



Comune di  
**Milano**

**City of Milan - improvement of air quality and the  
environment**

**TOKYO FORUM FOR CLEAN CITY & CLEAR SKY**

May 22 - 23 , 2018

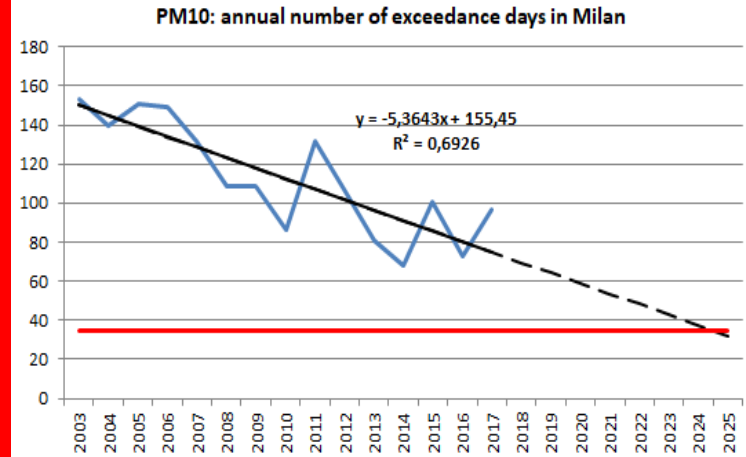
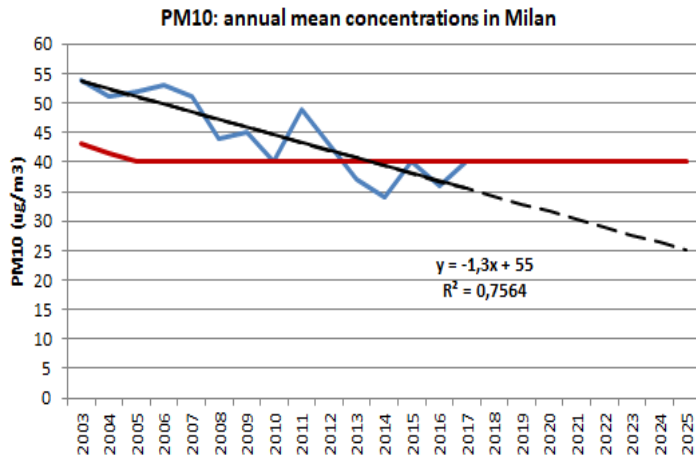
# Levels of environmental criticality

**PM10 has declined since 2002**, by the number of Daily Value Limits exceeded, however, the legal limit (35 exceeds a year) has never been respected.

It is estimated that **the annual average concentrations of PM10 should drop below 25 ug/m3**, in order to meet this limit in the typical weather conditions of Milan.

## EMISSIONS IN THE ATMOSPHERE (2015)

CO2	1.080 kTon/year
NOX	2.885 Ton/year
PM10	209 Ton/year



# Milan's Mobility Figures

**Inhabitants Milan city:**

~ 1.3 M

180 km<sup>2</sup>, ~ 7300 inh/km<sup>2</sup>

**Inhabitants Metro area:**

~ 3.2 M

1570 km<sup>2</sup>, ~ 2000 inh/km<sup>2</sup>

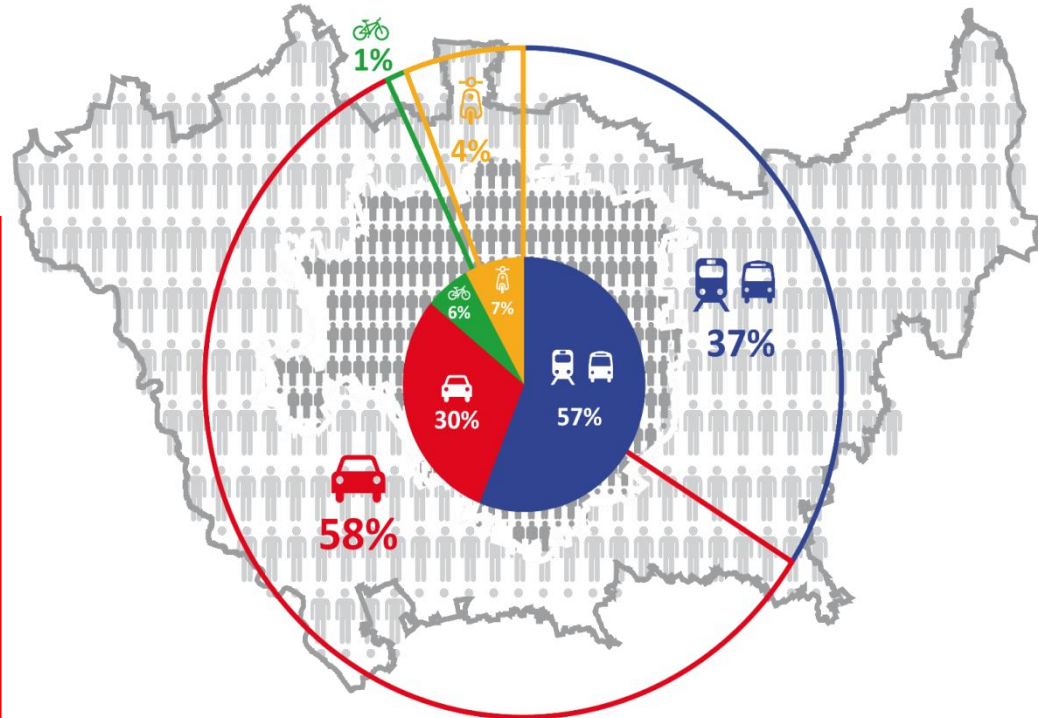
**Daily city users:** ~ 1 M

**Overall Mobility  
(trips/day, 2013):**  
5.255.000

**Trips in Milan:**  
2.978.000 (56%)

**Trips between Milan  
and the metropolitan  
area:**  
2.277.000 (44%)

**Motorization Rate: 50,5 cars per 100 inhabitants**



# Milan's Mobility Figures: public transportation

## Suburban Lines



12 lines  
599 km

## Subway Lines



4 lines  
180 km

## Tram



18 lines  
323 km

## Filobus

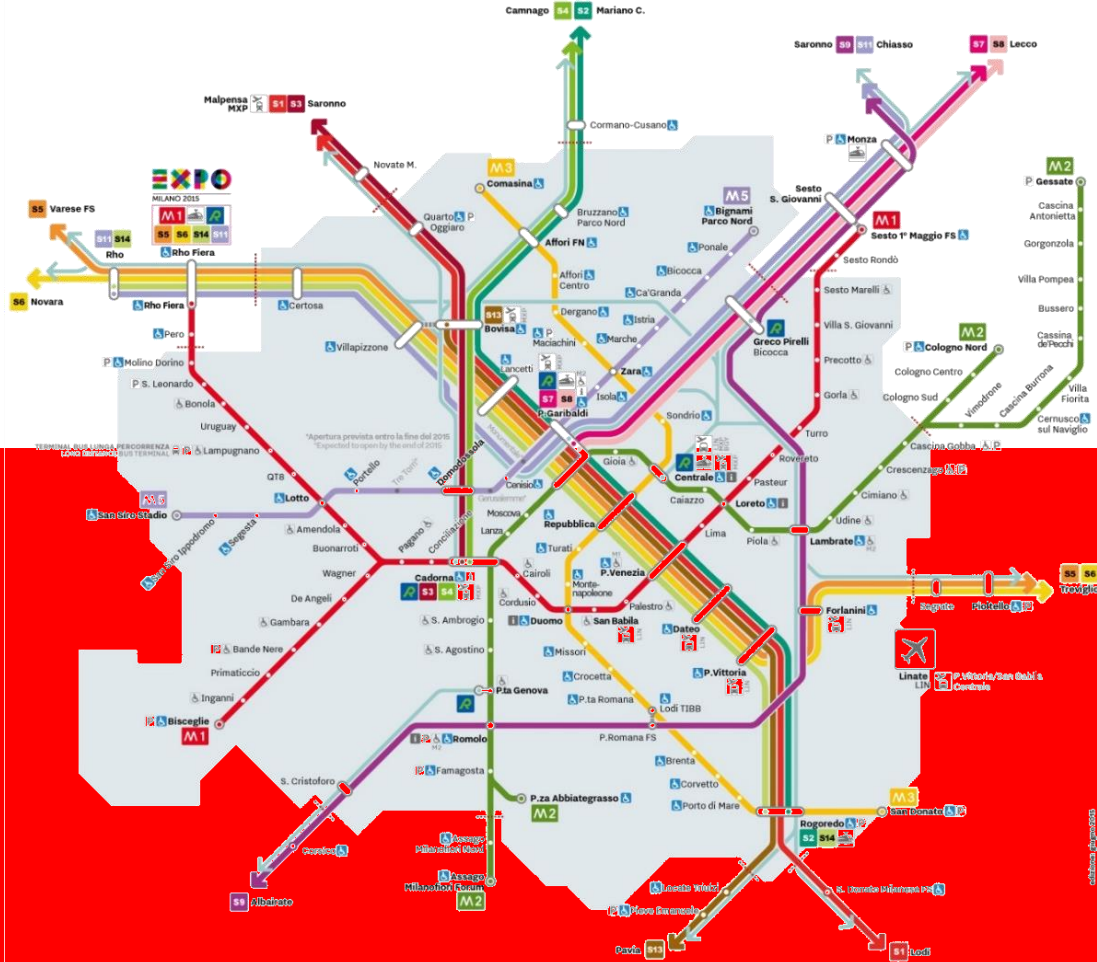


4 lines  
77 km

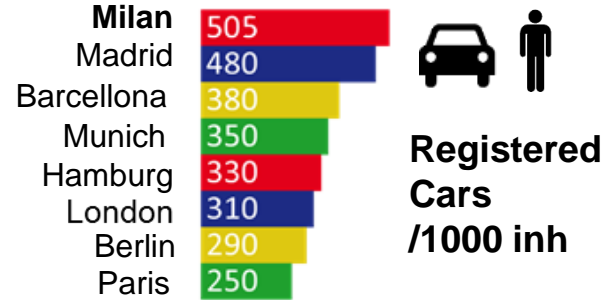
## Bus



117 lines  
2106 km



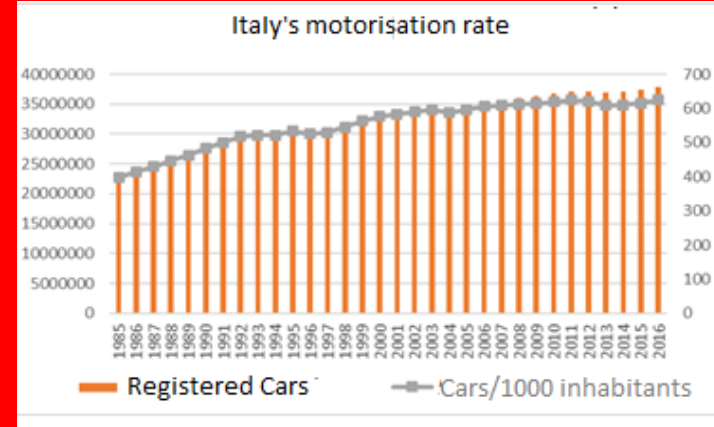
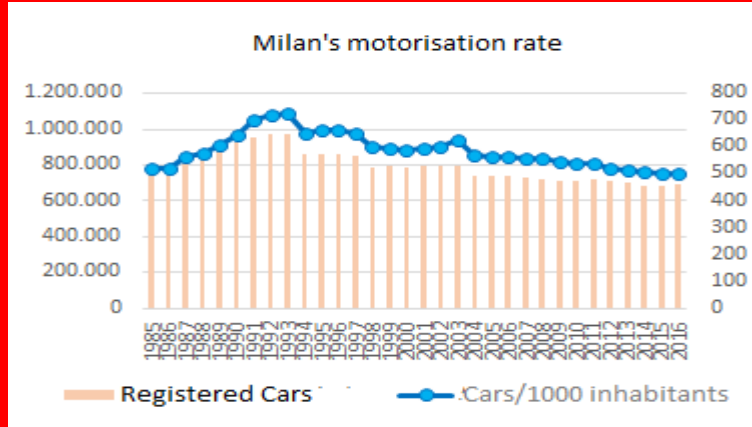
# Milan's Mobility Figures



Milan

Registered Vehicles

Italy

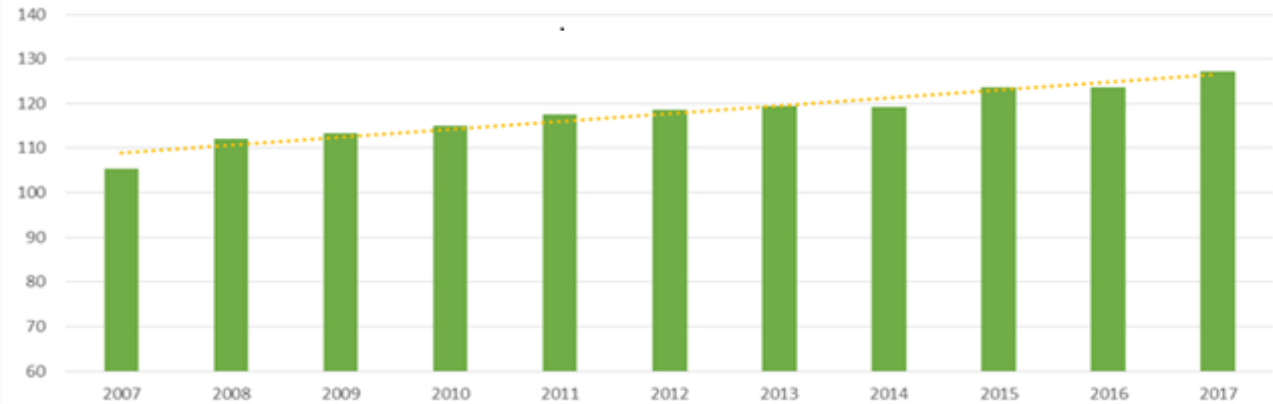


# Milan's Mobility Figures

TREND PASSENGERS OF PUBBLIC TRANSPORT SERVICE DURING LAST 10/15 YEARS



Urban Public Transport Passengers and Urban Area  
Index 100 – Year Base 2003



# Milan ZERO EMISSION BUS PLAN

Starting from 2020, ATM (Milan public transport company) will buy only electric vehicles. At the end of **2030**, the fleet is expected to consist of **1200 electric public buses**

- 70% of the public transport's fleet is electrically powered
- 25 electric buses to put into service during this year
- 80 new trolleybuses
- Expected purchase of 83 electric cars used for fleet assistance and maintenance
- Start of a study for the conversion of ATM depots into full electric hubs and the construction of 3 new innovative depots.



## New Commitments for 2030

For the 2030 target Milan wants to further strengthen its action in the following fields:

- **Energy retrofit of buildings**
- Further development of the **district heating** service
- A **mobility strategy** for 2030 that could further develop the measures included in Milan's Sustainable Urban Mobility Plan
- New Smart Cities Projects

Target by 2030:  
40% CO2 emissions reduction





# ACTIONS for the improvement of air quality and the environment



ENERGY EFFICIENCY



IMPROVING WASTE MANAGEMENT



ROAD PRICING AND ROAD CONTROL



INTEGRATED MOBILITY



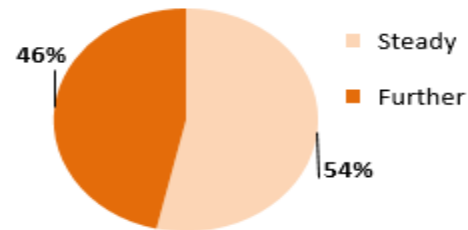


## Mobility

Measure/Action	CO2 emission reduction kton	Saved energy MWh
<b>Designed actions (SUMP Reference Scenario)</b>	<b>270</b>	<b>966000</b>
Public transport improvement in Milan and in the Metropolitan Area		
Cycle and pedestrian mobility		
People and freight transport demand side management		
Sharing mobility		
<b>SUMP (additional measures)</b>	<b>99</b>	<b>404000</b>
Public transport improvement in Milan and in the metropolitan area		
Cycle and pedestrian mobility		
People and freight transport demand side management		
Sharing mobility		
Measures dedicated to freight transport		
Development of electric mobility		
<b><u>TOTAL</u></b>	<b><u>369</u></b>	<b><u>1370000</u></b>



PIANO URBANO  
MOBILITÀ SOSTENIBILE  
MILANO



25 % of the total target



PIANO DI AZIONE PER  
L'ENERGIA SOSTENIBILE

**PAES**



# SUMP: Sustainable Urban Mobility Plan

The SUMP is the document that indicates Milan's mobility strategy for the next ten years.

The SUMP follows 4 main directives:

1. Milan as a Metropolitan City
2. Urban Accessibility for everyone
3. Urban Space as a common good
4. Governance of people and goods mobility.

By investing on the **development of public transport** and on **sharing mobility**, and by the exploitation of **public spaces** the SUMP confirms Milan's change of pace in the field of Mobility and Transport policies.



## Additional targets of the SEAP

Besides CO<sub>2</sub> emissions reduction there are additional targets:

Energy saving in final uses, in the residential, tertiary and transport sectors

Diversifying sources of energy supply, with a focus on renewable energy sources

Giving a contribution to air pollution reduction policies

Informing citizens about energy saving and environmental sustainability in order to increase the general level of awareness

Creating the conditions to enable the development of the energy efficiency market in the building sector



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Comune di  
Milano

# SEAP fields of action



## Public Buildings

Fuel and electricity use in municipal buildings (schools, offices, facilities and residential buildings)

## Private buildings, tertiary sector and industry

Fuel and electricity use in private buildings (residential and non residential)

## Public lighting

Street lighting and traffic lights system

## Renewable energy sources

Energy production from renewable energy sources (solar, geothermal, aérothermal)

## Mobility

Public and private transport

## Waste

Urban waste management and treatment

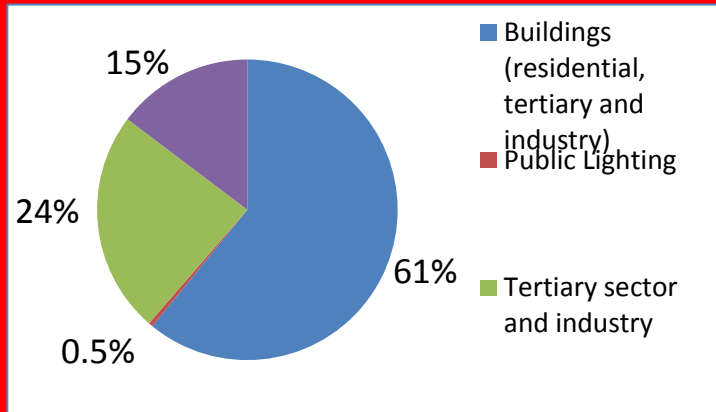
# Energy use in Milan 2013



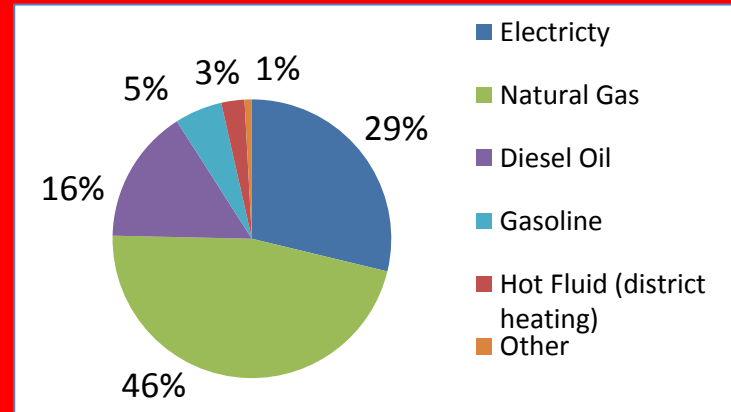
**Total final energy consumption: 23,9 TWh:**

- Total electricity consumption: 6,8 TWh
- Total fuel consumption: 17 TWh (1409.7 MTOE)
- Total heat consumption (DH): 0.64 TWh

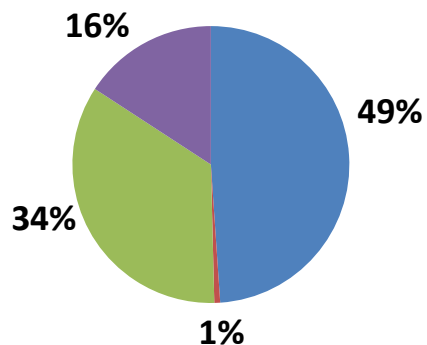
**Final energy consumption per sector**



**Final energy consumption per vector**

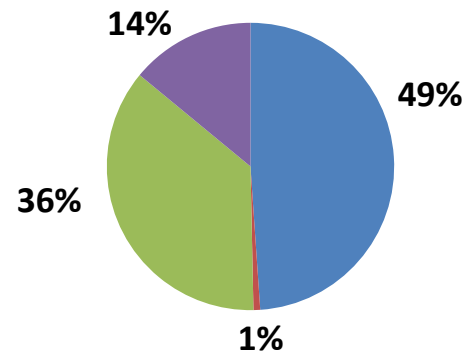


## CO2 emissions in Milan



2005: 7418 ktCO<sub>2</sub> (\*)  
5,7 tCO<sub>2</sub>/inhab

2013: 6948 ktCO<sub>2</sub> (\*)  
5,1 tCO<sub>2</sub>/inhab

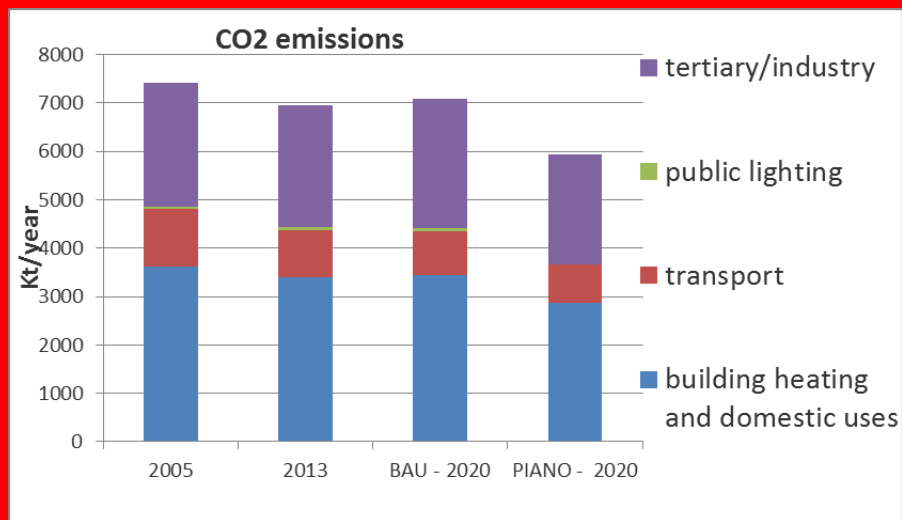


- Buildings (residential, tertiary and industry)
- Public Lighting
- Tertiary sector and industry
- Trasporti

# BAU Scenario and CO2 emission reduction target



Sector	2005 (Kt/year)	BAU-2020 (Kt/year)	Var%
Buildings (residential, tertiary and industry)	3.629	3.444	-5%
Public Lighting	51	52	4%
Industry/Tertiary	2.566	2.686	5%
Transport	1.172	911	-22%
<b>Total</b>	<b>7.418</b>	<b>7.093</b>	<b>-4%</b>
Target vs 2005	1.484	-20%	
Target vs BAU	1.158	-16%	





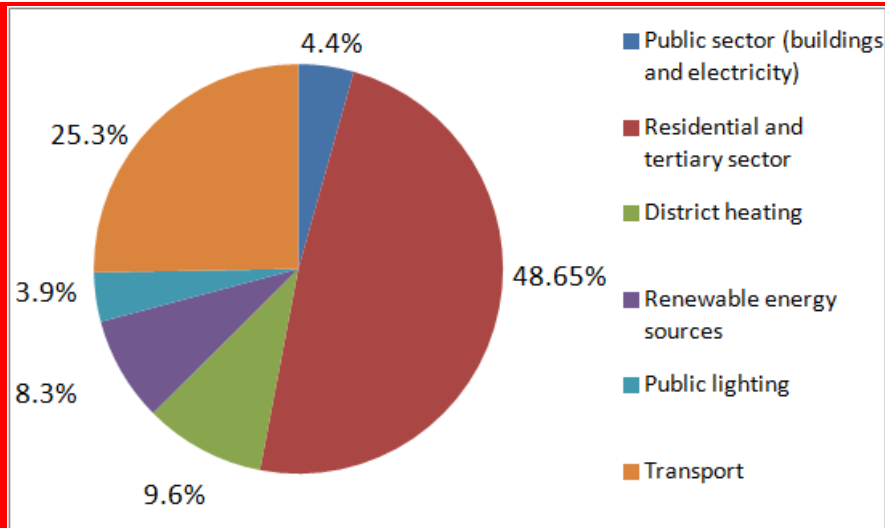
# SEAP target

## How is Milan planning to achieve its target?

The SEAP sets, describes and accounts in details Milan's actions to reduce global emissions, including measures that are already in place and additional measures essential to achieve the 2020 (and futures) target.



*Target contribution per sector*





## SEAP: Energy Help desks and awareness raising

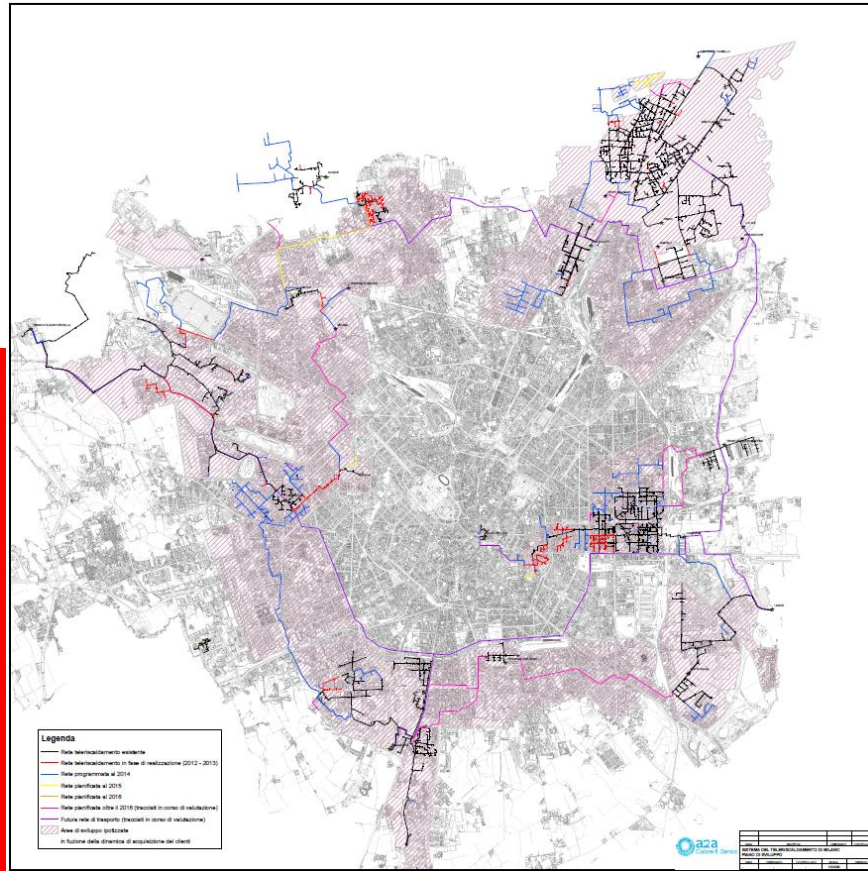
**Energy Help Desk** (sportello energia ) experts are available in fixed days in 9 institutional locations, in the different districts of the city, to provide citizens informations concerning:

- available incentives and financing sources for building energy retrofit and renewable energy use
- building energy performance assessment and advices on feasible retrofit interventions
- maintenance and management of heating plants





## SEAP: District Heating



*Planned development of the district heating service by the Milano Energy utility A2A*



## SEAP: District Heating

DISTRICT HEATING - MILAN 2017		
		<b>31/12/2017</b>
Total Heated Building Volume	m3	<b>30.048.202</b>
Total heat distributed	MWh/year	<b>704.186</b>

Technology	Generated Heat	Generated Electricity
	MWh/year	MWh/year
Waste to energy (Silla 2)	<b>300.717</b>	<b>345.159</b>
Combined Heat and Power (Canavese, Tecnocity, Famagosta, Linate)	<b>122.890</b>	<b>144.501</b>
Groundwater Heat Pumps (Canavese, Famagosta)	<b>25.011</b>	
Integrating Boilers (1)	<b>207.103</b>	
Minor local centralised heating plants (gas boilers)	<b>101.066</b>	
<b>TOTAL</b>	<b>756.787</b>	<b>489.659</b>

(1) boilers annexed to Heat and Power plants to cover peaks of heating demand





## SEAP: Private buildings. The new Building Code

The new building code sets minimum compulsory energy performance requirements for new buildings .

Incentives are provided for new and retrofitted buildings respecting specific parameters concerning energy performance and sustainability.

Incentives are provided in terms of additional authorized building volume

Besides the building code, energy efficiency in buildings is fostered also by providing a reduction of infrastructure charges for new and retrofitted buildings that respect specific criteria regarding energy performance and renewable energy use





## SEAP: BE2

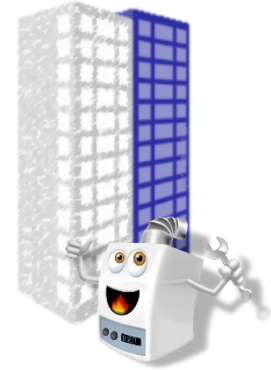


Milan Municipality's BE2 Notice will allocate a grant of **24 millions euros to promote and facilitate the energetic refurbishment of private buildings.**

This non-repayable **grant** will cover up to 20% of the intervention's cost.



Furthermore those admitted to the Notice may request a **soft loan** to the Credit Institutions that have subscribed an agreement with Milan Municipality.



Thanks to the non-repayable grant, the preferential financing and the opportunity to obtain the **ecobonus** granted by the State, **citizens must not anticipate any construction cost and starting from the first year they can save from 10% to 20% of the cost and afterwards up to 60%.**

DETRAZIONE  
FISCALE  
65%

AIMS



*To reduce the atmospheric emissions*

*To renovate the urban areas*

*To boost the local economy*



PIANO DI AZIONE PER  
L'ENERGIA SOSTENIBILE

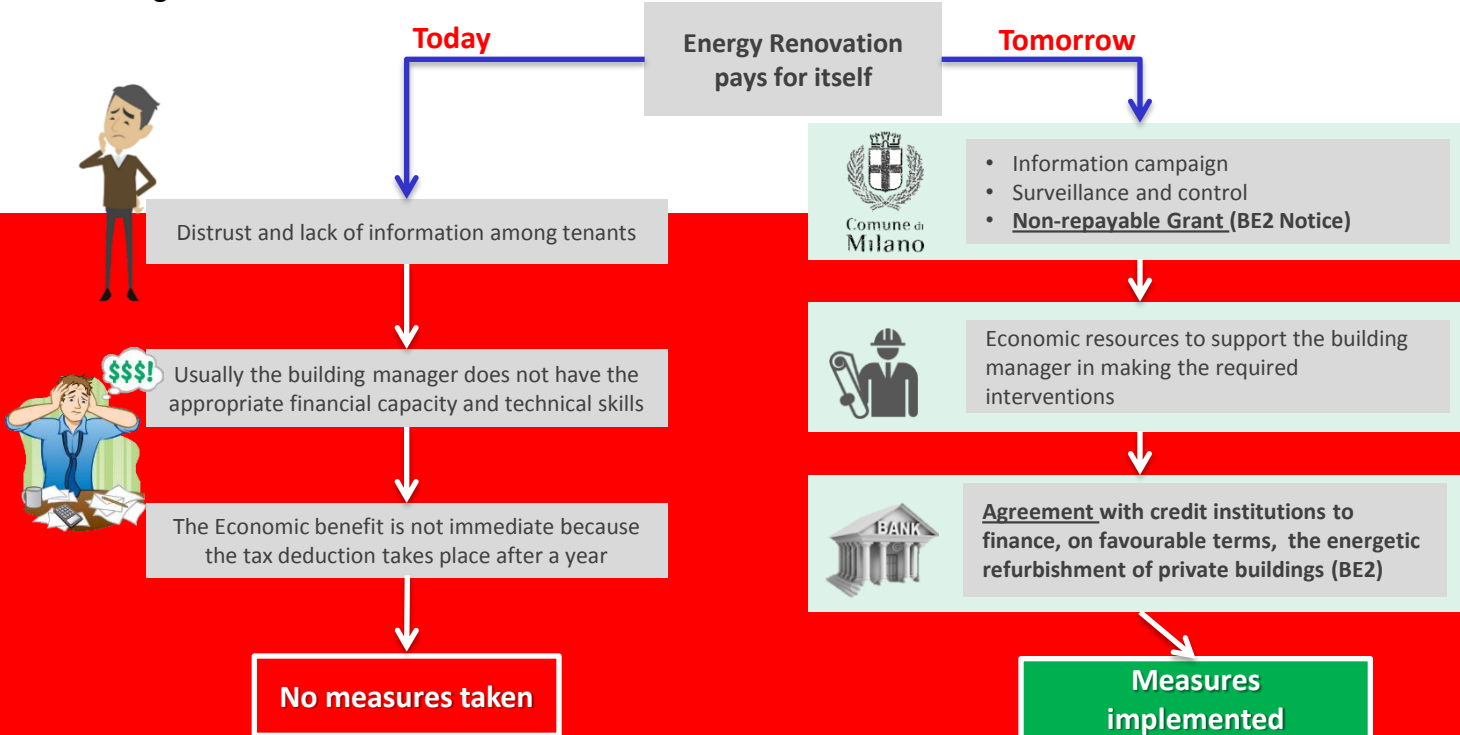
**PAES**



# SEAP: BE2

FORUM PA 2018

Sustainable Public Administration Award: 100 projects to achieve the goals set by the 2030 Agenda





## SEAP: Energy Procurement, Renewable sources

The Administration is **currently purchasing green electricity** for its buildings: offices, schools, museums, health care structures, local police stations, for a total electricity consumption of about 94 GWh and it's going to apply the same conditions in the next call.

The Contractor, upon request of the Administration, will be obliged to prove, with appropriate documentation, the production of a quantity of Green Energy for an amount not lower than the total consumption turnover.







## SEAP: Public lighting LED retrofit - expected results

The expected benefits of the implementation of the Plan are:

- **52% reduction in electricity consumption (from 14 Million KWh to 55 Million KWh)**
- **reduction of CO2 emissions: 23.650 Tons /year**
- **31% reduction in expenditure for electricity and management (maintenance included)**





## Urban Forestry

What are the actions implemented by the City of Milan?

### Tree-planting Program:

Planting of 14.500 trees a year and enhancement of tree species diversity

### Green Management Strategies and Resilience:

Collaboration with 100 Resilient Cities & ARUP, Bloomberg Associates and the Metropolitan City of Milan



## Milan's Green Areas





## SEAP: Waste management

### Separate waste collection

Door to door collection of:

- glass
- plastic and light metals
- paper
- **biowaste** (for households it started in 2012 and was progressively extended to the whole city)

54% waste separate collection rate in January 2018





## Milan Pollution Charge – ECOPASS

The **Ecopass** program was a **traffic pollution charge** implemented in Milan, as part of the overall sustainable mobility strategy of the Municipality of Milan and has been designed to **discourage the use of polluting private vehicles** inside the central Milan “Cerchia dei Bastioni” area (the internal ring), by applying an entrance charge related to the polluting emission levels (PM10).

Some motorists had to **pay an urban toll** when traveling within a Limited Traffic Zone corresponding to the central Cerchia dei Bastioni area and encircling around **8.2 km<sup>2</sup>**.





## From Pollution Charge to Congestion Charge



Ecopass resulted in a drastic traffic drop in 2008 (-21%), however, over time, the increase in the share of exempted vehicles (while in 2007 50% of vehicles entering the area would have been exempted from Ecopass, in the first year of the scheme this percentage went up to 75% and in 2010, the share of exempted vehicles was as high as 90%!) gradually reduced the dissuasive power of Ecopass.

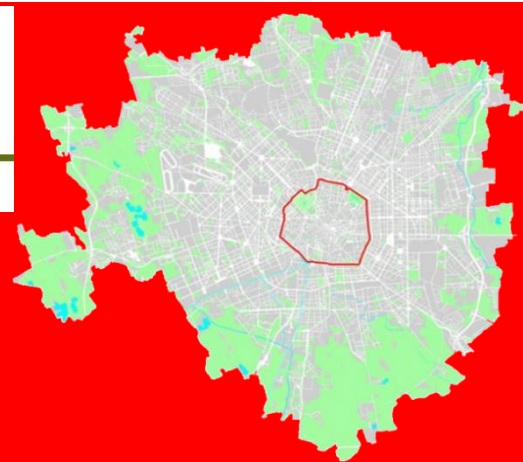


Moreover, following the results of a bottom-up referendum in which a large majority of voters (79%) demanded an upgrade of the Ecopass measure, the scheme was upgraded to a congestion charge in 2012.



## Milan Congestion Charge – AREA C

“Area C” is a road pricing measure launched by the Municipality of Milan in 2012 in order to improve life conditions of those who live, work, study and visit the city. “Area C” is the restricted traffic zone in the center of Milan (C as Cerchia Bastioni).

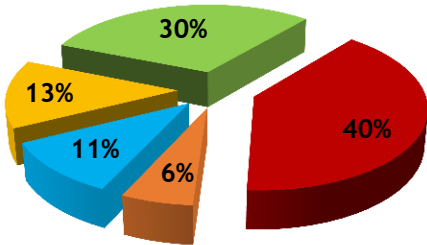




## AREA C – The aims

Decreasing vehicular access to the Area C therefore:

- ✓ Decreasing traffic congestion;
- ✓ Improving public transport speed;
- ✓ Decreasing the occupation of on-street parking;
- ✓ Reducing road accidents;
- ✓ Riducine pollutant emissions caused by traffic;
- ✓ Reducing health risks related to air pollution;
- ✓ Increasing the share of sustainable modes of travel;
- ✓ Improving urban center quality and attractiveness;
- ✓ Raising funds for sustainable mobility services and infrastructures.



- Resident vehicles
- Service vehicles
- Other paying vehicles
- Green vehicles
- Vehicles exempted by the payment





## AREA C – Mobility results

Improving the life conditions of those who live, work, study and visit the city is the goal of the Congestion Charge - Area C.



In 2015:

- **Decreasing road traffic in “Cerchia dei Bastioni” = - 29.2 %** compared with 2012
- **Decreasing Road accidents = - 26%** compared with 2012
- **Increase public transport speed = +2%** for buses between 9:00-10:00 and **+ 5,9%** between 18:00-19:00 and **+ 2,2%** for tram between 09:00-10:00 and **+ 4,4** between 18:00-19:00;
- Increase Public Transport users : **+12%** on surface PT; **+ 17%** on Underground
- Raising funds for soft mobility infrastructures = **+10%**







## AREA C – Environmental results

**Pollutant vehicles: - 49%** (-2.400 pollutant vehicles entering every day the Area C)

**Cleaner vehicles + 6,1 %** (from 9,6% to 16,6% of the total vehicles)

**Less emissions of pollutants:**

**Total PM10 -18% ; Exhaust PM10 -10%;**

**Ammonia -42%; Nitrogen Oxides -18%;**

**Carbon Dioxide -35%**

**Less Black Carbon (BC):**

**28% to 52% reduction of BC concentration**





## AREA C – Economic and social results

The reduction of the cars circulating in the city center enables the reuse of the public spaces once reserved to the parking. For instance, **an area of approximately 15.000 sqm near Castello Sforzesco was turned into a pedestrian area**, and new bike sharing stations and car sharing services were set up in the city.

Incomes reinvested in Sustainable mobility

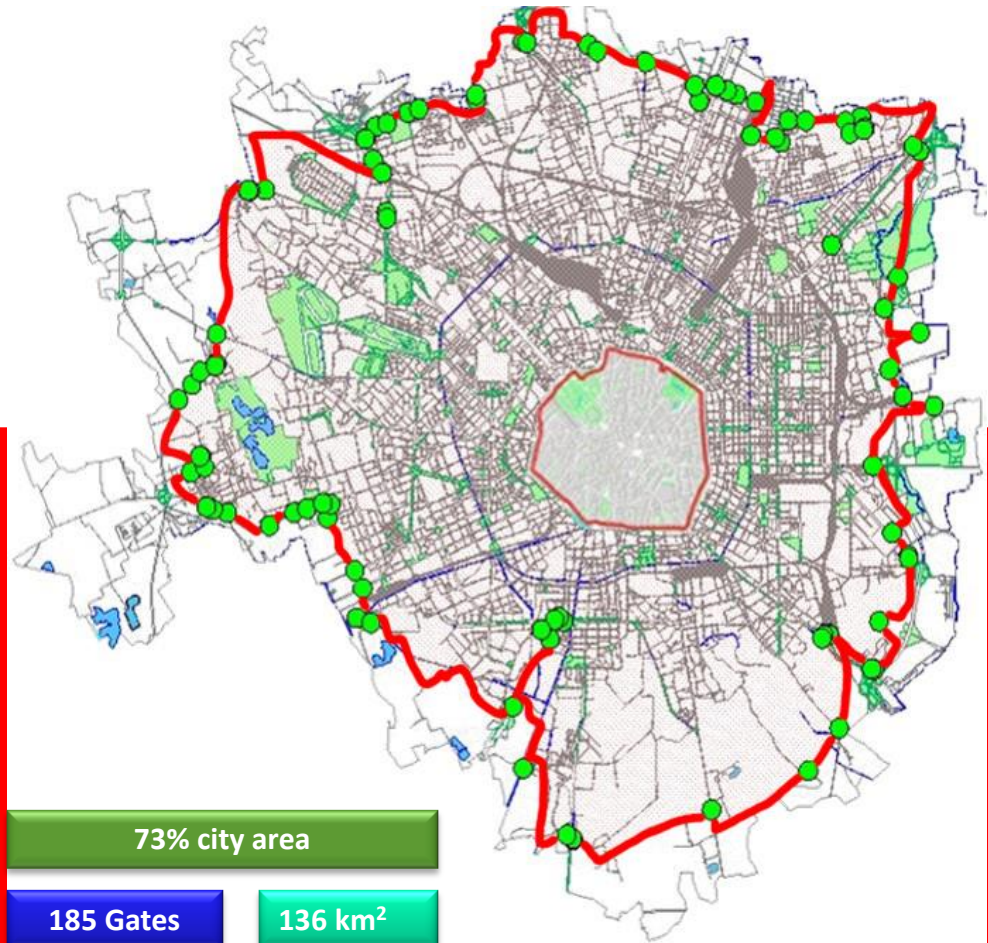
2016 incomes = **more than 28 million €**





## Towards a LEZ

Control of the most pollutant vehicle and control and tracking of access for heavy vehicles and for the transport of dangerous goods







## Towards a LEZ – Class of vehicles

MILAN MODEL IS INSPIRED BY MANY OTHER CITIES.

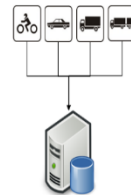
Currently, LEZ is in use in London, in Paris, in Berlin (and in 60 more cities in Germany), Amsterdam, Rotterdam, Anversa and many more. [www.urbanaccessregulations.eu](http://www.urbanaccessregulations.eu).

The rule is also enforced through the establishment of the Vehicle Registry and Environmental Bulletin (which has long been in Germany, and in January 2017 the stamp will also be used in Paris).

### *The advantages:*

- *The color of the stamp provides greater understanding and better control effectiveness.*
- *The registry maximizes regulatory compliance and contributes to simplifying and unifying database data. The model would contribute to a national standard.*

Municipal  
register of  
services



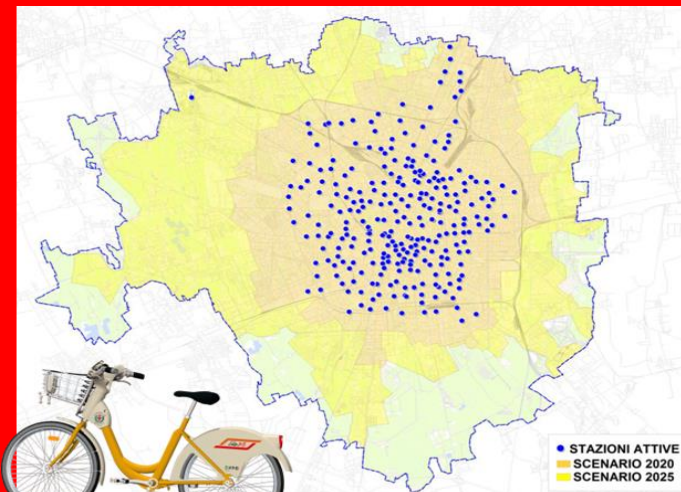
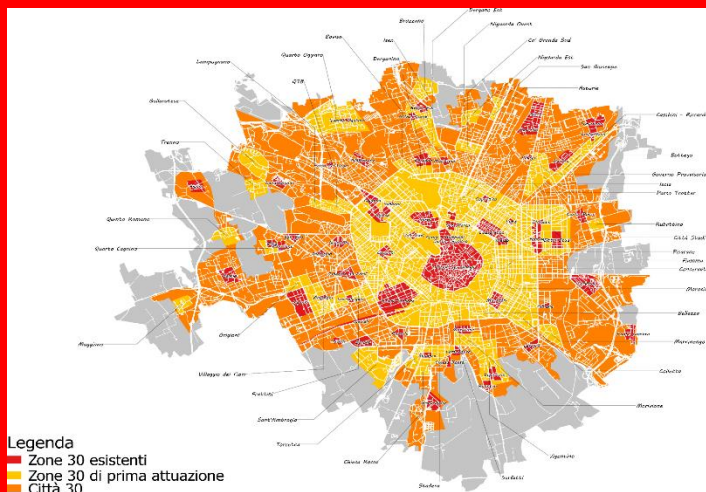
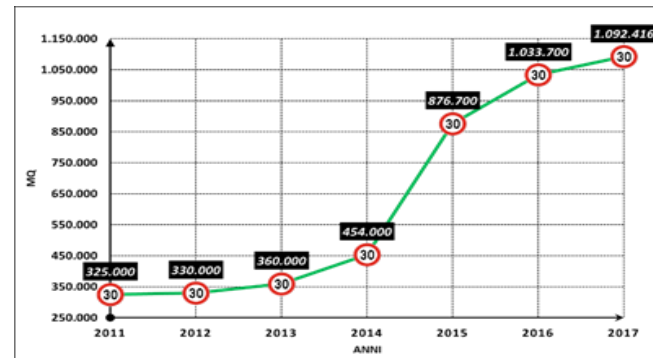


## SEAP: MOBILITY – other scenario -

Interventions for cycling and pedestrian mobility ('zero risk' view)

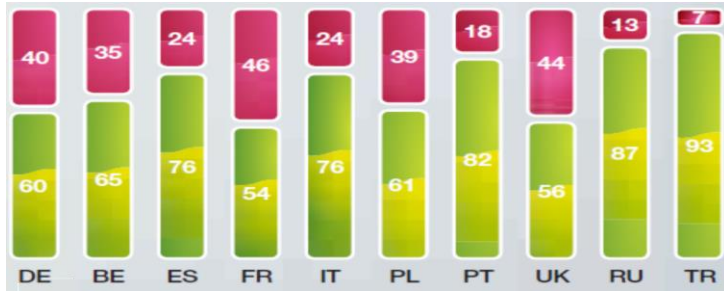
- Road network hierarchy, with a speed extension to 30 km / h on local roads
- Cycling routes system organized in a hierarchical structure
- Bike Sharing extension to cover the City

Zone 30 (sqm extension)

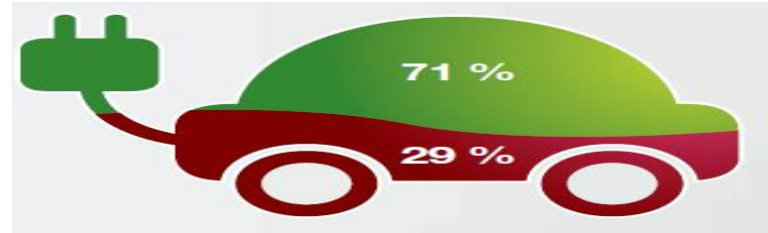




# SEAP: MOBILITY – other scenario -



Si No





The target to 2020 of the PAES is 50,000 electric/hidrid vehicles circulating in the Metropolitan Area (PUMS estimates, without strong incentives at national and regional level).



# Car sharing in Milan

Enjoy




 12/2013  
 982  
 392.000  
 0% electric vehicles



 07/2013  
 829  
 160.000  
 0% electric vehicles




Car2Go



 10/2016  
 473  
 93.000  
 4% electric vehicles

DriveNow

GuidaMi/Ubееqo




 2004  
 154  
 5.000  
 7% electric vehicles



 11/2010  
 106  
 33.000  
 75% electric vehicles

E-Vai



 06/2015  
 700  
 60.000  
 100% electric vehicles

Share'ngo

**Total**  
 3.394  
 743.000  
 28% Electric Vehicles

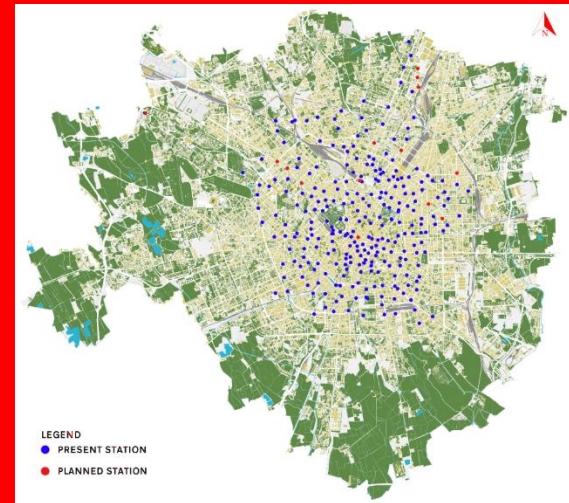




## Bike sharing station based

**BikeMi is the service of Bike-Sharing Station Based**, developed by ATM and operated by Clear Channel. Born in December 2008, it provides a user-friendly, practical and ecological service.

- 280 stations (October 2017);
- 3.650 traditional bikes;
- 1000 electric bikes;
- 57.000 yearly subscriptions;
- More than 11.700 rents per day on average
- 4.285.000 million rents in 2016
- 1.738.000 Kg of CO2 saved in 2017 (Defra's carbon convertor factor)





## Bike sharing free floating

One of the new challenge of the Municipality is to **improve the use of bicycle in Milan**, according to the goals of SUMP.

- **Start on October 2016;**
- **200.000 active members**
- **1.800.000 million rents in 2017**
- **traditional bikes;**
- **12.000 total bikes**
- **More than 14.000 rents per day on average**
- **no electric bikes;**





## Scooter sharing

- **Milan was the first Italian city to launch a Public call for identifying companies to perform the Scooter Sharing Service (December 2014).**
- **The first scooter sharing in free-floating mode in Italy was launched in Milan on 15 July 2015 with 150 Piaggio Mp3 three-wheel vehicles.**
- **At the end of the test, Milan has republished the public call, still open. In October 2017, a new operator, Mimoto, re-launched the service with 100 scooter Askoll ES2.**
- **At December 2017, this service counts 6.000 subscriptions and 7.000 trips.**





# Towards an integrated mobility - MAAS



Thanks for the attention

filippo.salucci@comune.milano.it

*www.muoversi.milano.it*

The screenshot shows the homepage of the 'Milano mobilità' website. At the top left is the Milan coat of arms. The main header features the title 'Milano mobilità' and a navigation menu with items: Home, Muoversi a Milano, Geomobilità, Pass e permessi, Area C, News, and Servizi online. On the right, there are links for 'IL PORTALE DELLA MOBILITÀ DEL COMUNE DI MILANO', language selection (Lingua), 'ContattaM', and a user profile area ('Area riservata'). Below the navigation is a search bar with 'CERCA INDIRIZZO' and 'PERCORSO' tabs, and a 'MAPPA' button. A prominent blue banner at the bottom contains the M4 logo and the text: 'SFORZA-POLICLINICO: DAL 6 MARZO INIZIO REALIZZAZIONE DEI DIAFRAMMI'. Below this, it states: 'Da martedì 6 marzo, per una durata complessiva di circa inizierà l'attività di realizzazione dei diaframmi quattro mesi (intervallati da periodi in cui saranno svolte altre lavorazioni di cantiere)'. The date 'Pubblicato il 05 marzo 2018 - 14:57' is also visible.