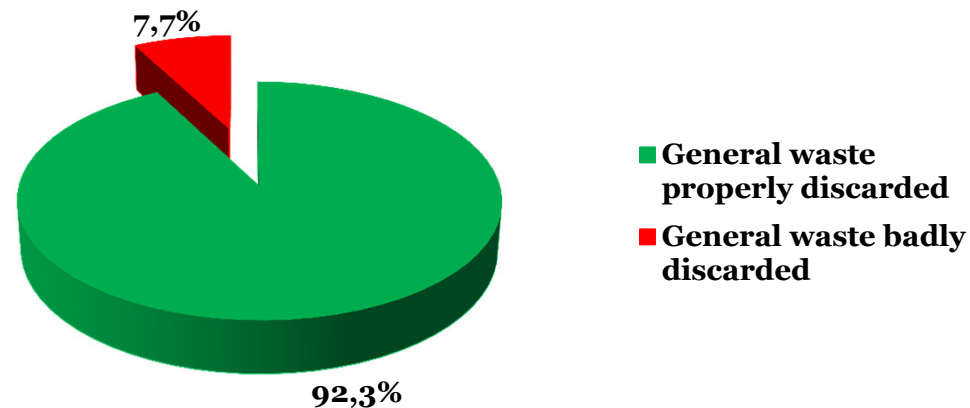
## Main fraction: paper and card board



$$BE_y = \varphi \times (1-f) \times GWP_{CH_4} \times \sum_j^y W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1-e^{-kj})$$

## Sorting waste: general waste

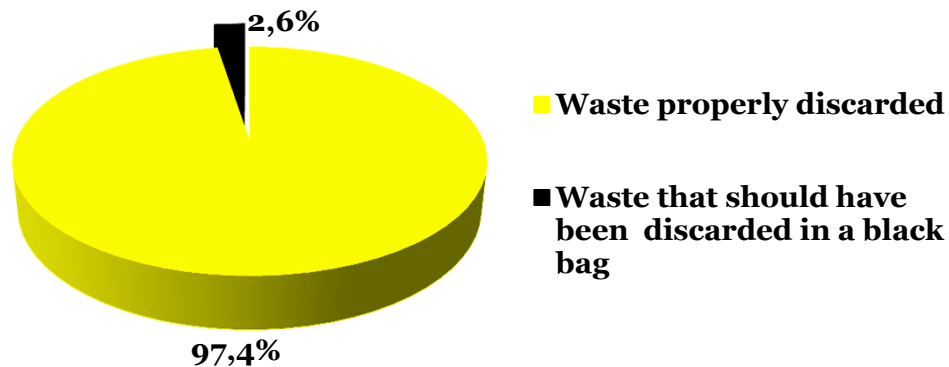
- A significant part of the waste generated in the REH is not properly sorted
- 7.7% or 717 kg will not be properly discarded / year



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## Sorting waste: paper and cardboard

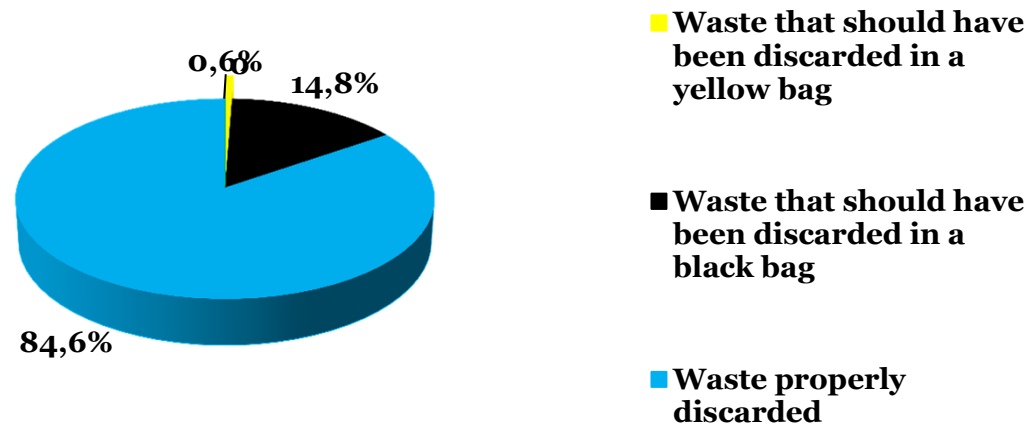
- 2.6% did not belong in yellow bags: cans, pet bottles, dirty tissues, handkerchiefs, post-its...  
→ 13.7 kg per month or 164.4 kg per year that are wrongly sorted into the yellow bags



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## Sorting waste: Blue bag for PMD

- About 15% not be properly discarded and rarely crushed to reduce volume

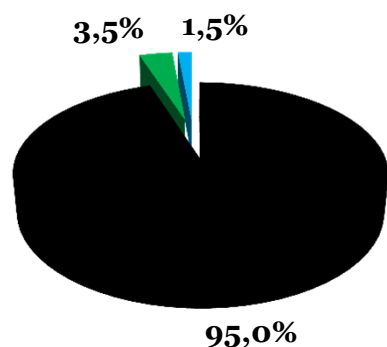


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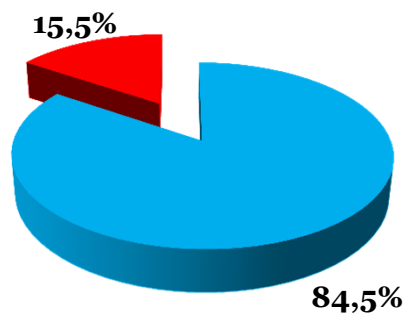
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## Sorting waste: PMD wrongly discarded

- In total 15.5% not properly discarded in the blue bag



- Waste properly disposed
- Waste that should have been discarded in a bin for glass
- Waste that should have been discarded in a blue bin



- PMD properly discarded
- PMD badly discarded



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## Mini-survey: REH tenants

- 85% has his/her own black bag for general waste
- 75% have yellow bags for paper (or boxes use for the same purpose)
- A significant part of the staff that they do not dispose can or PET bottles in the blue bags available in the kitchen > black bag
- No association (a part from EPIA in its kitchen) has blue bags

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## Conclusions: Office area

- Generates 9315 kg annually (or 93 kg per person working in the REH)
- 68% paper/card board: largest impact to be achieved
- 15.5% of office waste is not discarded in the correct bag: better recycling possible
- PET bottles and drinking cartons are rarely crushed to reduce volume
- 5% of waste consists of bathroom paper towels
- Organic waste is not recycled and incinerated
- REH tenants have baskets for general waste and paper

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# FINDINGS AND ANALYSIS

Event area

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## Waste generation event area

- Different nature of waste
  - Almost no paper
  - PET bottles properly discarded by cleaning team
  - Organic leftovers: consumed by REH staff 😊
  - Happy Hour: Glass bottles not recycled 😞
- Events without catering almost no waste (6g per pax)
- Waste generation at events with catering depends on caterer:
  - 40g, 104g and 233g per pax respectively

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## Waste generation event area



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## Potential for waste reduction in the event area

- Event 15 participants @ 40g per pax = 600g waste
- Event 15 participants @ 233g per pax = 3.5kg waste
- 3160 people @ 40g per pax = 126kg waste
- 3160 people @ 233g per pax = 736kg waste
- Average waste generation per year: 480kg waste

**Minimum possible reduction: 354kg!**

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## Mini-survey: Main caterers

- Interviewed 8 caterers (Biorganic Factory, Breaktime, El Vergel, Exki, Kamayammy, L'Orient, Pulp and Rama Rao)
- Some are more environmentally friendly than others
- All are prepared to use cutlery and china of the REH if available
- Would be able to provide reusable containers, trays, etc. if asked...

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## Event organisation: Figures

- 159 events (seminars and meetings...) in Jan/Feb 2012:
  - **1247 participants**
  - **29 events with catering for 528 people**
- Estimations on figures from Jan/Feb:
  - **About 7500 people will participate in meetings**
  - **Roughly 42% will receive catering (3160 people)**
- Receptions and Happy Hours...

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## Conclusions: Event area

- A substantial part of the waste could be avoided by re-using cutlery and china of the REH
- Due to a lack of storage space, PET bottles cannot be replaced by glass bottles
- PET bottles should be sorted and crushed to reduced volume
- Dedicated bins for proper sorting of glass bottles are missing in the lounge, kitchen and courtyard.



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**REH**

## Zero Waste Management Plan

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## REH Zero Waste targets 2015

- Commit to reach the following targets by 2015
  - 90 % of total waste generated prevented from being incinerated
  - 100 % avoidance rate of using disposable items such as plates, cups and cutlery
  - 100 % recycling rate for PET bottles, cans, drinking cartons, glass and organic waste
  - 35 % reduction of paper waste
  - 30 % volume reduction of PMD waste (15-16 containers less p.a.)

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## Zero Waste: Action Plan

- Launch event and signature of Terms of Commitment
- Awareness raising
  - Waste management (and energy efficiency) measures part of the REH introductory tour;
  - A4 hand-out for REH tenant also contained in the REH Guide received electronically;
  - Briefing session for cleaning team;
  - “Posters” will be available on key disposal points (kitchen, lounge, etc)
  - Regular updates will be communicated.

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## Proposed actions to AVOID!

1

- Buy cutlery, ceramic plates and glasses specifically for the events area
- Work with biodegradable cutlery and plates that can be composted.
- Potential saving:
  - 602 Euro spent on plastic cutlery, plates, etc
- Potential costs (examples):
  - Cutlery from IKEA Data 24 pieces at 24.95 Euro = 274.45 Euro for 66 pax
  - Plates from IKEA ARV at 2.50 Euro = 165 Euro for 66 pax
  - Bowles from IKEA ARV at 2.00 Euro = 132 Euro for 66pax

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## Proposed actions to **AVOID!**

**2**

- It is proposed not to buy Nutroma milk in little metal cups anymore and to use milk in small glass bottles or drink cartons instead.
- **Potential saving:**
  - 294 Euro spent on Nutroma milk cups
- **Potential costs:**
  - To be discussed

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## Proposed actions to **AVOID!**

**3**

- Buy glass bottles for water and juice, etc. instead of PET bottles
- OR
- Consider that meeting participants drink water from jars and where this water should come from (water fountains? tap water?)
- **Potential saving / Potential costs:**
  - To be discussed

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## Proposed actions to **AVOID!**

**4**

- Each association of the REH should calculate more accurately the number of brochures and other paper-based material to be printed since massive amounts are being thrown away each year.
- **Potential saving:**
  - Saving costs for everyone in printing brochures, etc.
  - Saving costs in paper containers (currently 52 containers = 260 Euro)
- **Potential costs:**
  - None

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## Proposed actions to **AVOID!**

**5**

- It should be discussed if hand dryers are an alternative to paper towel currently used i.e. energy use and noise
- **Potential saving:**
  - 2034 Euro currently spent on (14 km) paper towels
- **Potential costs:**
  - Dyson Airblade: 800£ at amazon.co.uk (incl.TVA)

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## Proposed actions to RE-USE!

- Paper should be re-used to also print on the other side or as draft paper. To this end, each person should keep a little tray holding paper that is already printed on one side.
- **Potential saving:**
  - Saving costs for everyone in buying new paper
  - Saving costs in paper containers
- **Potential costs:**
  - None

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## Proposed actions to RECYCLE!

1

- Place boxes or similar recipients in the kitchens, cantine und lounge to make glass collection easier
- **Potential saving:**
  - Saving costs in containers for general waste
- **Potential costs:**
  - 4 containers IKEA Samla Boite noir = 5 Euro
- Get rid of paper waste baskets and replace them with boxes to pile and collect paper properly.
- **Potential saving:**
  - Saving costs in paper containers and yellow bags
- **Potential costs:**
  - none

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## Proposed actions to RECYCLE!

2

- Take yellow bags for paper out of the kitchen, lounge and cantine and replace with boxes for organic waste
- **Potential saving:**
  - Saving costs in containers for general waste and yellow bags
- **Potential costs:**
  - none
- Open and flatten cardboard boxes to allow better use of space in the container.
- **Potential saving:**
  - Saving costs in paper containers
- **Potential costs:**
  - none

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## Proposed actions to RECYCLE!

3

- Each floor should receive several recipients at strategic points for the collection of PMD waste (from FOST PLUS)
- Plastic bottles, cans and drink cartons should be crushed before being disposed in the PMD recipients.
- **Potential saving:**
  - Saving costs in PMD containers (target 16 containers less = 80 Euro saved)
- **Potential costs:**
  - None

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$$BE_y = \varphi \times (1-f) \times GWP_{CH_4} \times \sum_{j=1}^y \sum_{x=1}^y W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1-e^{-kj})$$

## Proposed actions to RECYCLE!

4

- Organic waste should be collected and disposed in a composter that can be placed in the courtyard.
- **Potential saving:**
  - Saving costs in containers for general waste
- **Potential costs:**
  - 4 containers IKEA Retour Poubelle de tri 8.99 = 35.96 Euro
  - Composters (for example NatureMill Composter 15l (399\$) or GreenCone (99£))



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# THANK YOU FOR YOUR ATTENTION!

**ZERO WASTE: NO BURY, NO BURN!**



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# REH ZERO WASTE COMMITMENT 2015

SIGNATURE

 Greenovate!

  
NOVOCICLO

$$BE_y = \varphi \times (1-f) \times GWP_{CH4} \times \sum_j^y \sum_x W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1-e^{-kj})$$

CLIMATE SOLUTIONS