



MUNICIPAL SOLID WASTE MANAGEMENT IN MILAN

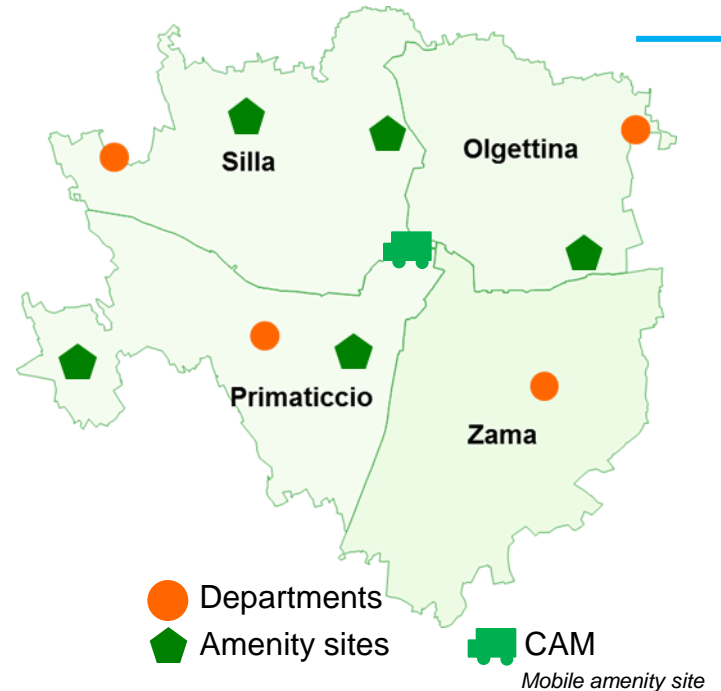
SEPARATE WASTE COLLECTION
IN THE CONTEXT OF A CIRCULAR
ECONOMY IN EUROPE

Bruxelles, January 29th, 2016

AMSA KEY NUMBERS

AMSA manages **collection, transportation and disposal of waste, as well as cleansing services** in the city of Milan.

- **Milano and 12 municipalities** as main clients
- ~**2.3 million** people served (800,000 city users included)
- ~**786,500 t** of MSW collected in 2015
- **500,000 km** of swept roads per year
- ~**1,400** waste collection and street sweeping vehicles
(30% CNG fueled)
- **ISO 9001, ISO 14001** and **OHSAS 18001** certifications



The «MILAN MODEL» IN MSW MANAGEMENT

Organizational and technological choices for the efficiency in collection

Collection and treatment

- Orientation towards **increasingly domestic collection system** and integration with other modes (**amenity sites and CAM – mobile amenity site**)
 - Introduction of household organic waste collection
- Waste treatment based on **handling of recyclable materials** and on the **recovery of energy from residual fraction** (Zero landfill)

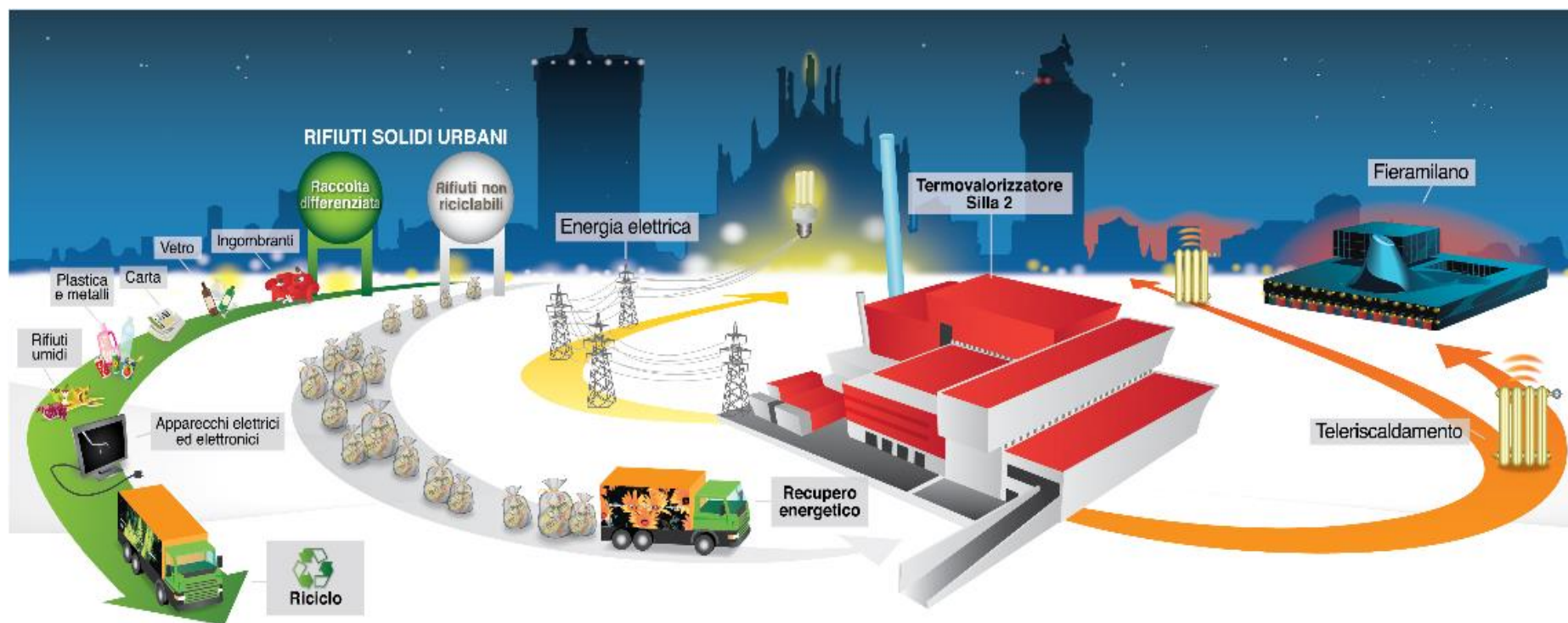
Environmental sustainability

- **Reducing vehicle emissions** (methane fleet > 30%)
- **Reducing impact on traffic** (diversification in services scheduling)

- **Goals of service quantity and quality**
- **Service efficiency**

MILAN INTEGRATED WASTE MANAGEMENT SYSTEM:

Separate waste collection and recovery of energy and heat

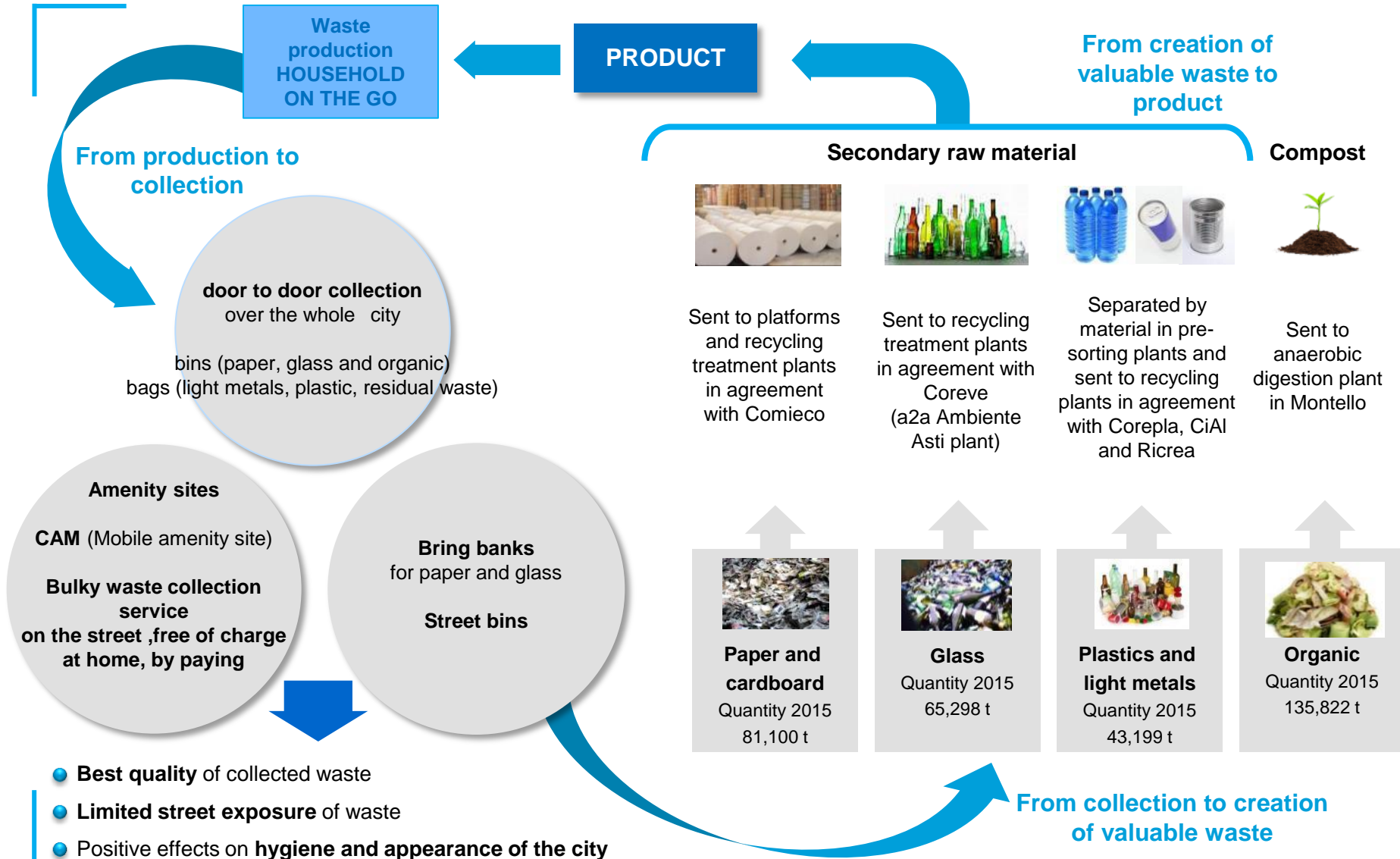


Typical parameters of an integrated waste management system:

- **Separate collection rate** - Maximizing separate waste collection geared to the actual recovery of materials
- **WtE** - Recovery of energy and heat through thermal treatment of **NON** recyclable waste
- **Zero landfill** (since 1997)

THE «MILAN MODEL» IN MSW MANAGEMENT

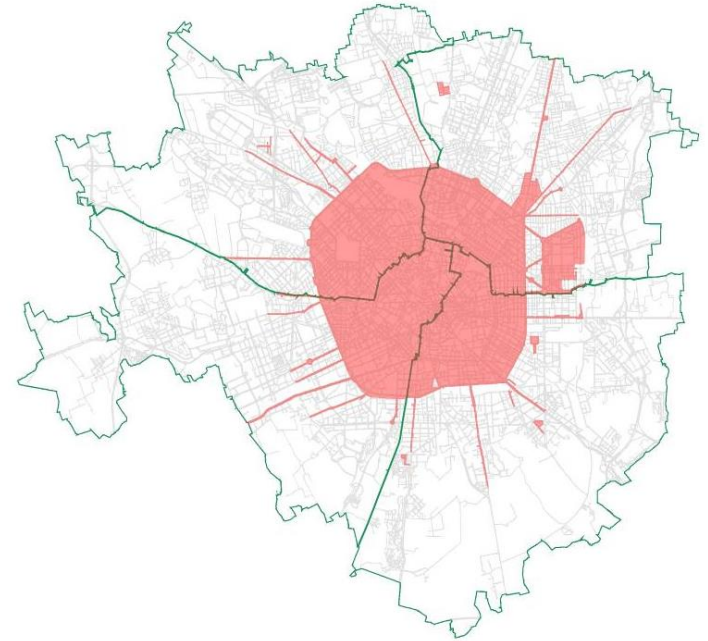
Separate waste collection, an example of circular economy



WASTE SEPARATE COLLECTION IN MILAN

Times and methods

- **Door to door collection** over the whole city with:
 - bins (paper, glass and organic)
 - bags (light metals, plastic, residual waste)
- **55,000 collection points**
- Residual and organic waste collection twice a week
- **Waste storage** in private premises within buildings
- Waste bins and bags brought on the street in specific days and times set by Amsa
- All pick-up services are carried out between **5:30 am and 11:20 am from Mon to Fri, between 6:50 and 11:40 on Sat (Sun services only for commercial users)**
- The city center (highest traffic area) is served before **8:15 am**



WASTE SEPARATE COLLECTION IN MILAN

Garbage pick up frequencies



Clear bag (residual waste)

Twice a week



Yellow bag (plastic and metals)

Once a week



Cardboard

Twice a week



White containers (paper)

Once a week



Green container (glass)

Once a week



Brown container (organic)

Twice a week for domestic waste

Every day for commercial waste

WASTE SEPARATE COLLECTION IN MILAN

Integrated plan for waste collection 2012-2014

BEFORE

- Milano is the **second largest city in Italy** with **1.3 million inhabitants**, over **7,000 inh./km²** and over **80% of families live in high rise buildings**
- In **2011**, Milan had **35% separate collection rate**, mainly dry recyclables collected with door to door system
- Only organic waste from commercial activities as restaurants, supermarkets, hotels, schools was collected separately and composted



ACTION PLAN

Action plan in 2 phases:

1. Introduction in 2012 of the **transparent bag** to replace the black bag **for residual waste collection**
2. Introduction in 2012 of the **households food waste collection**

OPERATIVE PLAN TO OPTIMIZE COLLECTION SERVICE IN MILAN

Household organic collection

Operative plan

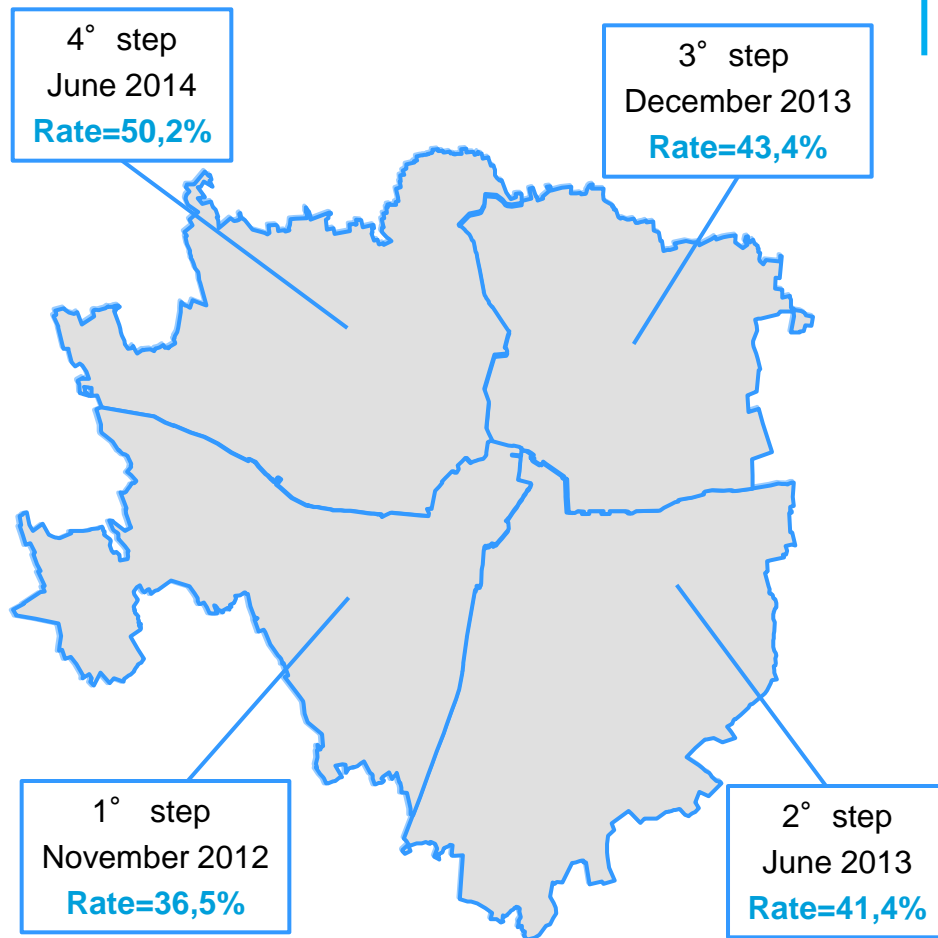
- **Door to door waste bins collection**
- Sizing of a **new collection system** and construction of a theoretical optimal model based on key elements (weights, users, routes, productivity, ...)
- Activities coordinated with the Municipality of Milan
- **Delivery of kits to households** with:
 - ✓ Informative leaflets and cards
 - ✓ compostable bags and 10lt bins as initial equipment (sponsored, free for citizens)



Quality analysis

- Compostable waste fraction consists of **kitchen waste**, with a negligible presence of paper, cardboard and green waste
- **Main contaminants: plastic bags** used improperly as containers (90% of NC fraction)

4 step implementation program



OPERATIVE PLAN TO OPTIMIZE COLLECTION SERVICE IN MILAN

Households kit



Wheeled bin

120 lt. wheeled bin at the curbside. Standard equipment for every building. Also available a **smaller 35 lt. bin** on request



Note: bins are given free loan to citizens

Ventilated kitchen bin

The small **kitchen bin** has a **special airy structure** to ensure optimal oxygenation of the bag and its content **and thus minimizing** the inconvenience related to the formation of **odors and liquids**.



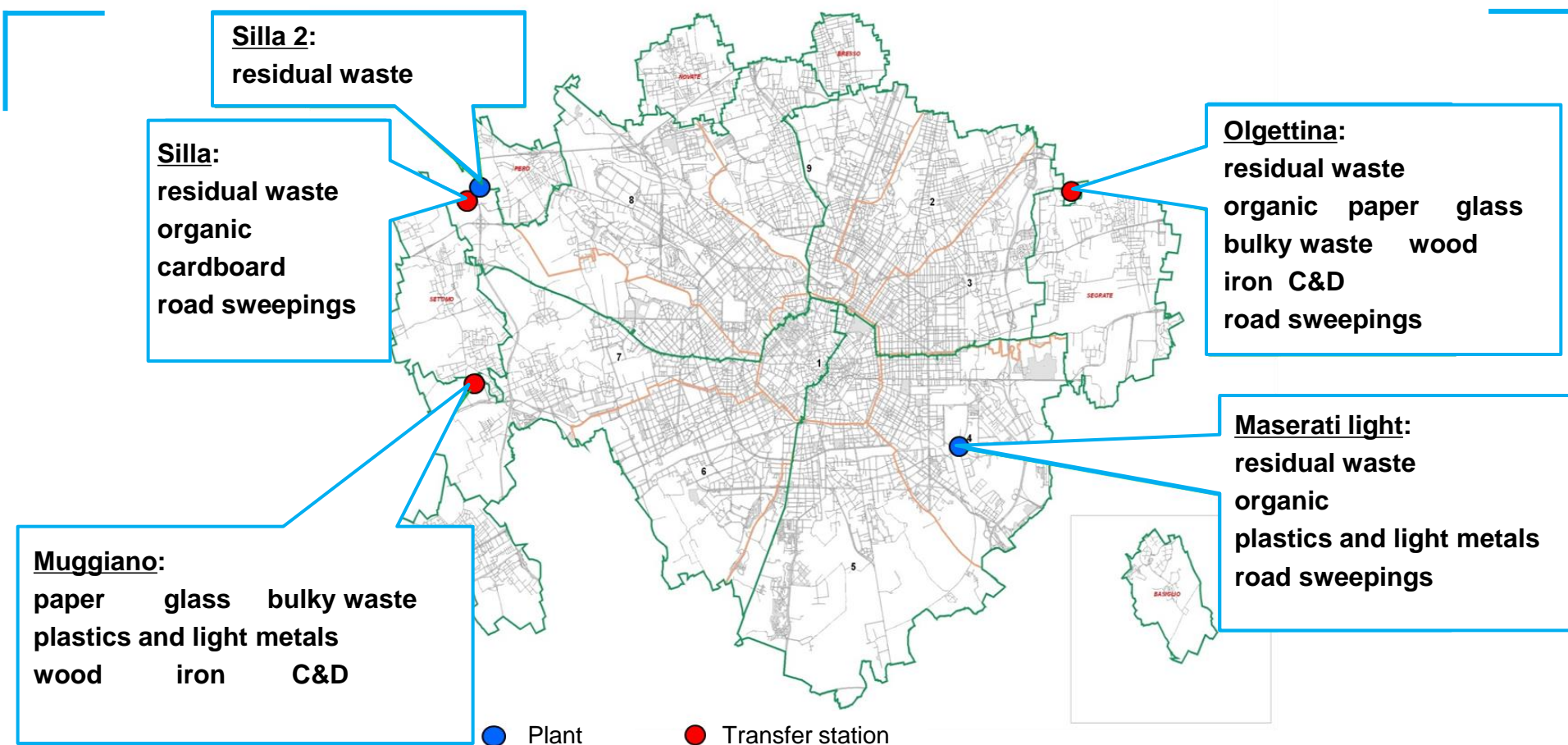
25 compostable bags

Bags made of **bioplastics** have **properties** and **characteristics** of use **very similar to traditional plastics**, but at the same time, they are **biodegradable and compostable** according to the European standard EN 13432



LOGISTICS AND DISPOSAL

Transfer stations and plants



AMSA has optimized **its** collected waste **transport system** to treatment centers, taking into account the criticality of a city like Milan (traffic, road conditions, different vehicles for collection, etc.) with a **network of transfer stations**: this system of **second level logistics** allows to reduce transfer times, to optimize the use of the vehicles and to reduce logistics costs.

COMMUNICATION TOOLS TO OPTIMIZE COLLECTION SERVICE

- **Customer Center** (24/7)
- **Web-site** www.amsa.it
 - possibility of downloading communication material in 8 languages (English, Spanish, French, Arabic, Chinese, Ukrainian, Romanian and Sinhalese)
 - search engine to control roads and paths reached by service
- **App** **PULIamo** for all mobile operating systems
- **Publications and information materials** (brochures, leaflets, audio / video, etc.)
- **Media relations** (press releases, interviews in newspapers and the trade press)
- **Passive advertising** (campaigns with billboards, commercials,...)
- **School Project** with educational tours for students (from elementary to high school)
- **Guided tours** of departments and facilities



RECALL ACTIONS AND SPECIFIC TARGETS CAMPAIGN

Information campaign on quality

Il sacchetto, quale ci metto?

I sacchetti non sono tutti uguali. Per raccogliere l'umido si devono utilizzare solo sacchetti compostabili, certificati:

Possono essere utilizzati anche i sacchetti compostabili della spesa.

Utilizzando i sacchetti compostabili la qualità della raccolta è migliore e si evitano sanzioni.

Per informazioni: www.amsa.it servizioclienti@amsa.it 800-332299

Ethnic campaign for separate collection in Milan

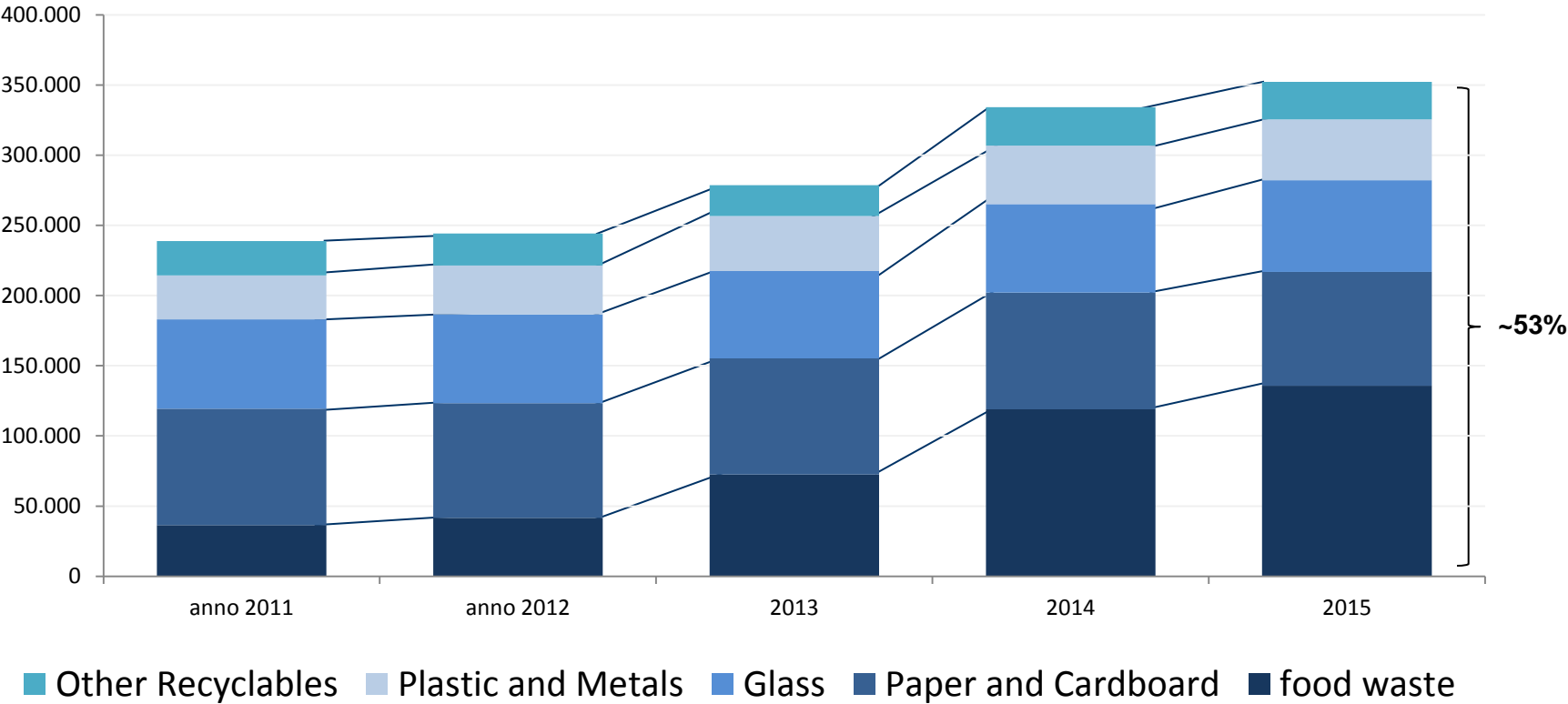


- **180,000 guides in 10 languages:** Italian, English, Spanish, French, Arabic, Chinese, Ukrainian, Romanian and Sinhalese and Tagalog
- **One to one distribution,** foreigners among people of the same Nation

RESULTS

Separate collection rate trend in Milan

	2012	2013	2014	2015
TOTAL MSW	666.418	649.838	665.641	668.158

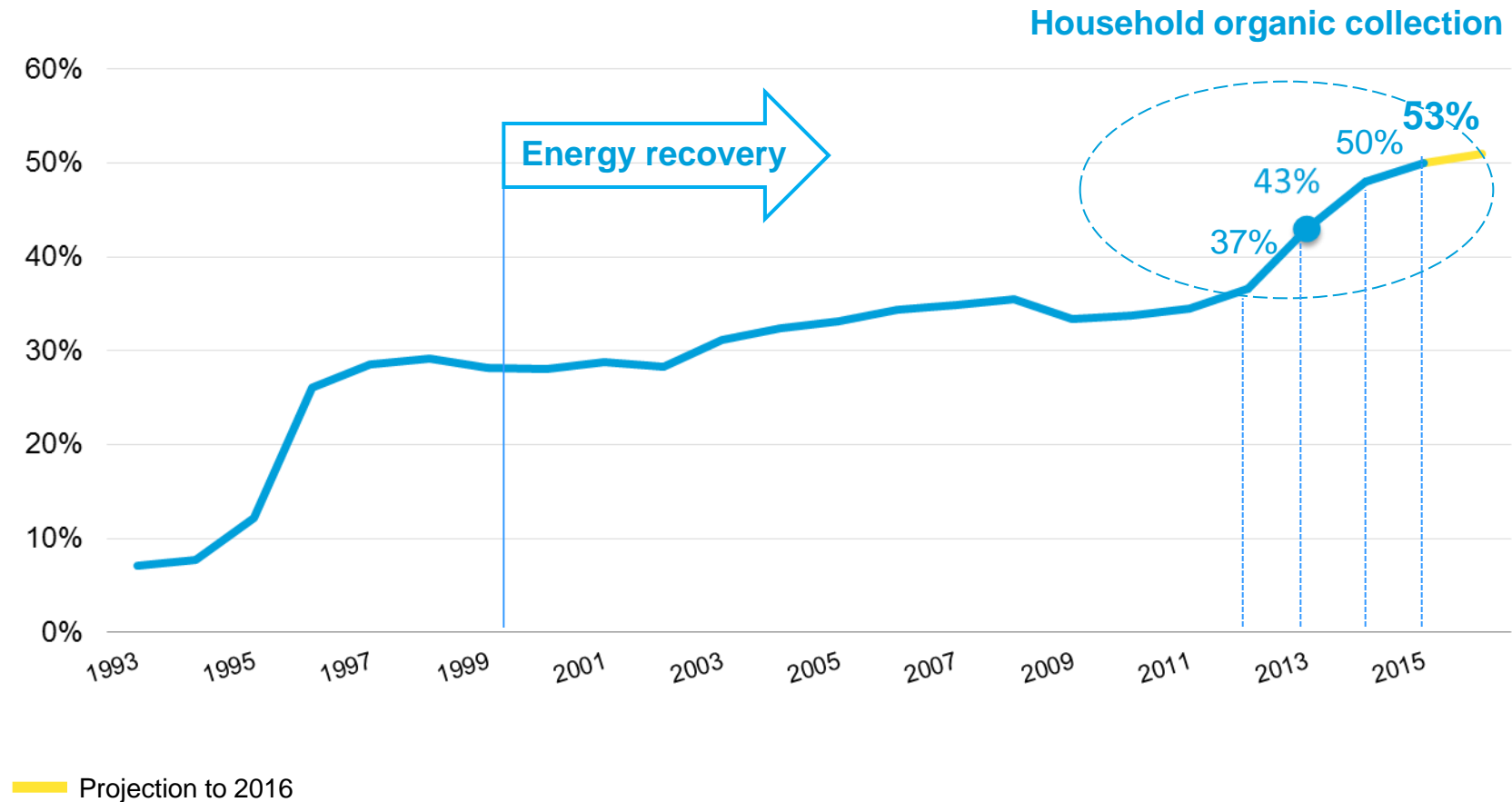


Elaborazione dati Amsa

RESULTS

Separate collection rate in Milan

TREND OF SEPARATE COLLECTION RATE IN MILAN (1993-2015)



CONCLUSIONS

Door to door collection system allows to be more efficient in order to achieve a better quality of all recyclable fractions and to minimize the residual solid waste fraction

Door to door collection service has been designed taking into account needs of **user comfort** and, most of all, **hygiene**

Residential organic waste collection has exceeded expectations leading Milan to break the **50% recycling in 2014**

The case of Milan shows that it is possible to implement **household organic separated waste collection system in densely populated metropolitan cities** with **excellent quantitative results and high standard service**



The “Milan model” in MSW management with the collection and recycling of waste (dry and wet fractions) contributes virtuously to the implementation of an innovative system of circular economy