EGGA General Assembly – *2023.06.19-21, Salzburg*

Decarbonization in Practice by GIMECO: Effective CO_2 Reduction, Credits and Gas Savings

HOT- DIP GALVANIZING PLANTS AND PROCESS KNOWLEDGE

FROM ~~A TO ZINC~~

zinc to sustainability

PASSIONATE _ EVERIMPROVING _ UNIQUEPARTNER

decarbonization in practice
think about the furnace

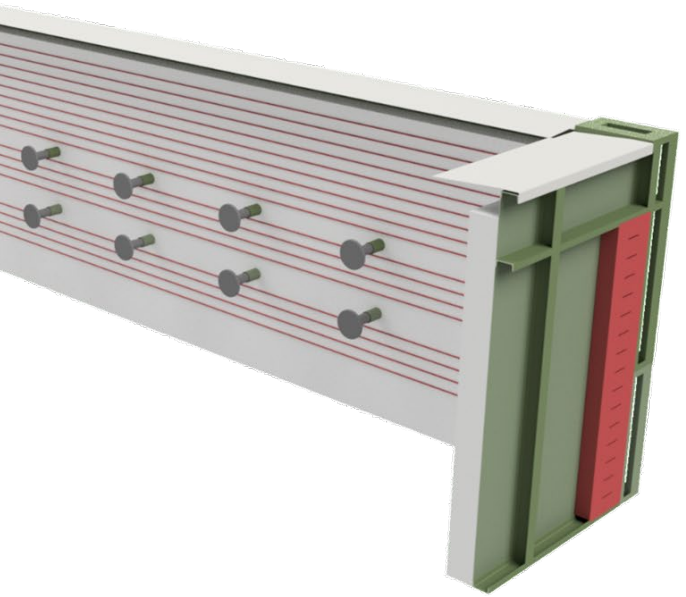
full electric

simpler overall installation*
high efficiency (–30/40% less power installed)*
temperature layering without hardware modifications
low stress on the kettle (up to +50% kettle service life)*
redundancy of resistances to reduce stress in the equipment
lower and stable chamber temperature*
little maintenance
no local CO_2 emissions
no chimney, no gas exhausts, no dust, no noise
suitable for renewable energy (solar, wind, ..).

hybrid

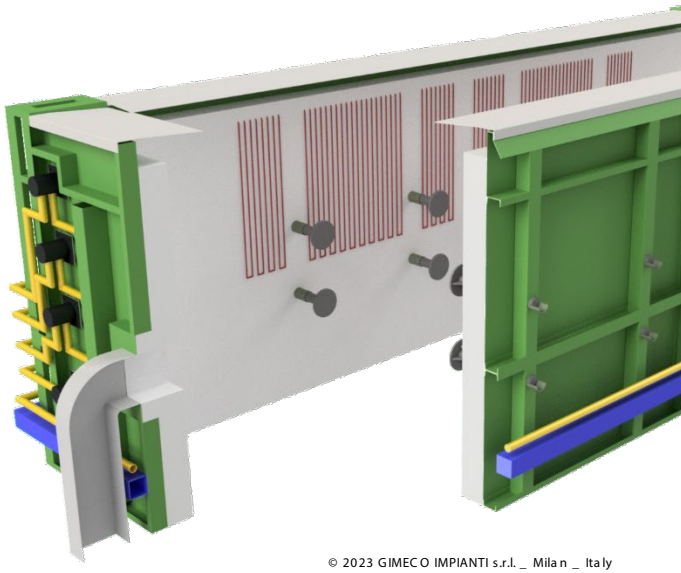
optimized fuel-electric system
electric (or gas) backup power
high flexibility of the system*
backup power mode over night-shifts or weekends
redundancy of resistances to reduce stress in the equipment
lower stress on the kettle*
gas saving*
less exhausts*
reduced local CO_2 emissions*
suitable for renewable energy (solar, wind, ..).

** compared to traditional gas-fired furnaces*



product quality, without local CO_2

flexibility is sustainability



decarbonization in practice
software management

energy consumption live tracking
the system detects, interprets, and stores all data regarding electrical & combustibles consumptions, verifying in real time the operating conditions of the system (mains voltage, electrical absorption)

adaptive and predictive automatic thermoregulation
the system knows the entity of incoming material next to be galvanized and, accordingly, the PID executes necessary modifications for the thermoregulation: this helps improving effectiveness of cycle-time resulting in significantly lower energy consumption and less downtimes

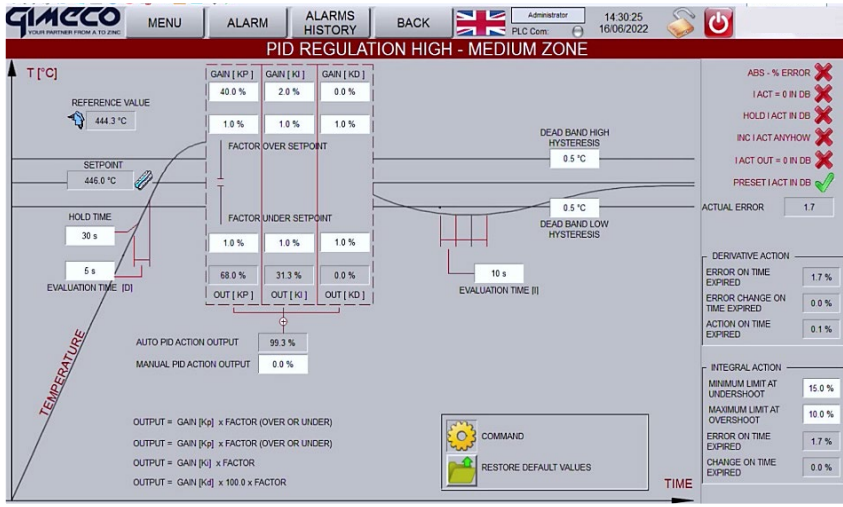
full control of dryer, heat economizing unit, hot air generator and gas control station
continuously retrieving data from sensors and valves for a live check-up; the system provides an optimization in the recovery of thermal energy exploiting the unique conditions of the system

heating elements adjustment
optimization of burners and/or resistances running cycles and turnover as well as controlling pressures to make energy consumption efficient

safety first and auto-diagnostic
running and log information can be used for on-time auto-diagnostics, to take corrective actions in advance to avoid any potential risk or damage, and for a perfect thermal group operation rationalization of energy consumption

dynamic scheduler
helps planning and arranging automatic thermal cycles avoiding real-time manual executions, communicating directly with production management software

integrated MES and MRP interface module
a complete software suite developed “tailor made” to get a real-time full access to the thermal unit, including equipment working status and diagnostic to communicate directly with MRP system; the unit, fully remote controlled (also via browser), is completely integrated in the production process



decarbonization in practice
case histories _ full electric

france, 2014

general jobbing plant

replacement of an old-styled copper induction furnace;
the first job of this type for GIMECO

shifts 2

power 1,20MW (by el. resistances)

production 25000t year

kettle 15,4 · 1,65 · 3,2m

temperature layering 6 – 9âC (colder bottom)

automatic thermoregulation ă2âC with predictive working schedule

digital auto-diagnostics, remote control, smart HMI

savings

gas savings up to 174,99m^3/h

local CO_2 reduction up to 346,48Kg/h**
up to **0,35 carbon credits (EU-ETS)** per hour

** standardized cubic meter – considering 65% combustion efficiency of gas-fired system*
*** average carbon footprint per natural gas 1,98Kg/smc (International Energy Agency, EU Imp. Reg. 2018/2066)*
figures with no contract value – specific cases to be analyzed individually

decarbonization in practice
case histories _ full electric

netherlands, 2023
spinning plant
replacement of a traditional gas-fired furnace

shifts 1
power 0,38MW (by el. armoured resistances)
production 3200t year
kettle 2,4 · 2,4 · 1,65m
temperature layering 6 – 9âC (colder bottom)
automatic thermoregulation ắ 2âC with predictive working schedule
digital auto-diagnostics, remote control, smart HMI

savings

gas savings up to 55,41m^3/h

local CO_2 reduction up to 109,72Kg/h**
up to **0,11 carbon credits (EU-ETS)** per hour

** standardized cubic meter – considering 65% combustion efficiency of gas-fired system*
*** average carbon footprint per natural gas 1,98Kg/smc (International Energy Agency, EU Imp. Reg. 2018/2066)*
figures with no contract value – specific cases to be analyzed individually

decarbonization in practice
case histories _ hybrid

italy, 2023

general jobbing plant

turn-key revamping to hybrid furnace
(gas-fired high velocity double-chamber™ with electric backup)

shifts 1

electric power 0,4MW (by el. armoured resistances)

production 45000t year

kettle 14,0 · 2,8/3,0 · 3,5m

temperature layering 15âC the gas-fired *double-chamber™* furnace, 6 – 9âC the electric system (colder bottom)

automatic thermoregulation å2âC with predictive working schedule

digital auto-diagnostics, remote control, smart HMI

savings

gas savings up to 58,33m³/h

local CO_2 reduction up to 115,49Kg/h**
up to **0,12 carbon credits (EU-ETS)** per hour

** standardized cubic meter – considering 65% combustion efficiency of gas-fired system*
*** average carbon footprint per natural gas 1,98Kg/smc (International Energy Agency, EU Imp. Reg. 2018/2066)*
figures with no contract value – specific cases to be analyzed individually

decarbonization in practice
case histories _ hybrid

italy, 2023

general jobbing plant

turn-key revamping to hybrid furnace
(gas-fired high velocity double-chamber™ with electric backup)

shifts 2

electric power 0,324MW (by el. armoured resistances)

production 35000t year

kettle 15,5 · 1,85/2,05 · 3,1m

temperature layering 15âC the gas-fired *double-chamber™* furnace, 6 – 9âC the electric system (colder bottom)

automatic thermoregulation å2âC with predictive working schedule

digital auto-diagnostics, remote control, smart HMI

savings

gas savings up to 47,25m³/h

local CO_2 reduction up to 93,55Kg/h**
up to **0,09 carbon credits (EU-ETS)** per hour

** standardized cubic meter – considering 65% combustion efficiency of gas-fired system*
*** average carbon footprint per natural gas 1,98Kg/smc (International Energy Agency, EU Imp. Reg. 2018/2066)*
figures with no contract value – specific cases to be analyzed individually

decarbonization in practice
case histories _ hybrid

poland, 2021
general jobbing plant
native hybrid furnace
(electric and high velocity double-chamber™)

shifts 2

electric power 0,264MW (by el. armoured resistances)

production 80000t year

kettle 9,0 · 1,8 · 5,0m

temperature layering 15âC the gas-fired *double-chamber™* furnace, 6 – 9âC the electric system (colder bottom)

automatic thermoregulation å2âC with predictive working schedule

digital auto-diagnostics, remote control, smart HMI

savings

gas savings up to 38,50m³/h

local CO_2 reduction up to 76,23Kg/h**
up to **0,08 carbon credits (EU-ETS)** per hour

** standardized cubic meter – considering 65% combustion efficiency of gas-fired system*
*** average carbon footprint per natural gas 1,98Kg/smc (International Energy Agency, EU Imp. Reg. 2018/2066)*
figures with no contract value – specific cases to be analyzed individually

decarbonization in practice
case histories _ hybrid

france, 2023

general jobbing plant

turn-key revamping to hybrid furnace
(gas-fired high velocity double-chamber™ with electric backup)

shifts 2

electric power 0,2MW (by el. armoured resistances)

production 50000t year

kettle 9,5 · 2,0 · 3,2m

temperature layering 15âC the gas-fired *double-chamber™* furnace, 6 – 9âC the electric system (colder bottom)

automatic thermoregulation ă2âC with predictive working schedule

digital auto-diagnostics, remote control, smart HMI

savings

gas savings up to 29,17m³/h

local CO_2 reduction up to 57,75Kg/h**
up to **0,06 carbon credits (EU-ETS)** per hour

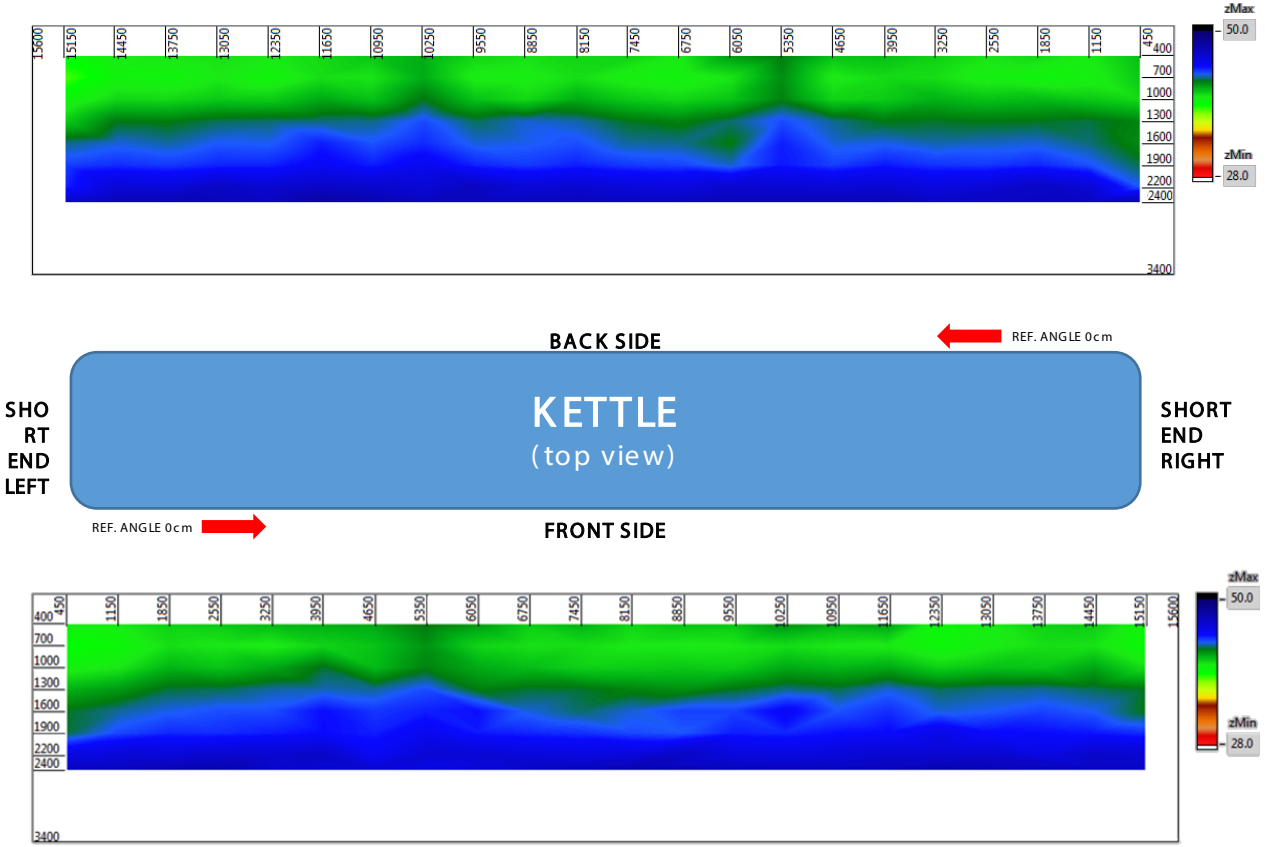
** standardized cubic meter – considering 65% combustion efficiency of gas-fired system*
*** average carbon footprint per natural gas 1,98Kg/smc (International Energy Agency, EU Imp. Reg. 2018/2066)*
figures with no contract value – specific cases to be analyzed individually

decarbonization in practice
kettle typical corrosion pattern (by KID™)_ electric

less kettle replacements

in the end, electric thermal groups used as full power (full electric furnaces) or as back-up power while in idle times (hybrid furnaces) produce a low stress* to the kettle providing a uniform and mild corrosion pattern.
this allows the kettle service life to be radically extended meaning that less kettle replacements are virtually needed, contributing to **further savings on capital expenditures.**

* compared to gas-fired furnaces



chemical pretreatment and passivation
degreasing, pickling, flux and passivation departments with green s-cleanbox™ technology

dryers
pit or aboveground, with infrared technology

furnaces
flat-flame, high-velocity, h.v. dual-chamber™, high-temperature, hybrid, induction elements, electric

logistics/handling of materials, automation and systems for robotics
smart jigging stations, hoists, cranes, buffering systems, automatic racks handling systems, smart manipulating device MOVER™

software solutions and digital transformation
productivity pack, energy mgmt. iknow™, chemicals mgmt. chempack™, HerMES™ mes suite and intelligent remote assistance GIRA™

kettle and furnace management
kettle ultrasonic inspections KID™, kettle replacements, zinc pump-outs, holding vessels, furnace check-up and tuning

coil lines technical services and pot management
pot management, inductor replacement, combustion

disposal/regeneration of fumes, waters, acids

solutions for sustainability and work bearability

chemical products

revamping of existing lines

industry 4.0 transition

technical assistance, training and spare parts

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thank you