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## EMPOWERING CITIES FOR A SUSTAINABLE FUTURE

**Silvia Arcieri**

Sustainability and Circular Economy at Enel X



# The Context

A photograph of an industrial facility, likely a refinery or chemical plant, silhouetted against a bright, hazy sunset sky. A thick plume of dark smoke or steam rises from a tall chimney on the left side of the facility. The foreground is filled with dark, out-of-focus foliage, suggesting the viewer is looking through trees at the industrial site.

## Climate change

The scientific community agrees that there is a direct link between **human activity and climate impacts**

# The role of cities

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Cities have a **pivotal role in shaping a sustainable future** for us.  
What are the **MAIN CHALLENGES** and **MEGA-TRENDS**?



# Resiliency

Lifestyles and citizens' needs  
change rapidly

**68%**

of world population  
will move to cities by 2050 vs  
**55%** of today\*



# Reduce emissions

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Cities account for

**70%**

of worldwide  
emissions\*



# Consumption

Cities consume over **75%**  
of natural resources,  
**producing**  
**50%** of total waste



# Financing

Budget constraints and lack of municipal economic resources for *Smart City* deployments is still one of the **key barriers** to the green transition

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# The role of Enel X



# Enel X Global Retail

Leading the revolution in energy uses

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Reference energy choice for customers **electrification** and digitalization

Energy partner to promote **electrification** and **Net Zero targets** for businesses

Trusted partner to support cities in their **electrification, digitalization**  
and **sustainability path**

# We have an integrated offering for different type of Customers...



**B2C**

Home Assistance

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Home Electrification

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Smart Home

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Single Family Home



**B2B**

Customer Insights

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Distributed Energy

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Battery Energy Storage

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Flexibility Solutions

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Condominium



**B2G**

Smart Lighting

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Smart City Solutions

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e-Transport

Commodity	Commodity	Commodity
Home Charging	Fleet Electrification	City Charging
Financial services	Financial services	Financial services
Telemedicine	Telemedicine	Telemedicine



**Commodity**



**Enel X Way**



**Financial services**



**e-Health**

## Enel X strategy

Our strategy for a **sustainable city model**

# The future of urban centers lies in a sustainable city model



## DECARBONIZATION

## URBAN CIRCULARITY

## CITIZEN-CENTRICITY



**Massive reduction of urban emission**

**Rethink usage of resources and consumption models**

**Build flexible and resilient systems that easily adapt to new citizens' needs**

# Our Solutions: Smart Public Lighting



Lighting points (#mn)

2.8

### KEY TECHNOLOGIES

- LED lighting solutions
- Lighting control
- Adaptive lighting
- Digital fault management
- Integration of cameras, sensors, digital screens and EV charging stations in the lighting pole

### KEY BENEFITS

- Up to -90% energy consumption
- Automize fault resolution process
- one asset = multiple services

Energy Efficiency

Digitization of the service

Multifunctionality of the asset



# Lighting infrastructure



SMART SECURITY  
CCTV & ANALYTICS

GREEN ENERGY  
VERTICAL PHOTOVOLTAIC

IOT & BLOCKCHAIN

TOURISTIC POINT INFORMATION

SOS AED & VOIP CALL

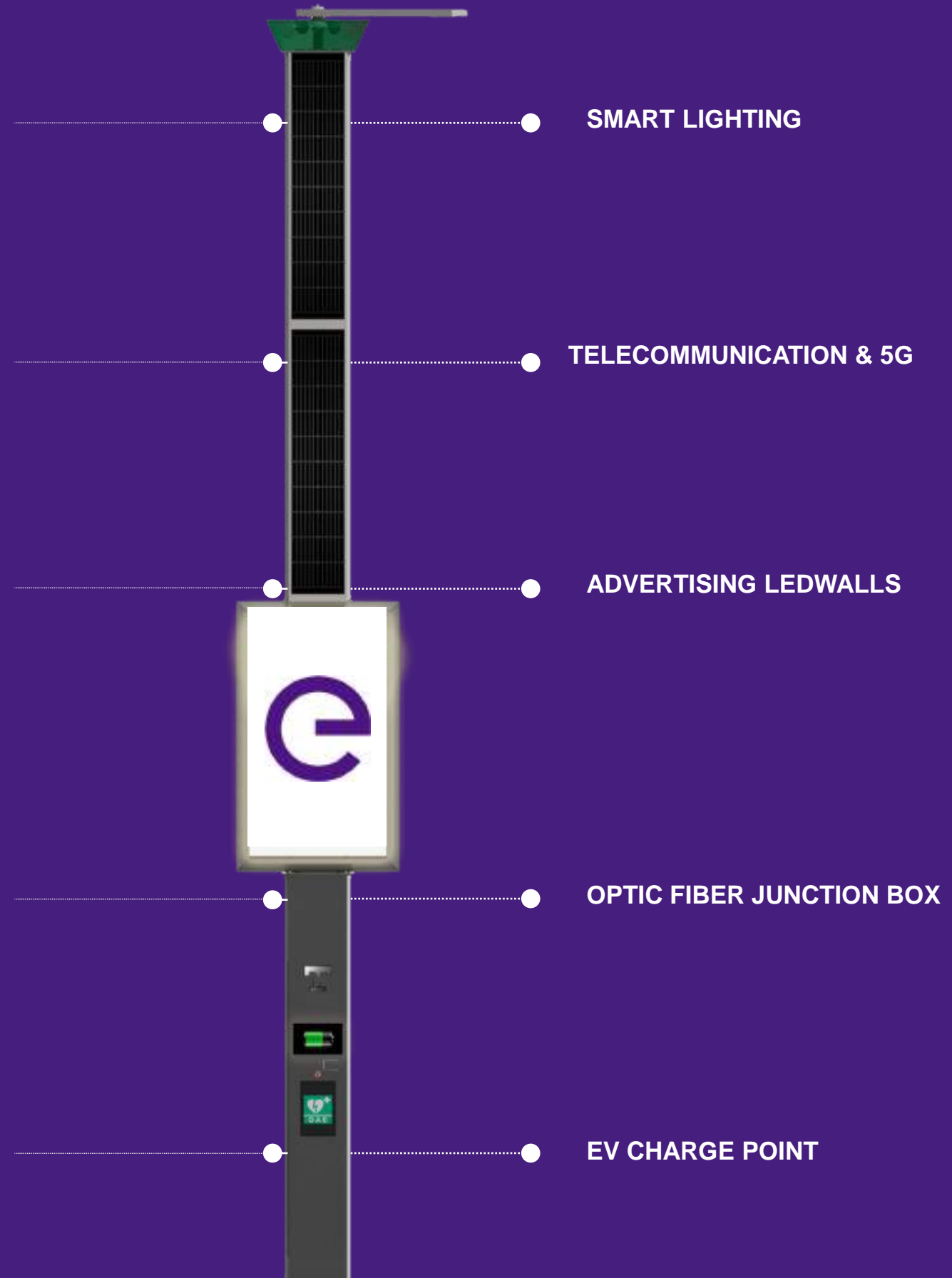
SMART LIGHTING

TELECOMMUNICATION & 5G

ADVERTISING LED WALLS

OPTIC FIBER JUNCTION BOX

EV CHARGE POINT



## eBus as-a-service model for clean urban public mobility

eBus served (#)

>3000

## All-inclusive service model

### OFFERING BUILDING BLOCKS

#### 1. eBUS vehicle & financing



#### 2. Charging & energy infrastructure



#### 3. Smart City Services



### KEY BENEFITS

- Saving up to 70% on consumption
- Maintenance savings
- 0% CO2 emissions, reduced noise, Nox and PM pollution
- Complexity, capex investment and risk shifted on private partner
- Full customization





# eBus: Enel X worldwide projects



**3.115**  
eBuses  
served

**100%**  
renewable energy

**30**  
Electro  
Terminals



**979**  
Charging  
Stations

eBus **Smart**  
Charging Platform



**106**  
Smart  
Bus-shelters



**11**  
Pantographs

# Smart & Efficient Public Buildings



Sustainable buildings to decarbonize cities and free up economic resources

Smart & efficient buildings served (#)

> 300

## PA-specific offering

### OFFERING:

1. Smart energy services
2. Renewable energy communities including PV installations
3. NZEB
4. Integrated Smart City project

### KEY BENEFITS

- Energy saving and expenditure reduction (~40%)
- Reduction on CO2 emissions through PV systems and KPI monitoring
- Fight poverty through reduced energy consumption and lower supply tariffs
- Leverage on national and international funds
- Shift complexity, capex investment and risk on private partner



# Digital Services



Cutting-edge digital technologies to provide city with insights for improved service quality

## Big Data and AI for the PA

### 1. CITY ANALYTICS → big-data analysis on:

- people presence and mobility
- Vehicle traffic (real time and historic)
- Road roughness

### 2. VIDEOANALYSIS → automatic event recognition through AI:

- Surveillance
- Traffic control
- Smart Parking
- Crowd Safety
- Access Control

### KEY BENEFITS

- Improved data-driven decision-making capacity
- Lower operative costs
- Shorter response time
- Higher service quality for the citizen

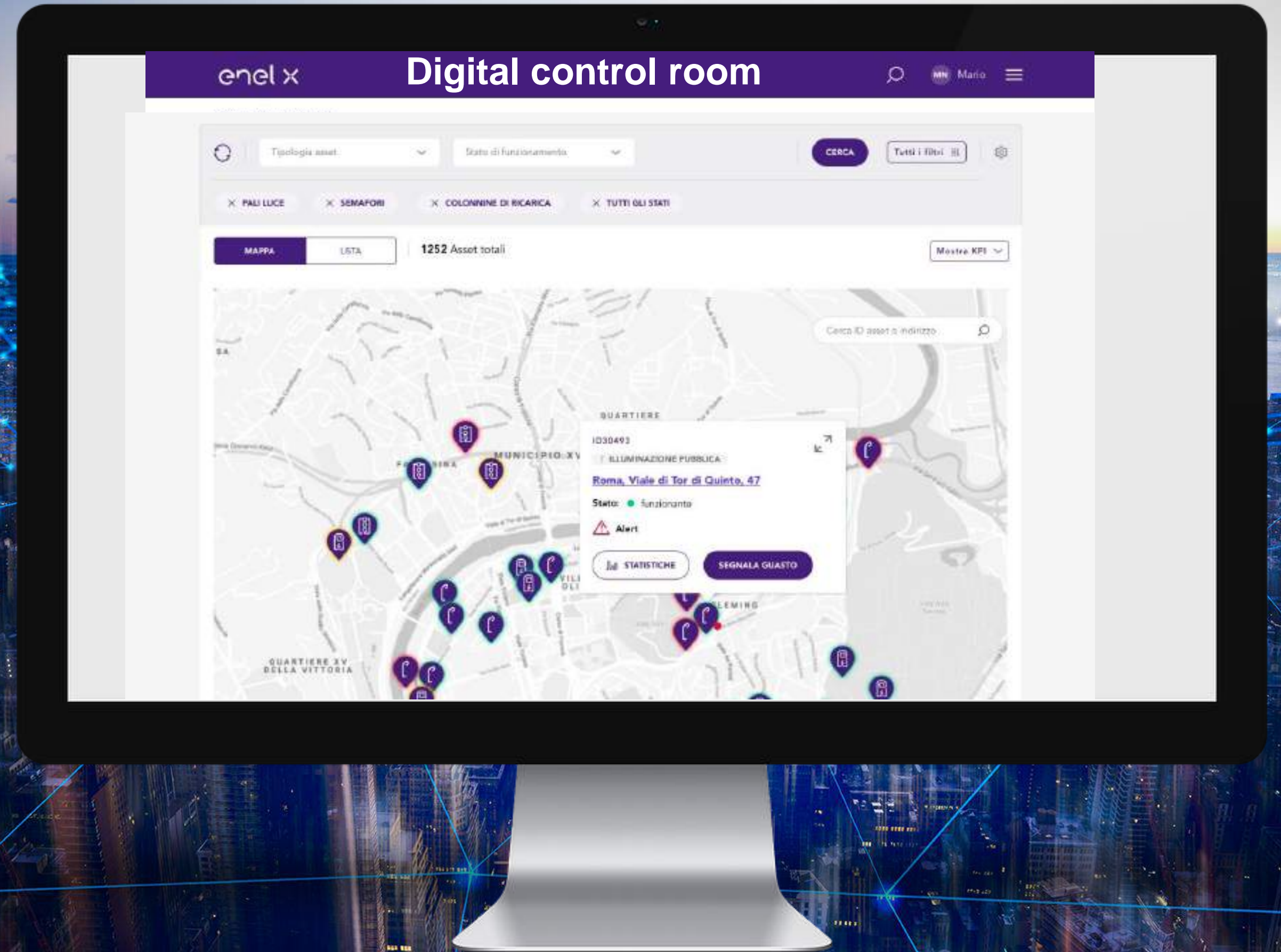
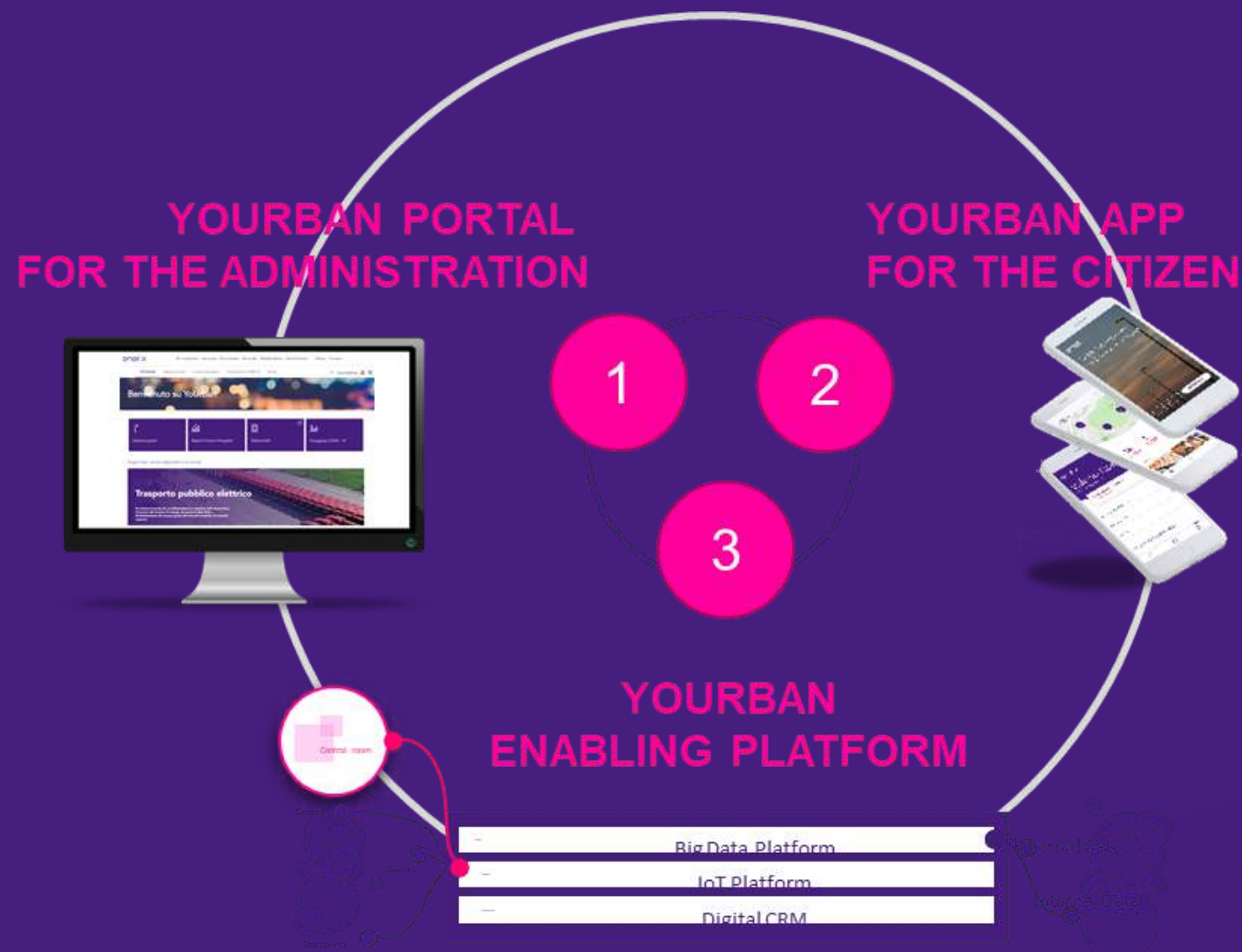


# Platformization as key enabler



## YoUrban digital ecosystem:

- the B2G platform
- to optimize and digitize public services
- at the same time increasing service quality and gaining process efficiencies





CIRCULAR  
INPUTS



SHARING  
PLATFORM



PRODUCT  
AS-A- SERVICE



PRODUCT  
LIFE-EXTENSION



RECOVERY &  
RECYCLE

## Circular economy and its potentials

Circular Economy is a glue between  
the **souls of Sustainability**

A successful sustainability strategy:

## Metrics & Certifications

Highlighting the relevance of our metrics and certifications **to measure the impacts** generated by organization

# Customized approach for each client and segment

CITIES



COMPANIES



CITIZENS



CITIES



COMPANIES



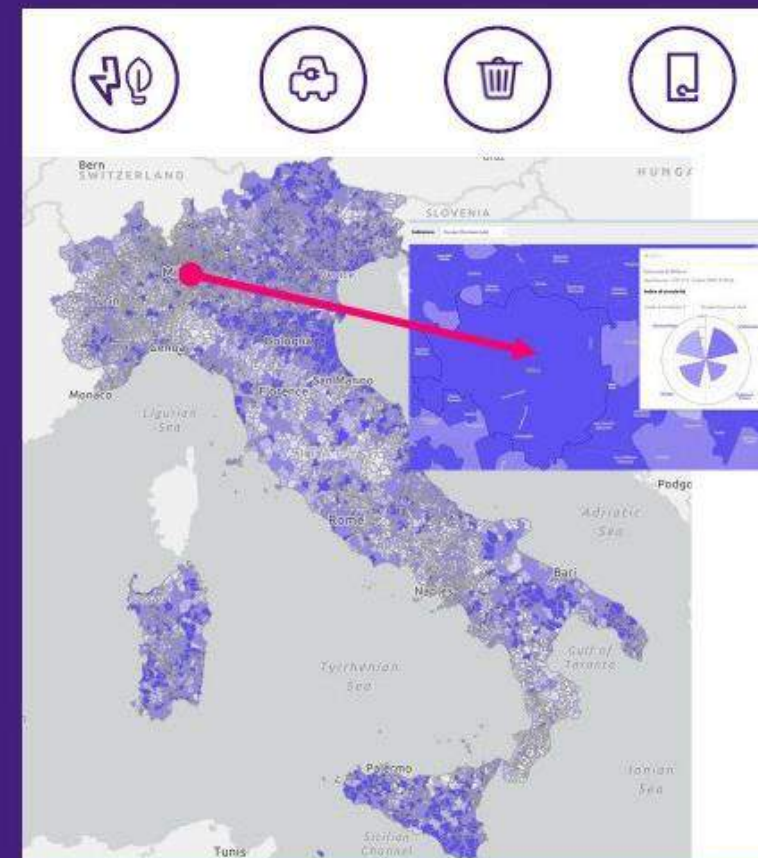
CITIZENS



# Circular City Index & Circular Economy (CE) Report for B2G

The Circular City Index and the Circular Economy Report measure the level of **circular maturity of municipalities**

## CIRCULAR CITY INDEX

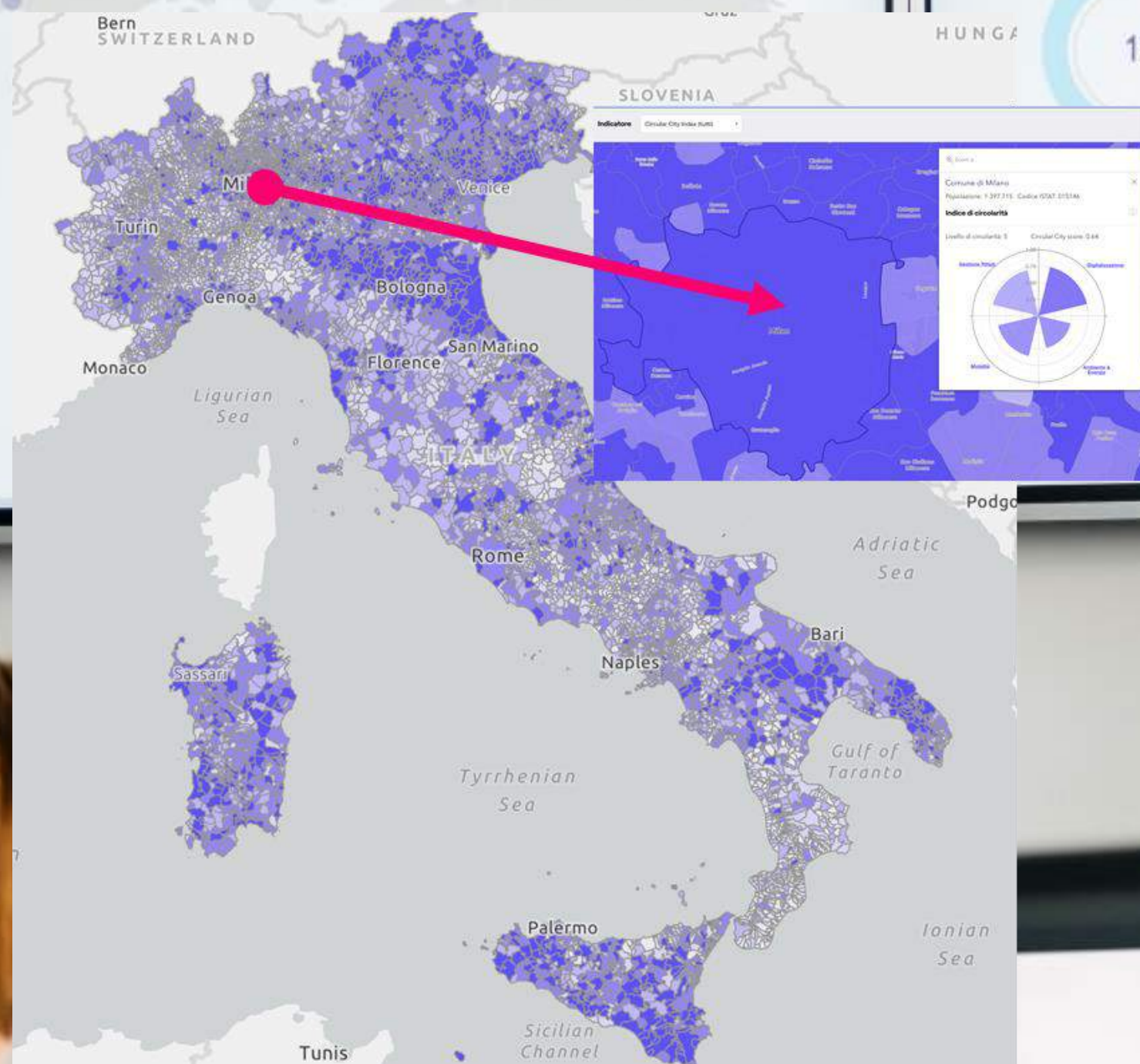


## CE REPORT FOR B2G





# Circular City Index



Relies on 100% open data

Developed with universities

Accessible for free on YoUrban

The Circular City Index measures the preparedness of all Italian municipalities to the green transition through open data

4 SUB-DIMENSIONS



ENERGY & ENVIRONMENT



WASTE MANAGEMENT



MOBILITY

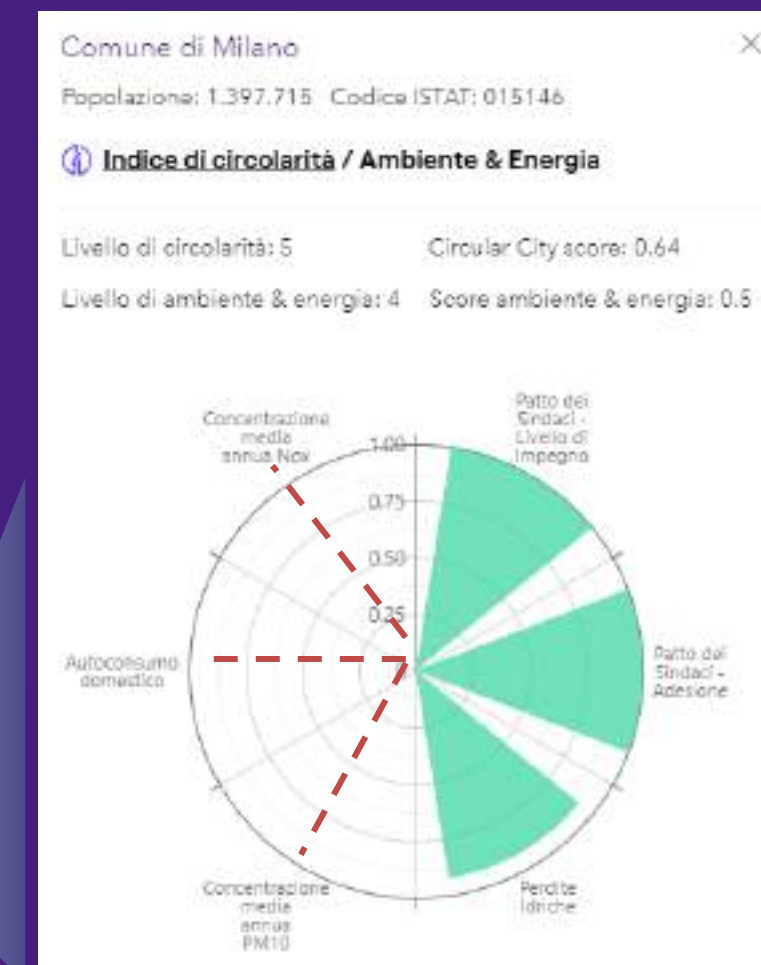
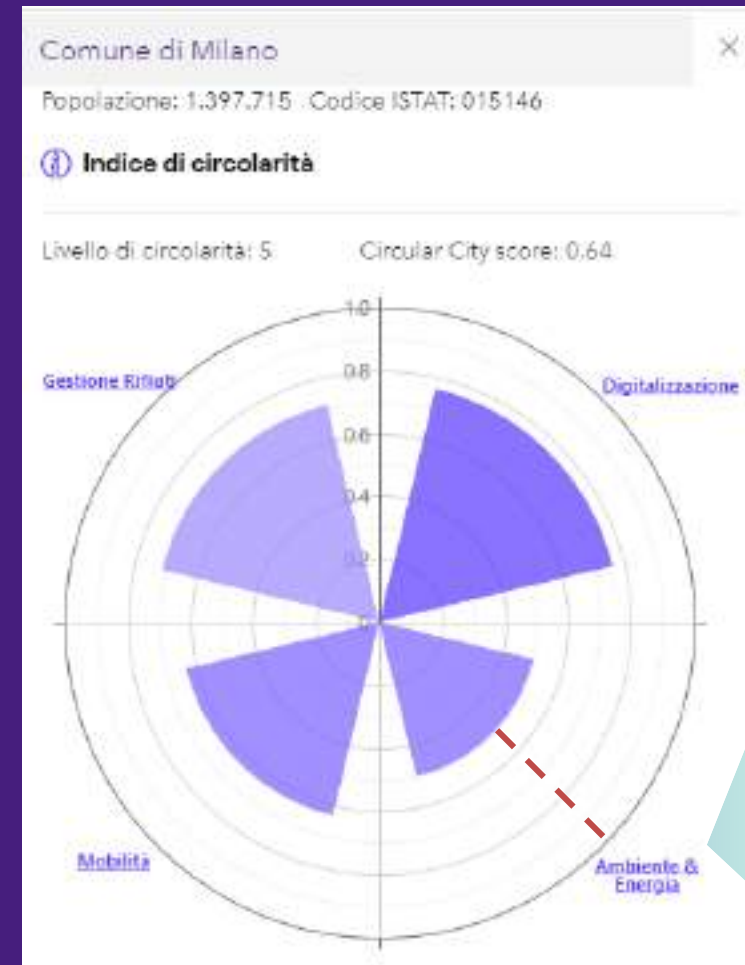


DIGITALIZATION

# Circular City Index



## 1. Identification of areas of improvement for each municipality



## 2. High level comparisons between territories



# Circular Economy (CE) Report for B2G



The Circular Economy Report helps municipalities measure their level of circular maturity

7 SUB-DIMENSIONS

CE  


ENERGY  


MOBILITY  


WASTE  


EMISSION  


WATER  
  
**NEW**

PROXIMITY  
  
**NEW**



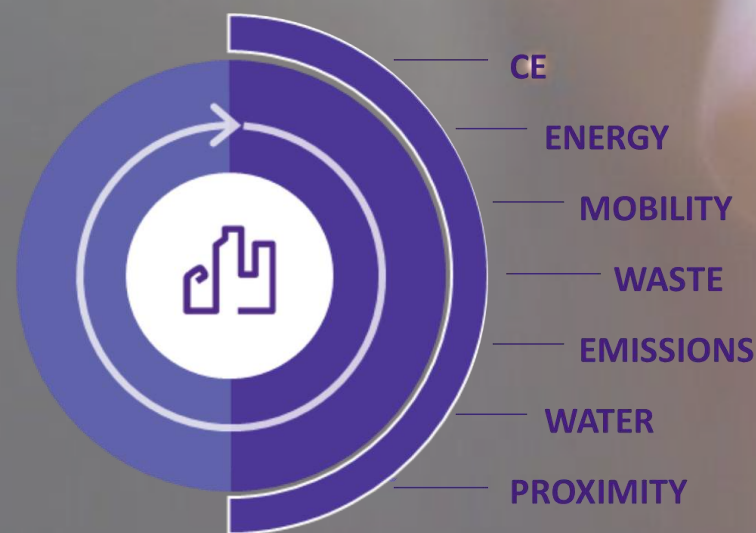
# Circular Economy (CE) Report for B2G



**STEP 1  
AS-IS ASSESSMENT**

**STEP 2  
CIRCULARITY ROADMAP**

**STEP 3  
SENSITIVITY ANALYSIS**



Strategic sustainability-driven planning

Effective and transparent communication

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# Circular Economy Report for B2B

The Circular Economy Report incorporates an innovative methodology to measure the **level of circular maturity of an organization**

Circular Economy & GHG Report





# CE & Social Inclusion Scores

Scoring for citizens and customers to assess the **level of circularity** and the **level of social inclusion** of portfolio solutions

CE & Social inclusion scores



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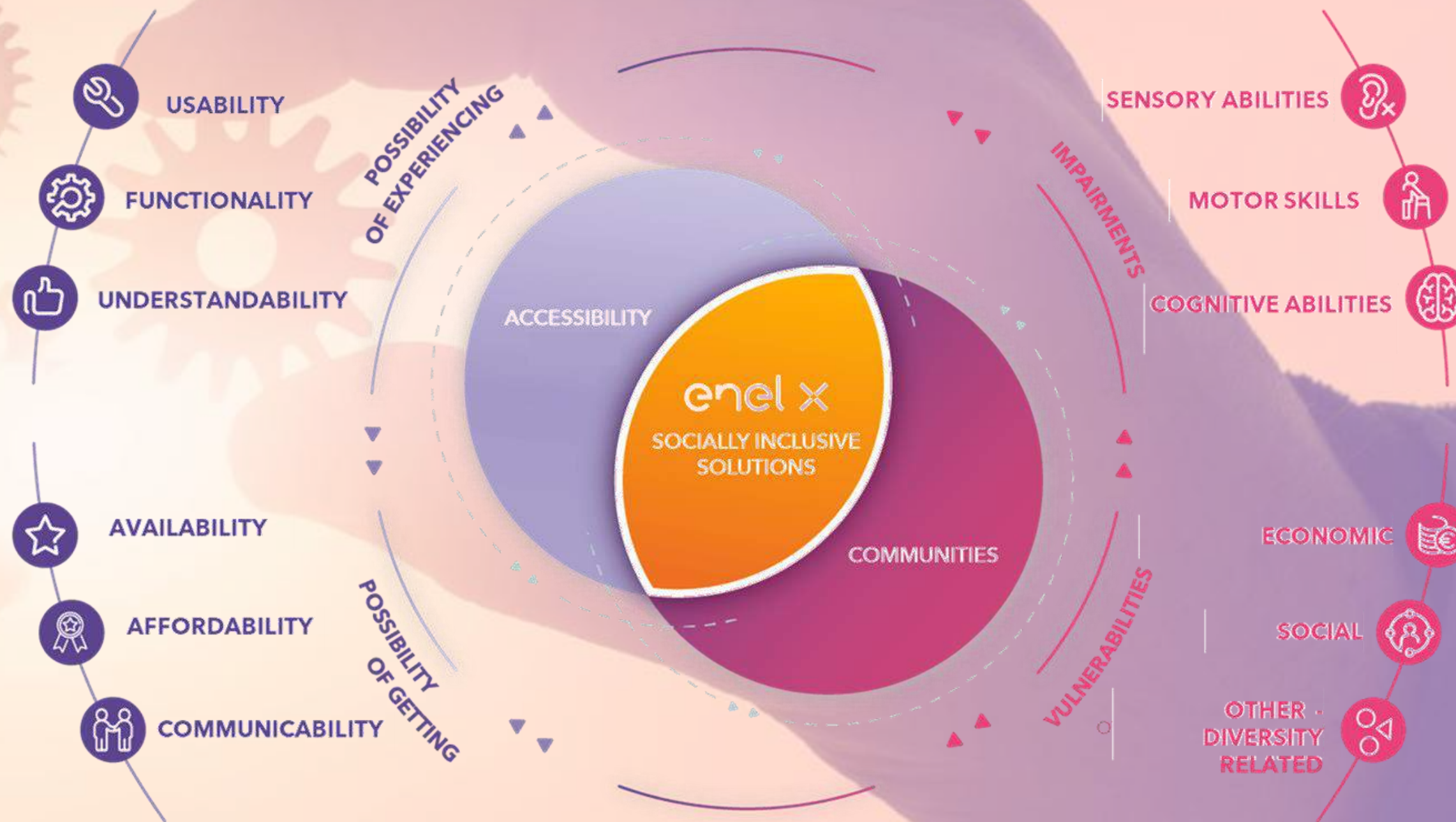
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# Social Inclusion Score

The Social Inclusion Model allows solutions rethinking through the combination of accessibility levers and needs of people with impairments and vulnerability conditions



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# Social Inclusion Score





# *SUSTAINABILITY*

A sketch of the citizen of the future

## Where we are right now?

The unique figure of the **circular citizen** does not yet exist, but it is already possible to see, however, that **some of its characteristics are present in some micro-communities** that embody some of the principles of the circular economy

+7%

2021 Home solar installation



# Residential PV

**+160%**

Global EV sales  
1<sup>st</sup> half 2021 vs 1<sup>st</sup> half 2020



**Electric Mobility**

**570 BLN €**

value of European sharing economy  
to 2025



**Sharing**



**2 BLN €**

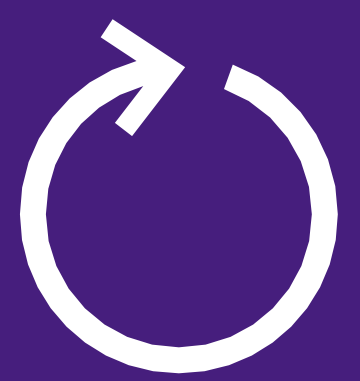
2020 Global Revenue\*

\* Do not include online mkt

 **Repairable Products**

11.2%

Annual growth rate (2021-2031) for second-hand apparel



2<sup>nd</sup> Hand

# LET'S IMAGINE A CIRCULAR CITIZEN



CIRCULAR INPUTS



SHARING PLATFORM



PRODUCT AS-A- SERVICE



PRODUCT LIFE-EXTENSION



RECOVERY & RECYCLE



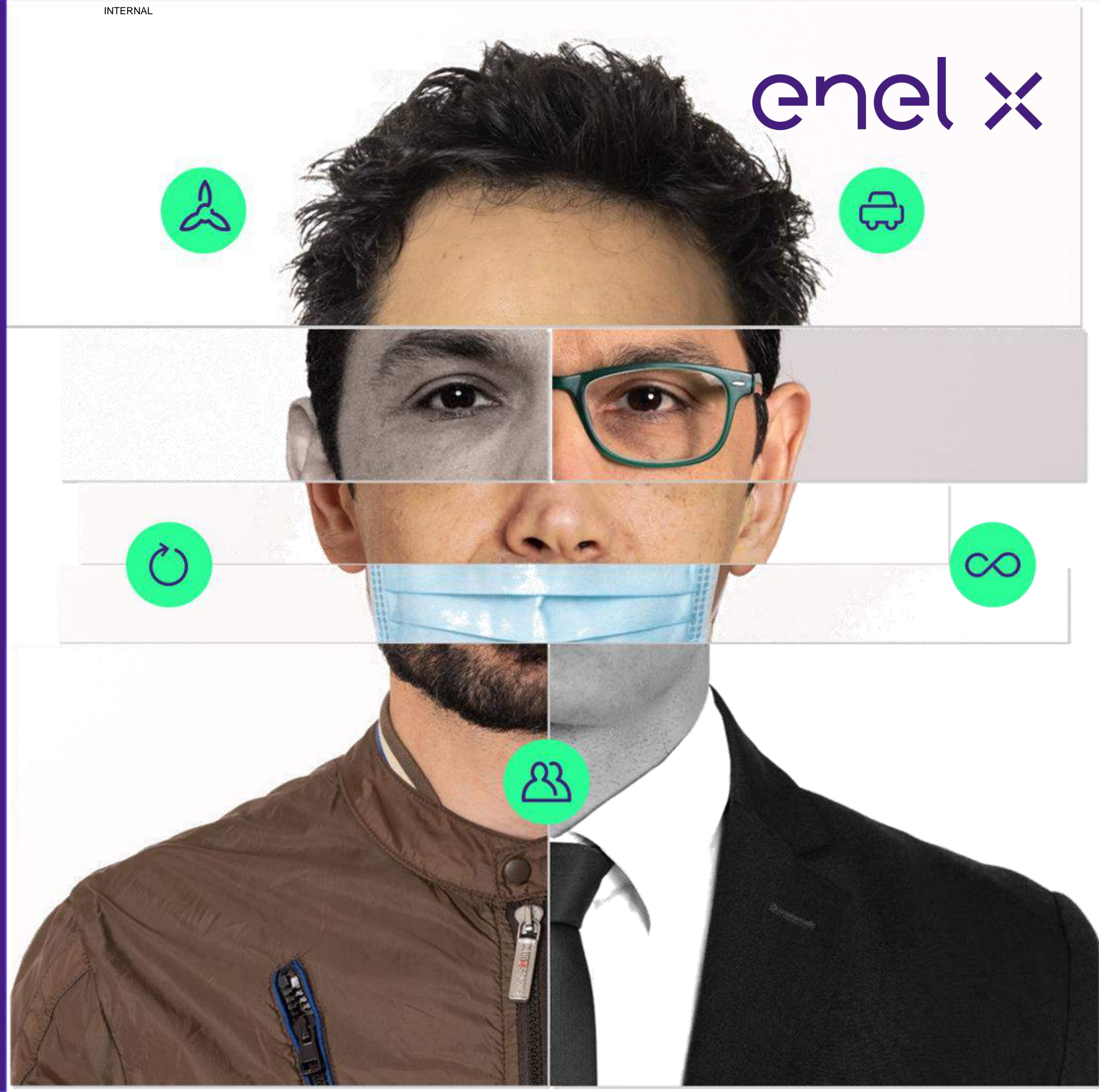


# LET'S IMAGINE A CIRCULAR CITIZEN

Currently, **some** of the **micro-communities** are **totally separate**, while **some** are just **beginning to interact**.

All these **characteristics** will come together soon **within a single individual**.

## The circular citizen



## A first example of Cross-Fertilization

Opportunities to maximize the investment of the photovoltaic system and optimize fuel-related transport costs



WHAT NEXT?



INTERNAL

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