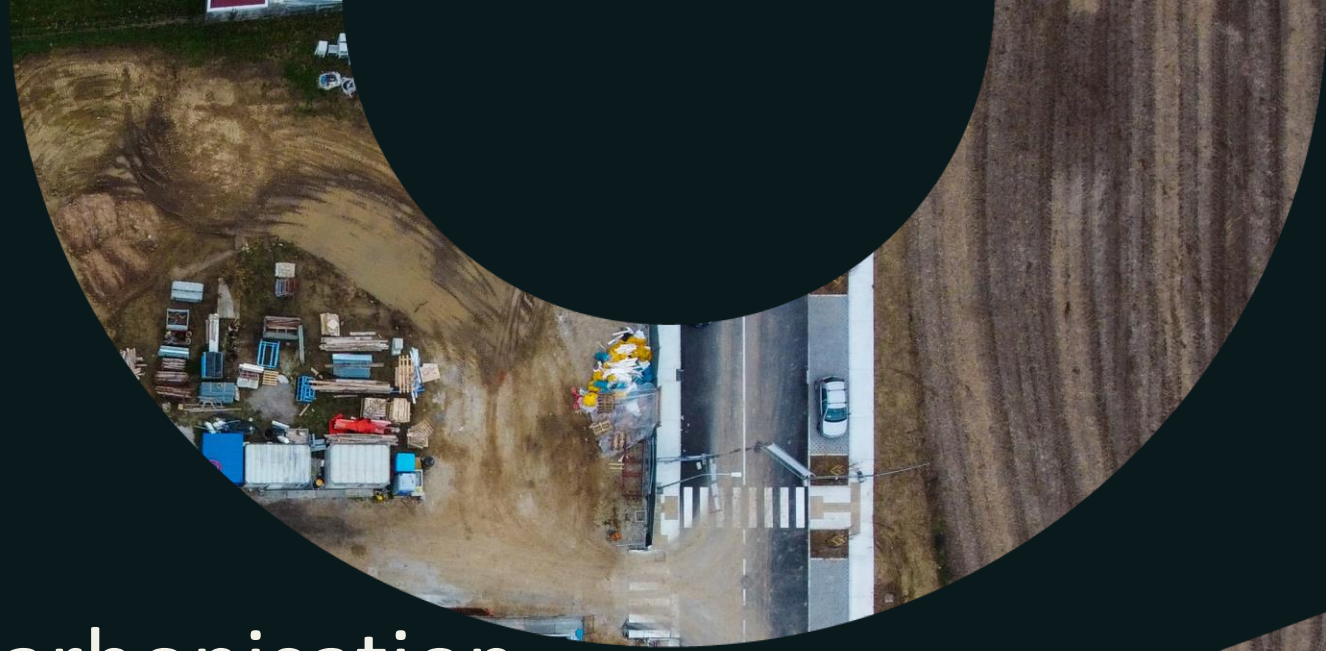
seingim

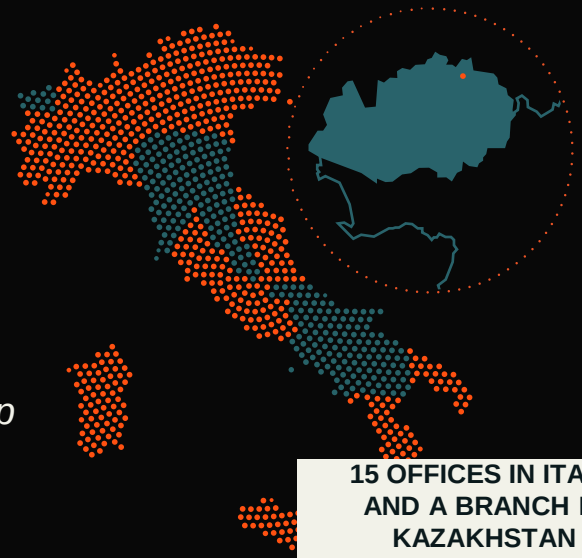


Integrated solutions for decarbonisation in industrial plants

All-Energy 2023 – 10/11 May – SEC Glasgow

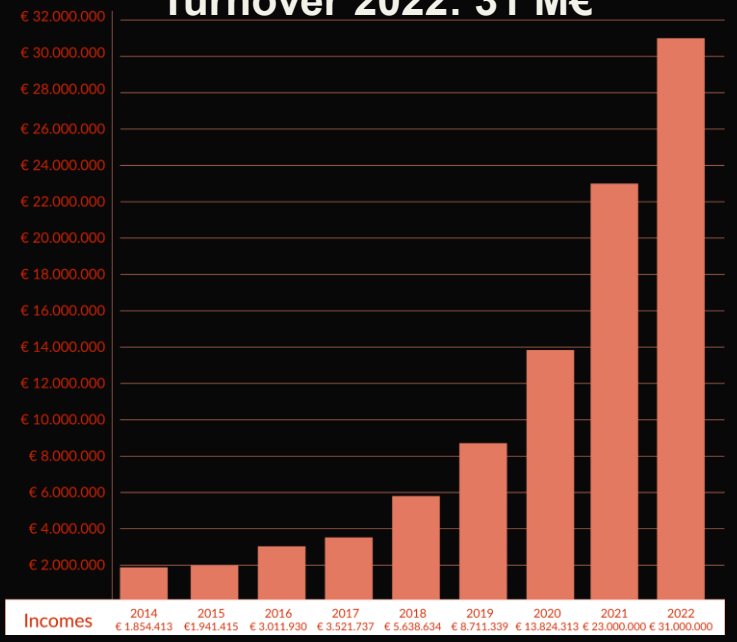
seingim - Company numbers and details

- One of the most relevant Italian Multidisciplinary Engineering and Consulting firm;
- More than 400 engineers, designers, architects, technicians and project managers;
- Driven by a common purpose: *provide top engineering services for a better and sustainable world*



15 OFFICES IN ITALY AND A BRANCH IN KAZAKHSTAN DELIVERING ENGINEERING SERVICES WORLD WIDE!

Turnover 2022: 31 M€



MAIN SECTORS

- POWER & RENEWABLES
- OIL & GAS
- INDUSTRIAL
- INFRASTRUCTURES
- BUILDINGS
- ENERGY EFFICIENCY
- TELECOMMUNICATION

PROJECT LIFE-CYCLE

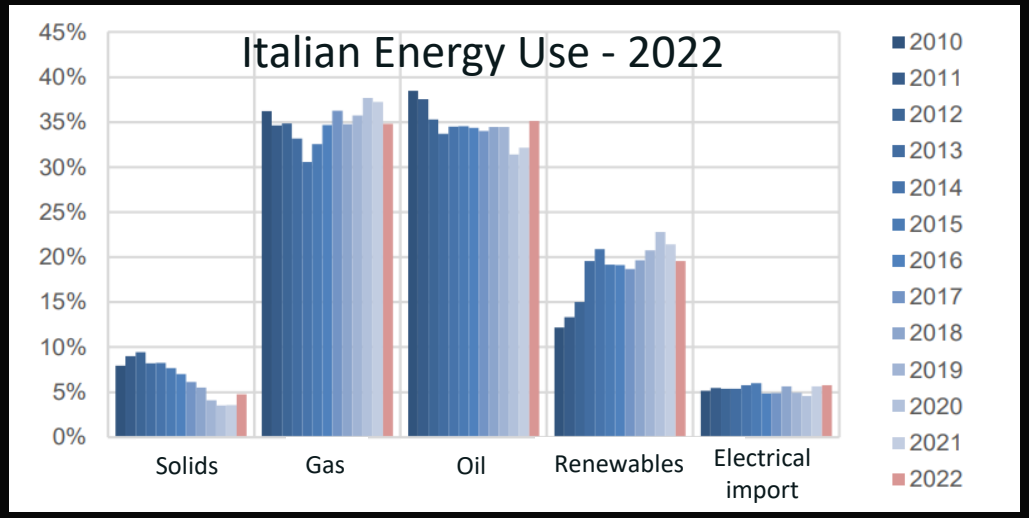
- DUE DILIGENCE
- FEASIBILITY
- BASIC
- FEED
- DETAIL
- OWNER ENGINEERING
- FIELD ENGINEERING

MULTIDISCIPLINARY ENGINEERING

- CIVIL & STRUCTURAL
- MECHANICAL & PIPING
- ELECTRICAL & HVAC
- INSTRUM. & CONTROL SYSTEMS
- PROCESS TECHNOLOGIES
- FIRE FIGHTING
- ARCHITECTURAL

How decarbonisation affects an engineering company

Each country starts decarbonisation strategy from its legacy energy mix. Despite the rise of renewables, most of the electricity still comes from fossil fuels.



Renewables cover about 20%

Fossil Fuels cover about 75%

Decarbonisation focuses on:

- Improving the fossil fuels energy transformation
- Promoting the low carbon energy fuels and the renewable sources
- Maximizing the final user's efficiency

Nowadays Engineering Companies dealing with energy shall offer a flexible technical organization, ready to develop tailor made solutions to match the decarbonisation goals in industrial plants

Decarbonisation solutions in industrial plants

Captive power plants are a valuable asset for industrial plants

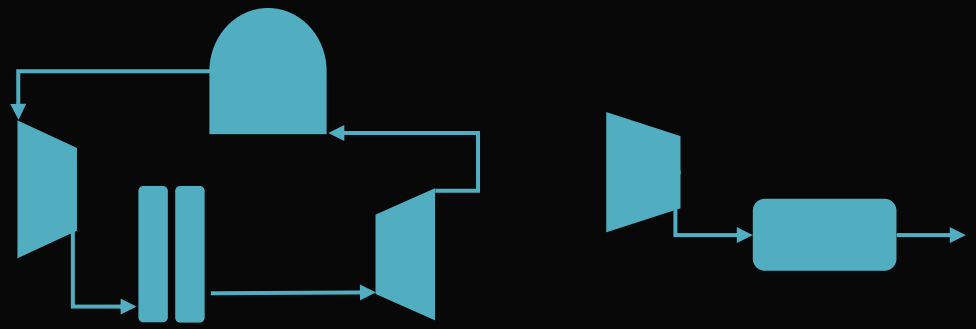
Improving fossil fuels transformation deals with

- Efficiency of individual equipment
- Power plant operation

Decoupling the production profile from the consumption profile so that the power plant works at the load where the overall efficiency is the highest and the CO_2 emissions are possibly the lowest

Feasible technical solutions are

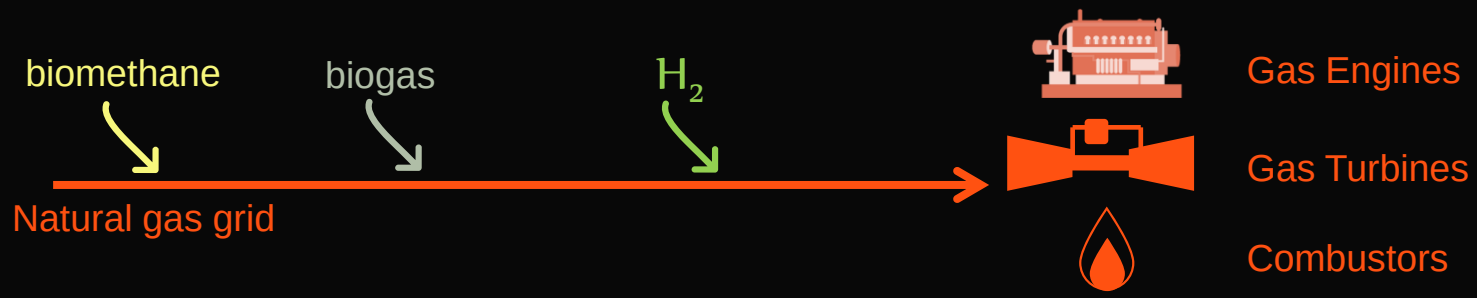
- **Thermal generation using electricity** with “zero emissions solutions” and **according to users’ needs**
- **Energy storages**



Decarbonisation solutions in industrial plants

Power plants component revamping allows to introduce **green fuels and renewable sources**

Natural gas can be **blended with hydrogen, biogas or biomethane**. The percentage of blended hydrogen is driven by the component adaptability, while biogas and biomethane can be used up to 100%



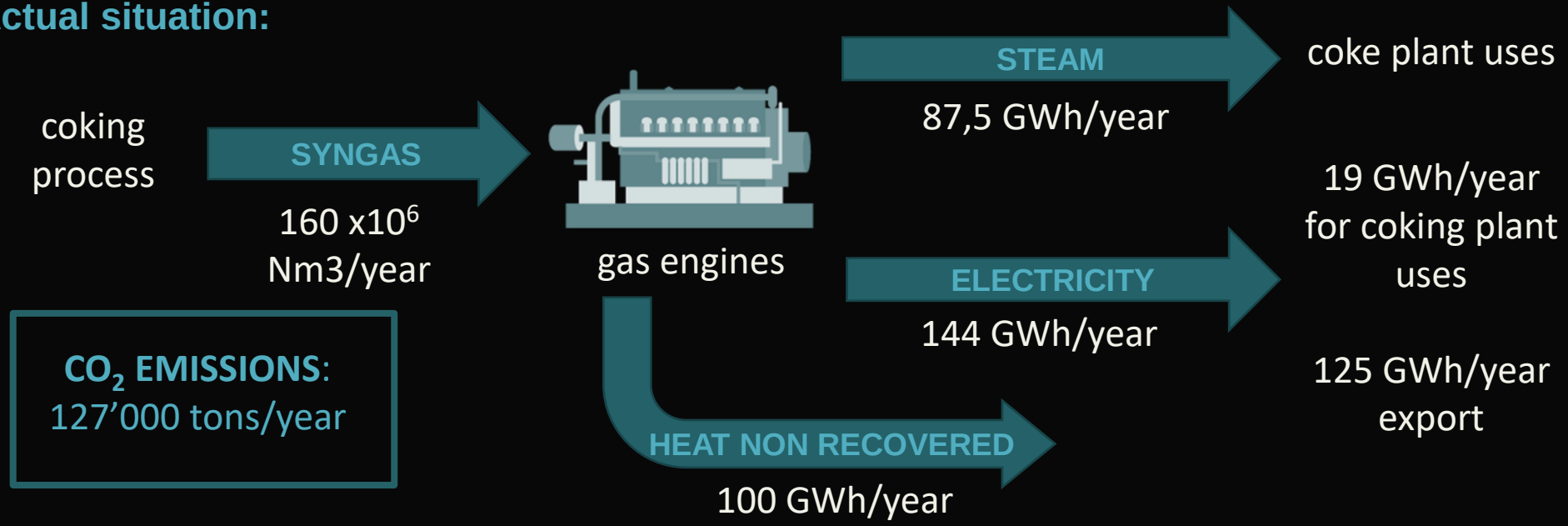
The final user's efficiency is maximized considering processes and user's needs

- Promoting lower temperature thermal inputs to processes
- Utilizing energy contents still available from processes
- Optimizing the O&M of the power plant to reduce inefficiencies

Case Study

Feasibility study of energy efficiency and decarbonisation solutions for a coking plant in Italy

Actual situation:



The input for the study was that **all the syngas has to be used**, as it is available from the coking process

Proposals studied so far:

- ❑ Heat recovery from the engines' high temperature systems for the municipal **district heating,** replacing natural gas boilers
- ❑ On-site **hydrogen production**, to be used as fuel for automotive
- ❑ Replacement of the engines

Case Study

First results - savings:

Proposal	Data	CO_2 savings [tons/year]
District Heating	10 GWh/year of heat recovered 1’110 x 10^3 Sm3/year of saved natural gas	**2’200**
On-site hydrogen production	Electrolysers daily production: 1600 kg_H_2/day Assumed electrolysers operation: 300 days/year Hydrogen electric trucks consumption: 8 kg_H_2/100 km Annual mileage: 3 x 10^6 km	**3’600(*)**

(*) ***5 LH Diesel Euro 6 Heavy Duty Vehicles as reference***

Next steps:

- Evaluate **heating and cooling needs** of the coking plant and of the nearby industrial plants
- Evaluate the implementation of **thermal storage solutions**
- Evaluate hydrogen production for the nearby port, part of the coking plant facilities