

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

Zero Waste Office: The Renewable Energy House (REH)

Astrid Severin, Greenovate! sprl



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The Renewable Energy House in Brussels: some figures



- Three buildings occupying 2800m²
- Head Quarters of 20 European renewable energy and environmental organisations
- Over 100 people workforce
- Up to 10000 visitors and participants in meetings and conferences per year



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

Zero Waste Office: The point of departure

- Exclusive use of renewable energy and reinforced energy efficiency policy
- 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 and glasses, bicycle parking...

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

Zero Waste Office: The approach

- Jan 2012: Get the management of the REH on board
- Jan_Feb 2012: Survey to analyse and benchmark waste
- March 2012: Draft report and Zero Waste Management Plan
- April 2012: Signature of Zero Waste Declaration
- May-Aug 2012: Implementation of first measures and involvement of REH associations (“Waste Ambassadors”)
- Sep 2012: Official launch
- June 2013: First evaluation planned in 2013

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

THE SURVEY Jan-Feb 2012

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

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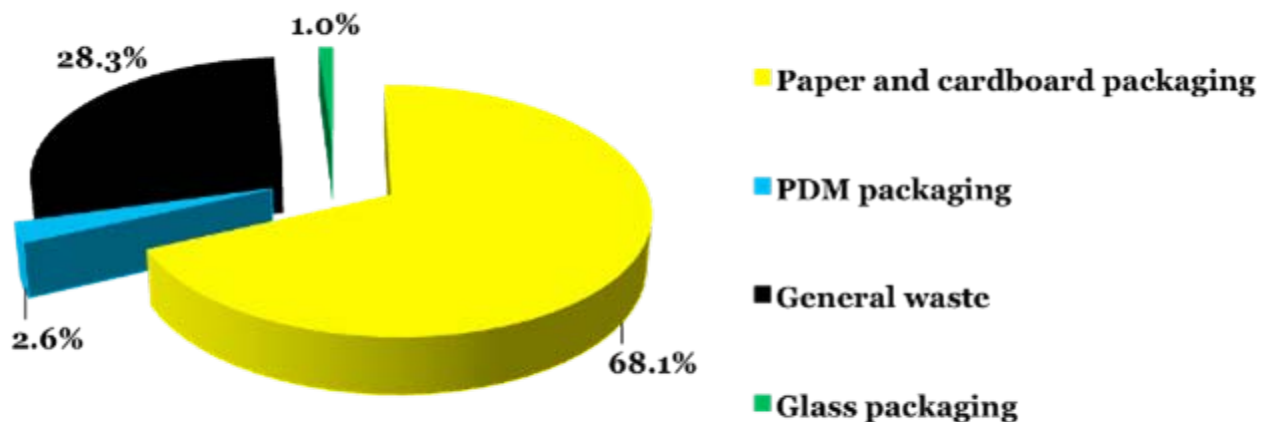
Zero Waste Office: The survey

- Waste sampling in two distinct areas:
 - **Office area (100 people)**
 - **Event area (10000 visitors)**
- 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

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

Office area: Distribution of waste

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



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

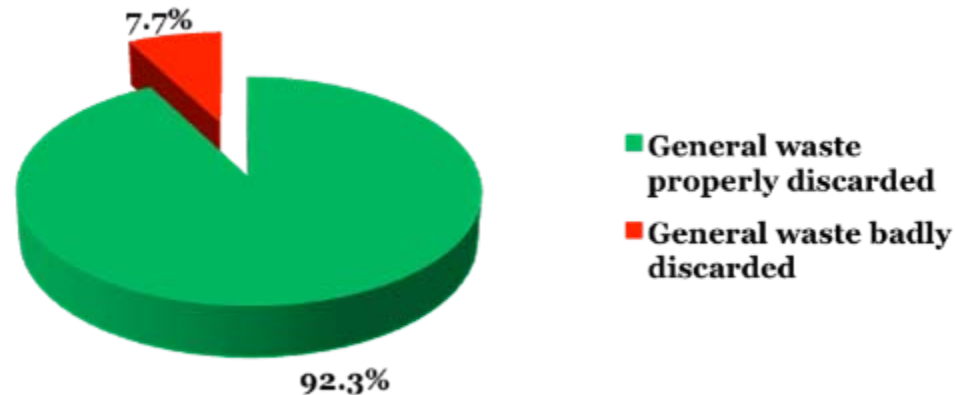
Office area: Main fractions are paper and card board



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

Office area: general waste

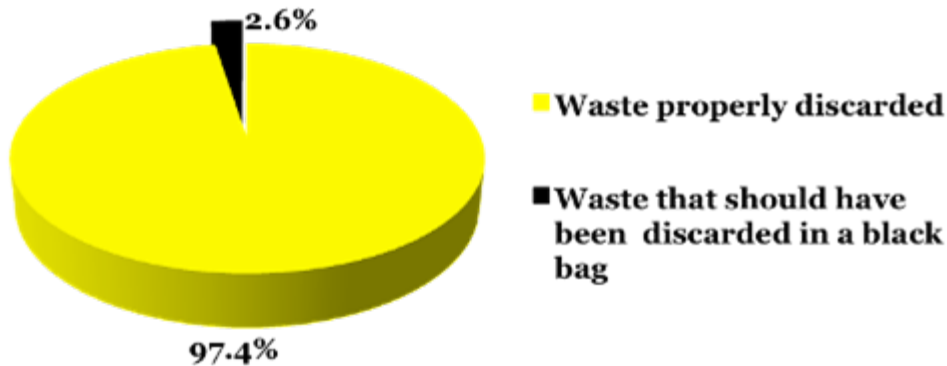
- A significant part of the waste generated in the REH is not properly sorted
→ 7.7% or 717 kg will not be properly discarded / year



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

Office area: paper and cardboard

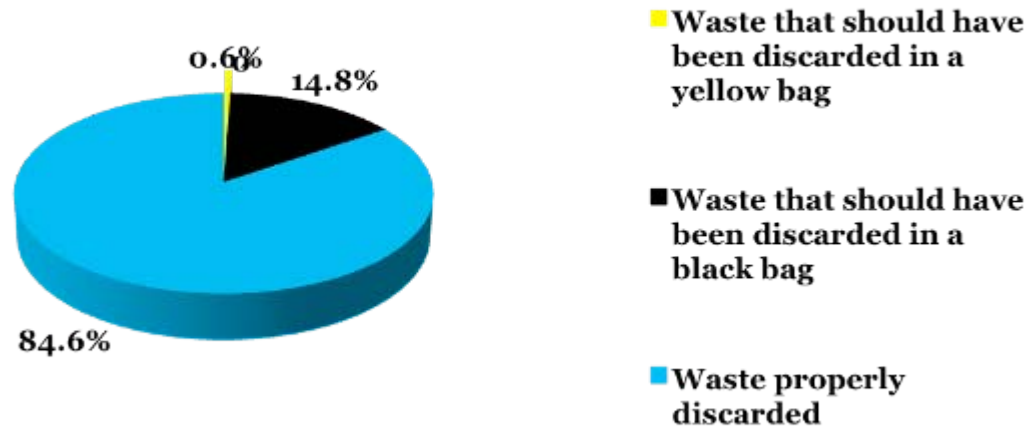
- 2.6% did not belong in yellow bags: cans, pet bottles, dirty tissues, handkerchiefs, post-its...
 → 13.7 kg per month or 164.4 kg per year that are wrongly sorted into the yellow bags



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

Office area: Blue bag for PMD

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

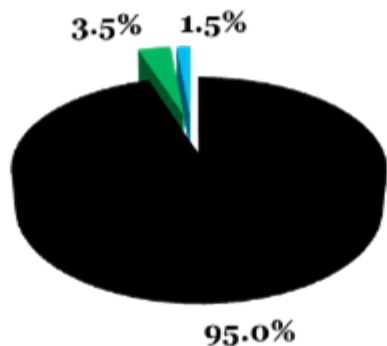


$$BE_y = \varphi \times (1-f) \times GWP_{CH_4} \times \sum_{j,x} W_{j,x} \times DOC_{j,x} \times e^{-kj} \times (1-e^{-k})$$

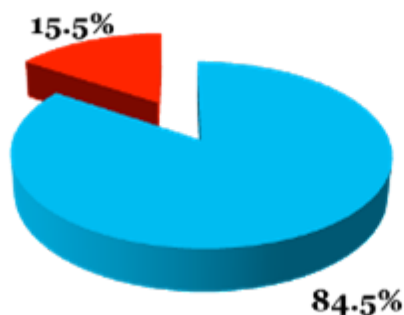
$$BE_y = \varphi \times (1-f) \times GWP_{CH_4} \times \sum_{j,x} W_{j,x} \times DOC_{j,x} \times e^{-kj} \times (1-e^{-k})$$

Office area: 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



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

Office area: Conclusions

- 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.

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

Event area: waste generation

- Different nature of waste
 - Almost no paper
 - PET bottles properly discarded (cleaning team)
 - Organic leftovers: consumed by REH staff 😊
 - Receptions: 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

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

Event area: Waste generation



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

Event area: 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...

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

Event area: Potential for waste reduction

- 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!

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

Event area: Conclusions

- A substantial part of the waste could be avoided by re-using cutlery and china of the REH
- Caterers are willing to come with cutlery and plates (at a cost)
- 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.

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

REH

Towards Zero Waste in 2015

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

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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.)**

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

Launch 24 April 2012



Renewable Energy House pledges to become 'zero waste' office

20 April 2012
News Europe & World Business & Industry



The Renewable Energy House (REH) has become the first zero waste office in Europe, in conjunction with SA, and the management commitment to achieve the basic principles of a zero waste office: reduce, reuse and recycle.

Brussels-based Greenovate, came out an an deposit at the REH in collaboration with a number of project waste diversion to 90 per cent include:

- Reducing plastic bottles
- Sorting the organic waste correctly
- Making sure that containers

For information please contact:
 Kim Vanguers, Secretary general of REH asbl
 Email: vanguers@rehbrussels.eu
 Astrid Severin, Managing Director of Greenovate sprl
 Email: astrid.severin@greenovate.eu

The Renewable Energy House (REH) commits to becoming the first Zero Waste Office Building in Europe.

Brussels 24th April 2012. Launch BEH Zero Waste Commitment in the REH, Brussels.

Today, Zero Waste Europe in conjunction with Greenovate! and Novociclo Ambiental SA, management structure of the Renewable Energy House, REH asbl, met at the Renewable Energy House in Brussels to sign a joint commitment to Zero Waste by 2015. The commitment is to meet the basic principles of a Zero Waste office: reduce, reuse and recycling waste.

We're looking forward to best using our resources and making the most of them for making the REH a better place to work.

REH President



The Renewable Energy House in Brussels goes Zero Waste!

The Renewable Energy House (REH) headquarters in Brussels is promoting sustainable energies in front of the European Union. It currently houses 100 people and it provides by example running the whole house completely on renewable energies. Now it also decided to be the first office building in Europe to go Zero Waste!



The REH knows better than anyone else that waste is, before anything else, a waste of energy.

Recycling vs producing anew from raw materials saves 95% of the energy for aluminum, 70% for paper & cardboard and 30% for glass. Going Zero Waste makes sense from the energetic point of view; the energy – and money! – savings will add to those already implemented in this office building by going renewable. Indeed, it is unlikely that in the short term renewable energies alone will be capable to solve the problems of energy supply in a world with soaring fuel prices. The first zero waste commitments perfectly the renewable energy sector for it.



The Renewable Energy House in Brussels goes Zero Waste!



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CLIMATE SOLUTIONS

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Action Plan

- AVOID
 - Cutlery, dishes
 - Water bottles
 - Printing brochures
- RE-USE
 - Paper
- RECYCLE
 - Paper, glass, plastic, organic material

What did we do so far?

- Formed a network of REH Waste Ambassadors (one representative for each of 20 REH associations)
- Organised a launch event with the Ambassadors
- Produced information material and displays
- Integrated Zero Waste Management into the REH Guidelines for newcomers



What did we do so far?

- AVOID
 - Avoiding 4638 PET bottles
 - Briefing on avoiding too much printing
- RE-USE
 - Briefing on re-use of paper
 - Event area:
 - Cutlery and china for meetings up to 25 people
 - Caterers with re-useable cutlery, plates for big events
 - Water fountains, glasses and jars for water

What did we do so far?

- RECYCLE
 - Exchanged yellow bags (paper) for blue bags (PMD)
 - Use cartons for recycling paper (partially)
 - Better recycling of PMD (almost 100%)
 - Glass (almost 100%)
 - Organic (almost 100%)



Challenges and next steps

- Challenges
 - Continuous communication required
 - Engaging everybody; every day
 - Paper and card board remain the big challenge
- Next steps:
 - March 2013: Re-launch information campaign and Ambassador network
 - June 2013: New survey against benchmark of Jan 2012

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

THANK YOU!

REH Management
REH Cleaning Team
REH Waste Ambassadors



Greenovate! sprl
Novociclo Brazil
Zero Waste Europe



Contact: Astrid Severin (astrid.severin@greenovate.eu)



$$GWP_{CH_4} \times \sum_{j=1}^y \sum_{k=1}^j W_{j,k} \times DOC_{j,k} \times e^{-k} \times (1-e^{-k})^{y-x}$$

CLIMATE SOLUTIONS