Ironman Development AS
Project objectives and status

IRONMAN

Ironman ï concept description

Iron plant located at Tjeldbergodden at the termination point of the gas pipeline from the Heidrun field; Direct reduced iron produced by reducing the oxygen content in iron ore with Norwegian natural gas as reduction agent (DRI):

- The main driving force is the steel industryôs demand for predictable supplies of raw material at improved cost/performance ratio, and with reduced CO_2 footprint
- Nordic iron ore, Norwegian gas and Nordic industry competence ensures high quality products, compact logistics and potential for high degree of customized deliveries
- Norwegian state owned Siva SF represents Norwegian interests and ensures participation in the project close to the decision making
  - Sivaôs mandate to facilitate large industrial projects by investing in infrastructure and site
- The best available process technology will be applied
  - ✓ Well proven and documented technology with significantly reduced climate impact and energy consumption, compared with traditional iron production technologies

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Key figures for the Ironman plant:

- Production capacity: 1,6 ï 2 million tons/year of Direct reduced iron (DRI)
  - ✓ Option to convert to Hot Briquetted Iron (HBI)
    - ✓ Argument: stabilization for transport and storage purpose, and optimization for Blast Furnace charge
- Iron ore demand: approx. 2,3 ï 2,9 million tons/year of iron ore pellets
  - ✓ Main source assumed from LKAB; global leader in high quality/high purity pellets
  - ✓ Possibility to allow for clientsôown pellets to be processed to final DRI (providing tailor making and cost/quality control of clientsôsupply chain), or allow for alternative iron ore sources to provide product quality diversification

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Key figures for the Ironman plant, continued:

- Annual demand for natural gas for the iron ore reduction process: 440-550 million Sm³ (15 – 21 million MMBTU)
  - ✓ The span in demand reflects choice of process technology supplier and final produced capacity (specific gas consumption 9,45 ï 10,6 MMBTU/ton DRI)
  - ✓ To be made available at plant entry gate at 15-25 barg pressure
  - ✓ Assumed operation: 8000 hours/year; 340 days
- Estimated gross CAPEX: EUR 800 million
  - ✓ Whereof site and infrastructure represent approximately EUR 180-200 million
- Annual energy demand: 230 ï 290 GWh
  - ✓ Specific energy consumption: 143 kWh/ton DRI produced

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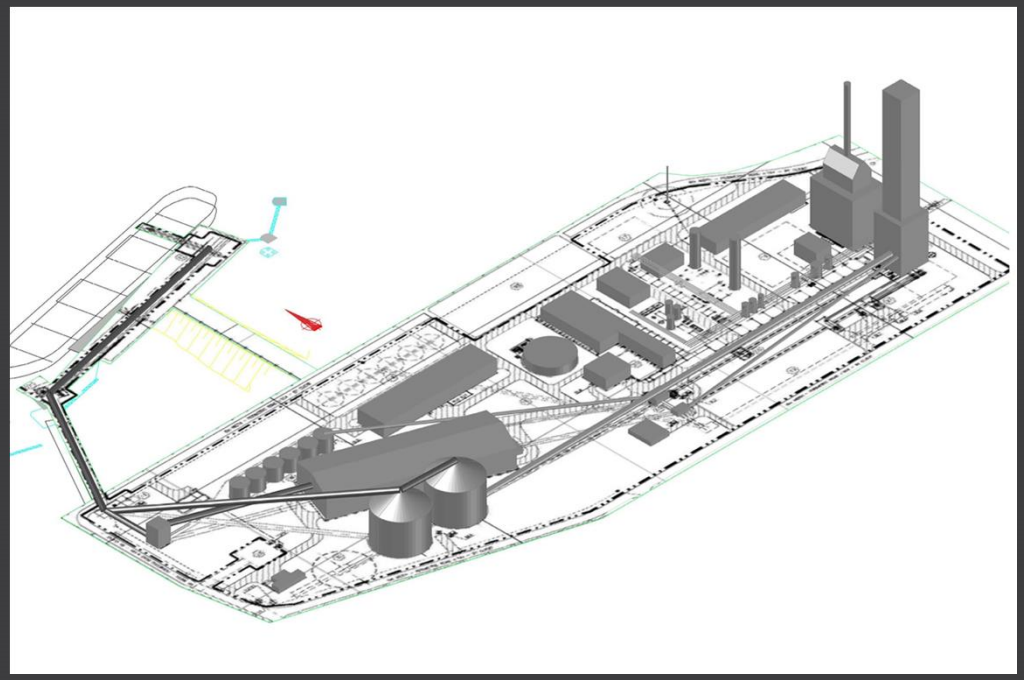
Assumed plant location Tjeldbergodden, next door to Statoil methanol plant, and at terminal point of gas pipeline from the Heidrun field

Plant layout

Estimated area consumption: 122.000 m², approximately 550m x 220m



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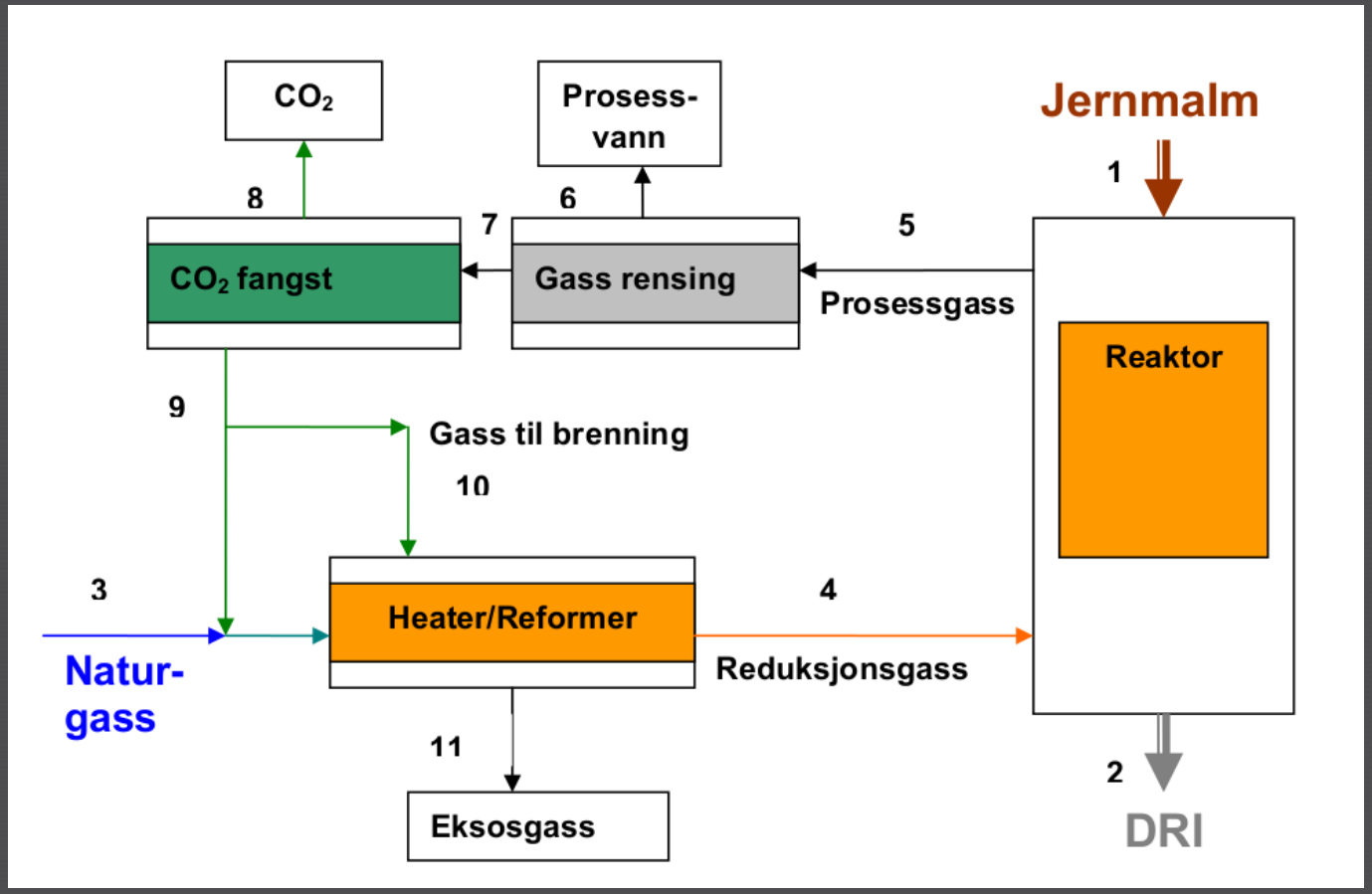
DRI ï process- and technology description



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DRI ï process- and technology description

- Å 65 to 75% reduced CO_2 emissions compared with conventional iron manufacturing and supply chain
  - ✓ More than 80% of CO_2 generated from the process may be represented as highly concentrated and purified CO_2 (>95% pure CO_2), well suited for transport/storage or further industrialisation
- Å The reduction process takes place at significantly lower temperatures than for conventional iron plants
  - ✓ Reaction temperature in the area of 900 ï 950 ºC
- Å Specific energy consumption is 143 kWh/ton DRI
  - ➢ ***Conventional processes typically require 35-40% more energy when the entire value chain is considered***

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Key market drivers for DRI in international steel industry:

- Key market drivers:
  - ✓ Increasing conversion across industry from Blast furnaces (coal driven) to Electric Arc Furnaces, drives the change in mix of raw material
  - ✓ Increasing scarcity of quality iron scrap as raw material
  - ✓ Steel industry chasing development of higher quality end products at lower or similar cost per ton
  - ✓ In addition DRI is relevant for Blast Furnace producers to increase product quality, decrease energy consumption and CO_2 footprint and boost productivity(production and product optimisation)
  - ✓ Interesting position for an independent regional supplier of high and predictable product quality, providing long term contracts
    - ✓ Opening up for different business model options with clients

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Key market drivers for DRI in international steel industry; continued:

- Expected market growth in Western Europe (EU27) alone
  - ✓ Up from todayÕs annual consumption of 2 million tons to > 10 million tons is a realistic scenario without assuming underlying market growth
- Additional areas of expected significant growth in demand, and well suited for Ironman supplies:
  - ✓ Turkey and Western parts of India
- Current supply of DRI from MENA, Venezuela and Russia
  - ✓ Total import 2 million tons
  - ✓ Quality, flexibility and predictability a challenge
  - ✓ No individual and market independent source of DRI in Europe

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Project organization, status and plans

- 2013: Ironman Development AS is incorporated and founded with Siva SF and Höganäs AB as shareholders
  - ✓ Siva SF: a Norwegian state owned company, facilitating large industrial projects and a key investment instrument for the development of innovation centras and industrial parks
  - ✓ Höganäs AB: a Swedish privately held metal powder producer, with global market presence
  - ✓ LKAB; a Swedish state owned mining and processing company, with global presence, as strategic partner
  - ✓ Mandate: Complete the work from former feasibility study (completed by LKAB, Höganäs and Statoil in 2010) towards final decision of investment (go/nogo)
  - ✓ Financing of the development work is being secured
    - Capital grants provided from local and regional municipalities/counties in addition to assets and capital grants from the shareholders
  - ✓ Main focus in 2013 was placed on two main issues:
    - Understanding of the gas market movements
    - Assessment of the market demand for DRI

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Project organization, status and plans; continued

- 2014: Develop and finalize business plan
  - ✓ Verify market demand; ensure significant share of volume from identified and confirmed off-takers(minimum at Letter of Intent level)
  - ✓ Development of sound and robust business case
    - Establish competitive cost position for the plant (USD/ton DRI)
    - Clarify and negotiate key input contracts (gas, iron ore, energy, utilities, transport) minimum at Letter of Intent level
  - ✓ Assessment and mobilization of additional investors
    - Elaboration and submission of Investor Memorandum
  - ✓ Develop a sound and robust business model
    - ✓ Assess the potential role for a global trader as a strategic partner
  - ✓ Preparation and submission of impact assessment study and emission permits
    - Revision and update of existing draft Impact Assessment program from DG2 study
    - Dialog with the climate and environmental authorities established

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Project organization, status and plans; continued

Status:

- **Verification of market demand and potential**
  - ✓ Meetings with key potential clients in global steel industry and traders/distributors
  - ➢ *Status: Demand, especially as productivity booster in BF production, is verified*
- **Verification of key value drivers**
  - ➢ *Status: Financial modeling and simulation is completed. A credible base case is established , with focus on assumed future pricing of natural gas, iron ore and DRI*
- **Gas terms and conditions with respect to volumes, qualities and sources, price and contractual structure**
  - ➢ *Status:*
    - ✓ *Strategies and preparations for negotiations in progress*
    - ✓ *A highly reputable advisory firm engaged to assist in developing a robust contractual and commercial case*
    - ✓ *First talks initiated with gas sellers*
- **Preparation of Investor memorandum**
  - ➢ *Status: Completed, ready for submission at the end of 2nd quarter 2014*