



XIII

CONGRESSO
NAZIONALE
DEGLI
ATTUARI

INNOVAZIONE
TECNOLOGICA
E RISCHI SISTEMICI:
L'ATTUARIO
VALUTATORE
GLOBALE
DELL'INCERTEZZA

ROMA
10-12 Novembre 2021

Smart Cities Analytics

Enel X - Making opportunities happen

Stefano G. Coiro

Global Head of Customer Operations
Enel X e-City

Enel (and Enel X)

*is the Utility at the center
of the Energy (R) evolution*

*Making opportunities
happen in Smart Cities*

The (R) evolution of the Energy world

Enel view on the future



Decarbonization



Renewables will account for 78% of new generating capacity by 2050

Digitalization



Investment in digital technology will increase by 55% by 2025 (excluding fossil fuel)

Electrification



Global electricity demand will increase by 60% by 2040

New customer needs



Customers require increasingly tailored services for a recurring engagement

Source: BNEF 2018, IEA 2018

A deep transformation triggered by global trends

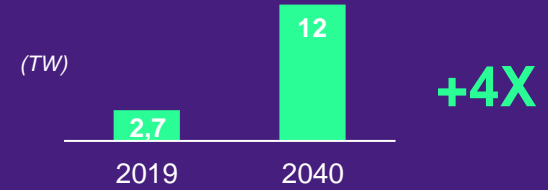
The Energy (R)evolution is fuelled by the transition to a more sustainable and decarbonized planet



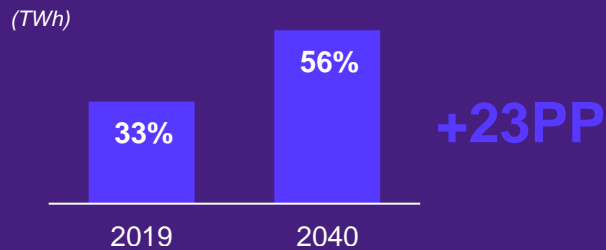
Electricity is the winner in this transition



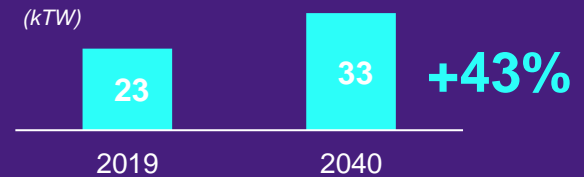
Global RES Capacity



Share of capacity connected to distribution grids¹



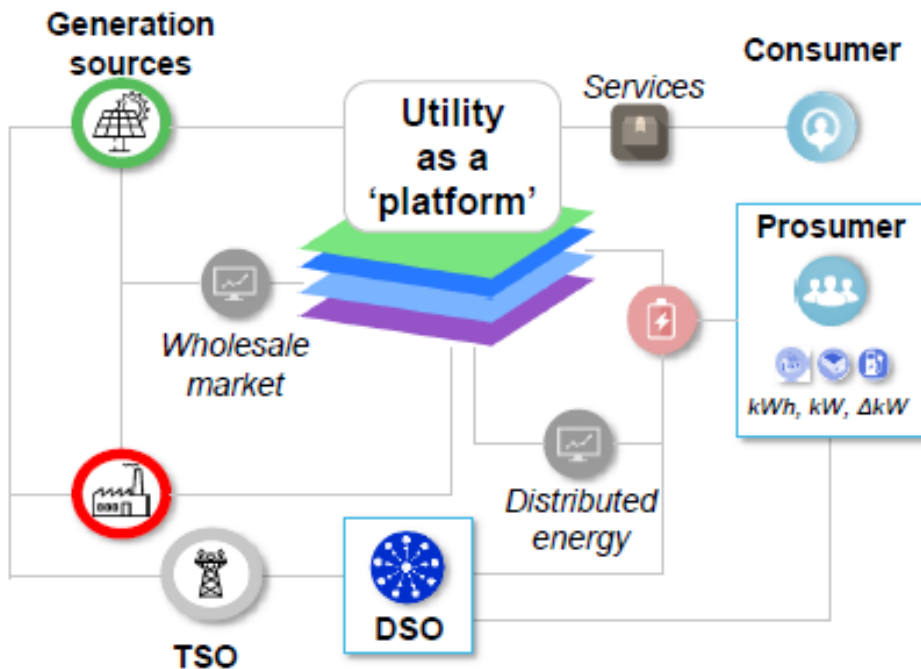
Electrified energy consumption



Source: IEA, World Energy Outlook 2020, Sustainable Development Scenario | Grid data from BNEF, NEO2020, Europe Figures 1.Europe

Enel, a leader with platform-based business models

to manage increasing levels of complexity

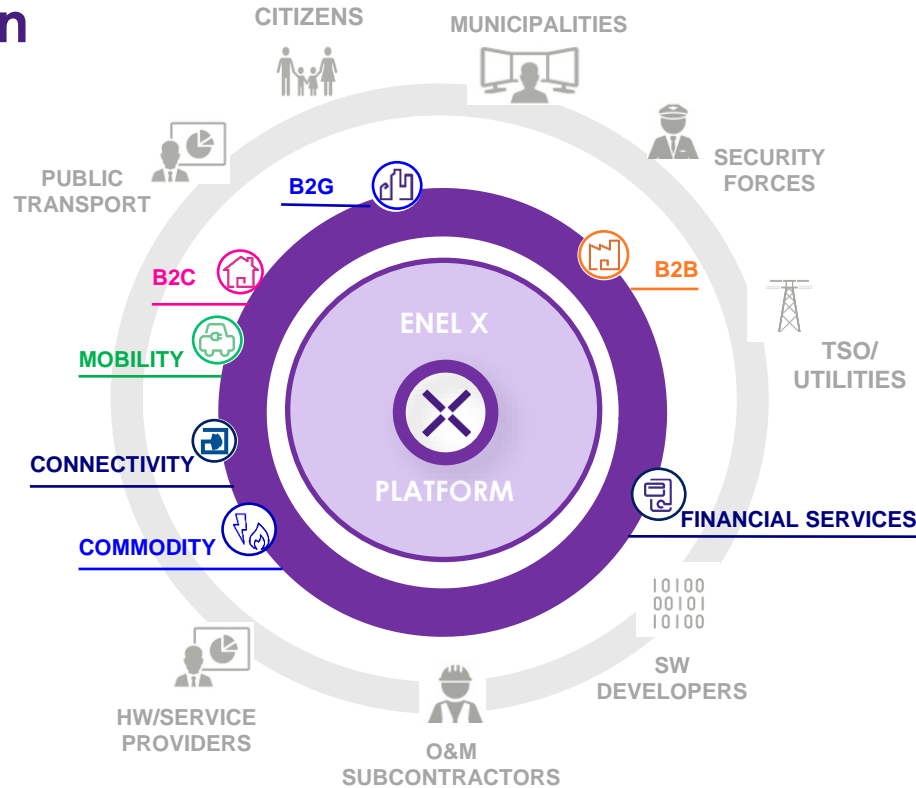


Why utility as a platform?

- Scale & efficiency**
Replicability of 'plug & play' models, marginal costs close to zero
- Value for customers**
Smart services designed around prosumers
- Sustainability**
ESG drives profitability and lowers risks
- Open Innovation**
Quick innovative solutions implementation and open to ecosystems

For more information see : Enel Capital Market Day 2020 at 2020<https://edge.media-server.com/mmc/p/9k5bb334/lan/it>

The Enel X vision



to create an **ecosystem** around the needs of customers that is based on a digital **platform**

STRATEGY

Key actions

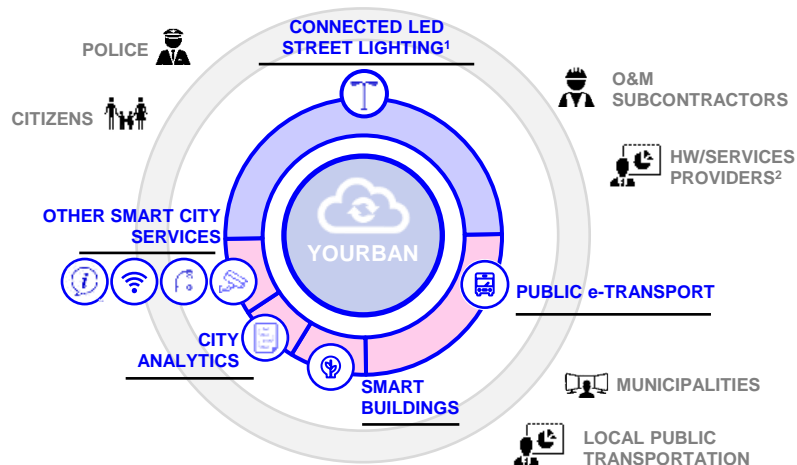
Allow decarbonisation in the cities through **electrification** of services (i.e. public transport)

Enable innovative services for **sustainable, smart** and **circular** cities

Leveraging our global leadership on **smart lighting**



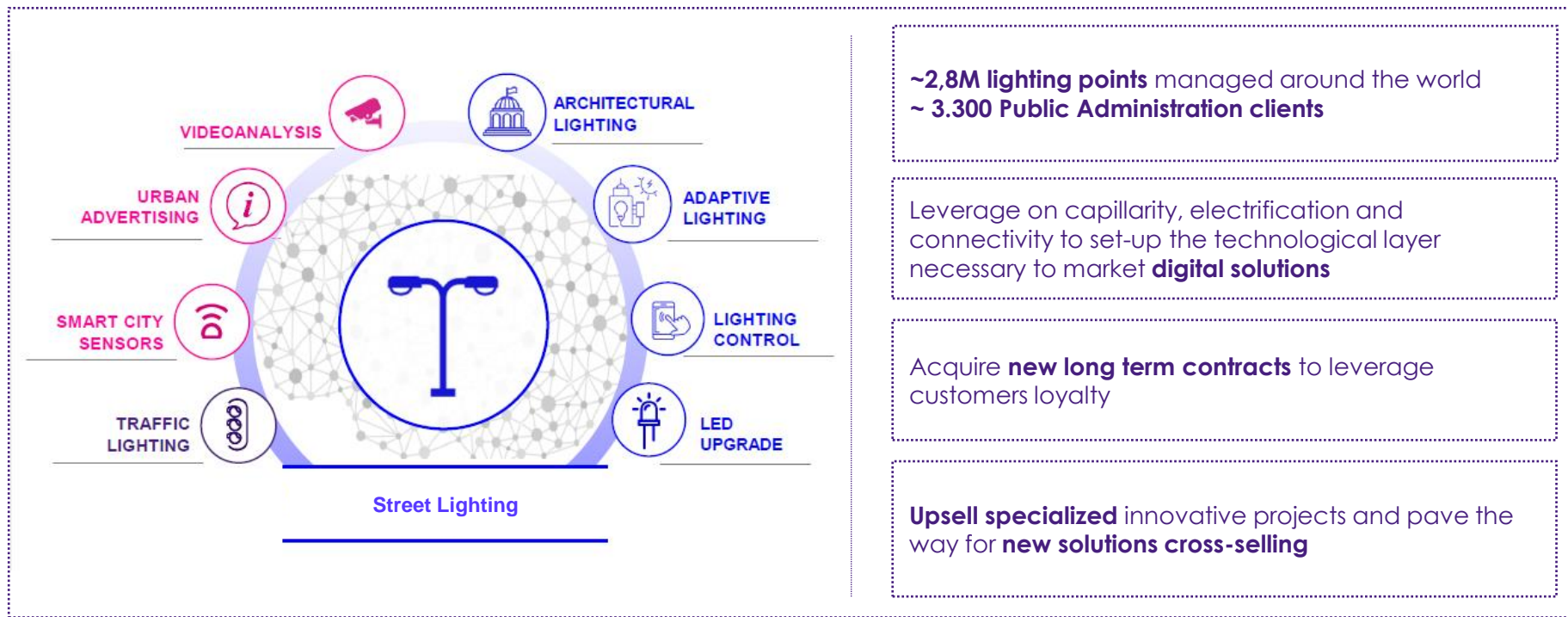
BUSINESS



Enel X E-City: the smart city ecosystem



We are a world leader in street lighting



~2,8M lighting points managed around the world
~ 3.300 Public Administration clients

Leverage on capillarity, electrification and connectivity to set-up the technological layer necessary to market **digital solutions**

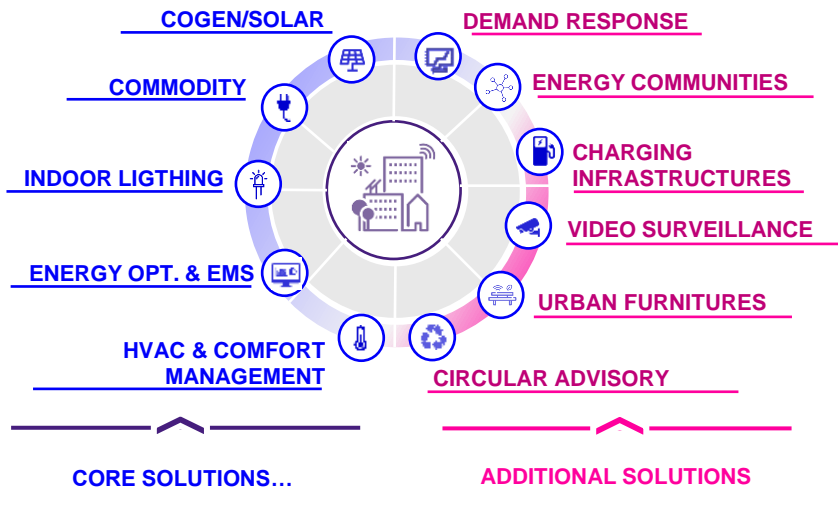
Acquire **new long term contracts** to leverage customers loyalty

Upsell specialized innovative projects and pave the way for **new solutions cross-selling**

We provide energy efficiency services for Public Buildings



ENERGY EFFICIENCY OFFERING



TARGET CUSTOMERS



PUBLIC OFFICES



AIRPORTS



HOSPITALS



SWIMMING POOLS



SCHOOLS



STADIUMS



PRISONS

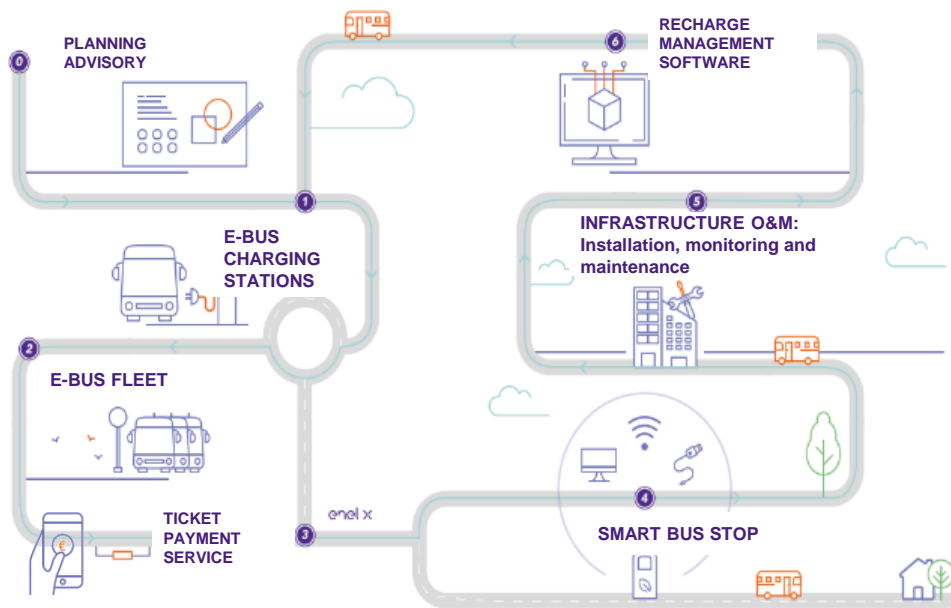


TRAIN STATIONS



WAREHOUSE AND PRODUCTION FACILITIES

We are a frontrunner in end-to-end solutions to electrify public transportation



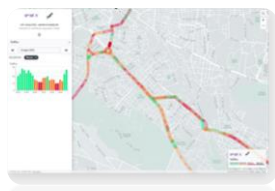
Enel X E-City and the journey in Big Data and Open Data



City Analytics – Mobilità delle persone

obiettivo:
stimare presenza e flussi
delle persone nella città
per pianificare i servizi e le
infrastrutture in base alla
domanda reale

Status:
LIVE



City Analytics – Traffico & Manto stradale

obiettivo:
analizzare le condizioni del
traffico e definire politiche di
trasporto e prioritizzazione
della manutenzione stradale

Status:
LIVE

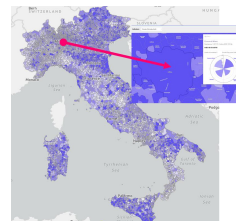


City Analytics Mappa di Mobilità

obiettivo:
verificare su base
quotidiana le variazioni
di indicatori di macro
mobilità (utilizzato nel
contesto pandemico)

Status:
LIVE (esteso fino 31-12-21)

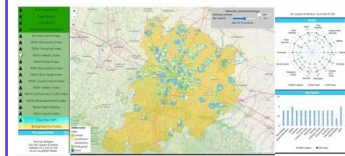
Open Data Solutions – programma avviato
a partire dalla *Openinnovability* challenge



Circular City Index

obiettivo:
definire il livello di
preparazione di ogni
città e comune alla
adozione dei
paradigmi della
economia circolare

Status:
LIVE



15 Minutes City Index

obiettivo:
definire il livello di
accessibilità dei servizi
base in micro distretti per
supportare la pianificazione
di prossimità

Status:
In sviluppo (Lancio Dic 2021)

Data products premium

Data products gratuiti

City Analytics: Data as driver of change

City insights at your fingertips



City Analytics solution

Tool of **big data analytics** having **dynamic dashboards and data extrapolation** supplying grounded information for **city planning and management**, especially around public services.

- **People mobility** (es. origin/destination, segmentation of resident people, commuters, tourists)
- Real time flows of **Traffic index** (es. average pace, traffic congestions indicators, typology of vehicles, ...)
- **Road roughness** (es. International Roughness Index geolocalization of issues)



Areas of application



MOBILITY



PUBLIC TRANSPORT



SECURITY



TOURISM

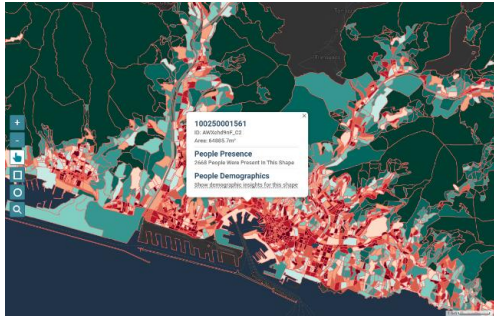
« We have applied Enel X City Analytics solution to build mobility matrixes based on real citizens movements within the city.

It has been a very interesting experience, which helped us to better understand how to face all decisions regarding flows analyses and to approach them in a more **integrated way basing on data coming from multiple sources**»

Marco Beltrami,
Amministratore Unico di AMT Genova

City Analytics: AMT Genova

THE CASE



AMT (Azienda Mobilità e Trasporti) of the city of Genoa, following the collapse of the Morandi bridge in August 2018, wanted to optimize the metro service

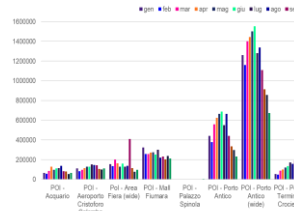
THE PROJECT

City Analytics has been applied on the entire 2019 to:

- Analyse the use of the city metro
- Estimate most common itineraries

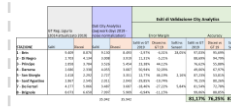
THE RESULTS

Min 75% of estimate accuracy on:



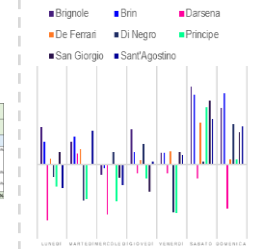
People presence at each metro station

Define most crowded stations, days and hours to identify seasonal trends



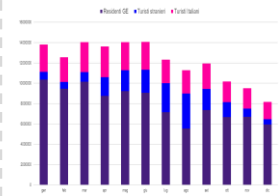
Metro Stations Origin/Destination matrix

Reinforce most frequent itineraries



Impact of marketing activities at each metro station (i.e. free ticket)

Define policies to incentivize usage of metro



Seasonal trends and origin breakdown by users type (resident, tourist, commuter)

Accommodate tourist and commuters peaks without compromising on service quality

City Analytics: Rome E-Prix

THE CASE



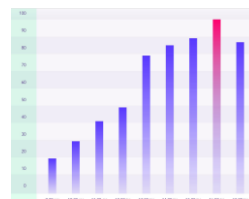
City Analytics has been used for qualitative and quantitative analysis of the e-prix event attendance in Rome (13^o April 2019)

THE PROJECT

City Analytics has been applied for 15 days (pre, during and post event)

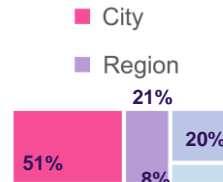
THE RESULTS

90% of estimate accuracy on:



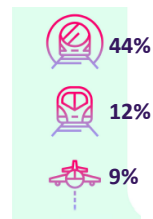
Attendance
measured on an
hourly basis

increase
security measures
during peak hours



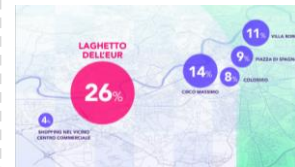
Attendance
origin

Define the
advertising
strategies



Means of
transport used

check sufficiency
of connections
to the event

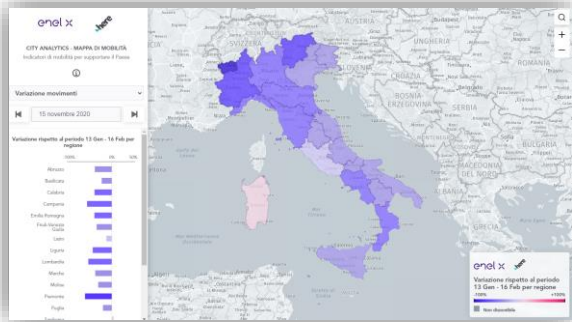


Other destinations
visited in the city

offer touristic packs or define
commercial partnerships for
cultural and or shopping
experiences

City Analytics: Mobility Map Italy

THE CASE



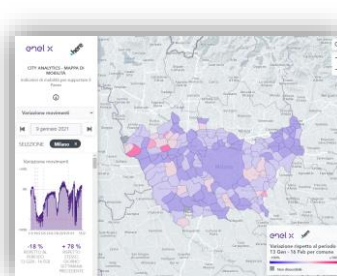
In the first weeks of the COVID-19 emergency Enel X, in partnership with HERE Technologies, has developed and launched a free online application of City Analytics specifically designed to answer to the pandemic challenges, such as the need to verify the compliance of mobility restrictive measures

THE RESULTS

- 1.800 Public Administrations with access to in-depth analysis and data
- 5.5 M clicks to the map; 400K unique visitors

THE ANALYSIS

14th of April 2020: Launch of City Analytics – Mobility Map



Mobility macro indexes

Daily analysis of variations in journeys and km used at regional, provincial and municipal level



Traffic monitoring

Historical and real-time traffic data on main national roads

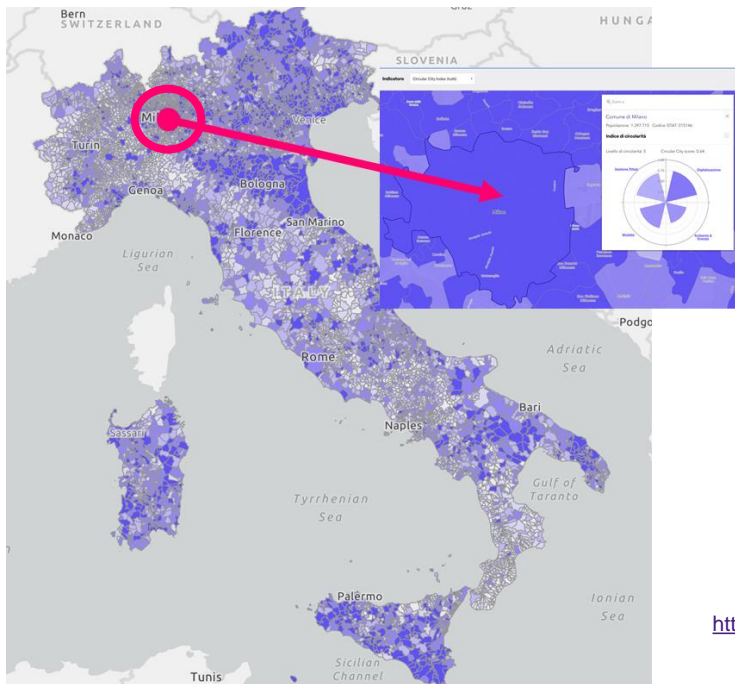


Origin Destination matrix between cities and regions

Weekly Origin/Destination matrices between the main cities and regions of Italy

From Open Data to actionable and comparable insights

Circular City Index: a free assessment tool



The Circular City Index measures the level of preparedness to the adoption of the circularity paradigm

The model evaluates 4 dimensions:



Digitization



Mobility



Energy & Environment



Waste

- Free
- Available online on Yourban Portal
- Based 100% on Open Data
- Developed in collaboration with the **University of Siena**
- Available for ALL Italian municipalities at :

<https://www.enelx.com/it/it/istituzioni/sostenibilita/circular-city-index>

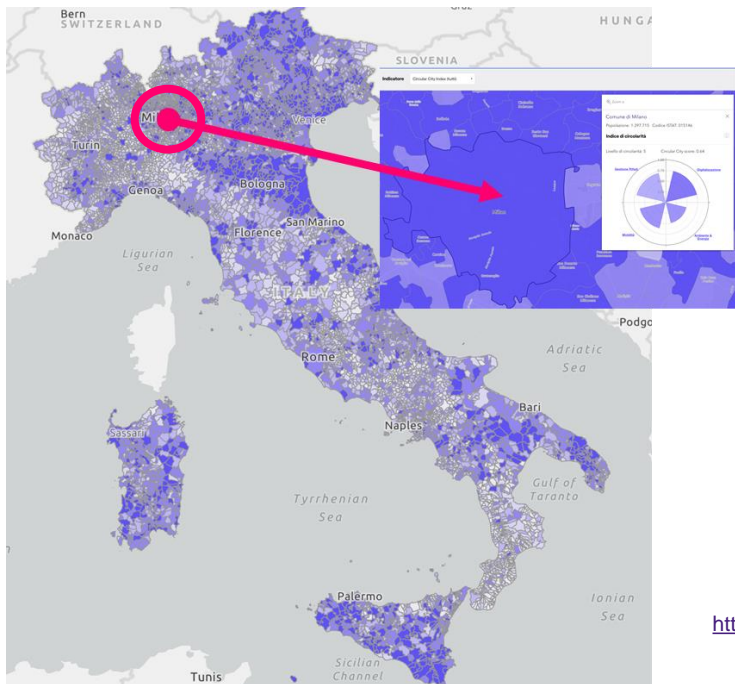
Identify key opportunity areas

Compare with national landscape

Monitor yearly progresses

From Open Data to actionable and comparable insights

Circular City Index: a free assessment tool



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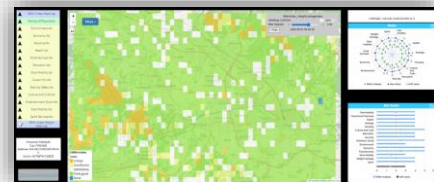
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COMING SOON

OPEN DATA 15 MINS City INDEX
a new tool under development, all based on Open Data, to provide administration with **city quality indicators** for all areas of the city (700 sqm)

The indicators is based on **proximity levels of key services for citizens**, which can be reached in 15 minutes by foot or bicycle



Identify key opportunity areas

Compare with national landscape

Monitor yearly progresses

Developed in collaboration with the **University of Firenze**

Thank you!

Stefano G. Coiro

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