The Gruppo CAP Case Study

Gruppo CAP

Who we are 1/2

GRUPPO CAP

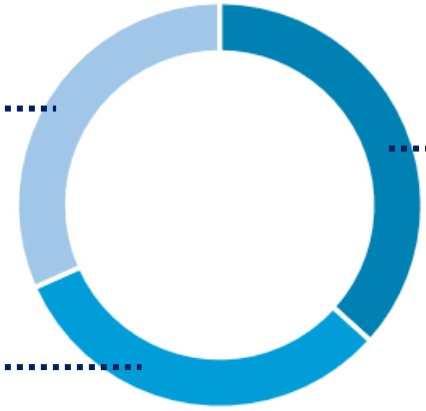
is the operator of the water integrated system for the METROPOLITAN CITY OF MILAN and other cities of the province of MONZA-BRIANZA, VARESE and COMO.

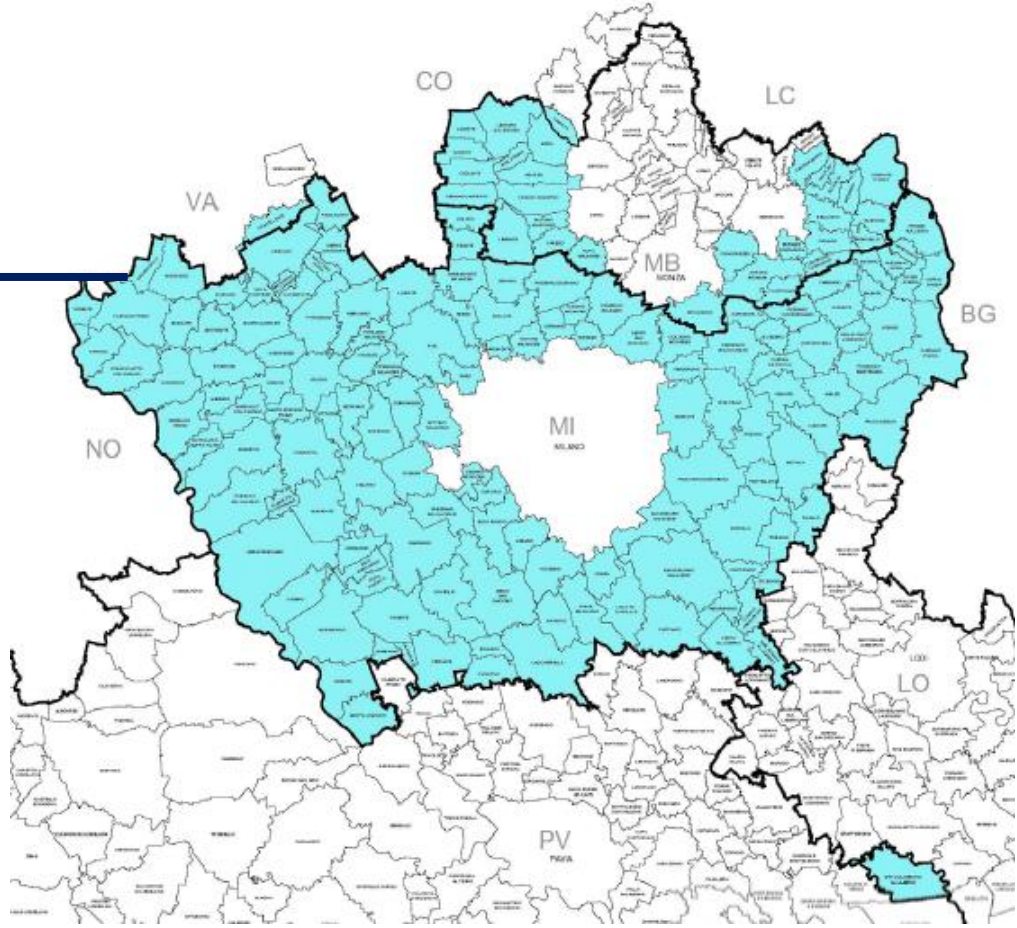
No. Municipalities served

154
Aqueducts

133
Water treatments

133
Sewers





Gruppo CAP in Numbers 1/2

2,2 million inhabitants served

(higher if you add the people who travel to work daily in one of the most industrialized and productive areas of Italy)

868 employees

over

6,500 kilometers

of sewerage

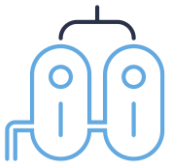
over

750 wells

about

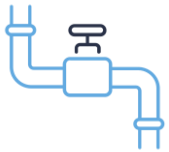
200 million m³

of water supplied



40

wastewater treatments plants



approximately

6,500 kilometers

of water network

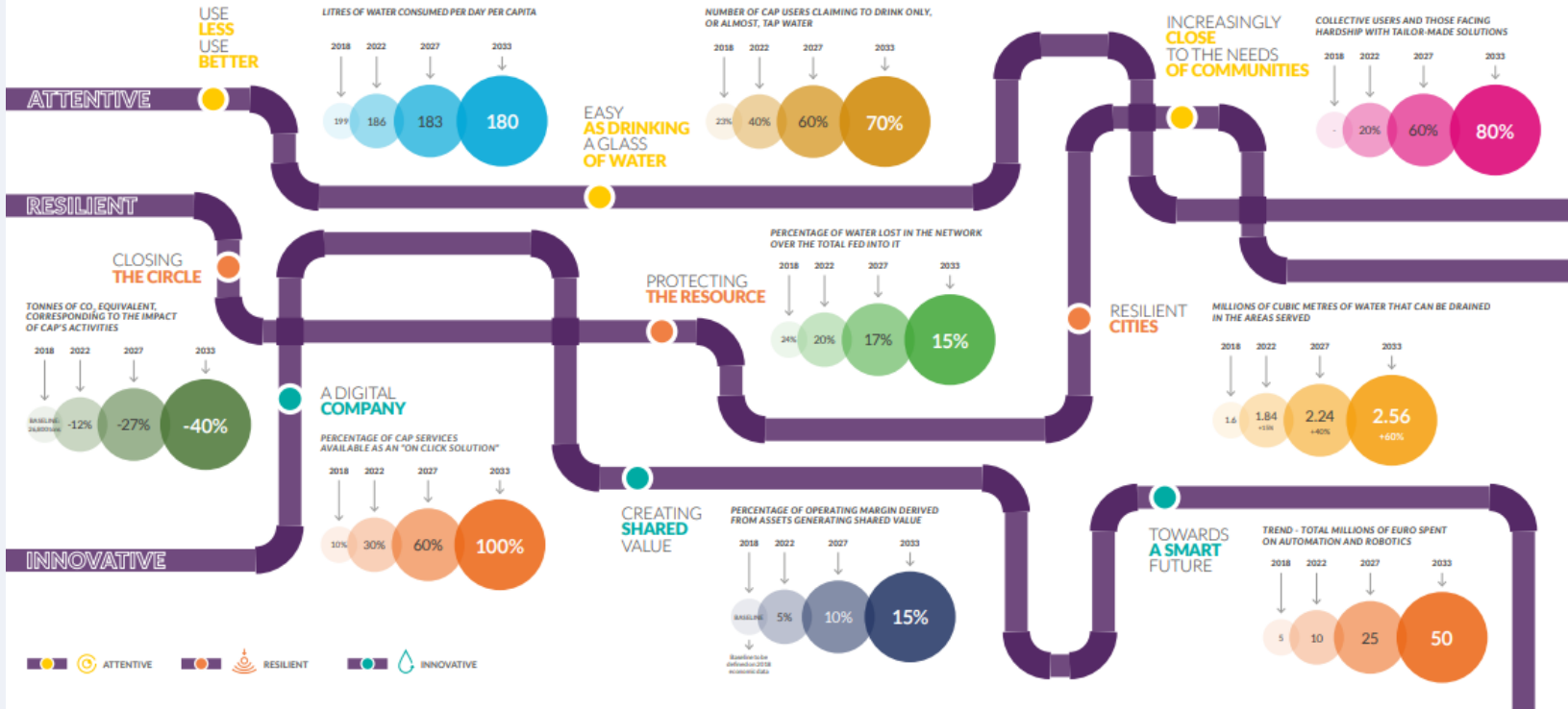
about

170 water houses

Sustainability in CAP

OUR SUSTAINABILITY STRATEGY

- The Group's first strategic **Sustainability Plan** inspired by the international best practices in the sector.
- A strategy resulting from the integration of **sustainability objectives in the business activities** which identifies the corporate changes and provides innovative tools able to respond to the challenges of the sector.
- A strategy built around 3 priority action lines and 9 ambitious targets to achieve by 2033 with the aim to anticipate the main **social, environmental and economic challenges and trends** of the sector.



Sustainability Plan

ATTENTIVE

to people's needs, to increase the well-being and trust of increasingly aware and demanding communities

Demographic and social changes are creating strong pressures on the functioning mechanisms of markets worldwide.
For the company, the ability to be attentive, that is, to know how to pick up the signals from society and to respond quickly and comprehensively, is of strategic importance in today's world.

+55%	Second	+5 million
growth in global fresh water demand expected between 2010 and 2050	in the world behind Mexico and first in Europe for per capita consumption of bottled water	Italians in absolute poverty, a record number since 2005

RESILIENT

in assets, governance and management to protect an essential asset for life

The evolution of consumption and production systems is putting increasing pressure on ecosystems, both in terms of resource consumption and of waste produced and emissions into the atmosphere. These production and consumption activities, together with short-sighted and often unsustainable urbanization methods, have growing local impacts that multiply extreme events. This also concerns water management with more frequent and critical episodes of flooding or drought.

August 1	10.4 million	5,000
Earth Overshoot Day 2018, i.e. the day humanity went into debt with the planet's resources	people whose water needs could be met with the volume of water lost in Italy	hectares of the national territory consumed between 2015 and 2016

INNOVATIVE

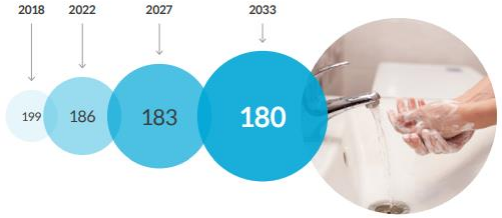
in the market, anticipating the rules and feeding our ability to network

Technological and knowledge developments are creating strong pressures on the functioning mechanisms of the markets.They are changing companies' organisation, collaboration and innovation logics and strategic choices.
The greatest challenge of the change is posed by the adaptability of people and organisations.

3-6 trillion	35 billion	10 billion
dollars: the economic impact of the IoT globally	euros: the opportunity for growth by stimulating collaboration between companies and start-ups in Italy	euros in damages attributable to cyber-crime in Italy in 2016

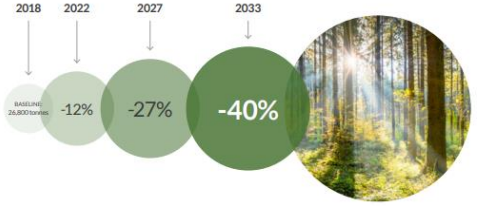
USE LESS USE BETTER

LITRES OF WATER CONSUMED PER DAY PER CAPITA
(CAP survey)



CLOSING THE CIRCLE

TONNES OF CO_2 EQUIVALENT, CORRESPONDING TO THE IMPACT OF CAP'S ACTIVITIES
(CAP survey)

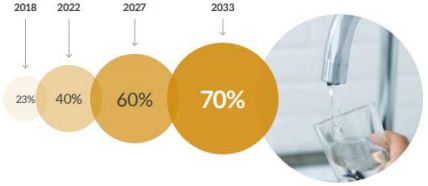


A DIGITAL COMPANY

PERCENTAGE OF CAP SERVICES AVAILABLE AS "ON CLICK SOLUTION"
(CAP survey)

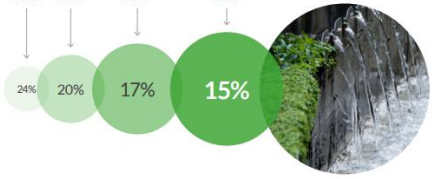
EASY AS DRINKING A GLASS OF WATER

NUMBER OF CAP USERS CLAIMING TO DRINK ONLY, OR ALMOST, TAP WATER
(CAP - Customer Satisfaction survey)



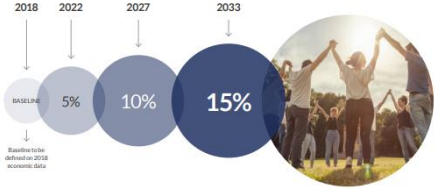
PROTECTING THE RESOURCE

PERCENTAGE OF WATER LOST IN THE NETWORK OVER THE TOTAL FED INTO IT
(CAP survey)



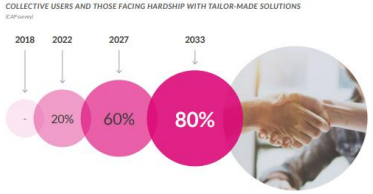
CREATING SHARED VALUE

PERCENTAGE OF OPERATING MARGIN DERIVED FROM ASSETS GENERATING SHARED VALUE
(Analysis based on the reclassification of CAP's Income Statement)



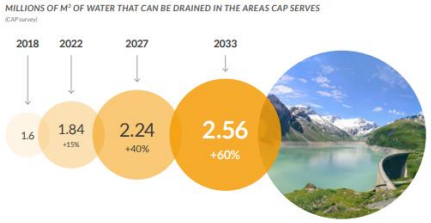
INCREASINGLY CLOSE TO THE NEEDS OF COMMUNITIES

COLLECTIVE USERS AND THOSE FACING HARDSHIP WITH TAILOR-MADE SOLUTIONS
(CAP survey)



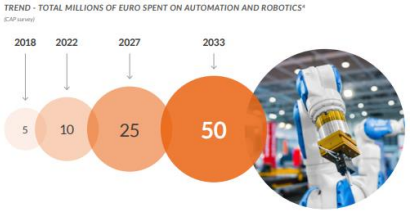
RESILIENT CITIES

MILLIONS OF M^3 OF WATER THAT CAN BE DRAINED IN THE AREAS CAP SERVES
(CAP survey)



TOWARDS A SMART FUTURE

TREND - TOTAL MILLIONS OF EURO SPENT ON AUTOMATION AND ROBOTICS*
(CAP survey)

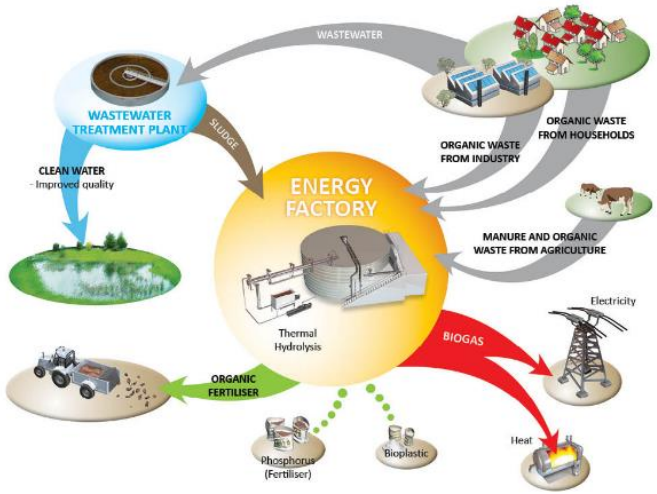


Projects and Activities

Defining the challenge - 2016

- Gruppo CAP provides municipal water and wastewater services to over 2 million inhabitants, producing in 61 waste-water treatment plants where almost 90.000 ton/year dewatered sludge is produced.

- **In such a scenario Gruppo CAP can and wants to deliver a circular economy approach**. To this aim Gruppo CAP has defined a territorial **Master Plan** to implement eco-innovative and energy-efficient solutions to
  - **renovate and innovate existing wastewater treatment plants**
  - **close the circular value chain by applying low-carbon techniques to recover materials that are otherwise lost.**



SMART-Plant

Digital Water .City

- The existing municipal wastewater treatment plants can be renovated and integrated to become multi-purpose urban biorefineries that serve the citizens to treat and valorize municipal waste streams, such as wastewaters and organic waste, towards a coherent urban strategy

- In order to include leading edge sustainable solutions, the **Master Plan (50 M€ budget)** considers synergic interaction with large ongoing European Horizon2020 innovation actions, **such as the "SMART-Plant" and the "Digital Water Cities" projects**

- Existing anaerobic digesters will be valorized towards the best exploitation of the existing reaction volumes, industrial symbiosis opportunities will be explored in order to provide better and cheaper services to our customers

The network – PERFORM WATER 2030 LIVING LAB

Vision and strategy

PerFORM WATER 2030 will create a living lab of strategic importance for the public water management sector. Innovative technologies and practices will promote a more efficient and sustainable future for the Integrated urban water management. The project aims to support water utility managers, so that they can act as key players and promoters of innovation in the water sector.

The project will take place in various wastewater treatment plants managed by CAP Group in the Metropolitan City of Milan and it will focus on 4 main thematic areas, whose research activities will be supported by transversal implementation and dissemination actions (or further information, please refer to the specific web-page dedicated to project activities of PerFORM WATER 2030).

Water

This themathic area includes drinking water quality and its network optimization, monitoring and removal of emerging contaminants, monitoring and reduction of gaseous emissions into atmosphere and wastewater treatment processes optimization.

Biosolid valorization

The planning and activation of measures to reduce the quantity of sludge produced during the purification phase is envisaged. This line of action also includes an action aimed at thermally exploiting the sludge, recovering energy and raw materials from purification activities.

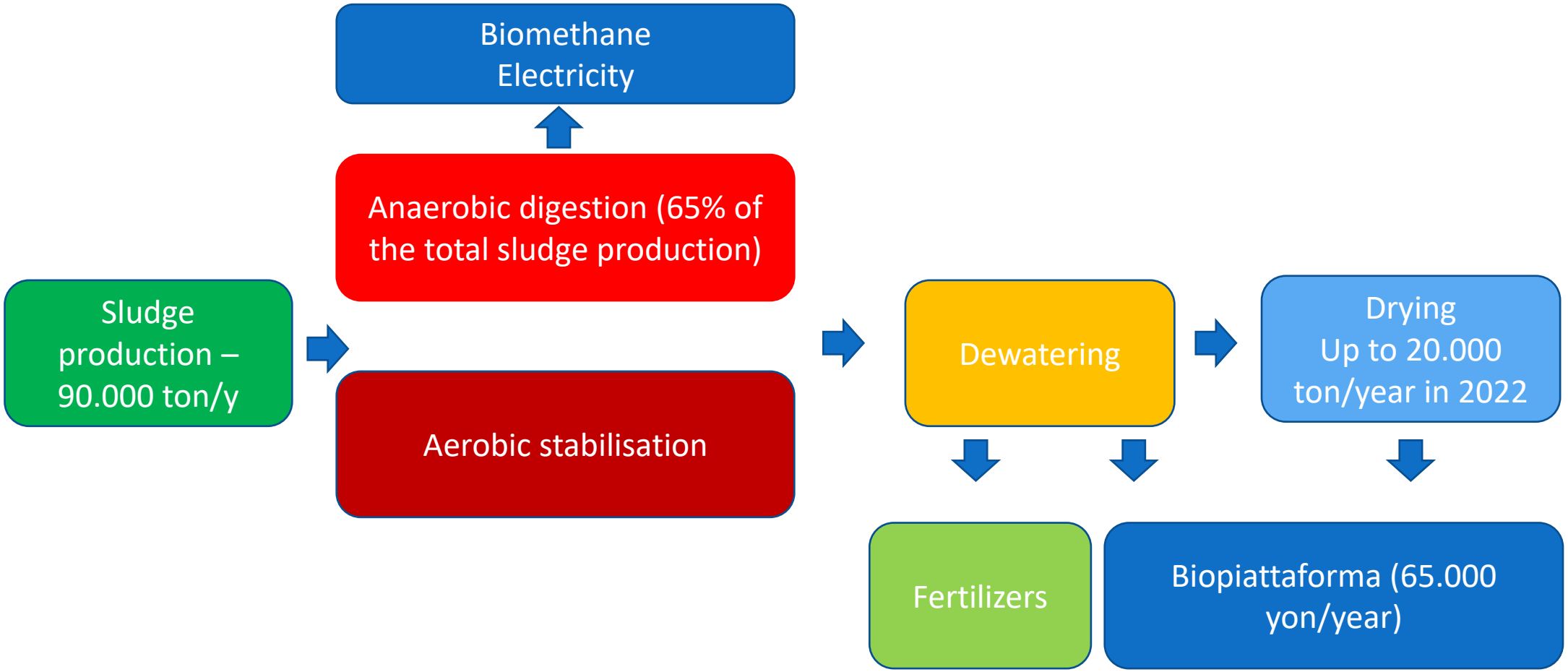
Recovery of energy and materials

This thematic area is addressed to the recovery of materials and energy in wastewater treatment plants, the upgrade of biogas to biomethane and the optimization of anaerobic digestion.

Economic and social issues

An extensive assessment of the economic and social acceptance of new technologies is carried out by involving stakeholders and by an advanced analysis of costs and pricing strategies for the water service.

Sludge management strategies



Biomethane Production

1. The biomethane production plant at the **Bresso- Niguarda** wastewater treatment plant was started up in April 2019. It is the first plant in Italy to feed SNAM biomethane from sewage wastewater into the network. All biomethane is sold for automotive purposes to a shipping company that manages several distributors in the Milan area.

2. CAP also obtained biomethane sustainability certification under UNI/TS11567 from RINA. Total production of biomethane meeting all national and international standards in 2019 amounted to
325,339 Smc.

3. In order to maximise production, CAP, in collaboration with **Kyoto Club**, has carried out simulations to make the treatment processes of organic materials (FORSU, agro-food waste, mowings) to be used in the production of biomethane more efficient.

Nutrients, chemicals and material recovery

TARGET Within 2033:

90% reduction of waste production

13,000 tonnes of green products made from waste

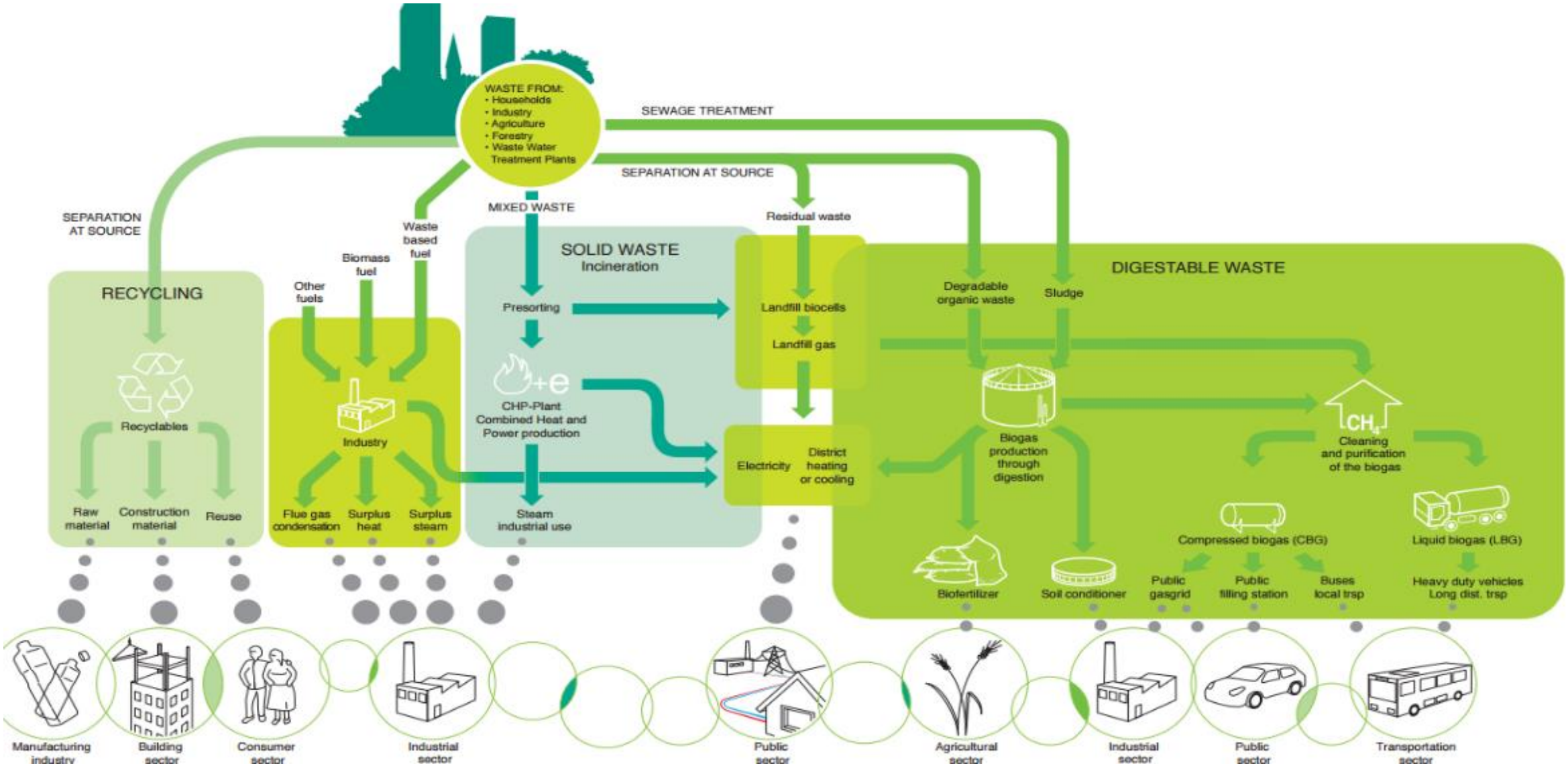
CAP launched several **projects**:

- sulphur recovery at the Bresso WWTP from April 2019;
- fermentation sludge with VFA production (volatile fatty acids) at the Sesto San Giovanni WWTP since September 2019.
- Sand recovery in Robecco (end of waste)

In addition, other **fertilizers production plant** have been implemented:

- compost, obtained with the sludge of the WWTP of Rozzano;
- Biosulfate at Peschiera Borromeo and San Giuliano Est WWTP

Biopiattaforma Sesto – The Idea



The BIOPIATTAFORMA Project

47 employees kept their jobs

New 547 new jobs induced

OBJECTIVE

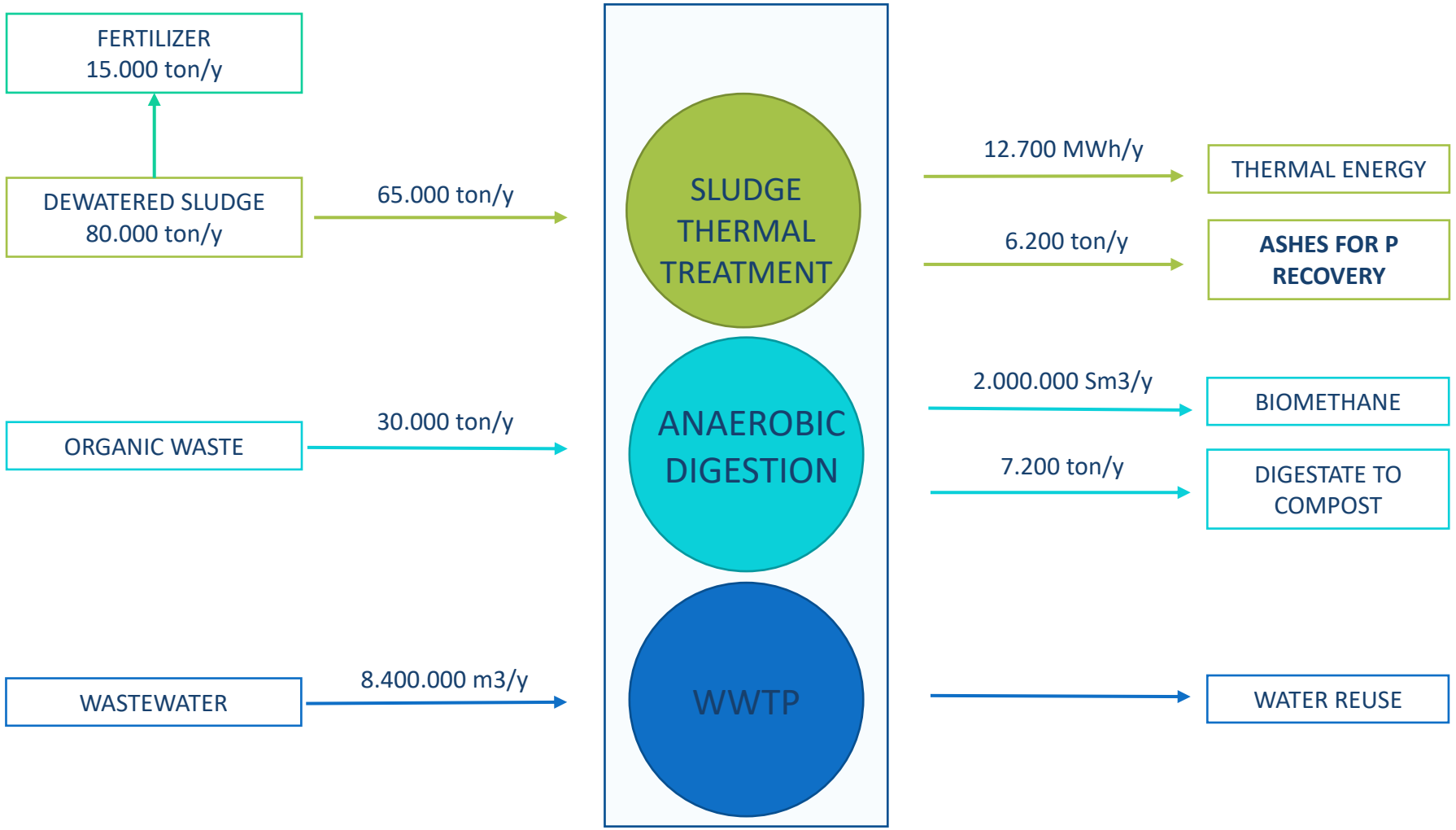
Transforming the existing municipal waste incineration plant into a biorefinery for sludge (65.000 ton/y) and OFMSW (30.000 ton/y) treatment and for nutrients/energy recovery

34,5 M€ Sludge line

12,5 M€ OFMSW Line

The BIOPIATTAFORMA Project

The BIOPIATTAFORMA Project



An opportunity for P-recovery – sludge stream?

62.000 t/year dewatered sludges (24% TS)
+
3.000 t/year dried sludges (90% TS)

→ **Drier**
+
Fluidised bed reactor

→ ASHES
(6.800 ton/y)
500 tonP/year?

→ **Phosphorus recovery technologies still to be assessed**

VALUE CHAIN STILL TO BE DEFINED

Raw materials → **Legislation and other initiatives** → **Treatment and extraction** → **End use**

- Need for centralized treatment plants (sludge mono-incineration and WWTP+OFMSW still to be developed in Italy)
- Real productivity to be assess trough pilots

- STRUBIAS
- Organic fertilzers regulation
- European Phosphorus Platform
- Italian Phosphorus platform

- Is our project «big» enough to ensure profitability?
- Which is the most suitable technical solution for the CAP case
- Which is the best business model?
  - Decentralized P-extraction plants?
  - One unique regional platform?
  - Export of ashes?

- End-users still to be involved in Italy

Time schedule

We believe in Citizens participation

Bio Piattaforma Lab

Città di Sesto San Giovanni · Città di Pioltello · Cormano · Città di Segrate · Città di Cologno Monzese

http://www.biopiattaformalab.it/

RESIDENTIAL ADVISORY BOARD https://www.rab-biopiattaforma.it/

Partners

BIOMETHANE

SMART PLANT

EXPERTS + LCA

DESIGN

UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA

RSE Ricerca Sistema Energetico

CNR-IIA

INNOVEN INNOVATION FOR THE ENVIRONMENT

POLITECNICO MILANO 1863

AWARE Assessment on WAste and REsources

tbfpartner Ingegneri e Consulenti

STM Studio Tecnico Miglio

tecno habitat società di ingegneria

quattroassociati

ICA

EXECUTION

RTI Mandataria:

LADURNER 30 ENVIRO

LADURNER srl
Via Innsbruck 33
39100 Bolzano (BZ)
0471-945600 0471-949805
info@ladurner.it
www.ladurnerambiente.it

RTI Mandanti:

cosedil spa

Cosedil spa
Piazza della Marina, 1 00196 - Roma
Via Pricessa n. 22 A/1 95010 - Santa Venerina (CT)
095.954388 095.954044
direzione@cosedilspa.com
www.cosedilspa.com

COMEF

COMEF s.r.l.
Via Milano 20/22 - 21049 - Tradate (Va)
0331.819411
comef@comef.net
www.comef.com

RTP:

TECHNITAL

Technital S.p.a.
(Mandataria)
VIA CARLO CATTANEO 20
37121 Verona (VR)
045.805.3611
technital@technital.it
technital@pec.technital.it
www.technital.net

SERING INGEGNERIA

SERING Servizi di Ingegneria S.r.l.
(Mandante)
Via Emerico Amari n. 148,
90139 Palermo (PA)
091.30.74.52
mail.sering@sering.it
www.seringingegneria.it

T&P Tecnologie e Progetti SAGL

T & P Tecnologie e Progetti SAGL
(Mandante)
Via G. Bernasconi n.6
6850 Mendrisio (CH)

DAF

Davide.scaglione@gruppocap.it

www.gruppocap.it

THANK YOU