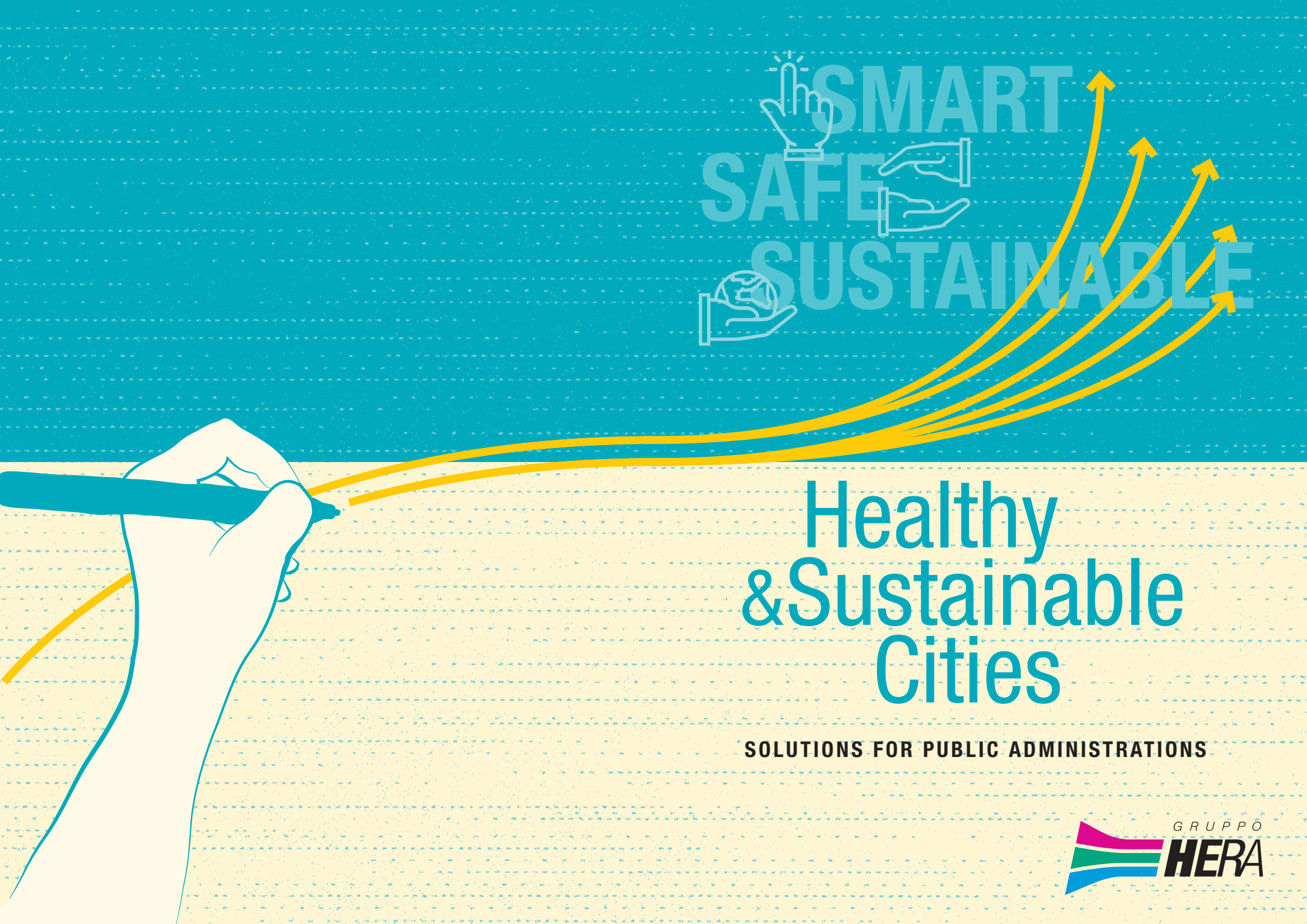


Healthy &Sustainable Cities

SOLUTIONS FOR PUBLIC ADMINISTRATIONS

GRUPPO HERA

The new **challenge** for cities.

More than 10,000 years after the first settlements, 2,700 years after the foundation of Rome and 150 years after the birth of city planning, cities are facing a **new challenge.**

The time has come to **draw up a new model of urban context, one that can regenerate our cities, combining innovation with sustainability, to foster a new period of development.**

SMART
SAFE
SUSTAINABLE

Cities are at a crossroads.

Hera's **Smart, Safe** and **Sustainable** model guides cities towards achieving sustainability goals – the SDGs.

New cities.

WASTE: it is reduced – recovered – recycled

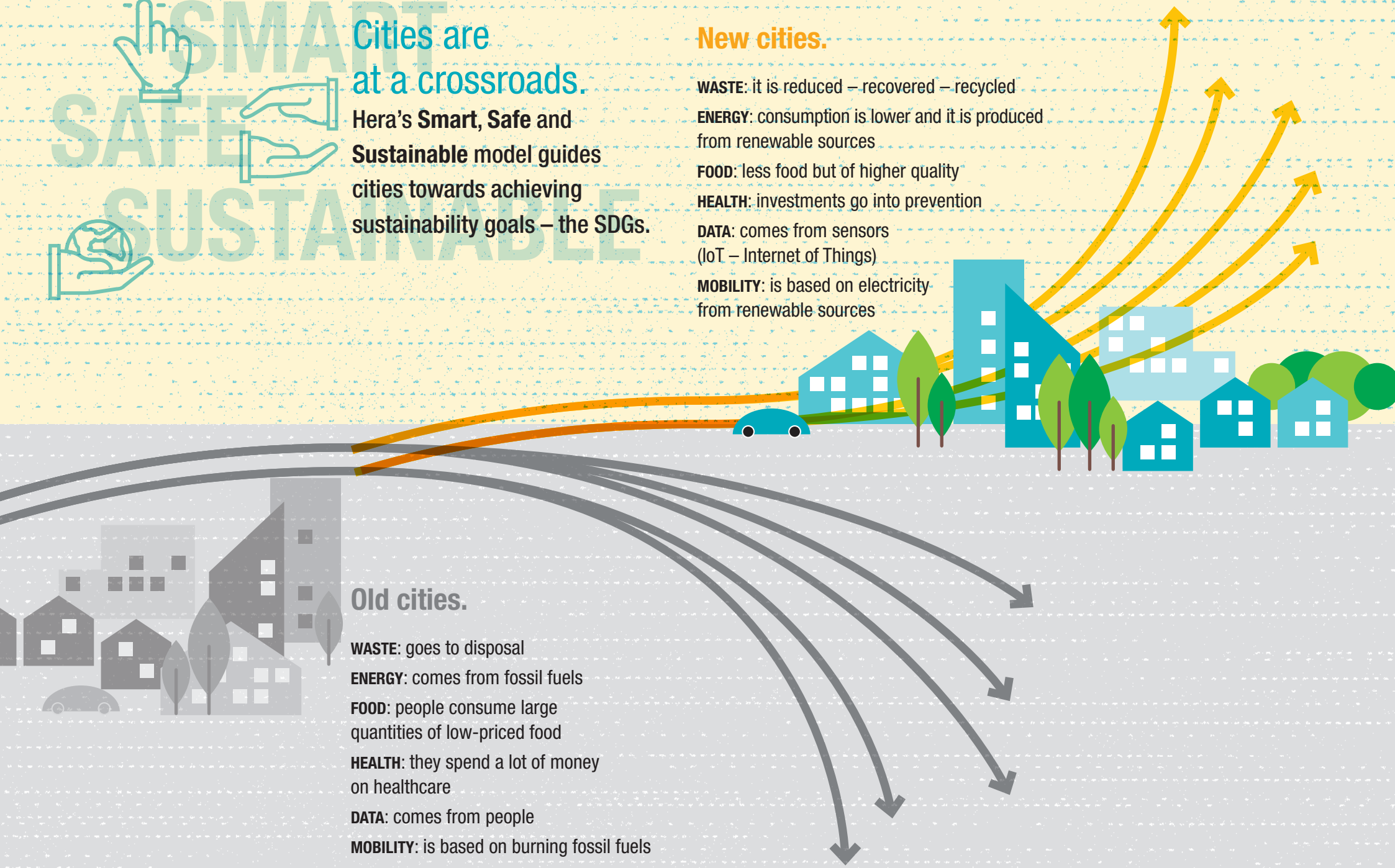
ENERGY: consumption is lower and it is produced from renewable sources

FOOD: less food but of higher quality

HEALTH: investments go into prevention

DATA: comes from sensors (IoT – Internet of Things)

MOBILITY: is based on electricity from renewable sources



Old cities.

WASTE: goes to disposal

ENERGY: comes from fossil fuels

FOOD: people consume large quantities of low-priced food

HEALTH: they spend a lot of money on healthcare

DATA: comes from people

MOBILITY: is based on burning fossil fuels

The UN's 2030 goals.

Sustainable Development Goals (SDGs)

health and nutrition

environmental quality

data

circular economy

energy transition

water resource management

resilience

SAFE

- to improve people's health through prevention, nutrition and physical activity
- to increase the quality of the environment and the safety of the area

SMART

to achieve the city's health and sustainability goals by using:

- new sensors
  Internet of Things - IoT
- data analysis technologies
  Data Analysis
- service management systems
  Operation Center

SUSTAINABLE

- to increase the recovery of material from waste
- to achieve the best energy efficiency standards
- to increase water use efficiency
- to use new tools that support land management to tackle climate change

SMART
SAFE
SUSTAINABLE

The path.

The first step to achieve the health and sustainability of cities is to make them smart.
The path consists of three steps:

- Operation Center
- Data Analysis
- Internet of Things (IoT) & Smart Points

OPERATION CENTER

Adoption of Sustainability Goals – SDGs

Issue of environmental passport

Monitoring of sustainability indicators

DATA ANALYSIS

Environment maps:

Green areas and soil use

Presence of asbestos

Waste management

Environment quality

Energy maps

IoT & SMART POINTS

IoT for environmental quality

PUNTOnet Bike/Bus

PUNTOnet Interactive Media Station

PUNTOnet Waste

Smarty Waste Bins

HeraRicarica

1. Operation Center

The Operation Center acts as a dashboard for information, analysis and management of the area, providing useful indicators to the Municipal Administration and Technical Offices.

The Operation Center collects and displays the information coming from the network of sensors installed throughout the area (IoT) and from other sources (open data, proprietary data and third-party data).

The Data Analysis service uses this set of information to develop interactive maps designed to facilitate the control and management of the city.

The Data Analysis phase can also create the Environmental Passport, a necessary tool to measure a city's sustainability.

Environmental Passport

The Environmental Passport is a tool that helps administrators control the sustainability of their cities, to plan the path and actions to take to achieve the environmental objectives listed in the SDGs.

6
Water Quality
- *Reduce water leaks*
- *Improve the status of aquatic ecosystems*

7
Energy transition
- *Reduce greenhouse gas emissions*
- *Improve energy efficiency*
- *Increase the production of energy from r enewable sources*

12
Circular economy
- *Increase sorted waste collection*
- *Reduce landfilled waste*

13
Adaptation to climate change and risk reduction
- *Mitigate environmental risks*

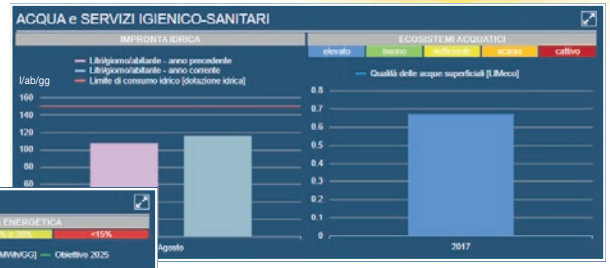
11
Sustainable land use and solutions based on natural processes
- *Reduce soil use*

Ecosystems, green areas in the city and protection of biodiversity
- *Increase the availability of green areas in the city per inhabitant*

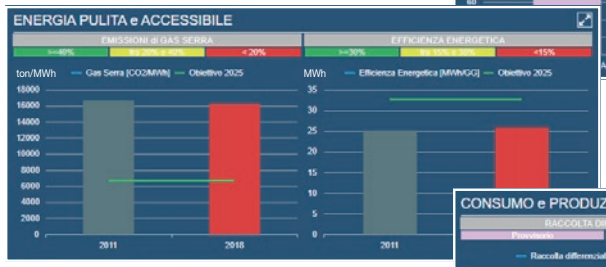
Sustainable mobility
- *Halve the number of vehicle trips and double the number of trips with sustainable vehicles*

15
Air Quality
- *Not exceed the daily PM10 limits for more than 35 days per year*
- *Respect the annual PM10 limits*
- *Respect the annual PM2.5 limits*

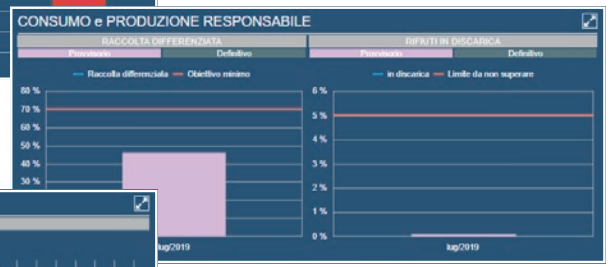
Monitoring of Indicators



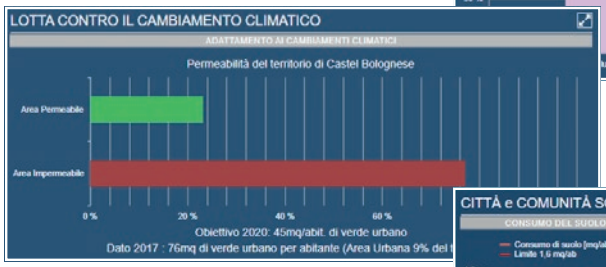
- **Water quality**



- **Energy transition**



- **Circular economy**



- **Adaptation to climate change and risk reduction**

- **Sustainable land use and solutions based on natural processes**
- **Ecosystems, green areas in the city and protection of biodiversity**
- **Sustainable mobility**

- **Air quality**

2. Data Analysis

MAPPA ENERGETICA

Efficienza

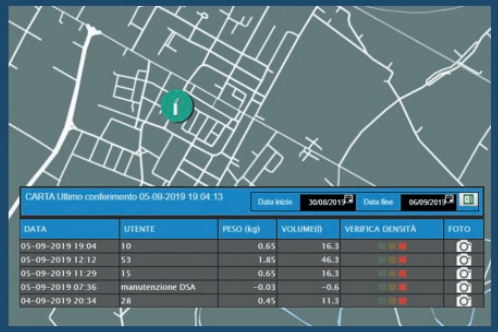
- 6 %
- 16 %
- 30 %
- 26 %
- 13 %
- 5 %
- 4 %

MAPPA QUALITÀ DELL'ARIA

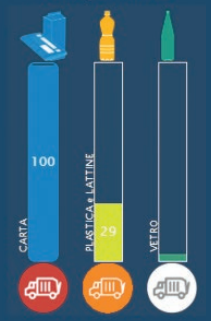
PM_{10} [µg/mc]

- 0 – 5.5
- 5.5 – 11
- 11 – 16.5
- 16.5 – 22
- 22 – 27.5
- 27.5 – 33
- 33 – 38.5
- 38.5 – 44
- 44 – 50
- + 50

MAPPA WASTE



Riempimento



MAPPA DELL'ACUSTICA

Noise [Db]

- 0 – 6.6
- 6.6 – 13.2
- 13.2 – 19.8
- 19.8 – 26.4
- 26.4 – 33
- 33 – 39.6
- 39.6 – 46.2
- 46.2 – 52.8
- 52.8 – 60
- + 60

MAPPA AMIANTO [coperture]

Legenda

- 199 Bonificato
- 504 Amianto
- 35 Incerto

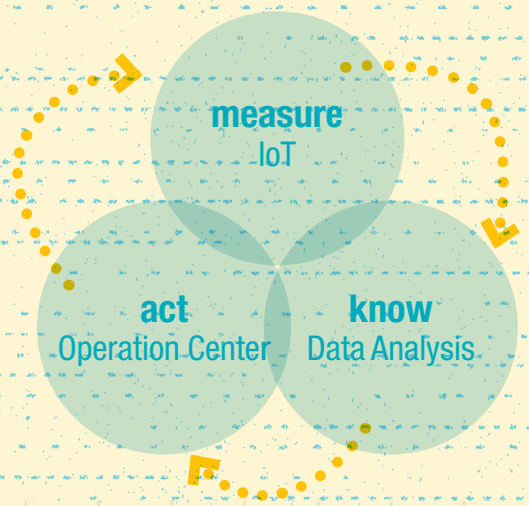
MAPPA VERDE URBANO

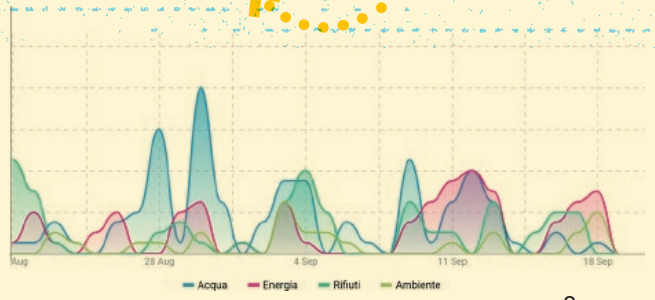
Legenda

- 58 % Vegetazione
- 22 % Campi agricoli
- 20 % Urbanizzato

Analytics services help create, distribute and capture, the value of the data produced by the area and local people.

Data Analysis is a great opportunity for administrations to manage information on the city such as: traffic, safety and new services.

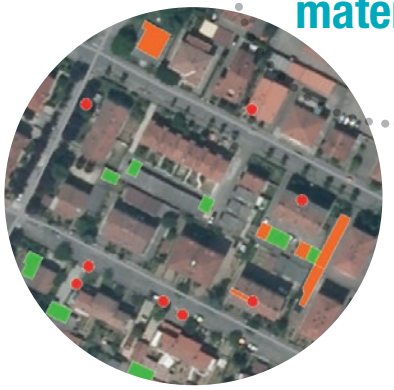




Environment Maps

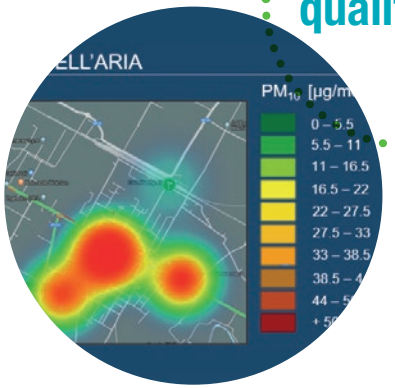
The current satellite-based detection technologies (space economy) can rapidly acquire a lot of useful information

Roofs made of asbestos-containing material

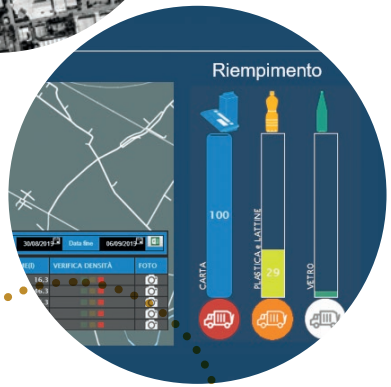


Green areas in the city and land consumption

Environment quality



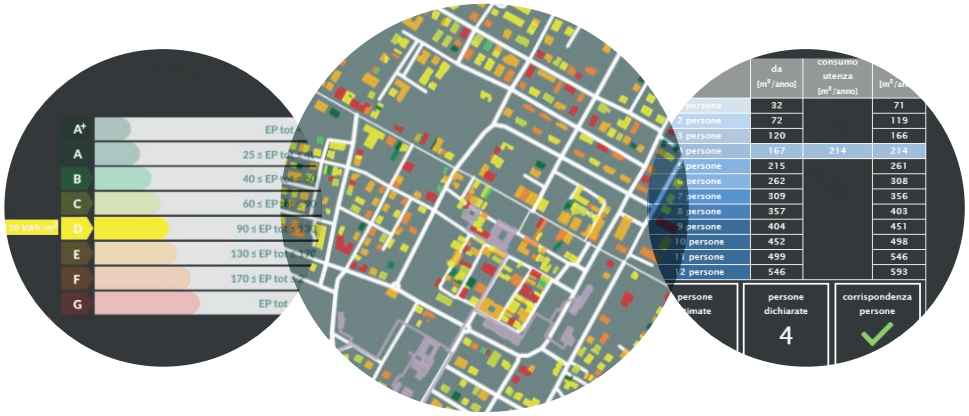
Waste management



Energy Maps

Energy Maps are a service designed in a Web-GIS environment to provide an **energy analysis of buildings**. By **correlating the consumption of gas**, **district heating**, **water**, **electricity** and the **Tari waste tax** we can extract value-added information such as:

- calculate the consumption class of the housing unit;
- evaluate the historical consumption trend;
- identify uninhabited dwellings;
- map renewable energy sources;
- estimate the type of system and fuel used for heating;
- monitor the city's water footprint;
- perform predictive analyses;
- identify actions aimed at energy efficiency;
- provide local people with useful information for their energy efficiency.



3. Internet of Things (IoT) & Smart Points

IoT &Points

The data needed to support the sustainability path are collected by sensors throughout the city and smart points. The available technologies are:

- PUNTOnet Bike/Bus
- PUNTOnet Interactive Media Station
- PUNTOnet Waste
- Smarty Waste Bins
- HeraRicarica

The technologies used can also be integrated into a single point that provides sustainable services.

IoT for environmental quality

The environmental quality analysis is carried out using a network of control units that can be installed stand-alone or integrated in suitable technological infrastructures (PUNTOnet multifunction points).

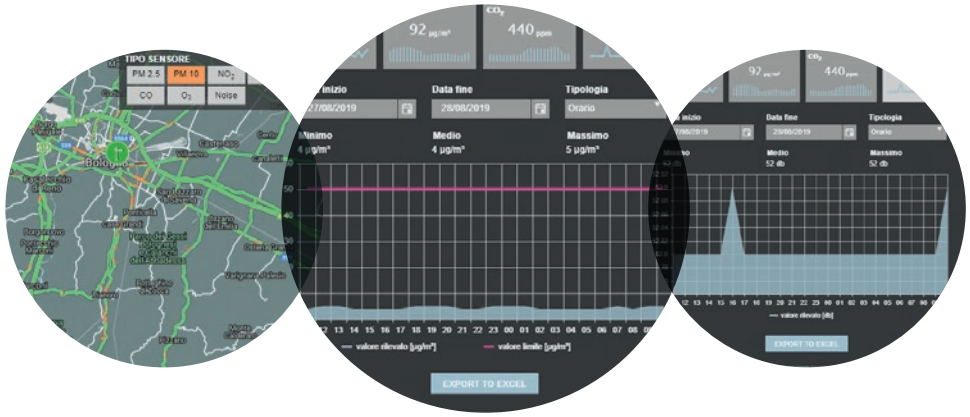
The control units inside them include several sensors to detect gases in the air, and can also include an **acoustic sensor** to monitor the quality of the acoustic zoning (in dB) of the area.

The parameters monitored are:

Airborne particulate (PM10 and PM2.5).

Gas in the air:
- Ozone (O_3)
- Nitrogen dioxide (NO_2)
- Carbon dioxide (CO_2)

Physical parameters:
- Temperature (T)
- Relative humidity (RH)
- Noise (dB)



All the data are collected by the sensors with a frequency of a few minutes, are sent and become available in the Operation Center. The data will be collected and processed to identify the quality 'level' of the emissions and to estimate the emission sources by means of Data Analysis.

This monitoring will support the identification of reduction and prevention actions to implement.

PUNTOnet

The PUNTOnet line includes three types of products:

- **PUNTOnet Bike/Bus**
- **PUNTOnet Interactive Media Station**
- **PUNTOnet Waste**

PUNTOnet Bike

It is a multi-function point, connected to the power and data network, which provides several services at the same location:

- Video surveillance
- Webcam
- Wi-Fi / 5G
- Sensor Box to monitor air quality and measure noise pollution
- Cycle-parking slots for recharging pedal-assisted bicycles (E-bikes) or areas dedicated to micromobility (scooters, Segways, etc.)
- Drop-off and collection of parcels
- Possible production of renewable energy through photovoltaic roofing as a replacement for laminated glass roofing
- Electric charging of mobile systems for the disabled
- Electric charging of portable devices
- LED lighting with intensity and colour adjustment

The structure is made of hot-dip galvanised and powder-coated metal, with silk-screened or photovoltaic glass roof and 100% recyclable composite wood cladding containing natural fibres, polymers and additives.

IoT & Points

The solution is modular, so services can be removed or added according as needed. Some of the services listed above may be enclosed in a technological **Interactive Media Station**.

The structure of the canopy or interactive media station is self-supporting so as to not require excavations or foundations and may require, depending on the case, simple anchoring to the ground.

360° external **video surveillance** to increase the safety of the public area. **Web cam**

Production of renewable energy through photovoltaic roofing

Sensor Box for **air quality monitoring** and determining **noise pollution**

Infrastructure for **Wi-Fi / 5G**

Drop-off and collection point for parcels

Recharge point for wheelchairs, portable devices and **electric bicycles**

PUNTOnet Bus

The bus shelter is smaller than the Bike version and is designed for bus waiting areas.

It can contain the services of the PUNTOnet Bike point and include new technologies of public transport companies.

PUNTOnet Interactive Media Station

The technological interactive media station is a solution that can provide the following services:

- Water dispenser
- Wi-Fi / 5G
- Environmental sensors (air and noise)
- Video surveillance
- Webcam
- Electric charging of portable devices
- Electric charging of mobile systems for the disabled per disabili

Room temperature and refrigerated **water dispenser**

Sensor Box for **air quality monitoring** and determining **noise pollution**

Infrastructure for **Wi-Fi/5G**

360° external **video surveillance** to increase the safety of the public area. **Webcam**

Charging of mobile devices, E-bikes and wheelchairs

PUNTOnet Waste

PUNTOnet Waste is an automated **sorted waste collection center** that is integrated with PUNTOnet Bike, Bus and Interactive Media Station.

The new waste collection system is designed to:

- Be accessible to people with **disabilities**
- Enable **clean** disposal without levers and pedals
- Allow an **easy** disposal using mobile phones and cards
- **Recognise users**, talking to them and helping them to dispose of their waste
- Reduce impact on the cityscape and improve urban **décor**
- **Weigh** the waste
- Enable application of **Quantity-Based Charging** (QBC)
- Enable **gamification** projects among people, communities and neighbourhoods
- **Call** when it's full
- Make **the area safe**, using integrated video surveillance and lighting
- Provide **connectivity** to local people with Wi-Fi
- Check **air and noise quality**
- Provide **electric recharging** of portable devices

PUNTOnet Waste improves existing collection systems in the city such as door-to-door collection and roadside bins.

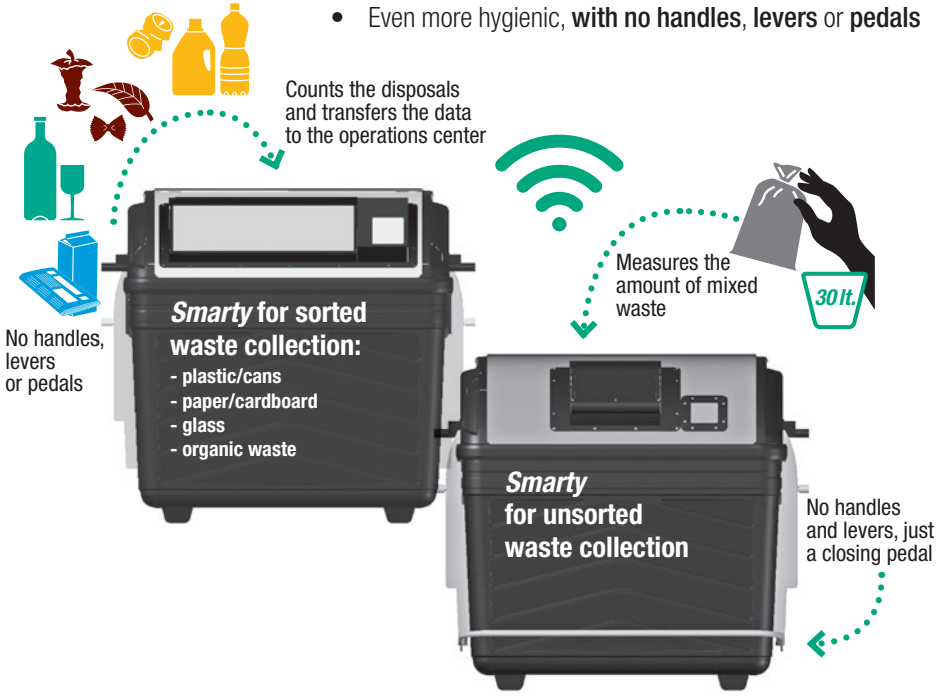
Enables a high quality of sorted waste in line with European standards.

PUNTOnet Waste is integrated into the city's Operation Center, and communicates data for disposal, operation, control and supervision.

smarty Waste Bins

The Smarty line waste bins are automatic, smart, with user recognition and a waste measurement system to improve the quality of **sorted waste collection**.
The solution can provide the following services:

- **Recognise the user** via card or smartphone
- **Record disposals**, encouraging the quality of sorted collection
- It is preparatory to the **introduction of QBC** (Quantity-Based Charging)
- **Communicates data wirelessly** to the operations center
- The data are **certain** and **certifiable**
- **Calls Hera's operators** when it's full or in the event of a breakdown, to ensure increasingly punctual and efficient service
- Even more hygienic, **with no handles**, **levers** or **pedals**



HeraRicarica

Hera Comm aims to encourage the growth of **sustainable mobility** to help improve the air quality of our cities.

HeraRicarica is the public charging solution designed to charge electric vehicles.
Its main features are:

Technology

- 'Interoperable' with the main operators' infrastructure
- Simultaneous charging from 2 sockets
- Fast charging: up to 22 kW on a single socket
- Compatible with all EVs
- Vandal-proof outlets
- Locking system against unauthorised disconnections
- UMTS/LTE connectivity for remote control

The model: infrastructure open to all operators

Charging Point Operator

- Installation (property)
- Management
- Maintenance

Mobility Service Provider

- User services (offer, app, booking, call center...)

End user

- Electric vehicle recharging

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SMART
SAFE
SUSTAINABLE

October 2019

GRUPPO HERA