

Main industrial Impact

- **Reduction of CO2 emissions**, by limiting or avoiding the need to flare useful process off-gases, which are fully and optimally exploited.
- **Improved valorisation of process gases** by saving energy costs and weakening dependence on external providers (e.g. lower volume of purchased natural gas, enhanced possibility to replace it with internally produced synthetic gas, power plants providing more energy when demand is higher).
- **Faster adaptation of gas and steam networks** in the transition phase from traditional BF/BOF route to novel C-lean production routes.

Lower CO2 emissions and costs in integrated steelworks



The SMARTER project

The project aimed at optimizing the management and the structure of the steam and gas networks inside integrated steelworks in the light of the future developments of the steel production.

Consortium



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SMARTER Project

Steam and gas networks revamping for the steelworks of the future



This project has received funding from the Research Fund for Coal and Steel under grant agreement No 101034060



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Improved process synchronization and networks optimization

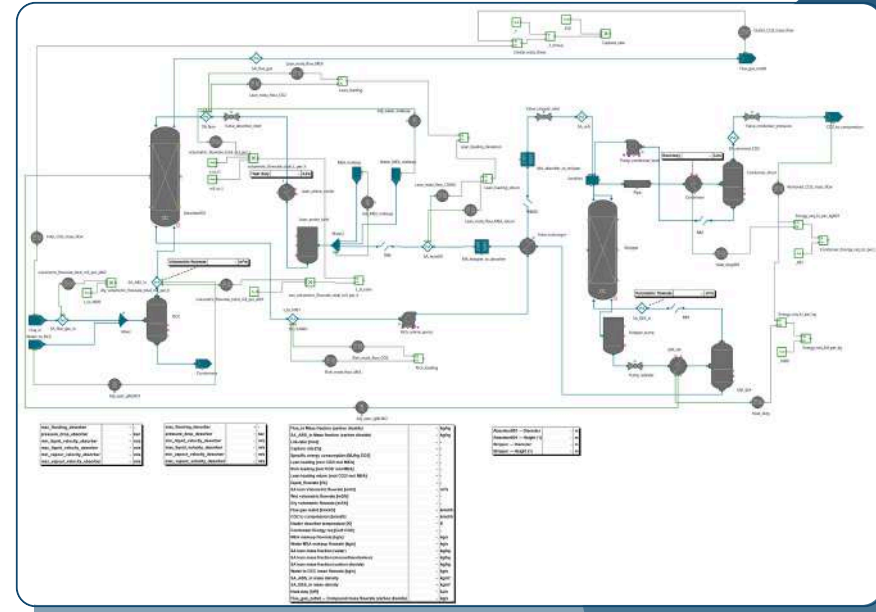
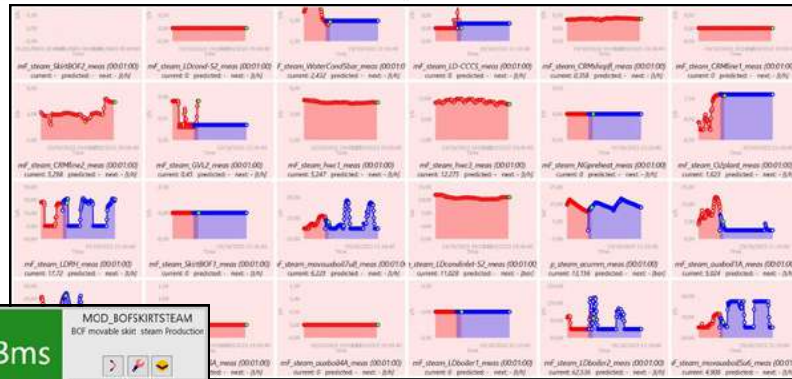
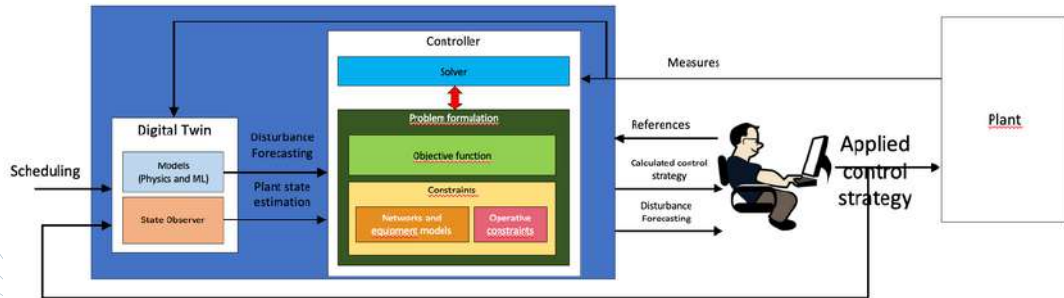
A software platform for:

- data-driven Machine Learning-based modelling and forecasting of off-gases, steam and energy production consumption and transformation by different processes and equipment.
- a decision support tool for networks management helping operators in decision-making thanks to forecasting capabilities enabled by models and advanced optimization algorithms.

Simulation-driven analysis of different scenarios to decarbonize the BF-BOF route

10 different scenarios analyzed through gPROMS simulations

- Step by step replacement and adjustment of metallurgical aggregates to achieve green steel production and meet the EU climate targets
- Close the carbon cycle with carbon capture and utilization technologies for unavoidable CO₂ emissions from raw materials (e.g., limestone, iron ore)
- Calculation of avoided CO₂ emissions and changes in the energy network for each scenario
- Assessment of economic viability



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| BLP MOD_BOFHOLDER_LEVEL_WE BOFHOLDER Level Prediction Model model ready | BHS MOD_BOFHSTTEAM BOF HP Steam Production model ready | Bms MOD_BOFSKIRTSTEAM BOF movable skit: steam Production model ready |
| Ccs MOD_CCSTEAM Continuous casting steam model ready | CRM MOD_CRM Cold rolling Mills model ready | CRm MOD_CRMSTEAM Cold Rolling mills steam consumption model ready |
| GL1 MOD_GV1 Galvanizing Line 1 model ready | GL2 MOD_GV2 Galvanizing Line 2 model ready | GI2 MOD_GV2STEAM Galvanizing Line 2 steam consumption model ready |
| HSm MOD_HSMLECPower Hot Strip mill Electrical Power consumption missing implementation | HSM MOD_HSMGASCONS Hot Strip Mill Gas consumption missing implementation | HWC MOD_HWC Hot Water Cascades model ready |

