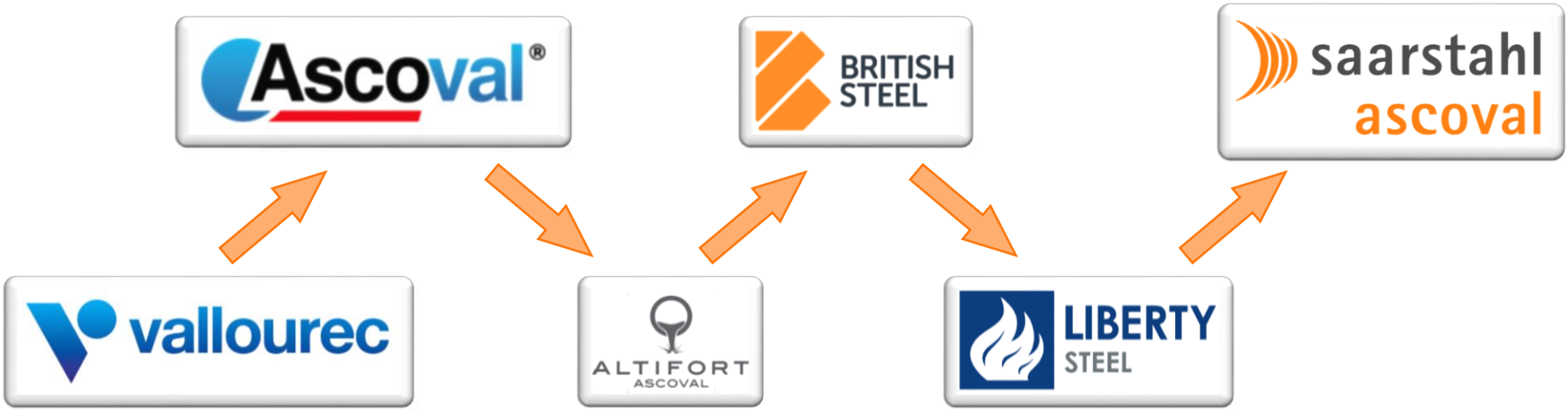
Corporate Presentation

Saint-Saulve, 01 / 2023

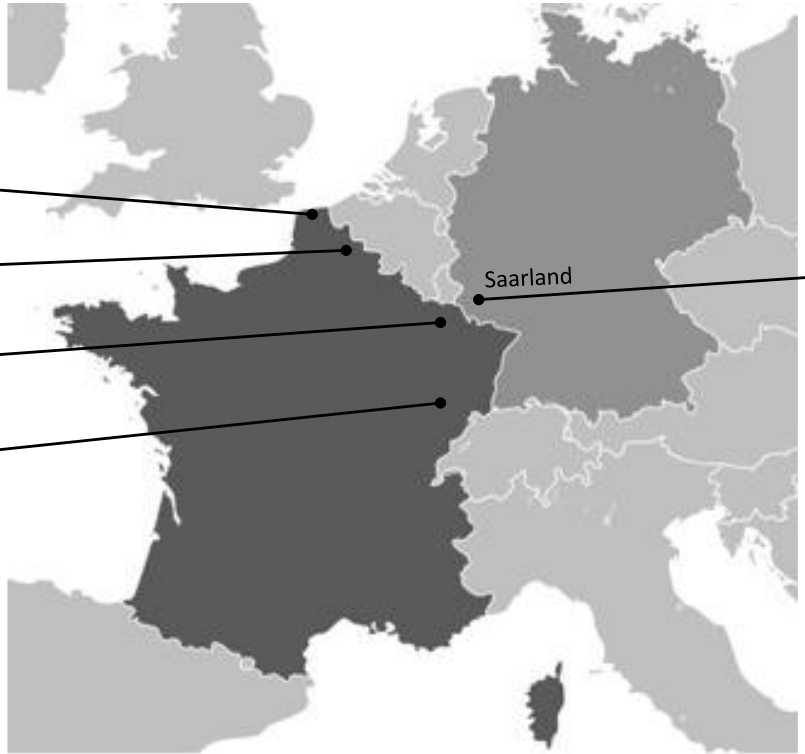
Recent history

Year:	2016	2017	2018	2019	2020	2021	2022	2023
Owner:	Vallourec	Ascoval		Altifort	British Steel		Liberty Steel	Saarstahl Ascoval



Production locations of the SHS Group

Focus on Saarland and France



DILLINGER France

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saarstahl rail

Conflandey Industries

saarstahl

DILLINGER

saarschmiede Freiformschmiede

Saar-Bandstahl GmbH

Schweißdraht Luisenthal

Drahtwerk St. Ingbert

SAAR BLANKSTAHL

Facilities and equipment

Main facilities:

- Electric Arc Furnace 90t, 115 MVA, (SMS Concast)
- Ladle Furnace 15 MVA (Sarralle)
- Twin tank Vacuum Oxygen Degassing unit (VOD)
- Continuous Caster, 4 strands, bow type, 12 m radius, (Danieli)

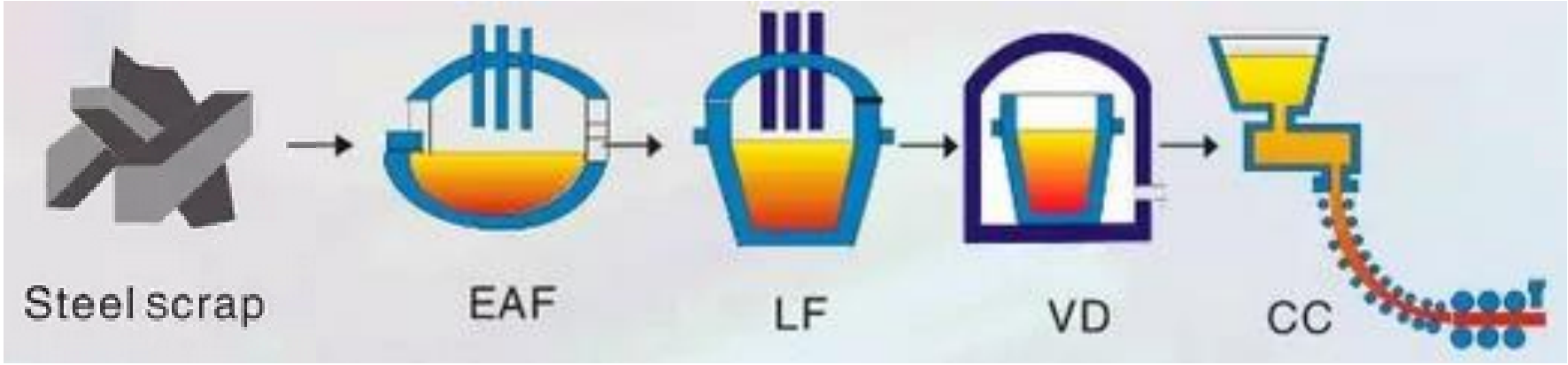
Products:

- Continuous cast billets and blooms (round, square, rectangular profiles) in carbon and alloy steel

Logistics:

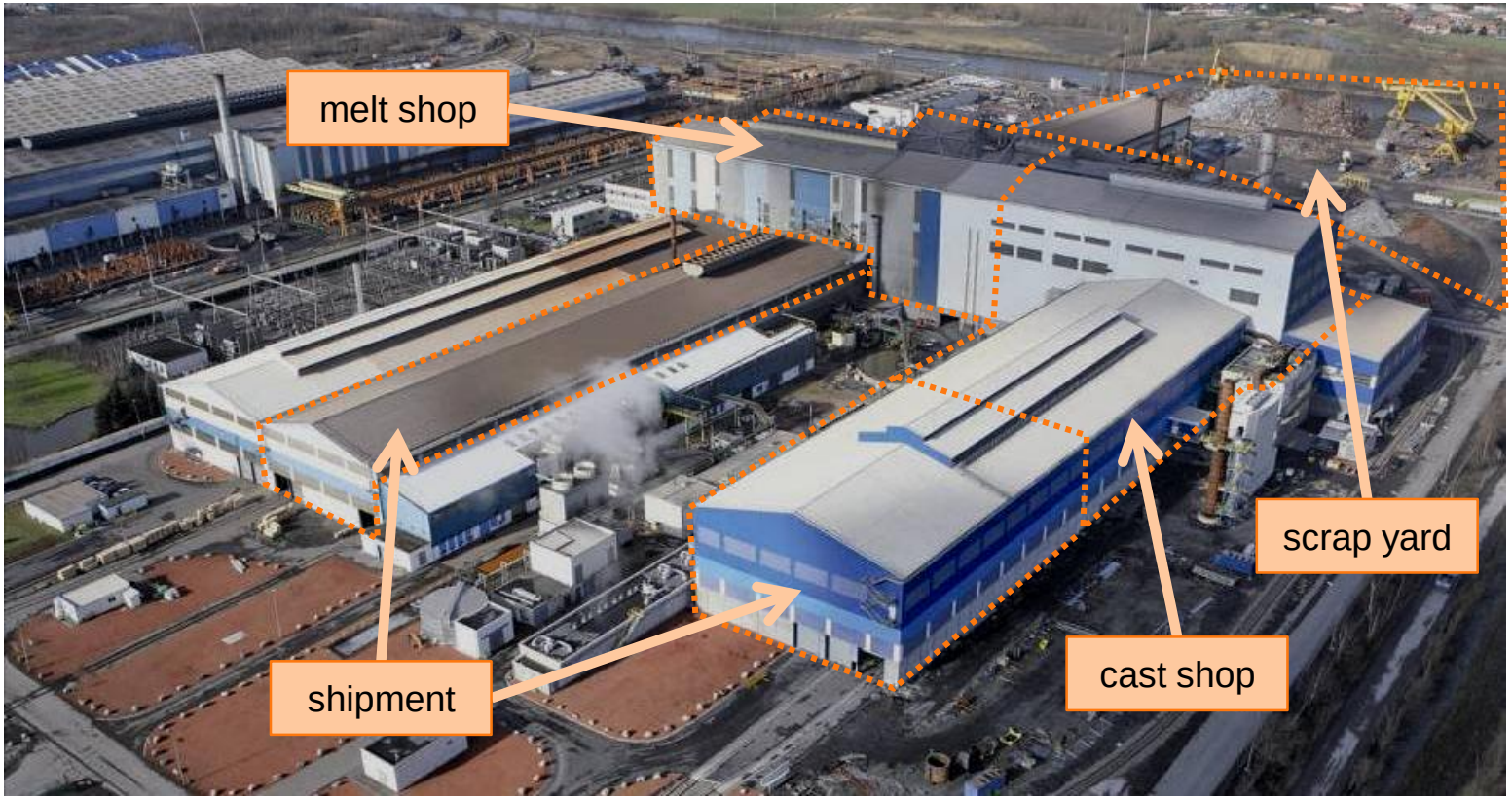
- Connection to: 1) railway network,
  2) Escaut river (Schelde),
  3) highway (distance 7km)

Main process route

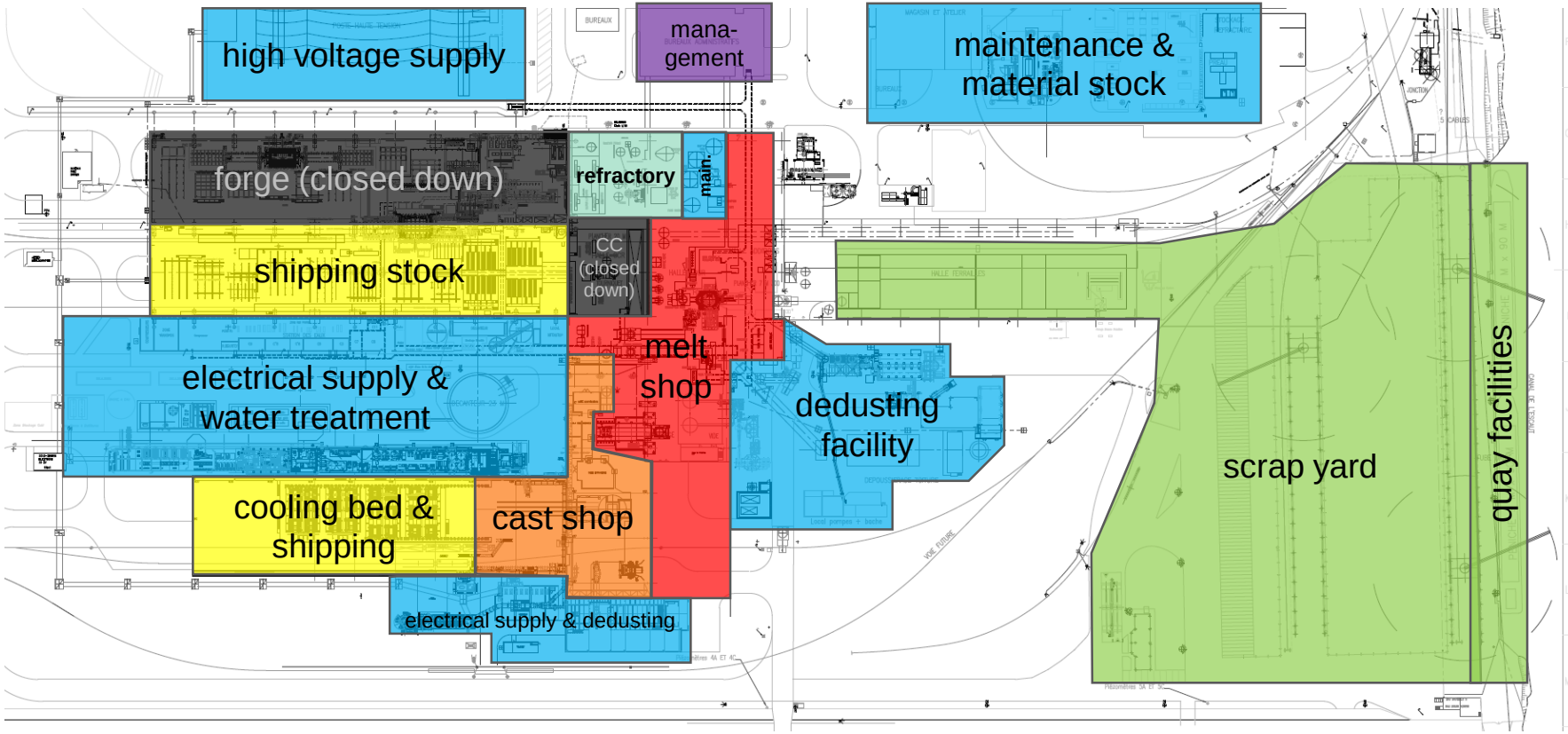


using the right scrap compostion regarding trace elements	melting scrap into liquid crude steel	meeting customer demanded chemical composition	reducing hydrogen, further improving steel purity	transforming liquid steel into blooms of customer demanded dimensions

Plant overview



Plant overview



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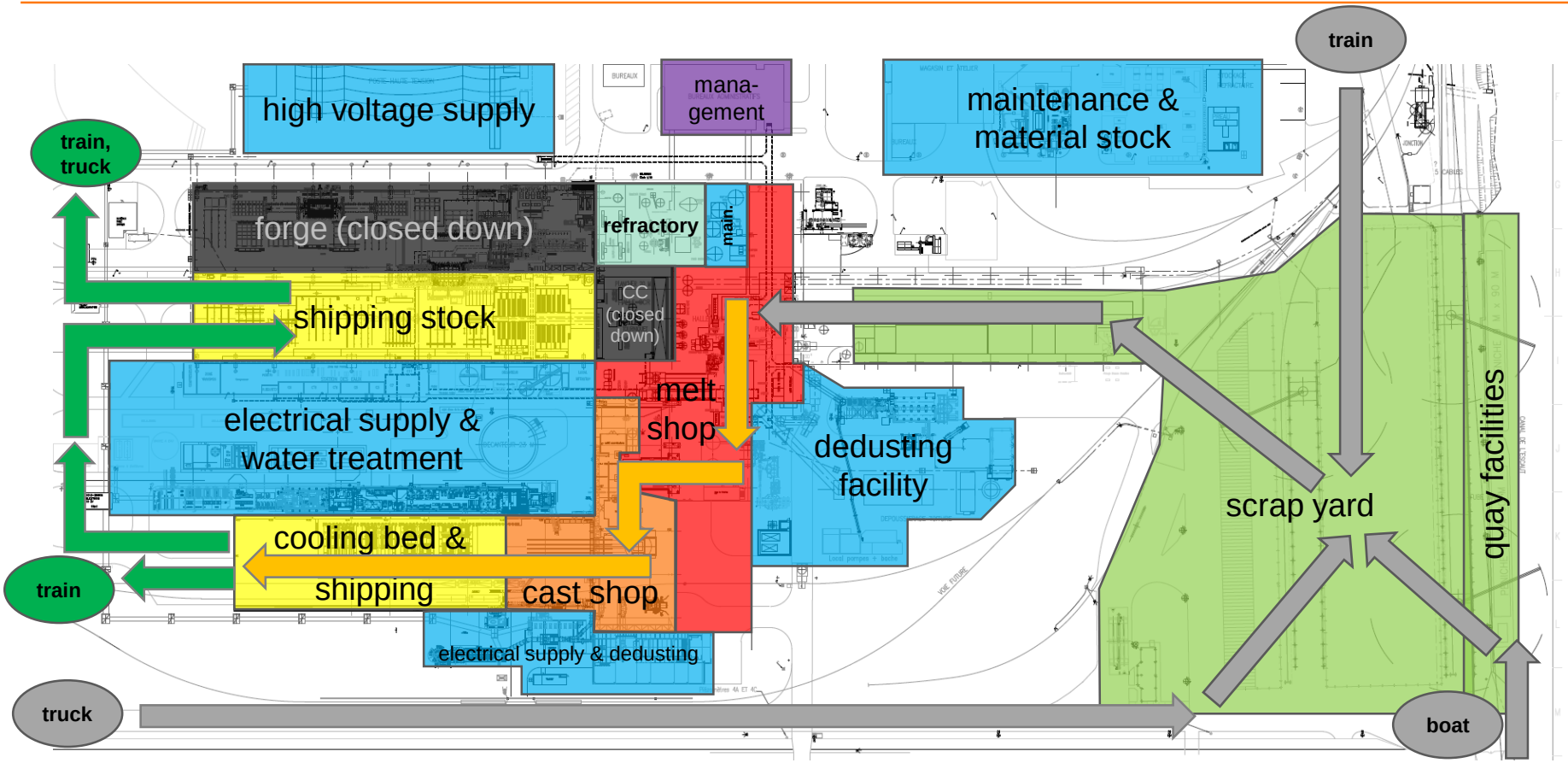
Scrap and steel logistic



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Facilities description – Scrap Yard

Main figures:

- surface: 13.000 m²
- storage capacity: 80.000 tons
- loading capacity: > 50 buckets per day

Scrap deliveries:

- 80 % by trucks (75/day)
- 5 % by barges (1 - 2/month)
- 15 % by train (11 wagons/day)
- 23 different scrap categories
- scrap sources: automotive industry, internal scrap, scrap collecting, old rails

Incoming inspection:

- chemical composition
- radioactivity

Equipment:

- 3 harbor cranes and 3 mobile cranes
- 3 bucket transport trucks with weighting cells
- Radio connection with the EAF

Facilities description - Electric Arc Furnace (EAF)

Electric Arc Furnace:

- Supplier: SMS Concast - 2013
- Tapping capacity: 90t (in the future 100t), ~24 heats/day
- Power: 116MVA – 32kV/700-1100V
- Reactance: 27MΩ
- Shell diameter: 5,9 m
- Electrodes: 3x Ø 600 mm
- Burners: 3x supersonic oxygen/naturel gas
- Injectors: 3x carbon → foamy slag
- Buckets per heat: 2
- Tapping temp.: 1650 – 1700°C
- Alloying: 5th hole EAF roof or during tapping conveyer system (bulk material)

automatic systems

- EBT: automatic sand filling system
- Slag door: automatic (CONDOOR)
- Manipulator: a) sampling
  b) temperature measurement
  c) oxygen activity measurement

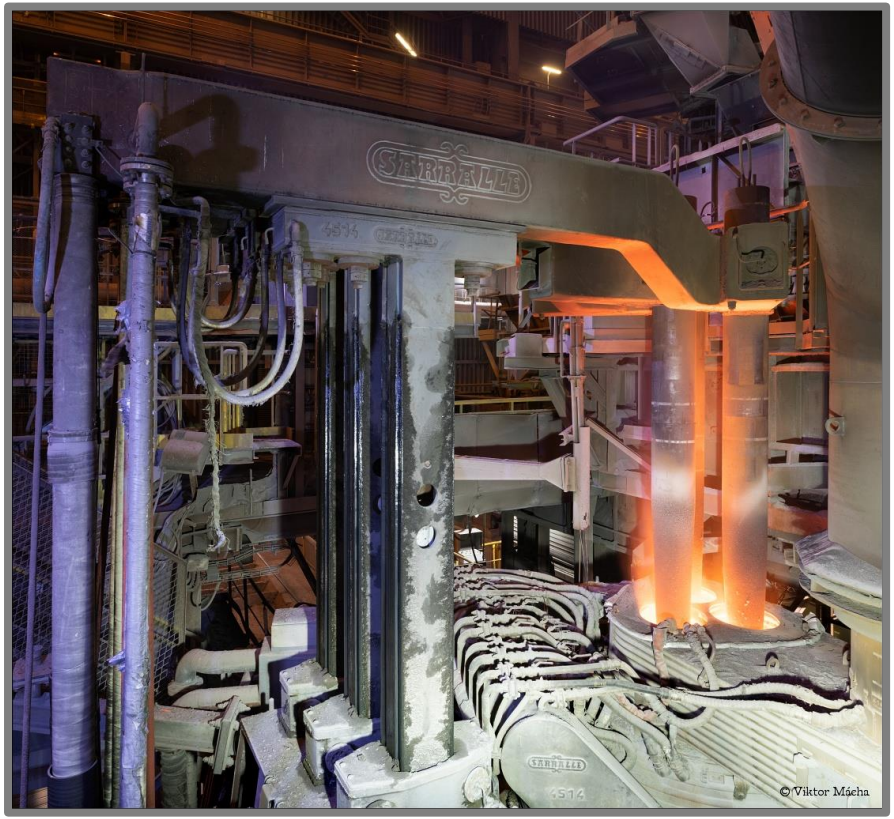
Facilities description - Ladle Furnace (LF)

Ladle Furnace

- Supplier: Sarralle – 2009
- Electrical power: 14MVA at 30.000A
- Heating rate: 4°C/min
- Electrodes: 3x Ø350mm
- Automatic manipulator: a) sampling
  b) temperature measurement
- Alloying by: a) conveyer system (bulk material)
  b) injection of cored wire

Ladle:

- Capacity: 90t liquid steel
- Refractory Magnesia and Dolomite
- Bubbling: 1 porous plug (automatic coupling)
- Bubbling gas: Argon or Nitrogen



Facilities description - Vaccum Oxygen Degazing (VOD)

Vacuum Oxygen Degazing

- Supplier: Danieli – 2010
- Tanks & roofs: 2 (vacuum possible on 1 tank)
- Oxygen lances: 2
- Gas analysis: spectrometry
- Alloying: a) hoppers (bulk material)
b) injection of cored wire
- Automatic manipulator: a) sampling
b) temperature measurement
c) hydrogen measurement
- Bubbling gas: Argon or Nitrogen (automatic coupling)

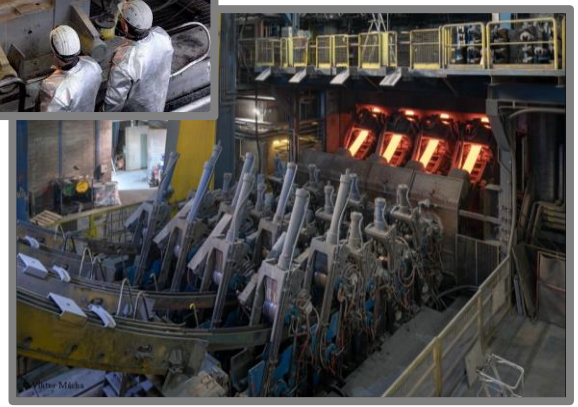
Vacuum system

- Water ring pumps: 2
- Steam generators: 2 (12 bars)
- Steam ejectors: 7
- Deep vacuum: 1 mbar (in 6 min.)

Facilities description - Continuous Caster

Continuous Caster

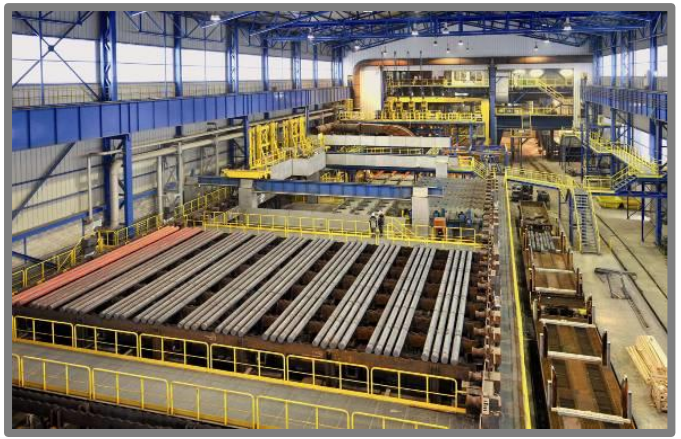
- Supplier: Danieli – 2007 (modification 2020 → blooms)
- Ladle turret: 1 (2 positions)
- Strands: 4
- Bending points: 2
- Capacity: 100 – 150t/h (depending on steel grade)
- Mould length: 780mm, 1000mm
- Casting speed: 0,5 – 2,6m/min
- Metal. length: 32m
- Curve radius: 12m
- El. magn. stirrer: a) Mould b) foot (blooms)
- Tundish: 25t (max. 12 heats per tundish)
- Nozzle typ: SES, SEN
- Casting formats: rounds Ømm: 180; 220; 250; 260; 270; 280; 310; 325
  rect. (mmxmm): 155x155; 180x180; 255x330; 300x365
- bar length: 4,5 - 12,4m (oxycutting)



Facilities description– Cooling bed and shipping

Cooling bed

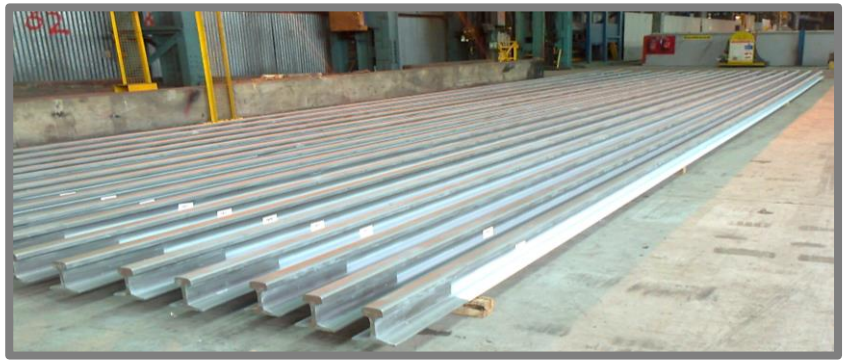
- Supplier: Plakoma – 2007 (modification 2020 → blooms)
- Bed length: 80m
- Cooling rate: 90°C/h
- Tracability: Marking machine and labeling
- Hoods: 4 (reduction of hydrogen)
- Rail capacity: 15 wagons
- Cranes: a) electromagnets
  b) lifting clamps for hot bars



Shipping activities:

- Sampling
- Visual inspection
- Packaging and shipping

Products of Ascoval customers



Rails for High-Speed lines

Rails for Heavy Haul Tracks

Grooved Rails for Tramways

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Certificates

SNCF RÉSEAU

Hayange customers confirm Ascoval material for:

- rails R200
- rails R260

INFRABEL
Right On Track

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GREEN STEEL RAIL

Saarstahl Ascoval introduced the “Green Steel Rails” concept in December 2020, utilizing a circular economy approach by recycling rail scraps from the Hayange mill and external customers to produce Green Steel blooms for rail production by Saarstahl Ascoval. This manufacturing process significantly reduces CO2 emissions and promotes sustainable practices in the rail industry.

The future – Green steel

Electric Arc Furnace VS Basic Oxygen Steelmaking

Basic Oxygen Steelmaking (BOS)

- 1t of steel generates 2,211t of CO2 (ref. ADEME/FEDEREC 2017 table VI-1 p.99)
- Need 1,143t of steel to manufacture 1t of rail (due to yield)
- Total emission including other emissions posts (transport bloom and rail, transformation of bloom in rail, others): 2,711t of CO2 per ton of rail

Electric Arc Furnace (EAF)

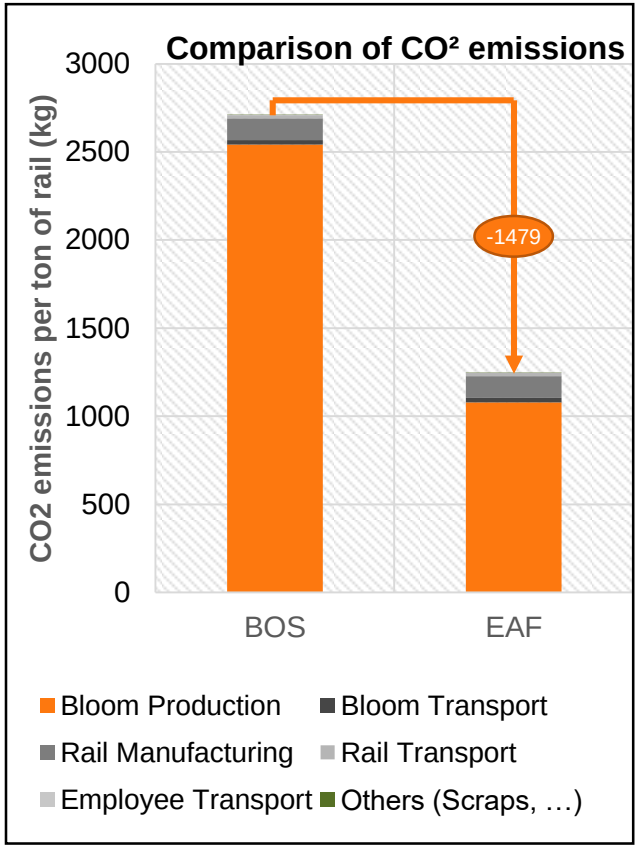
- 1t of steel generates 0,938t of CO2 (ref. ADEME/FEDEREC 2017 table VI-1 p.99)
- Need 1,143t of steel to manufacture 1t of rail (due to yield)
- Total emission including other emissions posts (transport bloom and rail, transformation of bloom in rail, others): 1,232t of CO2 per ton of rail

EAF route permits to save at least 1,4t CO^2/t of rail compared to BOS

	BOS	EAF
Bloom Production	2 541	1 078
Rail Production	122	122
Bloom Transport	27	27
Rail Transport	19	19
EmployeeTransport	1	1
Other (waste, …)	1	1
Total CO2 emissions	2 711	1 232

[ref ADEME] https://bilans-ges.ademe.fr/fr/accueil/documentation-gene/index/page/Acier

FEDEREC / Mars 2017 / Évaluation environnementale du recyclage en France selon la méthodologie de l'analyse de cycle de vie - Rapport final



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Thank You