Parma towards Zero Waste

“Door by door waste collection and pay-as-you-throw system in a 190.000 inhabitants town”

Gabriele Folli, Deputy Mayor for Environment, Municipality of Parma
Parma plans
Reach 80% separate collection within 2016

- Extend door-to-door system on the whole territory
- Apply pay-as-you-throw system as a method of equity for citizens
- Introduce a cultural change in the habits of the citizens
- Introduce waste prevention and reduction at the source
At the beginning - nov 2012

- 48.5% separate collection
- Most of the territory served with on road waste containers
- Less than 1/3 of the citizens served with door-to-door collection system
- City of Parma responsible for about 40% of the whole waste production in the province
- High incineration costs (170 Euro/ton), low packaging recycling incomes
Information and participation

- Public meetings at the start of the new system in every district
- Meetings with foreign and religious group (Senegal, Islamic, etc)
- Meetings with shop owners, scouts, buildings administrators, schools
- Door-to-door information with operators

- Info points in every district
- Press, TV, social media, internet
- Smartphone apps
Information through web, apps & social media

- Dedicated portal and App for waste collection
- Dedicated website and App for invoicing
- Wide use of social media

Visita il nuovo portale

RACCOLTA RIFIUTI dove, come, quando.

la raccolta differenziata a portata di click
Main containers & waste type

- Organic waste collection
- Plastic, metals and tetra-pack collection with 80 lt bag
- Road collection for glass
- Paper and carton
- Door-to-door collection for residual waste

or

Bag or 40 lt bin with transponder
### Change from road containers to door-to-door waste collection

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Family container</th>
<th>Collection frequency</th>
<th>Building container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic waste</td>
<td><img src="image" alt="Organic waste" /></td>
<td>2/3 times a week</td>
<td><img src="image" alt="Building container" /></td>
</tr>
<tr>
<td>Plastic, metals and Tetra-pak</td>
<td><img src="image" alt="Plastic, metals and Tetra-pak" /></td>
<td>1 a week</td>
<td><img src="image" alt="Building container" /></td>
</tr>
<tr>
<td>Paper &amp; carton</td>
<td><img src="image" alt="Paper &amp; carton" /></td>
<td>1 a week</td>
<td><img src="image" alt="Building container" /></td>
</tr>
<tr>
<td>Glass</td>
<td><img src="image" alt="Glass" /></td>
<td>1 a week</td>
<td>*road collection</td>
</tr>
</tbody>
</table>
| Residual waste              | ![Residual waste](image) | 1/2 times a week    | ■ Delivery between 19,30 and 21  
■ Collection starting from 21 |
Facilitations for newborns, elders and disable

- Maximum discount in the PAYT system for families with newborns up to 30 months yr old and elders/disable with health problems
- Collection frequency doubled
Alternatives to door-to-door Eco-Station & Eco-Wagon

- Automated collecting stations for each waste type accessible with badge or twin-tub trucks with fixed paths and stops for city center active on days when standard service is not available.

- Supplementary services offered to users as an alternative to standard calendar for:
  - Working shifts, commuters
  - Extra production of waste
  - Holidays, etc.
## Eco-Station

### Benefits compared to underground facilities

<table>
<thead>
<tr>
<th></th>
<th>Underground facilities</th>
<th>Eco-Station</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchase cost</strong></td>
<td>High</td>
<td>1/3 or half</td>
</tr>
<tr>
<td><strong>Maintenance costs</strong></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Civil works</strong></td>
<td>Needed; uncertain archaeological finds</td>
<td>None</td>
</tr>
<tr>
<td><strong>Flexibility and reversibility</strong></td>
<td>Poor</td>
<td>High</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>Need to purchase dedicated trucks</td>
<td>Use of standard trucks</td>
</tr>
</tbody>
</table>
Timeline

- Zona 0 (November 2012)
- Lubiana-San Lazzaro (June 2013)
- Completamento Centro est (September 2013)
- Oltretorrente (October 2013)
- Montanara (October 2013)
- Molinetto (November 2013)
- Pablo-Golese (March 2014)
- San Leonardo (April 2014)
- Adeguamento Cittadella (June 2014)
- Adeguamento Frazioni (September 2014)

Pay-as-you-throw start July 2015
Pay-as-you-throw system through micro-chip on residual waste containers

In the first 6 months of PAYT system application

- More than 80% of the families has obtained the maximum discount
- More than 70% of the business activities has obtained the maximum discount
Door-to-door separate waste collection - 2011-2015 Results

<table>
<thead>
<tr>
<th>Category</th>
<th>2011</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic waste per capita (kg)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Residual waste per capita (kg)</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>Total urban waste per capita (kg)</td>
<td>283</td>
<td>283</td>
</tr>
<tr>
<td>Recyclable waste separate collection (%)</td>
<td>117</td>
<td>117</td>
</tr>
<tr>
<td>Recyclable waste separate collection (%)</td>
<td>556</td>
<td>523</td>
</tr>
<tr>
<td>Recyclable waste separate collection (%)</td>
<td>49</td>
<td>72</td>
</tr>
</tbody>
</table>
Residual waste per capita as the real performance indicator

Every citizen in Parma has sent to incineration half of residual waste compared to Bologna’s citizen (2014)

-130 kg/ab

Compared to the regional average of other capital cities
Total residual waste per capital city in Emilia Romagna (2014)
## More incomes from packaging materials

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Previous system</th>
<th>Actual system</th>
<th>Euro/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass, plastic and metals</td>
<td></td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Plastic, metals and Tetra-pak</td>
<td></td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>Glass</td>
<td></td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The table includes incomes from the disposal of different types of packaging materials under two systems: Previous and Actual. The Actual system shows a higher income per ton compared to the Previous system, indicating a more efficient or cost-effective waste management strategy.
More incomes from packaging materials

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VPB Glass, plastic and metals</td>
<td>16.91</td>
<td>11.879</td>
<td>212.488</td>
<td>4.759</td>
<td>80.486</td>
<td>1</td>
</tr>
<tr>
<td>GLASS</td>
<td>32.76</td>
<td>187</td>
<td>6.113</td>
<td>5.953</td>
<td>195.023</td>
<td>8.808</td>
</tr>
<tr>
<td>PB Plastic, metals</td>
<td>105.71</td>
<td>186</td>
<td>19.616</td>
<td>4.614</td>
<td>487.784</td>
<td>6.912</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>226.607</strong></td>
<td></td>
<td><strong>763.275</strong></td>
<td></td>
</tr>
</tbody>
</table>

+800.000 Euro
Conai incomes with the new model (+340%)
+35% materials recovery
Separate collection of glass

- 2012: 0.98 kg/ab/anno
- 2013: 8.51 kg/ab/anno
- 2014: 31.06 kg/ab/anno

Intercettazione separata vetro
### Overall Economics Effects

- **-3.5 millions €**

**Incineration Costs**

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual waste collection and transport</td>
<td>5.300.099</td>
<td>6.868.191</td>
<td>1.568.092</td>
</tr>
<tr>
<td>Residual waste treatment and incineration</td>
<td>9.050.214</td>
<td>5.563.844</td>
<td>-3.486.370</td>
</tr>
<tr>
<td>Recyclable materials collection</td>
<td>14.063.648</td>
<td>15.049.744</td>
<td>986.096</td>
</tr>
<tr>
<td>Recyclable materials treatment and transport</td>
<td>1.957.782</td>
<td>2.752.128</td>
<td>794.346</td>
</tr>
<tr>
<td>Incomes from recyclable materials (Conai)</td>
<td>- 805.295</td>
<td>- 1.340.000</td>
<td>- 534.705</td>
</tr>
<tr>
<td>Street cleaning and other services</td>
<td>5.908.646</td>
<td>6.127.451</td>
<td>218.805</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>35.475.094</td>
<td>35.021.358</td>
<td>- 453.736</td>
</tr>
</tbody>
</table>
Overall occupation effects

- Changing from road waste containers to door-to-door collection has created more jobs
- From 2006 since today operators dedicate to collection has increased by 57%

+57% jobs on waste collection
Waste bill timeline

3 persons family in 100 sqm
* For 2015 considered maximum discount possible
Control and fine of littering

- Task force to control, inform and issue fines to illegal activities
- Dedicated personnel of the municipality, the contractor and volunteers
- Wide use of video control systems
Waste prevention
Public water in school canteens and public water dispensers

- **Elimination of plastic bottles in school canteens** (93 schools; more than 15,500 children involved)
- 5 public water dispensers (sparkling and still) with more than 40,000 liters/month supplied

**Avoided energy in PET bottle production & transport for school canteens**

- 219,000 1.5 lt PET bottles
- 7,328 kg of plastics
- 128,000 lt of water
- 183 kg sulfur oxide
- 161 kg carbon monoxide
- 16,855 kg carbon dioxide
Pilot project started in a child day care center to substitute single-use diapers with washable diapers:

- Less waste
- Positive change in child habits
Waste reduction and prevention
Eco-Events project

- Contribution to organizers of eco-events with advantages in terms of:
  - Free supply of compostable dishes
  - Zero costs for publicity and waste treatment
Installation of 5 eco-vending machines that accept packaging waste such as plastic bottles, metal cans, etc and issue a bonus discount.
Re-use center started in April 2016 to prevent waste production of furnitures, electric appliances, etc.

- Repair laboratory inside the center
- Educational activities with schools
Incentives for domestic composting

- 12% discount on the waste bill for users
- At least 1000 families are making domestic compost
- Community compost facilities also available
Customer Satisfaction Survey

- Interviews with CATI method in February 2015
- Local and national comparison

<table>
<thead>
<tr>
<th>Customer Satisfaction Index</th>
<th>Parma</th>
<th>Piacenza</th>
<th>Reggio Emilia</th>
<th>Nazionale</th>
<th>Emilia-Romagna</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSI Totale</td>
<td>85,9</td>
<td>86</td>
<td>90,3</td>
<td>74,5</td>
<td>80,2</td>
</tr>
<tr>
<td>CSI Servizio</td>
<td>85,6</td>
<td>86,5</td>
<td>90,4</td>
<td>72,7</td>
<td>78,3</td>
</tr>
<tr>
<td>CSI Relazione</td>
<td>89,8</td>
<td>72,2</td>
<td>87,1</td>
<td>80,5</td>
<td>86,6</td>
</tr>
</tbody>
</table>

- Collection frequency, timetable, containers supplied by the contractor, number of bins, street cleaning, information, cost/quality, ecologic centers, contact center response, problems solving, etc.
Merceological analysis of the residual waste after 69% separate collection

- Organic: 22.98%
- Plastics: 26.40%
- Metals: 10.01%
- Textiles: 13.55%
- Glass: 0.40%
- Wood: 5.08%
- Paper & carton: 14.38%
- Batteries: 0.00%

December 2014
Information through web, apps & social media

- Dedicated portal and App for waste collection
- Dedicated website and App for invoicing
- Wide use of social media
Dedicated portal and App for information on waste collection

Georeferenced information based on user address to give custom data on:

- Days, hours of collection for each type of waste
- Street cleaning dates
- Waste bin position and emptying calendar
Dedicated portal and App for information on waste collection

- Days, hours of collection for each type of waste (extra info on type of container, holidays, other useful info)
Dedicated portal and App for information on waste collection

- Street cleaning dates and times (type of service, frequency, waste bin location and emptying frequency)

Pulizia strade e altri servizi

**SPAZZAMENTO MANUALE**
- GIOVEDI (POMERIGGIO)
- LUNEDI (MATTINO)
- MERCOLEDI (MATTINO)
- SABATO (MATTINO)
- VENERDI (MATTINO)

**COMBINATO (SPAZZATRICE + OPERATORE MANUALE)**
- OGNI 9 GG C.A. (MATTINO)
### Benvenuto nella sezione di calcolo della TARI (Tassa Rifiuti)

<table>
<thead>
<tr>
<th>Comune</th>
<th>1034027 - PARMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mq</td>
<td>100</td>
</tr>
<tr>
<td>Componente</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Contentitore (vuotature min.)

- Mastella 40 lt (24)
- Sacchetto 50 lt (48)
- Mastella 40 lt (24)
- Bidoncino 120 lt (3)

| Numero vuotature eccedenti | 5 |

- **Possibility to check costs depending on how many times the container for residual waste is emptied**
- **Available both for families and business**
TARIFFA UTENZE DOMESTICHE

Comune: 1034027 - PARMA

Metri quadrati: 100

Numero componenti: 3

Importo da pagare: € 252,43
(Corrispondente a: € 84,14 pro-capite)

Tale importo è suddiviso nelle seguenti parti:

Parte fissa: € 78,90

Attività di igiene Ambientale quali spazzamento e lavaggio strade, gestione dei rifiuti abbandonati su ecc.

Parte variabile: € 161,51

Quota contenitori € 37,10

Raccolta e trasporto dei rifiuti, raccolta differenziata e avvio al recupero, gestione e attività degli imp.

Contributo ambientale provinciale (5%): € 12,02

Calcolo effettuato con le tariffe deliberate per l'anno 2015.

Possibility to check costs depending on how many times the container for residual waste is emptied
Available both for families and business
**Eco-wagon waypoints**

- Eco-wagon stops and times
- Brochure with calendar delivered to each family/business activity in the city center

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**Punti di raccolta sosta di 25 min**

<table>
<thead>
<tr>
<th>INDIRIZZO</th>
<th>DOVE</th>
<th>Lun - Mer - Ven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Via Giuseppe Verdi, 10/a</td>
<td>dietro edicola - sul marciapiede</td>
<td>13:00 - 13:25</td>
</tr>
<tr>
<td>Strada delle Fonderie, 7</td>
<td>ecoisola vetro</td>
<td></td>
</tr>
<tr>
<td>Via dei Farnese, 6</td>
<td>fronte civ. 5 - lato chiesa</td>
<td></td>
</tr>
<tr>
<td>Borgo S. Spirito, 29/a</td>
<td>angolo Vicolo Grossardi</td>
<td></td>
</tr>
<tr>
<td>Piazzale S. Croce, 27</td>
<td>sul piazzale</td>
<td></td>
</tr>
<tr>
<td>Piazza Guido Picelli</td>
<td>sul piazzale</td>
<td></td>
</tr>
<tr>
<td>Strada Imbriani, 2</td>
<td>lato chiesa Annunziata</td>
<td></td>
</tr>
<tr>
<td>Vicolo S. Maria</td>
<td>lu - me - ve 13:00 - 13:25</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indirizzo</th>
<th>dove</th>
<th>Lun - Mer - Ven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Via Alberto Riva, 2</td>
<td>angolo Via Filzi Fabio</td>
<td>13:00 - 13:25</td>
</tr>
<tr>
<td>Strada Costitutente, 10</td>
<td>angolo Borgo dei Grassani</td>
<td>13:32 - 13:57</td>
</tr>
<tr>
<td>Strada Costitutente, 2</td>
<td>angolo Strada Bixio</td>
<td>14:01 - 14:26</td>
</tr>
<tr>
<td>Viale Gorizia, 19/b</td>
<td>angolo Strada Bixio</td>
<td>14:32 - 14:57</td>
</tr>
</tbody>
</table>
Where do I throw it?

- For each type of waste indication of type of container and/or destination (i.e. recycling center)
Other infos on map

- Dog areas and their cleaning calendar
- Recycling centers
- Public water dispersers
Downloadable material

- All brochures, calendars, instructions are available for download
In one month more than 7,000 users
More than 50% between 18 and 34 yr old
More than 60% desktop access
30% of the users are returning visitors
30% of the sessions last more than 1 min
App Ecolren – Reporting features

Users can send feedback to waste collection company with photo and address for:
- littering
- damaged containers
- missing collection
- Other
Users can book a free of charge withdrawal of bulky waste directly from the app, for big volume waste such as:

- furniture
- Electric appliances
- Bedding, etc.
App Ecolren – Recipes for food leftovers

A series of recipes where users can re-use food leftovers and avoid waste!
App ClickIren – Control invoices and verify container micro-chip reading

- In pay-as-you-throw systems part of the bill is related to how many times the residual waste container is emptied.
- With the app users can check in real time how many times the container has been emptied.
Users can verify invoices not only for waste but even for electricity, gas and tele-heating services (if applied)
■ All invoices are stored and can be examined both on the app and on the web portal.
Thanks for your attention

Gabriele Folli
Deputy Mayor for Mobility & Environment
Comune di Parma

e-mail: folli@comune.parma.it