

THE EUROPEAN EXPERIENCE IN THE FIELD OF “WASTE-TO-ENERGY”: EMBLEMATIC CASES-STUDIES IN FRANCE AND OTHER EU COUNTRIES

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**Investing in energy utilization of waste & biomass -
circular economy – renewable energy sources**

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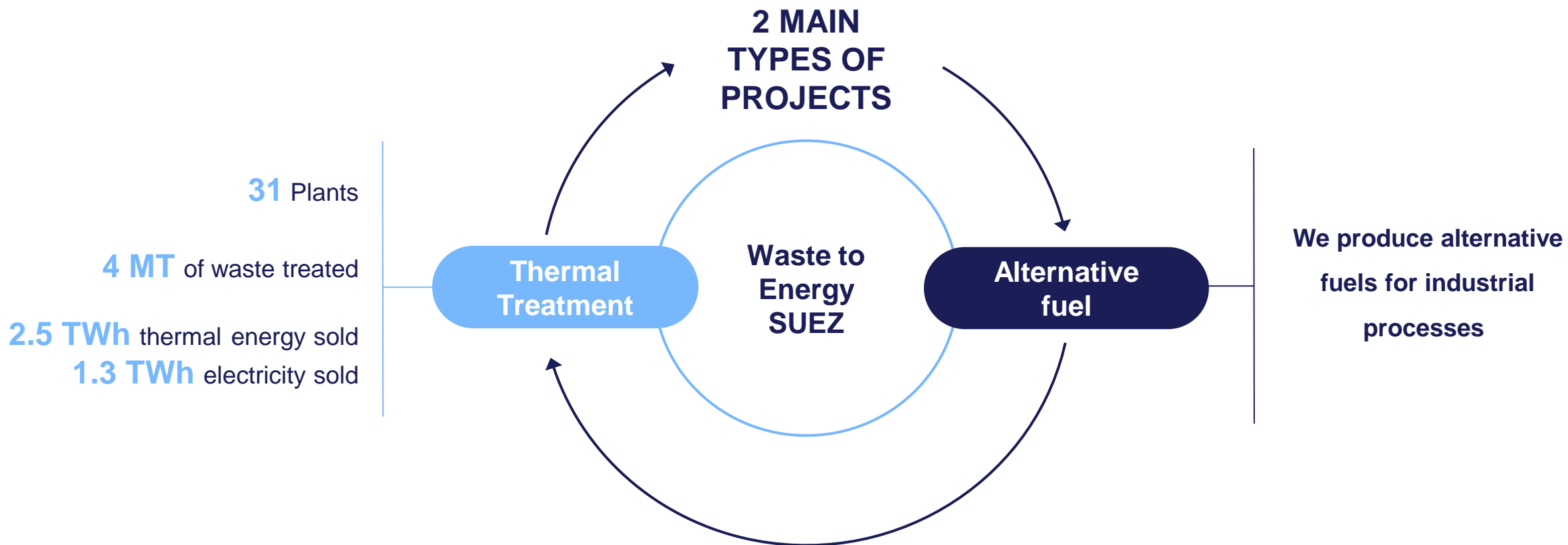
CAPACITIES

KEY FIGURES

Capacities

Solutions

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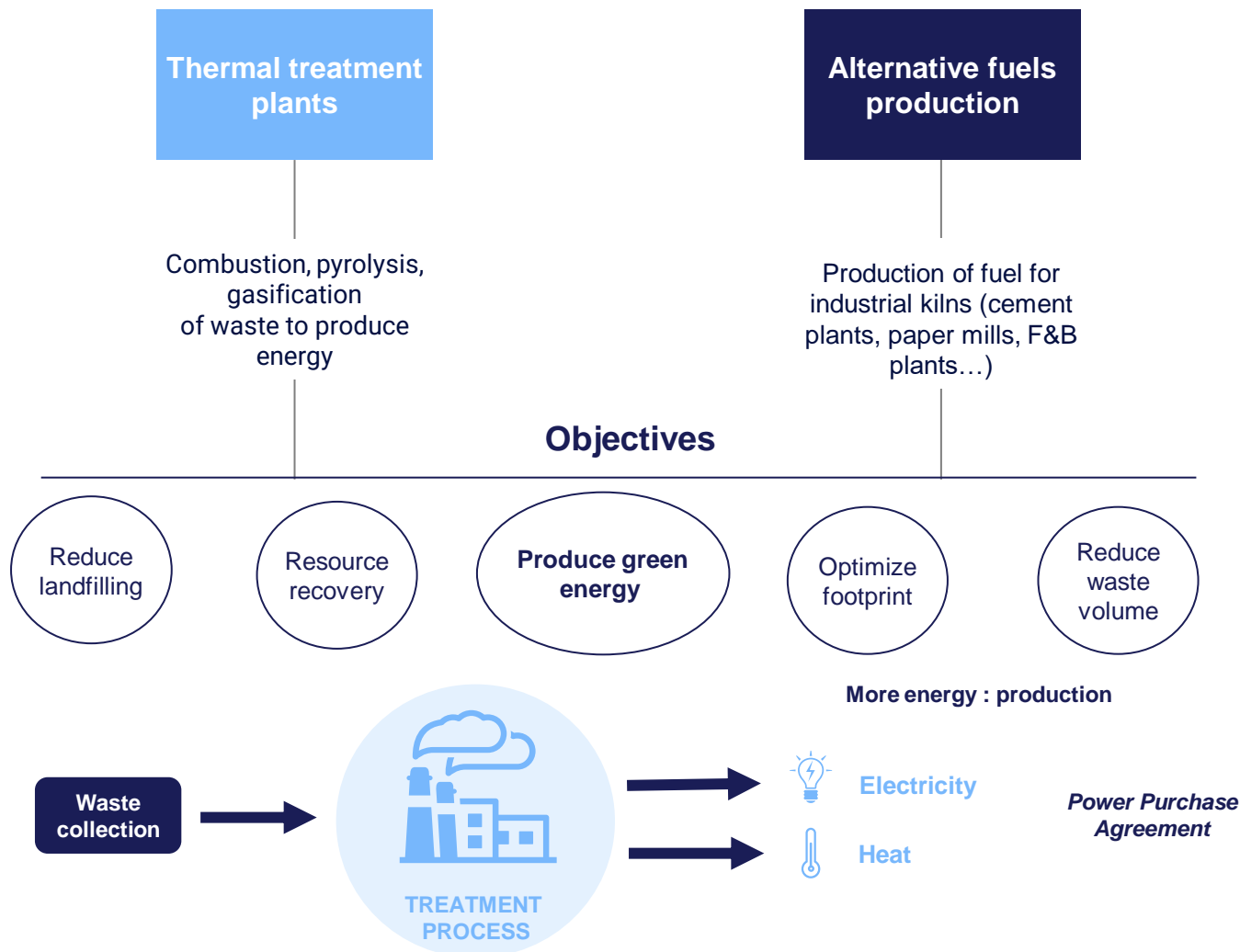
SOLUTIONS

WASTE TO ENERGY SOLUTIONS: 2 MAIN TYPES OF PROJECTS



Based on your specific objectives and constraints

Turning challenges into opportunities



Capacities

Solutions

References

SOLUTIONS

WASTE TO ENERGY SOLUTIONS: SUPPORT HIGH QUALITY STANDARDS, LOCAL ENERGY PRODUCTION AND SUSTAINABILITY

Capacities

Solutions

References



NEW BUSINESS MODELS

COMPETITIVE DELIVERY EXCELLENCE

Advanced & complex integration
End-to-end support
Continuity of service
High standards guarantee

JV & SPV

Offtake agreements with Authorities and private actors

Design & Build + Finance + Operations & Maintenance

CUTTING-EDGE DIGITAL SOLUTIONS

Energy & emission monitoring tools

BIM software

LEADING INDUSTRIAL INNOVATIONS

Cogeneration

Waste treatment to **produce substitute fuels**

CO2 emission curbing
CO2 capture and recovery

LOCAL ECOSYSTEM & TRANSPARENCY

Local **ecosystem** inclusion

Local **recovery** cycles

Citizen / Municipality portals

REFERENCES

GLOBAL OVERVIEW

Capacities

Solutions

References



**Mulhouse,
Sausheim**
France

Energy recovery Unit
for industry

[→ Read more](#)



**Paris, CIE
Emeraude**
France

Combined energy
recovery unit for district
heating

[→ Read more](#)



Poznan Plant
Poland

Energy recovery unit for
district heating

[→ Read more](#)



Carhaix
France

SRF production to
supply green heat to
local industry

[→ Read more](#)



**Vernea,
Clermont-Ferrand**
France

First global recovery
facility in France
coupling AD and
thermal treatment

[→ Read more](#)



**Istres,
Marseilles**
France

Alternative fuel
production in Provence

[→ Read more](#)



Econotre
France

A local circular
economy hub

[→ Read more](#)

References

Sausheim, Mulhouse [France]



Combined Energy Recovery unit for industry

KEY FIGURES

- **54** co-workers
- **40 000 MWh** of electricity produced each year
- **58 000 MWh** of green heat produced per year either **5,000** housing equivalents
- **75,000 tons** of new cardboard manufactured each year from green steam

CHALLENGES

- On this plant, SUEZ receives **non-recyclable household** waste mainly from the Mulhouse region, **non-recyclable waste** from industries, medical **waste** and **sludge from wastewater treatment plants**.

SOLUTION

- Suez partnered with **Papeteries du Rhin**, the local waste Authority of Mulhouse (SIVOM), and Cofely in the commissioning of a **steam network intended to supply the local Paper Mill with green thermal energy** for a 10-year term. This local and renewable energy solution enables the paper maker to reduce its CO2 emissions by around 10,000 tons per year.
- SUEZ produces **new energy resources**. Cofely Services, a major player in energy efficiency, designed and built the network to ensure the connection between the plant and the paper mill. This 1 km network, operated by Cofely Services, makes it possible to channel green energy to supply the papermaker's manufacturing lines.

BENEFITS

- This infrastructure allows Papeteries du Rhin to benefit from nearly 52GWh of thermal energy per year to **cover 80% of its steam needs**, while reducing its consumption of fossil fuels. Through this partnership, SIVOM has increased the energy efficiency of its WtE unit and is fully in line with the region's energy transition plan.

References

CIE Emeraude, Paris [France]



Combined Energy Recovery unit for district heating

KEY FIGURES

- **68%** of energy efficiency coefficient
- **98%** of the waste is recovered
- **235,000 tons** of waste per year
- **45,000 tons** of bottom ash recycled per year
- **137 GWh** annual electricity production
- **30 GWh** annual thermal energy produced for Creteil district heating network

CHALLENGES

- One WtE plant to manage MSW of **615,000 residents** of south-eastern Parisian suburb area as well as local hospitals

SOLUTION

- Waste is received by truck and weighed at the entrance to the site, they are **tipped and mixed in the bunker**. They are then introduced into the furnace to be incinerated.
- The energy recovered in the boilers, in the form of superheated steam, is recovered in **electrical energy** sold to the EDF network and in **thermal energy** distributed on the heat network supplying the town of Créteil. The electrical energy is generated by a turbo-generator group.

BENEFITS

- **1st treatment center in France with an authorized capacity of 42,000 tons of annual Infectious Disease Care Waste.**
- **Ensure the hot water production to the urban heating network of the town of Créteil.**
- **River transport of bottom ash to their processing platform : Suppression of more than 2,200 trucks / year on roads and 18,000 tons of CO2 equivalent.**

References

Poznan Plant [Poland]



Waste-to-energy
facility for district
heating

KEY FIGURES

- **20€ million** in annual revenues
- **42 %** of the electricity produced certified renewable by Green Certificates
- **100 %** of incineration bottom ashes recovered

CHALLENGES

- The City of Poznan, decided to build a **waste-to-energy facility** to meet **EU standards of landfill diversion**, replace coal by waste as a source of energy for the local heating network

SOLUTION

- The energy-from-waste facility processes **non-recyclable waste** collected in the city of Poznan and several neighboring communities.
- The plant can **deliver** both **power** (up to 18 MW) and **heat** (up to 34 MW) depending on the demand of the district heating network.
- A **public-private partnership business model** to spare the City's borrowing capacity while keeping a close control on the delivery of the services and plainly tapping into the efficiency of the private sector.

BENEFITS

- **High-efficiency turbine** and a connection to the **district heating network**
- A **public-private partnership combined with EU cohesion funds** to optimize the project funding
- The plant allows Poznan to **secure one of the most cost-effective waste management systems** in Poland.
- The facility is regularly **open to the public** and was already visited by more than 4,000 people
- The power **produced covers the consumption of 120,000 inhabitants** and covers 5% of the city's district heating needs

References

Carhaix [France]



SRF production to supply green heat to local industry

KEY FIGURES

- **51,000 MWh/year** of energy produced
- **30,000 tonnes** of waste valorized
- **7GWh** delivered to the electricity grid
- **75%** of energy performance rate

CHALLENGES

- The WtE and recycling center of Carhaix in Brittany is **supplying green energy to the largest milk dehydration plant in France**

SOLUTION

- As part of a contract renewal, SUEZ and SIRCOB develop energy production on the site, **producing 51,000 MWh / year of green energy**, equivalent to the consumption of more than 9,000 inhabitants
- The energy produced will serve in particular to **supply the industrial processes of the SYNUTRA milk dehydration plant** in Carhaix, the largest in France, and will allow the production of milk powder.
- SUEZ WtE plant will be supplied with **Solid Recovered Fuel (SRF) from non recyclable local waste wood, plastics, paper and cardboard**
- The vapor produced will arrive in SYNUTRA dairy plant at a temperature of 270 ° C and will be released as water at a temperature of 90 ° C and will be used to **heat the 25 hectares of greenhouses** that SUEZ intends to establish nearby.

BENEFITS

- 30,000 tonnes of non-recyclable waste turned into energy to supply a major industrial player and support the regional energy transition plan

References

Vernea, Clermont-Ferrand [France]



First global
recovery facility in
France
coupling AD and
thermal treatment

KEY FIGURES

- With Vernea, more than **70 %** of the territory is recovered
- **230 000 tons** of waste treated per year
- **6 500 tons** of compost produced per year used for degraded soils

CHALLENGES

- **Gather all treatment modes** in a single site
- **Mechanical treatment**
- **Anaerobic Digestion**
- **Thermal treatment**

SOLUTION

- **Mechanical sorting** that classifies and separates residual household waste for biological stabilization
- **Biological Recovery Unit (BRU)** dedicated to the organic and green waste generated by the separate collection of bio-waste
- **Energy Recovery Unit (ERU)** treating residual waste and transforming it into energy
- **Air treatment**, as odorous gases require treatment before releasing them into the atmosphere

BENEFITS

- **Energy recovery** (electricity, biogas)
- **Adopt an environmental position** (compost production)
- **Landfill diversion**
- **Reduction in greenhouse gases emissions**

References

Istres, Marseilles [France]

Capacities

Solutions

References



Alternative fuel
production in
Provence

KEY FIGURES

- **100 000 t/year** of demolition waste
- **100 000 t/year** of CIW capacity
- **50 000 t/year** of wood
- **20 000 t/year** of tyres

CHALLENGES

- Treat various streams of **commercial & industrial waste (CIW)** with a maximum recovery rate

SOLUTION

- Provence Valorisation is an **eco park** that recycles **commercial and industrial waste** such as source segregated papers, plastics, cardboards, wood, tyres
- Non recyclable materials are processed as alternative fuels for industries

BENEFITS

- **Long-term supply contracts** with cement companies
- **Supply of biomass** fuel to municipal heating plant
- **Produces a standard SRF** under European standards (NF EN 15359)

References

Econotre Haute Garonne [France]



A local circular economy hub

KEY FIGURES

- **86** co-workers
- **192,000 tons** of household waste not recyclable treated by incineration **45,000 tons** of bottom ash recovered
- **30,000 tons** of household waste sorted in MRF
- **8,000 tons** of green waste recovered in **3,500 tons** of compost
- **120,000 MWh** of electricity produced

CHALLENGES

- **Gather all treatment modes** in a single site
- **Mechanical treatment**
- **Composting**
- **Thermal treatment**

SOLUTION

- **A sorting center** for recyclable household waste from selective collections
- **An energy recovery center** for household and similar waste that cannot be recycled
- **A bottom ash recovery center**
- Econotre also operates a **green waste composting center** in Lègevin

BENEFITS

- Sorting center : produce secondary raw material for new plastic bottles, cans, public benches, recycled paper, egg cartons...
- Energy recovery : treatment of non-recyclables to produce **electricity and heat**
- Heat for agriculture : low temperature steam allows to reach **high levels of energy recovery and save 6,000 tons of CO₂** in heating greenhouses.

THANK YOU FOR YOUR ATTENTION!

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