PUBLIC SUMMARY REPORT: WORK PACKAGE 01 (DELIVERABLE 01-01)

PHASE 1 OF THE FEED STUDY FOR THE HISARNA CO_2 CAPTURE PILOT PLANT (HICCP)

ZERO EMISSIONS IRONMAKING PROCESS (ZEROCO_2@HISARNA)

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EXECUTIVE SUMMARY

PUBLIC SUMMARY REPORT: PHASE 1 OF THE FEED STUDY FOR THE HICCP

ZERO EMISSIONS IRONMAKING PROCESS (ZEROCO2@HISARNA)

HIsarna ironmaking process is “CO_2 Capture Ready” and could potentially deliver a nearly zero emissions ironmaking process with the lowest hot metal cost.

Tata Steel IJmuiden (TSIJ) is planning to build a new CO_2 capture pilot plant, downstream of the existing HIsarna pilot plant facility. The primary objective of building the capture pilot plant is to fully demonstrate the technology readiness and to use this facility as a test bed to learn how to effectively integrate the capture plant and the ironmaking process. More importantly, this is aimed to de-risk the scaling up of this technology to a larger scale HIsarna Demonstration Plant (Demo).

In this regard, TSIJ has initiated the Phase 1 of the FEED Study to develop the different pre-engineering studies and documentations needed to prepare for the implementation of the building and integration of the HIsarna CO_2 Capture Pilot Plant (HICCP).

The purpose of this report is to present a short overview of the key outcomes delivered for the “HIsarna CO_2 Capture Plant (HICCP) Development: Phase 1 of the Front End Engineering Design (FEED) Study”. Based on the different work packages set out for this phase of project, the teams led by Tata Steel have successfully delivered all the key milestones and deliverables as presented in the proposal to the Dutch Government (via RvO).

As part of this work, the plot area needed for the construction of the HICCP has been selected. The different tie-ins and interconnections to the existing HIsarna Pilot Plant and to the TSIJ site have been identified. Based on the plot area information to be used for the HICCP, the Basis of Design (BOD) and different Request for Tender (RFT) documents were developed.

The Request for Tender (RFT) documents were issued to several OEMs; and Tata Steel invited them to submit a proposal to undertake the FEED study for the delivery and construction of the HICCP, based on the process and engineering design related to their own CO_2 capture technologies.

The major outcome of this project is the delivery of several “Engineering Books of References” providing preliminary Process Design Packages (PDP) for the HICCP.

REVISION HISTORY

REVISION:	C01	F01	F02	
DATE:	30/12/2020	05/02/2021	10/02/21	
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ACKNOWLEDGEMENT

This work has been completed with the close collaboration between Tata Steel ("Project Owner"), TNO ("Project Partner") and Wood PLC ("Owner's Engineer").

The report was authored by Stanley Santos (Project Leader, HICCP Development).

The author(s) would like to acknowledge the contributions and support provided by the different Project Team Members from Tata Steel (TSNT & HIsarna), TNO and Wood PLC.

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TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ASU	Air Separation Unit
BEDD	Basic Engineering Design Data
BFD	Block Flow Diagram
BOD	Basis of Design
CAPEX	Capital Expenditure
CCUS	CO_2 Capture Utilization and Storage
CPU	CO_2 Processing Unit / Cryogenic Purification Unit
EOR	Enhanced Oil Recovery
EPC	Engineering, Procurement and Construction
FEED	Front End Engineering Design
GPU	Gas Processing Unit
HICCP	HIsarna CO_2 Capture Pilot Plant
HMB	Heat and Mass Balances
ISBL	Inside Battery Limit
ITB	Invitation to Bid
NDA	Non-Disclosure Agreement
OCAP	Organic CO_2 for Assimilation in Plants
OEM	Original Equipment Manufacturer
OPEX	Operating Expenditure
OSBL	Outside Battery Limit
PDP	Process Design Package
PFD	Process Flow Diagram
PFD	Process Flow Diagram
RFI	Request for Information
RFT	Request for Tender
RvO	Rijksdienst voor Ondernemend Nederland
TNO	Toegepast Natuurwetenschappelijk Onderzoek
TSIJ	Tata Steel Ijmuiden B.V.
TSNT	Tata Steel Nederland Technology B.V.
ULCOS	Ultra Low CO_2 Steelmaking Programme
UN	United Nation

1. INTRODUCTION

Tata Steel IJmuiden (TSIJ) is responsible for a significant share of the Dutch National CO_2 emissions. In line with the “Klimaatakkoord” for 2030 and 2050, TSIJ is developing strategies to substantially reduce these emissions.

TSIJ is investigating several technologies to address this issue. HIsarna is one of the many CO_2 reduction initiatives to develop an innovative ironmaking process with reduced CO_2 footprint. TSIJ aims to demonstrate HIsarna at full scale producing at least a million tonne of hot metal annually by 2030 - 2035. One of HIsarna’s unique features is being a “CO_2 capture ready” process. Due to the high CO_2 concentration off-gas produced, the capture of CO_2 for storage or other uses is more efficient.

TSIJ has been operating the HIsarna pilot plant successfully for several campaigns since 2011. A future campaign will be aimed at integrating the CO_2 capture pilot to the current HIsarna pilot plant operation. The purpose of building the capture pilot plant is to fully demonstrate the technology readiness and to use this facility as a test bed to learn how to effectively integrate the capture plant and the ironmaking process. More importantly, this is aimed to de-risk the scaling up of this technology for a large scale HIsarna Demonstration or Commercial Plant.

This report presents a short overview of the key outcomes delivered for the HIsarna CO_2 Capture Plant (HICCP) Development: Phase 1 of the Front End Engineering Design (FEED) Study.

2. PROJECT GOALS

The main goals of this project are:

- To deliver the pre-FEED study packages for the CO_2 capture plant of the HIsarna Pilot Plant.
- To identify and shortlist technology suppliers of the capture plant that could provide design and engineering data, and provide the guarantees needed in the building of the capture pilot plant and its scale-up.
- To establish a preliminary estimate of the CAPEX and OPEX of the CO_2 Capture Plant.
- To perform a study to identify possible routes for CO_2 utilization and storage.
- To reserve the necessary plot area near the existing HIsarna pilot plant for the location of the HICCP.
- To initiate the preparatory work needed to develop the OSBL FEED Package(s) covering the tie-ins to the HIsarna pilot plant and site utilities.
- To gather information required for the regulatory and permitting applications.

3. PROJECT MOTIVATIONS

The HIsarna technology is a breakthrough programme of Tata Steel to promote sustainable ironmaking by reducing its CO_2 footprint and other emissions, and by stimulating circular economy.

For Tata Steel to achieve this goal, it is critical to successfully demonstrate the integration of the CO_2 capture plant to the current HIsarna Pilot Plant Operation. However, in order to de-risk the commercialising of an innovative and breakthrough technology, it is critical to address the different technical, business investment, regulatory and public acceptance challenges.

This section enumerates some of the key motivations and justifications why it is essential to build, integrate and operate the HIsarna Pilot Plant with CO_2 Capture technology.

3.1. BUSINESS NEEDS

- Tata Steel faces significant challenges to reduce its CO_2 footprint and other environmental emissions (i.e. NOx, SOx, Mercury, Dust, Dioxins and others). The potential of HIsarna ironmaking technology combined with CO_2 capture, storage and/or utilisation needs to be convincingly demonstrated on a pilot scale.
- Tata Steel will need to meet the demand for other sustainability metrics (for example – reduction of process water consumption and waste water discharge).
- Tata Steel is promoting a circular economy within the production of iron and steel, and a successful HIsarna zero-CO_2 ironmaking technology will enable this.
- Tata Steel needs to understand the potential of CO_2 storage and/or utilisation associated to the CO_2 capture technology combined with HIsarna ironmaking.
- Tata Steel needs to understand the Capex and Opex requirements for upscaling CO_2 capture technology to a commercial-scale HIsarna plant in order to prove the concept of a low-cost zero-CO_2 ironmaking technology.

3.2. TECHNICAL AND ENGINEERING JUSTIFICATIONS OF THE PROJECT

- The CO_2 capture plant to be deployed in HIsarna will be based on "Low Temperature or Cryogenic CO_2 Separation Technology" – which is more efficient and totally different as compared to other conventional CO_2 capture technologies (i.e., amine based chemical absorption, pressure-swing adsorption, etc.).
- HIsarna Pilot Plant in combination with the CO_2 capture plant provides the best platform to demonstrate the dynamic interaction of the HIsarna ironmaking process with a CO_2 capture facility.
  - The design of the CO_2 capture plant needs to be flexible enough to manage the fluctuating off-gas flow and concentrations from the HIsarna process.
  - The cryogenic separation has been primarily developed for oxyfuel combustion based power plants. The dynamics of the HIsarna ironmaking

process differs from that of power plants, and a new control philosophy for cryogenic CO_2 separation needs to be developed and demonstrated at pilot scale, before scaling the technology up.

- The CO_2 capture pilot plant should be able to provide the key data to investigate the integration of HIsarna and an Air Separation Unit (ASU) (and potentially the integration of the ASU to the CO_2 Capture Plant).
- The engineering, construction and commissioning of the CO_2 Capture Pilot Plant provides an important learning vehicle in the development of the scope for engineering of the CO_2 Capture Plant for a commercial or demonstration scale HIsarna plant.

3.3. ENVIRONMENTAL JUSTIFICATIONS OF THE PROJECT

- The HIsarna CO_2 Capture Plant has the potential to simplify the environmental permitting procedure – given that the technology is mainly based on Physical Separation of CO_2 from the off-gas via partial condensation and with minimal emissions to air. (Demonstrating a nearly zero emission ironmaking process).
- The operation of the HIsarna Pilot Plant in combination with the CO_2 Capture Plant will provide the Reference / Tangible Evidence on the CO_2 reduction potential of the larger plant.
- The pilot plant will provide the Reference / Tangible Evidence demonstrating the reduction potential of the NOx and SOx emissions.
- The Dutch Government has committed to reduce Mercury Emissions under the U.N. Minamata Convention / Treaty; requiring nearly zero emissions before the end of 2030.
    - With the expected closure of all the coal fired power plants by 2025 in The Netherlands, it is to be expected that the requirements from the national mercury emission regulations will shift toward the natural gas, steel and cement industries to meet these commitments.
    - HIsarna with a CO_2 capture plant will potentially demonstrate zero mercury emissions from iron and steel production. The HIsarna pilot plant combined with the HICCP will be the best platform to demonstrate this potential.
- The level of water consumption and discharge of the waste water will become an important sustainability metrics in the future. HIsarna Pilot Plant with CO_2 Capture Plant could become an important platform to demonstrate maximum level of water recovery, recycle and re-use, which could realise significant societal value for these aspects of sustainability

3.4. PUBLIC RELATION VALUE OF THE PROJECT

- Demonstrating the full chain of HIsarna ironmaking technology combined with CO_2 capture is an important public relation platform manifesting the commitment not only to reduce CO_2 but also address the reduction of other emissions.

- The HIsarna pilot plant shall provide an innovation platform to demonstrate circular economy not only in scrap recycling but also with the use of secondary raw materials.
- The HIsarna Pilot Plant combined with the HICCP will show the potential of CO_2 utilisation technologies as well as net negative CO_2 emissions (via use of sustainable biomass).

4. PROJECT OVERVIEW: HICCP DEVELOPMENT

Tata Steel is planning to build the HIsarna CO_2 Capture Pilot Plant (HICCP) downstream of the existing HIsarna Pilot Plant.Figure 1 presents the simplified schematic block flow diagram of the HIsarna integrated with CO_2 capture.

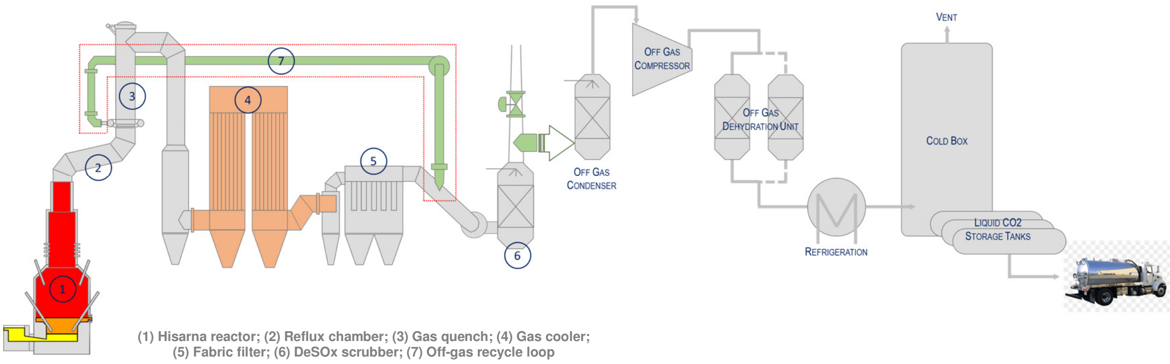

FIGURE 1: SIMPLIFIED SCHEMATIC BFD DIAGRAM OF THE HISARNA PILOT PLANT WITH CO_2 CAPTURE.

The HICCP Development Project consists of the following:

- Revamp of the existing gas conditioning units of the HIsarna Pilot Plant
- Development of the CO_2 Capture Pilot Plant (HICCP)

The HIsarna Pilot Plant will undergo a revamp to replace the current air quench system with recycle off-gas quench and the current gas cooler (see Figure 1) to be replaced with a semi-wet scrubber.

The changes to the gas conditioning units are mainly aimed to reduce the level of air ingress within the existing pilot plant in order to achieve highest possible CO_2 concentration in the off-gas that could be fed into the CO_2 capture plant in order to achieve an efficient capture process.

The CO_2 capture pilot plant will be built downstream of the existing HIsarna Vessel and gas conditioning units. The battery limit for the new CO_2 capture plant will be located after the DeSOx scrubber (see Figure 1). The Basis of Design will use the estimates for the gas composition from the HIsarna off-gas taken after the DeSOx scrubber (also incorporating the possible impact of the revamp to the HIsarna Pilot Plant) and the product specifications of the liquid CO_2 that will be produced from the capture plant as the starting points to develop the design of the HICCP.

5. HIsarna CO_2 Capture Pilot Plant (HICCP)

5.1. BACKGROUND: LOW TEMPERATURE CO_2 CAPTURE TECHNOLOGY

Due to the very high CO_2 concentration of HIsarna off-gas, the most suitable candidate to produce high purity food/OCAP or EOR/Storage grade CO_2 from the HIsarna pilot plant and from a large-scale demo plant is based on a low temperature ("Cryogenic") CO_2 capture process.

This class of technology has been developed by a handful of original equipment manufacturers (OEMs) in the last two decades to enable the demonstration of the CO_2 capture and storage used in oxyfuel combustion power plants. The cryogenic CO_2 capture process is also referred to as CO2 Processing Unit (CPU), or similar, in literature.

The full chain pilot scale facilities of this technology have successfully been operated in the power generation industry. This includes the Callide Oxyfuel Project in Australia, theCiuden Project in Spain, the Lacq Project in France, and the Schwarze Pumpe Project in Germany.

Development of the engineering design to capture between 1 to 3 million tonnes of CO_2 per year have been completed in various governments co-funded projects (i.e. White Rose Project in UK, FutureGen 2.0 Project in USA, Compostilla Project in Spain, Janschwalde Project in Germany). More importantly, it should be noted that this is also the same class of technology that has been considered to be implemented in the ULCOS Florange Project (France). A similar class of technology with a commercial / industrial scale plant capacity is operational at Port Jerome Project (France) and Doe Canyon Project (USA).

It is foreseen that the application of this class of technology to capture CO_2 from the HIsarna off-gas will be more cost effective and efficient than any similar technology demonstrated in the past.

5.2. KEY COMPONENTS

The low temperature CO_2 capture technology can be broadly divided into the "Warm Part" and the "Cold Part".

The "Warm Part" consists mainly of the following major process units: (a.) Off-Gas Condenser, (b.) Off-Gas Compressor, (c.) DeNOx & DeSOx Unit, (d.) Dehydration Unit, (e.) Mercury Removal Unit (see Figure 2). The "Cold Part" as applicable to the pilot plant consists of the (a.) Cold Box, (b.) Refrigeration, (c.) Liquid CO_2 Tank Farm, (d.) Recovery of CO_2 from the Cold Box Vent – as an add-on unit to increase CO_2 recovery. Figure 2 below presents the simplified block flow diagram of the Low Temperature CO_2 Capture Unit to be used in HICCP.

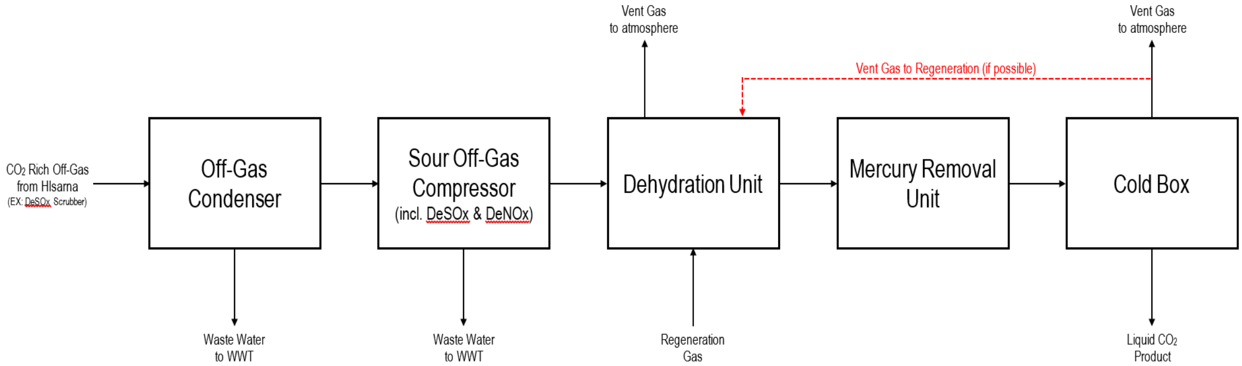

FIGURE 2: SIMPLIFIED BFD OF THE HISARNA CO_2 CAPTURE PILOT PLANT (HICCP)

5.3. DESIGN CONSIDERATIONS

Warm Part

The largest part of the CAPEX for the Low Temperature CO_2 Technology is the investment cost of the sour off-gas compressor. It is to be expected that a centrifugal compressor will be used in a commercial or demonstration-scale plant. Therefore, it is essential to learn from the operating experience of using the same class of compressor technology in the pilot facility in order to have the relevant insights to the operation for the larger-scale unit. Likewise, it should be noted that the off-gas compressor will incorporate the DeNOx and DeSOx Units (where the designs of these units are proprietary to the OEMs).

Cold Part

The very heart of the Low Temperature CO_2 Capture Technology is the design configuration of the cold box. As this defines the operating pressure, the cold duty required and the liquid CO_2 product specifications. In the design of the cold box configuration, the liquid CO_2 product specifications are not only defined by the bulk CO_2 concentration (whether it has to achieve food grade, or industrial/technical grade purity, or underground storage purity); but more critically, it is also required to specify the O_2 and NO_2 contents in the liquid CO_2 product.

On the other hand, the CO_2 recovery rate and purity of the product will be governed by the feed gas composition entering the cold box, operating pressure and temperature. Further optimization of the CO_2 recovery rate and energy performance could be achieved by integrating an additional unit to recover the CO_2 in the vent. The design of this unit is specific to the proprietary design developed by the OEMs.

6. WORK PACKAGES

The Front End Engineering Design (FEED) Study for the HICCP is executed in two phases. Figure 3 presents the overview of the different activities of the FEED study. This project only covers the Phase 1 activities of the FEED Study.

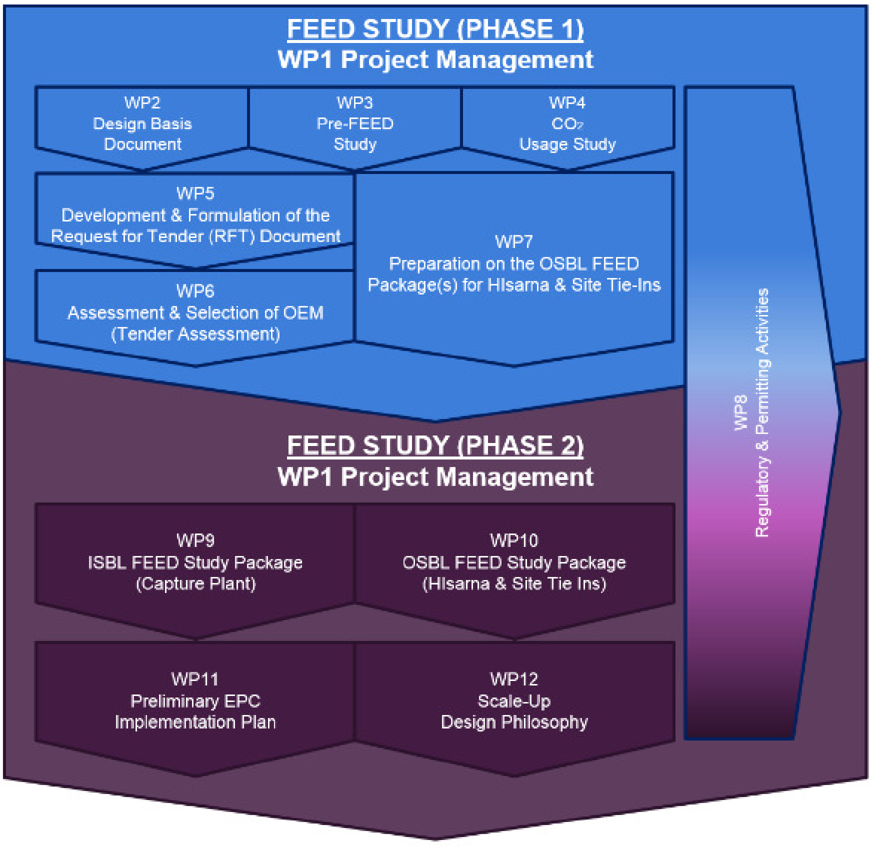

FIGURE 3: DIFFERENT WORK PACKAGES FOR THE FEED STUDY OF THE HICCP

In this Project Phase, there are 8 different Work Packages (WP):

- WP1 – Project Management
- WP2 – Development of Basis of Design (BOD) Document
- WP3 – Pre-FEED Studies / Technology Evaluation Criteria Development
- WP4 – CO_2 Usage Study
- WP5 – Development of the Request for Tender (RFT) Documents
- WP6 – Tender Assessment / Evaluation of the Bids
- WP7 – Preparatory work for the OSBL FEED Package(s)
- WP8 – Regulatory and Permitting Activities

Tata Steel was involved in all Work Packages. TNO contributed to WP 2, 3, and 4. Tata Steel was assisted by Wood plc as Owner's Engineer in WP 1, 2, 3, 5, 6 and 8.

7. SHORT NOTES ON PROJECT SCHEDULE

The Project Proposal for the Phase 1 of the FEED study was submitted to RvO in April 2019. Tata Steel received a positive response from RvO and was granted the subsidies for this project in July 2019.

The Phase 1 of the FEED Study (involving all of the Pre-FEED activities) formally started in September 2019.

Originally, was aimed to complete the project by April 2020. However, due to the Covid-19 situation and other circumstances, the project has been delayed and was only completed in December 2020.

8. KEY OUTCOMES

Overall, the project has achieved all milestones and deliverables as agreed with RvO, and documented by 42 written reports and annexes. The following key outcomes have been achieved:

1.) The Basis of Design (BOD) for the HICCP has been fully developed. The BOD documents were issued together with the other Request for Tender (RFT) Documents to serve as the common assumptions to be used by the OEMs to develop their capture plant design and their tender.

2.) The RFT Documents were formulated and issued to the OEMs. These documents specified the requirements to be submitted by the OEMs in their bid. These include:

   - ✓ Request for Information (RFI) on the Technical Details about the Design of the CO_2 Capture Plant, and the Budgetary Quotation of the Capture Plant to be proposed.
   - ✓ Specification of the FEED ITB Scope of Services Document including the list of FEED Deliverables.
   - ✓ Commercial bid providing a Fixed Lump Sum Quotation to deliver the FEED Engineering Services.

3.) The plot area for the HICCP has been selected. The parcels of land needed for the building of the capture plant have been registered and reserved.

4.) The project completed a Pre-FEED study to fully define the different design considerations and parameters needed to develop the HICCP. Considerations were also made for the scale up of the HICCP from Pilot Scale (~80,000 tonnes/year of CO_2) to Demo Plant (~1.5 million tonnes/year of CO_2).

5.) The different tie-ins and interconnections between the existing HIsarna pilot plant and the HICCP have been identified. The possible cable routing for the electrical connection from the High Voltage Station to the candidate site has been established.

6.) The Design Capacity for the HICCP was defined, based on the production capacity of the HIsarna Pilot Plant and the smallest off-the-shelf Off-Gas Compressor that could be bought in the market, in order to allow scale up to industrial scale with the same compression technology.

7.) The definitions for the environmental framework have been established. This defines the possible limits to the different emissions to the air, quality of the waste water discharge, solid disposals, and noise.

8.) The Tender Evaluation Methodology has been developed. This has been used to evaluate the different tenders submitted by the OEMs with full transparency and objectivity.

9.) The project evaluated six different design configurations for the HICCP. Four out of the six design configurations were fully developed to deliver several set of "Engineering Books of References".

10.) Each of the "Engineering Book of References" consists of the preliminary Process Design Packages (PDP) which include:

- ✓ Basic Engineering Design Data (BEDD)
- ✓ Process Flow Diagram (PFD)
- ✓ Heat and Mass Balances (HMB)
- ✓ Utilities Requirements and Balances
- ✓ Preliminary Sized Equipment List
- ✓ Indication for the Main Materials of Construction
- ✓ Plot Plan and General Equipment Layout
- ✓ Preliminary Tie-Ins and Interconnecting
- ✓ Environmental Data

11.) Potential vendors for the non-proprietary equipment have been identified. The potential scope of their work has been outlined and evaluated.

12.) The CAPEX and OPEX of the HICCP have been independently validated for the different design configurations submitted by the OEMs. This has been achieved by using the information delivered for the RFI; and verifying the indicative budgetary quotation submitted by the OEMs.

13.) The preparation and planning for the revamp of the existing HIsarna Pilot Plant to make it ready for the integration of the HICCP has been initiated. A proposal for the next phase has been developed and proposed.

14.) The results of the Tender Evaluation have been reported to the management of Tata Steel and RvO. The recommendations for the next step have been provided.

9. CONCLUDING REMARKS AND NEXT STEPS

The HIsarna ironmaking process is "CO_2 Capture Ready" and could deliver a nearly zero emissions ironmaking process with the lowest hot metal cost. The next step in the development of the HIsarna ironmaking process is to build and integrate the HIsarna CO_2 Capture Pilot Plant (HICCP).

The primary objective of building the capture pilot plant is to fully demonstrate the technology readiness. More importantly, this is aimed to de-risk the scaling up of this technology to a larger scale HIsarna industrial or demonstration plant. Tata Steel initiated the development of the HICCP by undertaking the pre-FEED studies to establish the different process and engineering design parameters to be used for the next phase.

The main outcome of the RVO subsidized project **"ZERO EMISSIONS IRONMAKING PROCESS (ZEROCO_2@HISARNA)"** is the development of several "Engineering Books of References" to enable the implementation of the full FEED study for the successful demonstration of the integration of an efficient CO_2 capture technology to the HIsarna ironmaking pilot facility at the IJmuiden site of Tata Steel.

The next step for Tata Steel is to move ahead to the FEED stage of the project. This shall provide the necessary information needed to make the final investment decision to realise a cost competitive CO_2 capture technology for HIsarna. This will then be the first-of-a-kind ironmaking process with an integrated CO_2 capture unit.

Tata Steel will explore partnerships and funding opportunities to reduce technological and financial risks by building on the successful collaboration of this endeavour with project partners, technology providers, equipment suppliers; and with the support from RVO.

10. LIST OF DELIVERABLES

The list below presents the catalogue of all of the deliverables produced in this project. It should be noted that there are also other peripheral reports that support several work packages but are not included as deliverables.

	Deliverable No.	Document Title
1.	**D01-01**	Public Summary Report: Phase 1 of the FEED Study for the HIsarna CO_2 Capture Pilot Plant (HICCP)
2.	**D01-02**	Project Management Report: Phase 1 of the FEED Study for the HIsarna CO_2 Capture Pilot Plant (HICCP)
3.	**D01-03**	[CONFIDENTIAL]
4.	**D01-04**	[CONFIDENTIAL]
5.	**D01-05**	[CONFIDENTIAL]
6.	**D01-06**	HIsarna CO_2 Capture Plant (HICCP) Training Materials
7.	**D01-07**	[CONFIDENTIAL]
8.	**D01-08**	Project Deliverables Document Map
9.	**D02-01**	Basis of Design (BOD) Document
10.	**D02-02**	Land Reservation & Registration Notification Documents
11.	**D02-03**	Considerations in the Site Selection for HIsarna CO_2 Capture Plant (HICCP)
12.	**D02-04**	Supporting Document: Site Conditions
13.	**D02-05**	Supporting Document: Ground Vibration Measurements Report
14.	**D02-06**	Supporting Document: Meteorological Data
15.	**D02-07**	Supporting Document: Design Capacity - Establishing the Design Points for the HIsarna CO_2 Capture Plant
16.	**D02-08**	Cases to Evaluate for the CO_2 Capture Plant of HIsarna (Demo and Pilot Scale) Definition of the Different Case Matrix
17.	**D02-09**	Cases to Evaluate for Cold Box of the CO_2 Capture Plant for HIsarna - Study Prioritisation
18.	**D02-10**	Compilation of the HCM and HFS Modelling Results Providing Gas Composition from HIsarna as Key Inputs to the Different Modelling Activities
19.	**D02-11**	Modelling of the Gas Conditioning Units of HIsarna Pilot Plant using Aspen Plus
20.	**D02-12**	Gas Composition Input Data for the BOD Document - HICCP (Pilot Plant)
21.	**D03-01**	[CONFIDENTIAL]
22.	**D03-02**	[CONFIDENTIAL]
23.	**D03-03**	HICCP - Simulation Results of the Cold Part for the Demo Plant
24.	**D03-04**	HIsarna Off-Gas Sour Compressor
25.	**D03-05**	DeSOx/DeNOx in Pressurized Systems - Literature Overview and Short-Cut Model Description
26.	**D03-06**	HIsarna Off-Gas Dehydration Unit
27.	**D03-07**	Hisarna Off-Gas Mercury Removal via Fixed Bed Adsorption

	Deliverable No.	Document Title
28.	**D03-08**	[CONFIDENTIAL]
29.	**D04-01**	CO_2 Utilisation Study of The Netherlands
30.	**D04-02**	Dutch CO_2 Utilisation Study - Extended Analysis
31.	**D05-01**	Request for Tender (RFT) Documents
32.	**D05-02**	RFT Notification Documents to the OEMs
33.	**D05-03**	RFT Notification Results
34.	**D06-01**	Technology Evaluation Methodology
35.	**D06-02**	[CONFIDENTIAL]
36.	**D06-03**	[CONFIDENTIAL]
37.	**D06-04**	[CONFIDENTIAL]
38.	**D06-05**	[CONFIDENTIAL]
39.	**D06-06**	[CONFIDENTIAL]
40.	**D07-01**	Summary Report – HICCP OSBL Preparatory Work
41.	**D08-01**	Environmental Permitting Framework
42.	**D08-02**	Minutes of the Meeting: Initial Discussion with Regulatory Authorities