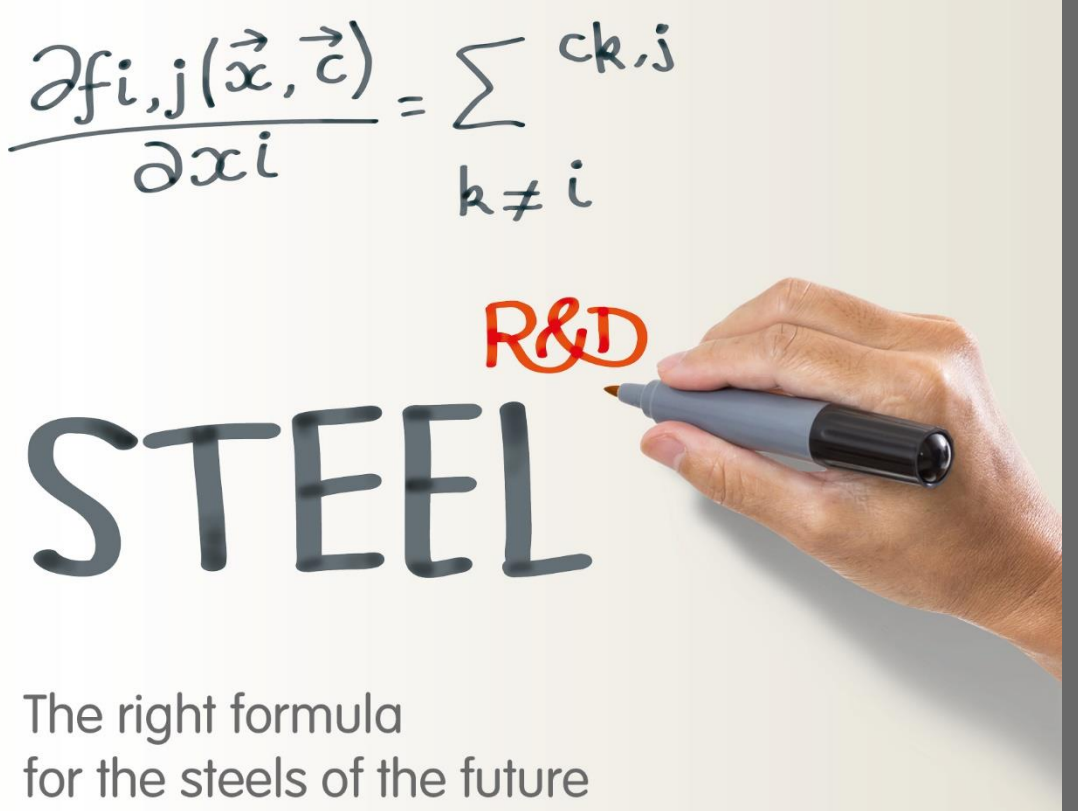
ArcelorMittal active in H_2 research

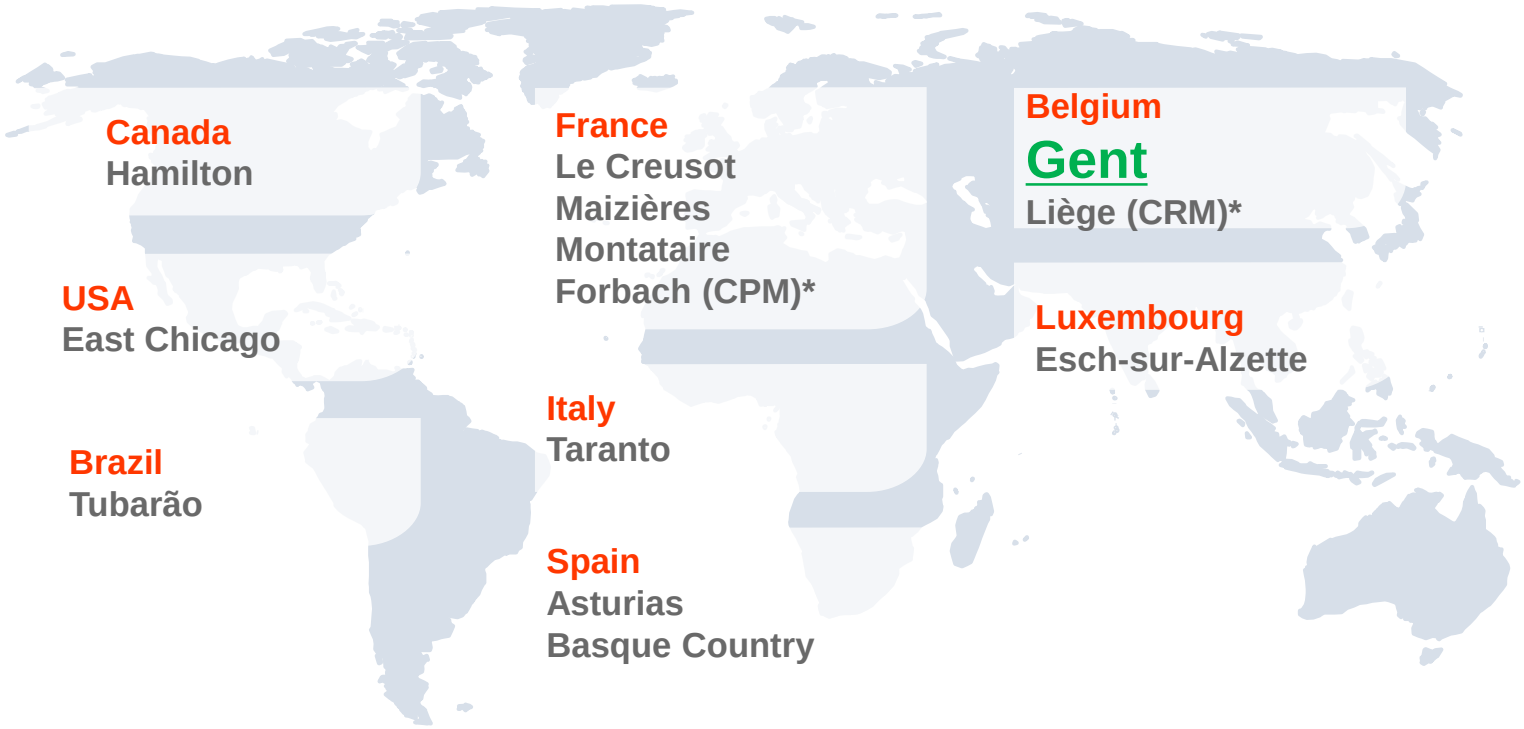
18-sep-19



Global R&D
ArcelorMittal

OCAS is also part of the ArcelorMittal Global R&D team

11 research sites



Presence at customer locations on 3 continents

Canada USA	Spain France Germany Italy	China South Korea Japan

On-site product and process portfolio deployment:

- Product Development Engineers
- Automotive Residents
- Process Development and Deployment Specialists

** Strategic partner*

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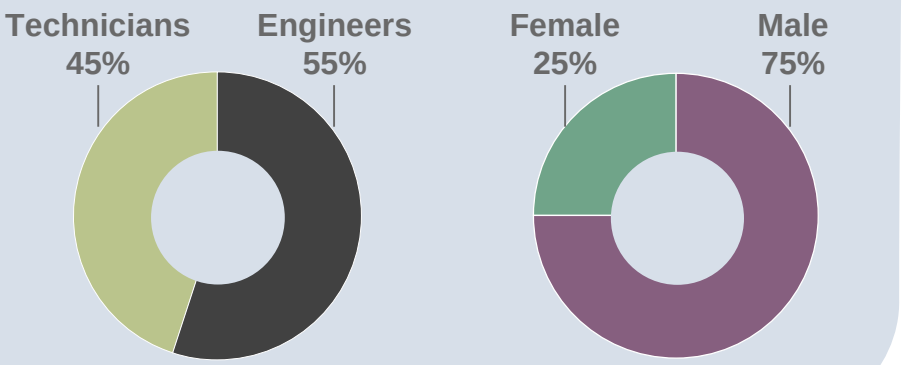
Global R&D
Highly talented people

1500+
researchers



Over 25 nationalities
Mixed generations

Working together
in result-driven projects

Extensive
international
experience

Graduates from
the best universities and
engineering schools
worldwide

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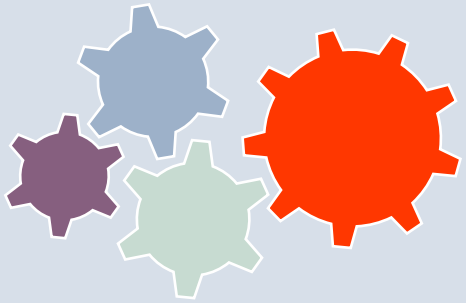
Global R&D
Other 2018 key figures



150
new process solutions deployed

26
new products and solutions launched

70
new inventions protected

600+
active patent families

100+
ongoing R&D programmes

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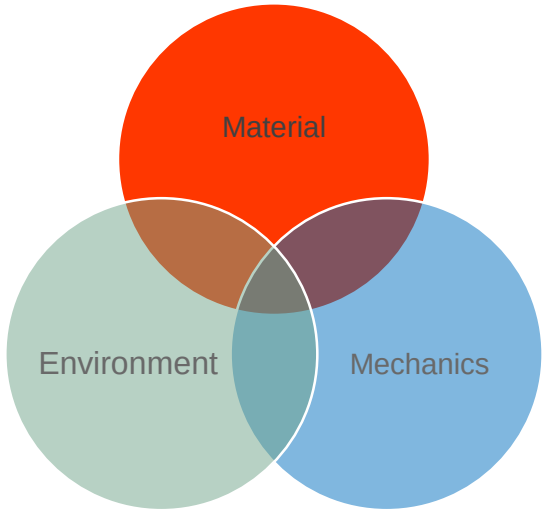
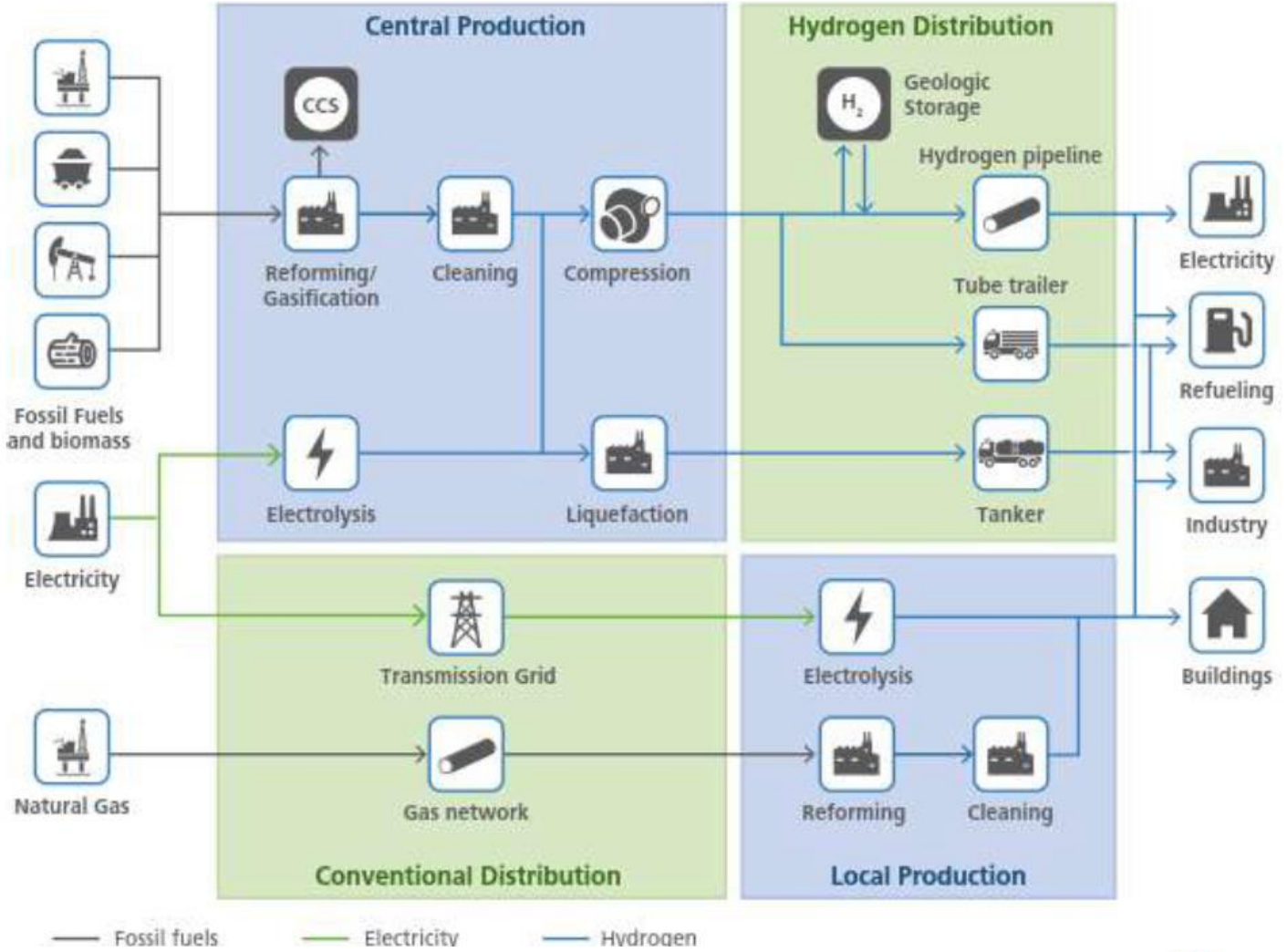
Research related to the H_2 economy

- Focus: intersection of environment, mechanics and materials variables to understand Hydrogen Embrittlement
  - Environment: Temperature, Pressure, Impurities, Gas mixtures
  - Material: Microstructure, defects (NMI, segregation…)
  - Mechanics: crack tip behaviour, fracture resistance





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Research related to the H_2 economy

- Topics included in R&D programs:
  - Hydrogen distribution
    - Line pipe grades
  - Hydrogen storage
    - Pressure vessel grades

Air Liquide hydrogen pipelines in Benelux, France and Germany (Ruhr area). Impact of high capacity CGH2-trailers. Deliverable 6.4

Pressure vessel Industeel - ArcelorMittal

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Research related to the H_2 economy

- Involvement in funded projects

GE
Research

Low Cost, High Strength Gradient Structure Ferritic Steel for Hydrogen Storage Pressure Vessels

Concept Paper

In response to: **DE-FOA-0002022**
Topic Area: 1B
Control Number:

Submitted to
U.S. Department of Energy
Energy Efficiency & Renewable Energy (EERE)

Figure 1 Team members and responsibilities

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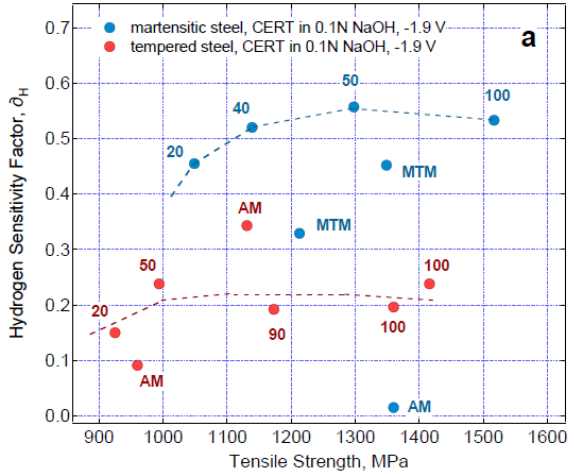
Research related to the H_2 economy

- Involvement in funded projects

European Commission

Hydrogen sensitivity of different advanced high strength microstructures

(HYDRAMICROS)



This project investigated microstructural features and to obtain insights into causes and mechanisms of HE in UHSS.

Main findings: significant differences between the embrittlement of different microstructures

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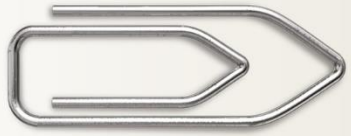
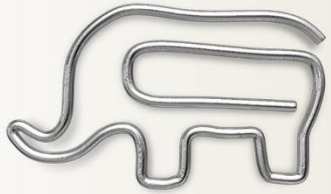
Lightweight, ...



Strong design



Our constant goal