ENERGIAHATÉKONYSÁGI PROJEKTEK MEGVALÓSÍTÁSA A GYAKORLATBAN: MPK KAZÁNCSERE PROJEKT

ENERGY EFFICIENCY PROJECTS IN PRACTICE: MPC BOILER REPLACEMENT PROJECT

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Technológia Fejlesztés MOL vezető

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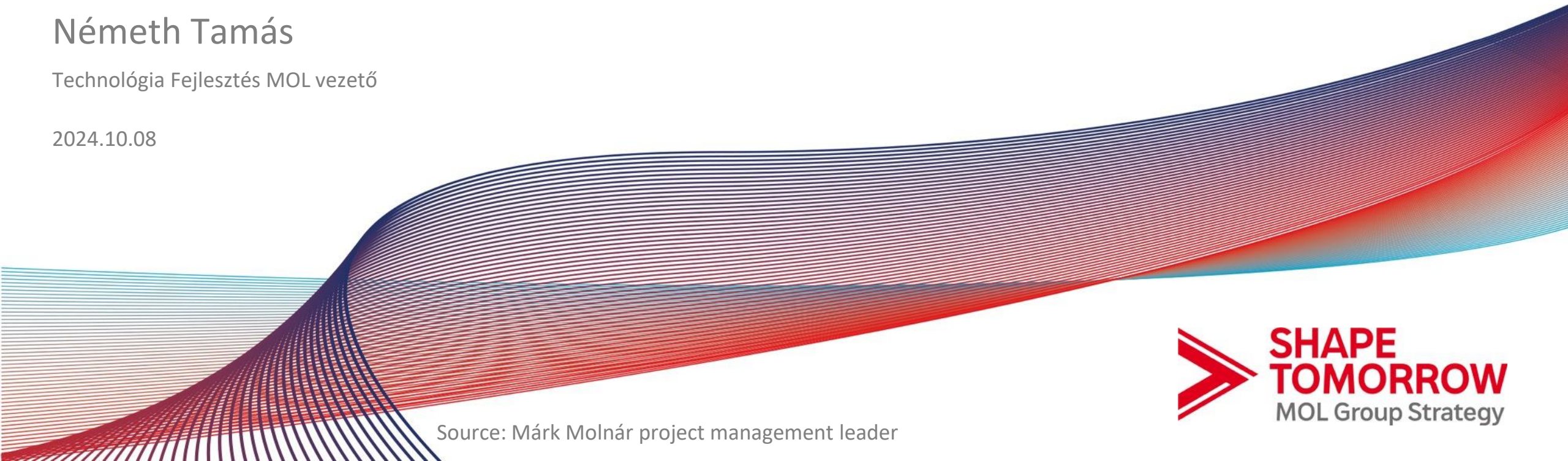


SHAPE TOMORROW
MOL Group Strategy

Source: Márk Molnár project management leader

AGENDA

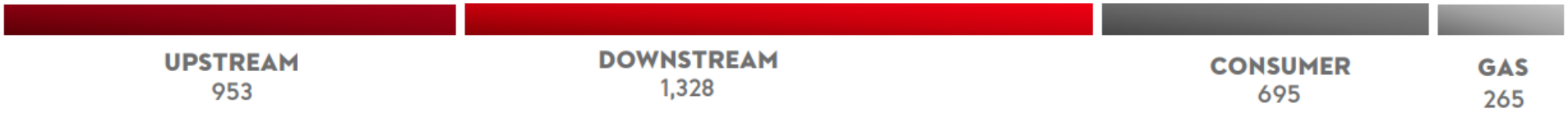
- MOL GROUP IN BRIEF
- SCOPE OF THE PROJECT
- GOAL OF THE PROJECT
- IMPLEMENTATION
- SUMMARY

MOL GROUP IN BRIEF

INTEGRATED CENTRAL EUROPEAN MID-CAP OIL & GAS COMPANY

CORE ACTIVITIES

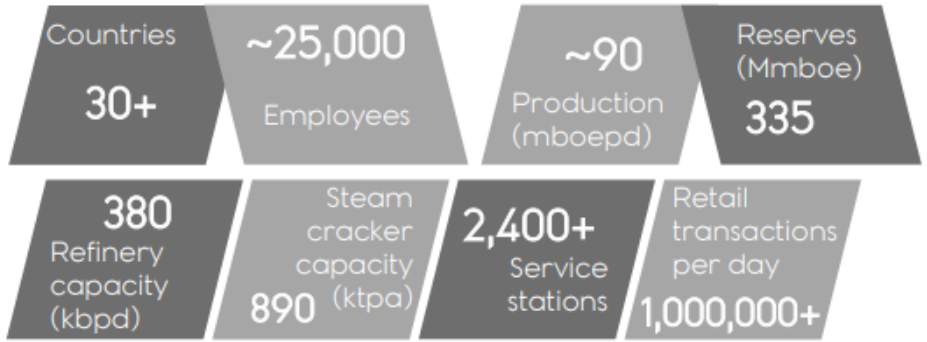
CLEAN CCS EBITDA BY SEGMENTS IN 2023 (USD MN)[1]



KEY FIGURES

CAPITAL MARKETS

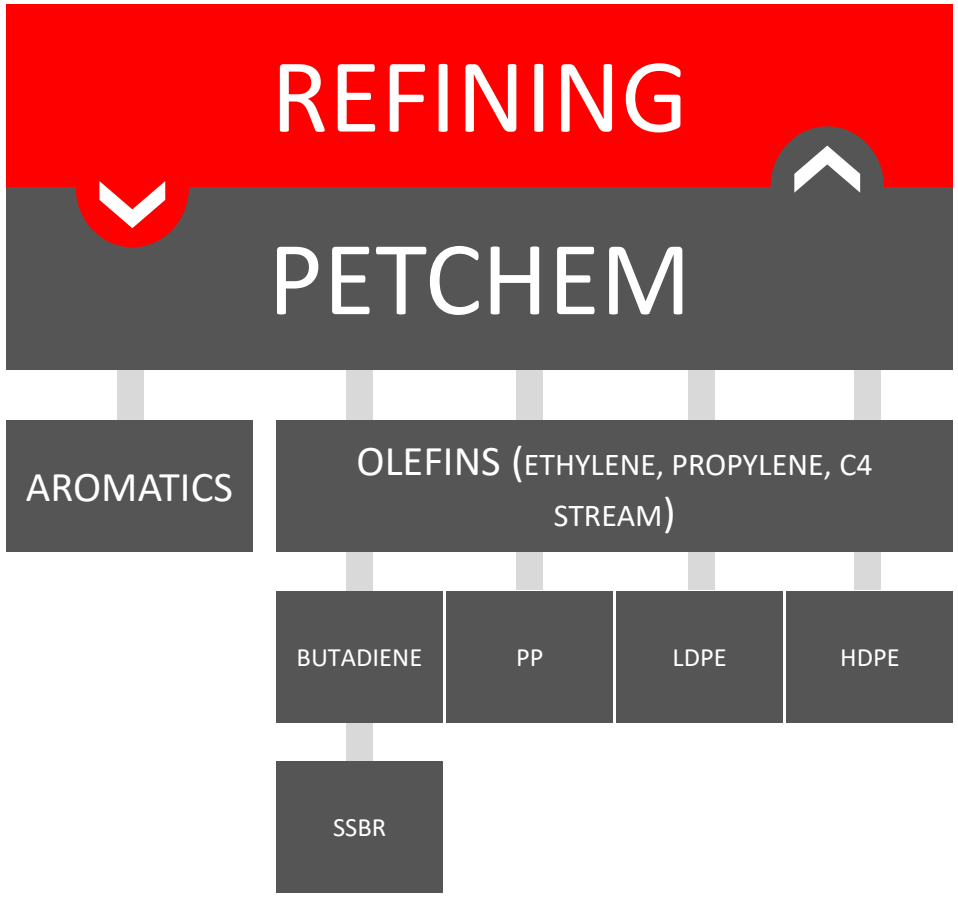
BUSINESS / ASSETS



MOL GROUP IN BRIEF

MOL PETROCHEMICAL (MPC)

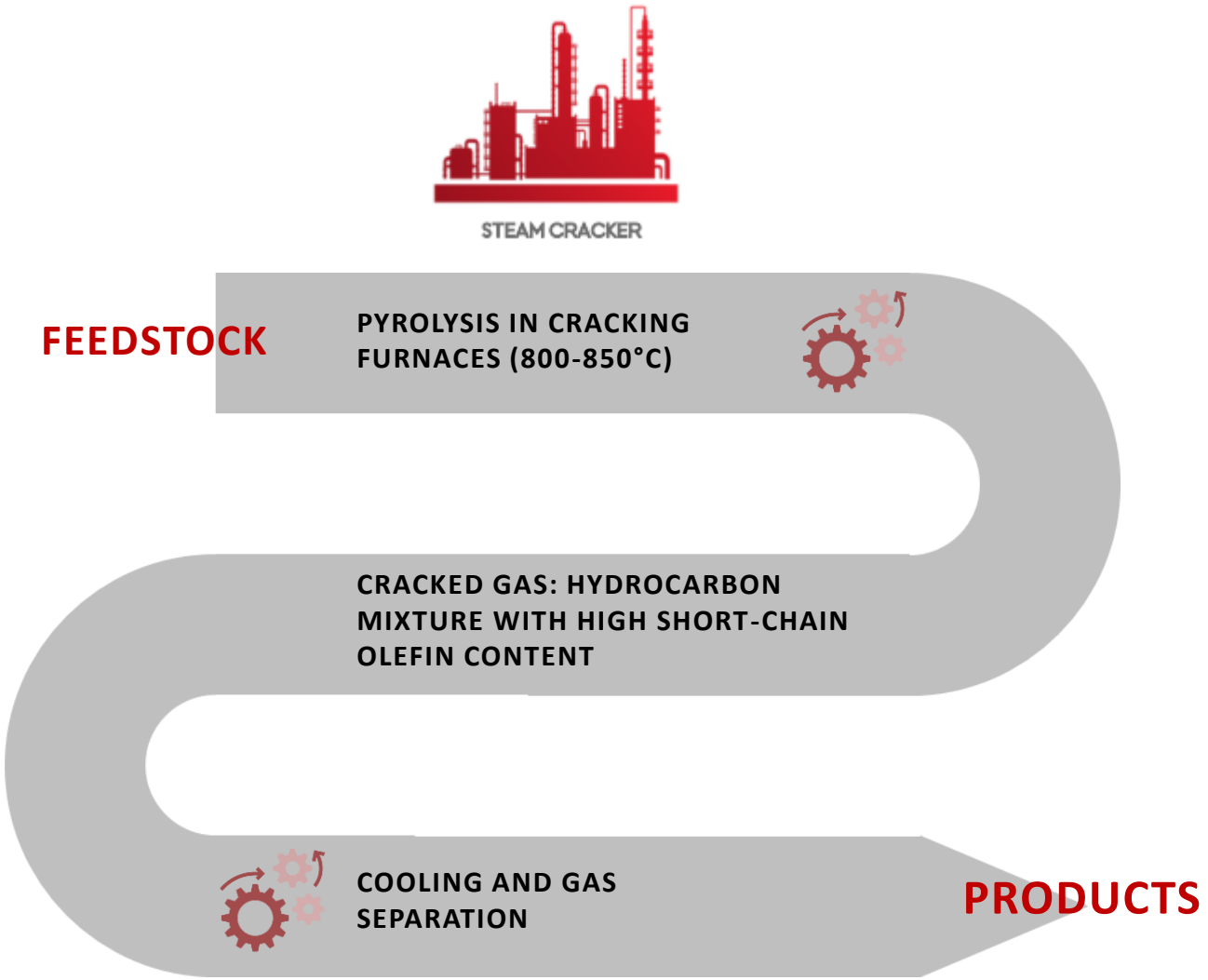
- FORMER TVK
- LOCATED IN TISZAÚJVÁROS,
- PART OF INTEGRATED MOL DOWNSTREAM
- BEGAN OPERATIONS IN 1953
- EMPLOYS 1,100 PEOPLE
- 2 STEAM CRACKERS WITH 660 KT/Y ETHYLENE CAPACITY
- 5 POLYMER UNITS WITH 765 KT/Y CAPACITY
- BUTADIENE PLANT WITH 130 KT/Y CAPACITY ON THE SITE.
- FROM 2024 THE SITE EXPANDED WITH POLYOL COMPLEX



PROJECT SCOPE

OLEFIN 1 UNIT

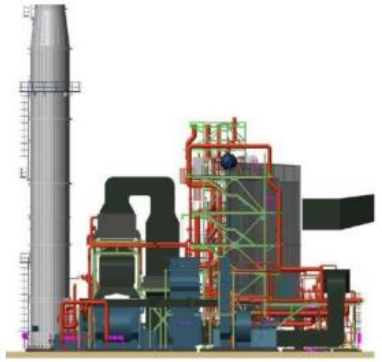
- BUILT IN 1975
- CHEMICAL NAPHTHA FEEDSTOCK SOURCED FROM REFINERY
- PYROLYSIS PROCESS: CRACKING HYDROCARBONS AT HIGH TEMPERATURE IN THE PRESENCE OF STEAM
- PRODUCES MONOMERS FOR POLYMER PRODUCTION
- CAPACITY 370 KTPA
- HIGH CRACKING TEMPERATURE. EFFICIENT HEAT RECOVERY IS ESSENTIAL
- WASTE HEAT RECOVERY BOILER REPLACEMENT

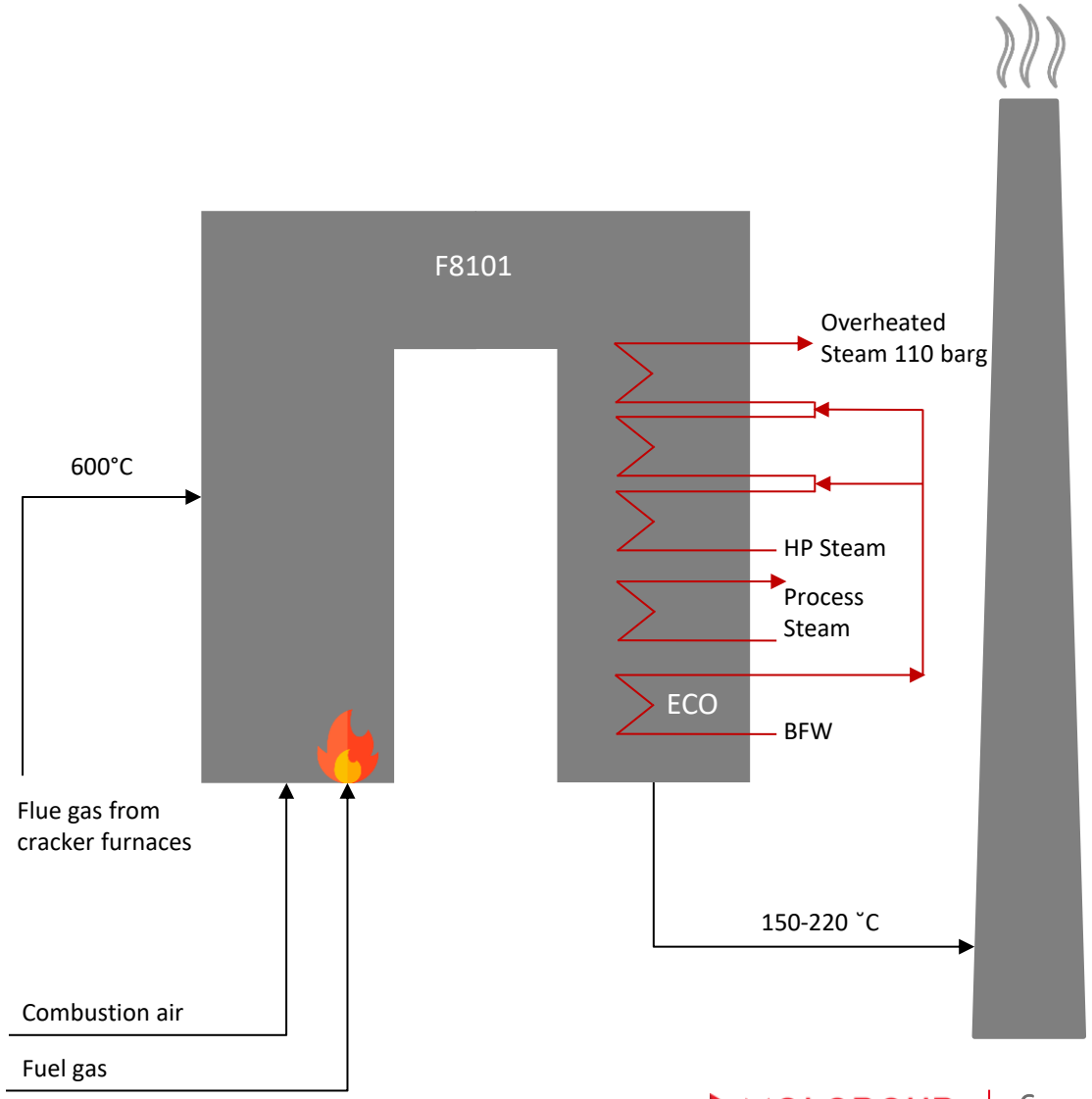


PROJECT SCOPE

ROLE OF THE WASTE HEAT RECOVERY BOILER (WHRB)

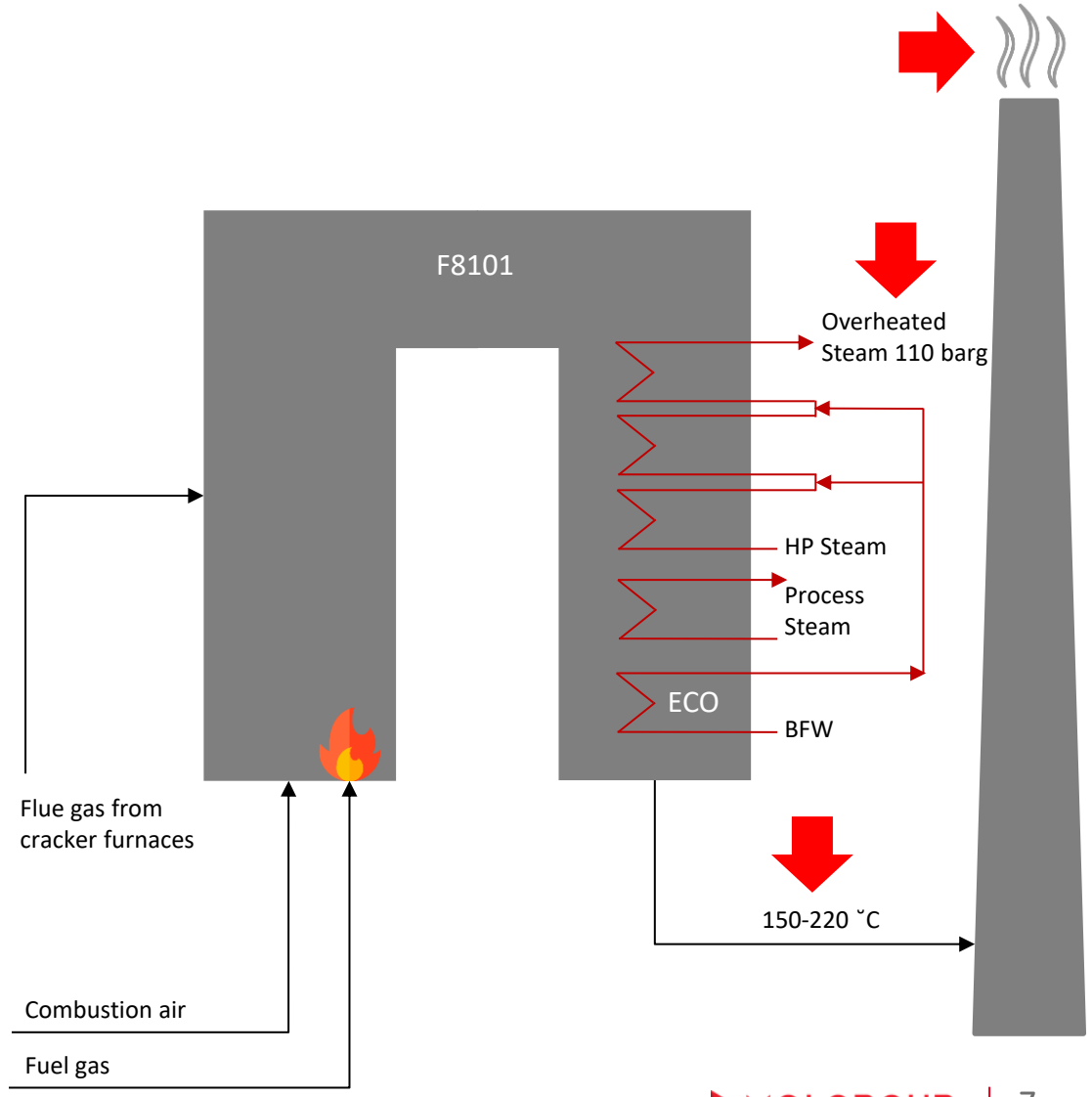
- **WASTE HEAT RECOVERY BY UTILIZING THE 600°C TEMPERATURE OF FLUE GAS FROM CRACKER FURNACES**
- **PRODUCES 110 BARG OVERHEATED STEAM FOR STEAM TURBINE OPERATION AND FOR PYROLISIS FURNACES**
- **„HEART" OF THE OLEFIN UNITS WITH CONTINUOUS OPERATION**



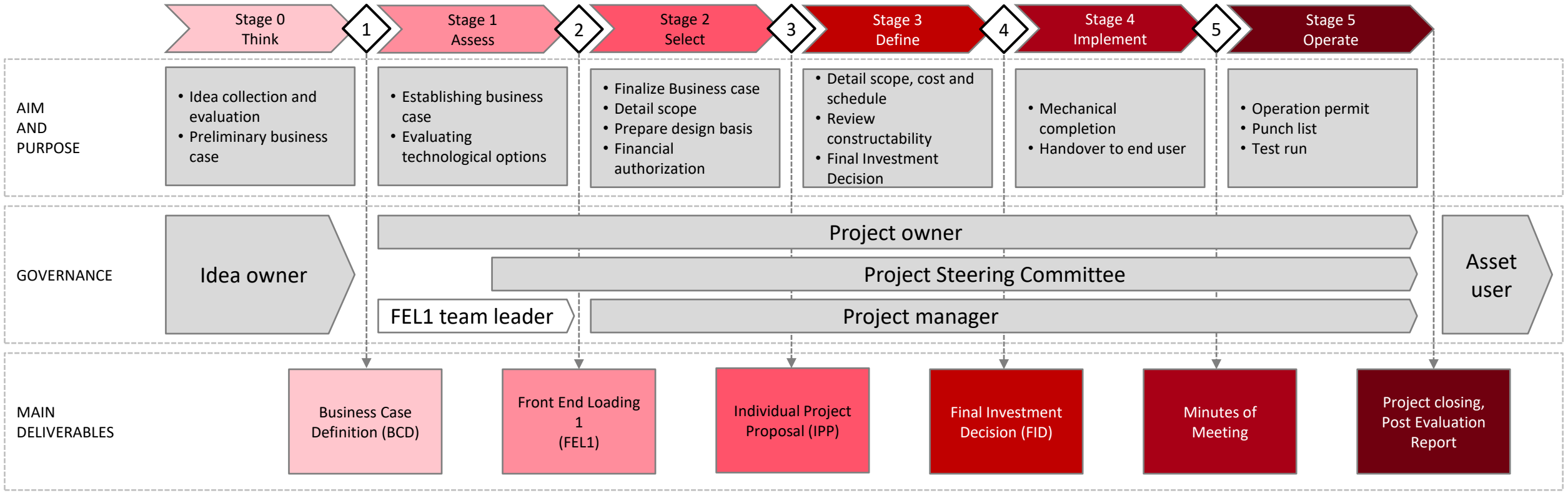


GOAL AND RESULTS OF THE PROJECT

- NEW AND MORE EFFICIENT BOILER
- OLEFIN UNIT LIFETIME EXTENSION
  - LESS UNIT SHUT DOWN AND IDLE TIME
  - IMPROVE OPERATIONAL AVAILABILITY
- IMPROVE ENERGY EFFICIENCY
  - DECREASE THE FLUE GAS TEMPERATURE FROM 220°C TO 150°C
  - FLUE GAS HEAT RECOVERY
  - MORE THAN 90 THOUSAND MW ENERGY SAVING A YEAR
  - ALMOST 2% SAVING FROM TOTAL ENERGY CONSUMPTION
  - DECREASE CO2 EMISSION BY 18.4 KTPA
- ENVIRONMENTAL LIMITS, NEW NORMS

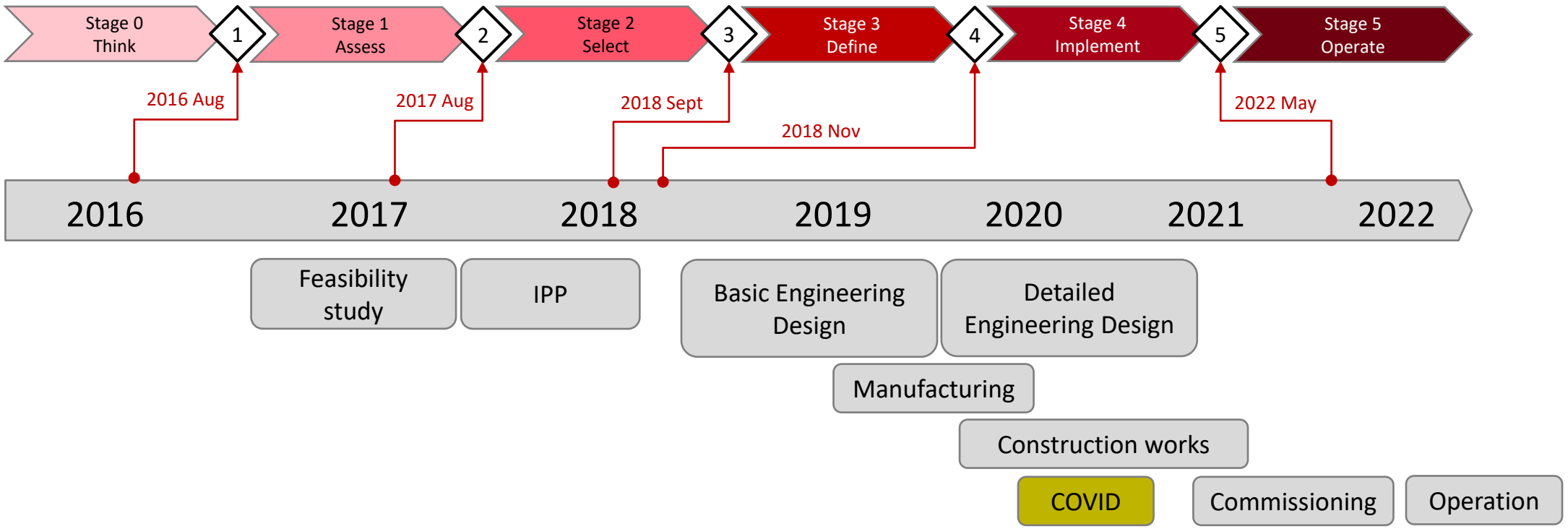


STAGE GATE PROCESS



IMPELEMNTATION

BOILER PROJECT ALONG STAGE GATE PROCESS



IMPLEMENTATION

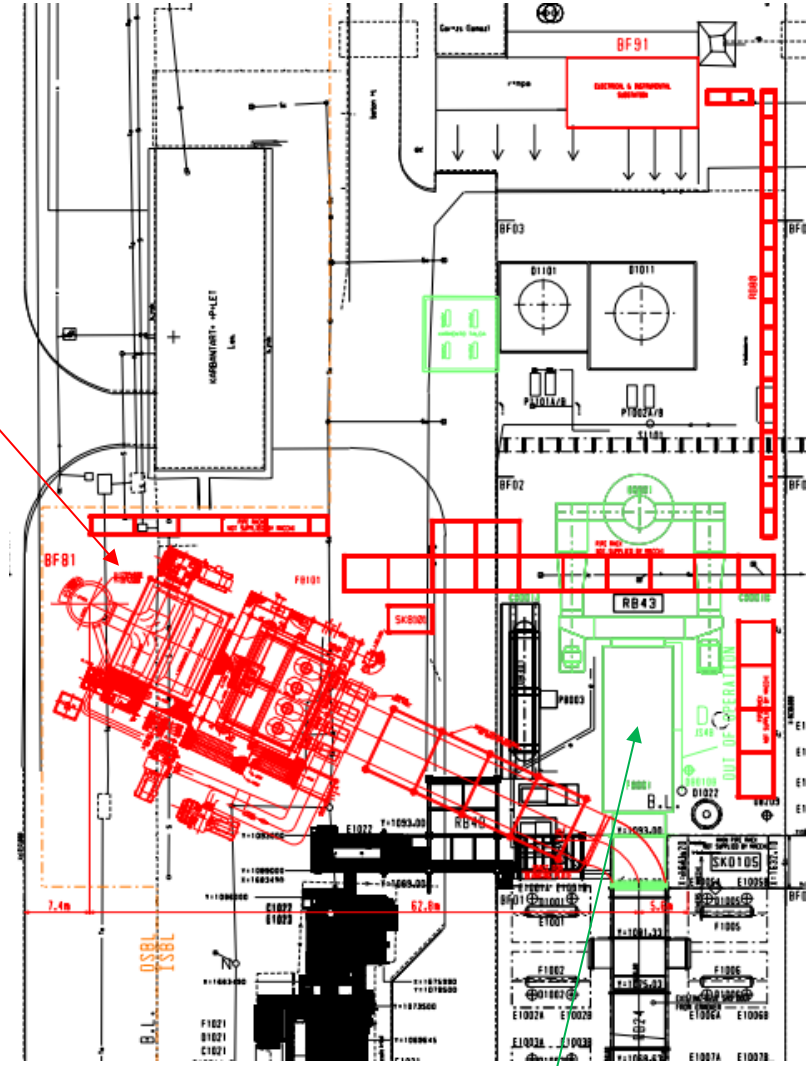
OLD AND NEW BOILERS

ISBL SCOPE (CONTARCTOR)

- **NEW WASTE HEAT RECOVERY BOILER**
- **CONTROL**
- **PIPELINES**
- **PIPERACKS**

OSBL SCOPE (MOL)

- **POWER SUPPLY**
- **ROUTES**
- **PLOT AREA**

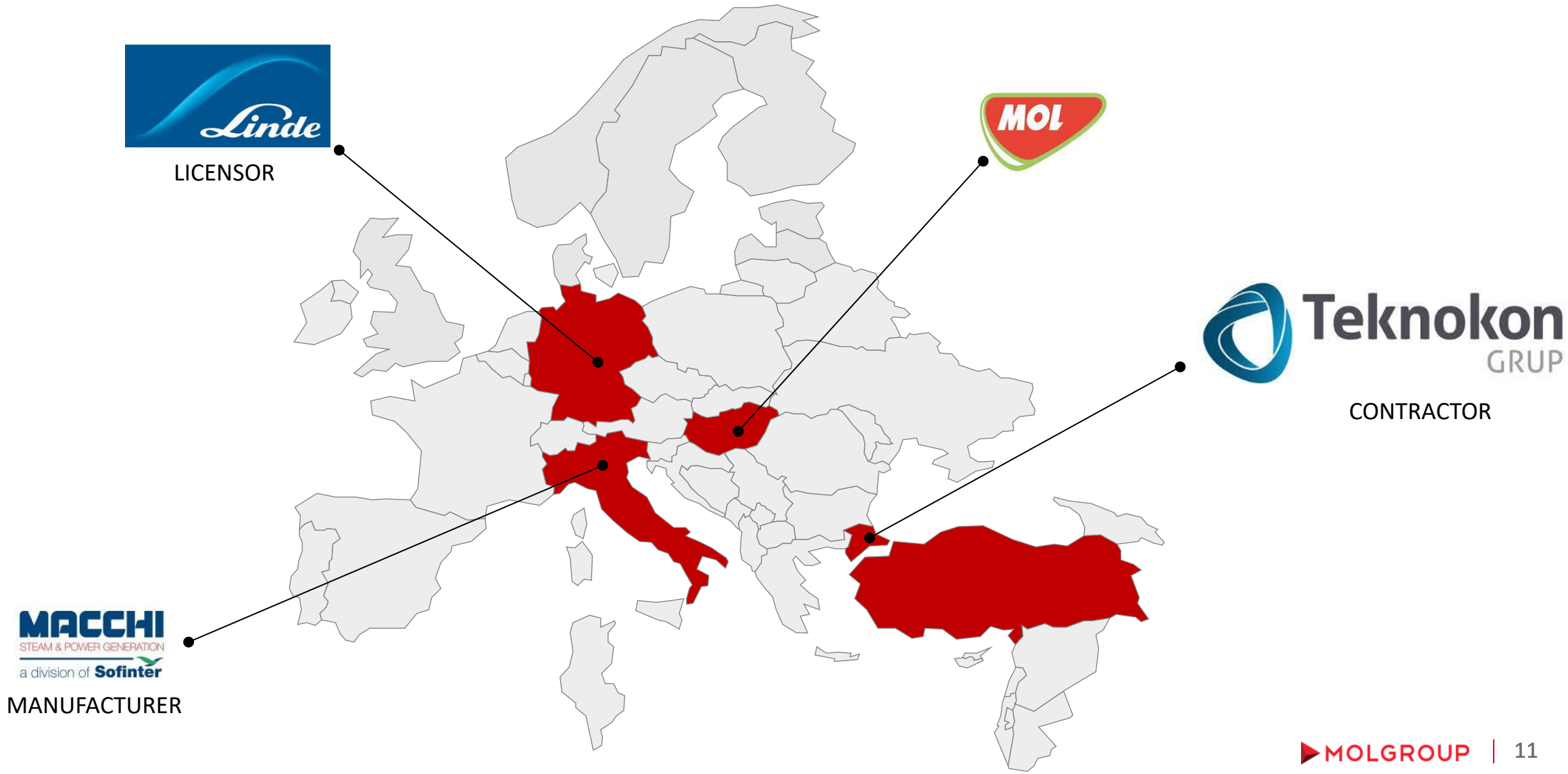


OLD WASTE HEAT RECOVERY BOILER

- **CONTINUOUS OPERATION OF THE BOILER IS ESSENTIAL**
- **PLANNED SHUTDOWN FOR MAINTENANCE IN EVERY 2-3 YEARS**
- **TWO OPTIONS FOR IMPLEMENTATION**
  - **SHUT DOWN, DEMOLITION OF OLD FURNACE AND BUILD A NEW ONE ON THE PLOT AREA**
  - **PARALLEL IMPLEMENTATION DURING UNIT OPERATION AND TIE-IN CONNECTIONS DURING PLANNED SHUT DOWN**
- **WINNER: OPTION-2 (DECISION BASED ON RISK ASSESSMENT)**

IMPLEMENTATION

CULTURAL DIFFERENCES BUT ONE COMMON GOAL



THE PROJECT IN PICTURES

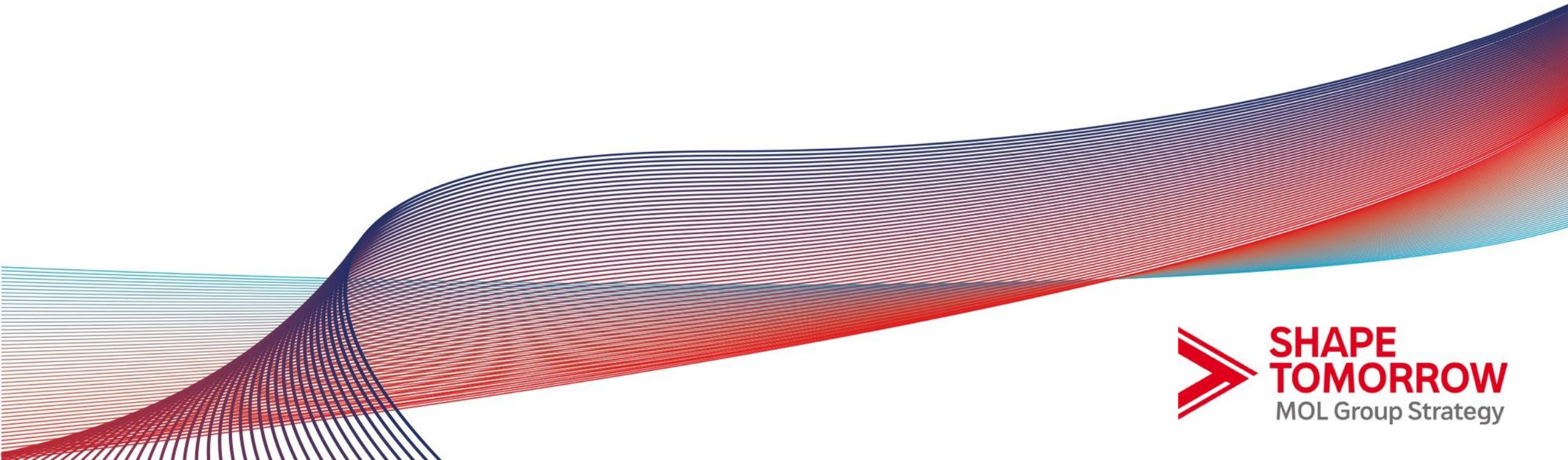
- 280 t/h steam capacity
- 192 MW boiler capacity
- Weight: 900 tons

- 1250 t crane from Greece
- 41 trucks
- 2 weeks assembly

SUMMARY

- ENERGY EFFICIENCY IS CRITICAL FOR SURVIVAL
- NEW AND MORE EFFICIENT BOILER
- IMPROVE OPERATIONAL AVAILABILITY
- IMPROVE ENERGY EFFICIENCY
- MORE THAN 90 THOUSAND MW ENERGY SAVED PER YEAR
- REDUCE CO2 EMISSIONS BY 18.4 KTPA
- 6 YEARS FROM IDEA TO IMPLEMENTATION
- INTERNATIONAL PROJECT

THANK YOU FOR YOUR ATTENTION!



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