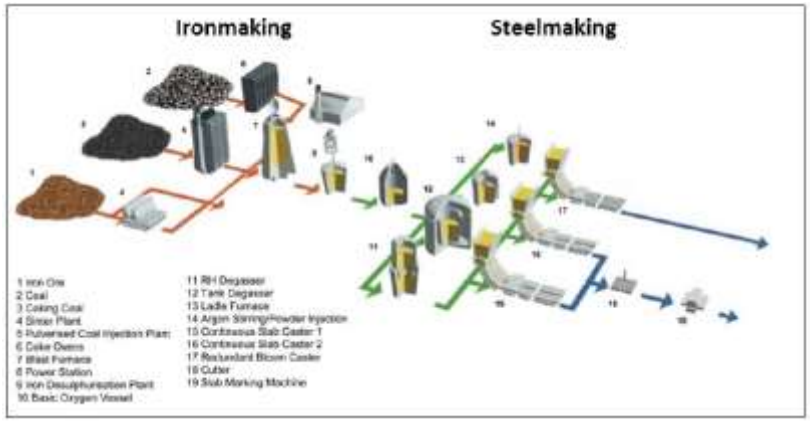
Teesside Collective
Steel and Transport Challenges

07 09 2015

Iron and Steel

What we did

- SSI Teesside
- Iron and steel works
  - 3.2 million tonnes/year steel
  - 7.1 million tonnes/year CO2
  - Onsite power generation
- Examined the emission points for the site
- Determined screening factors and issues
  - Provides basis for decision making
  - Identifies drivers and restrictions
  - Screen options
- Technology options
  - Based on each emission source and the whole site
- Considered 3 options, out of an initial 26,
  - ~2 million tonnes/year of CO2
  - Power plant PC unit
  - BFG, pre-combustion capture
  - BFG & BOS gas pre-combustion w/h shift



Key considerations

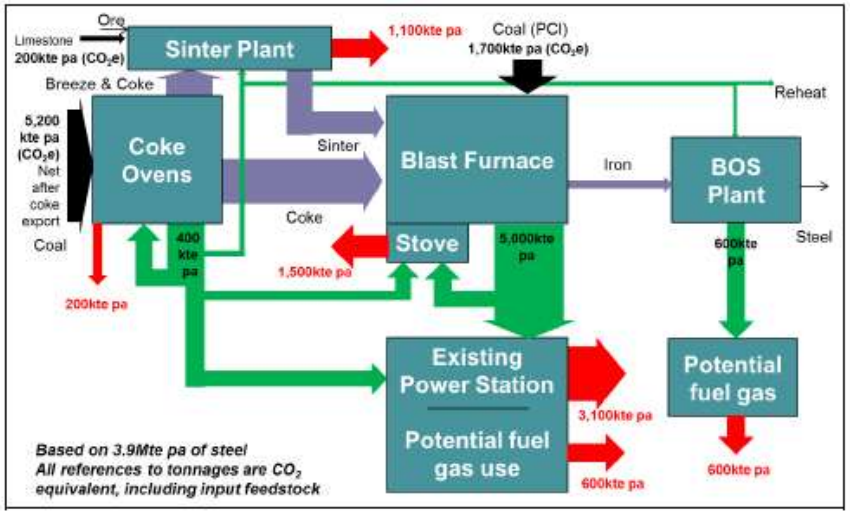


Figure 3-4 Carbon pathways through the Redcar Steel works

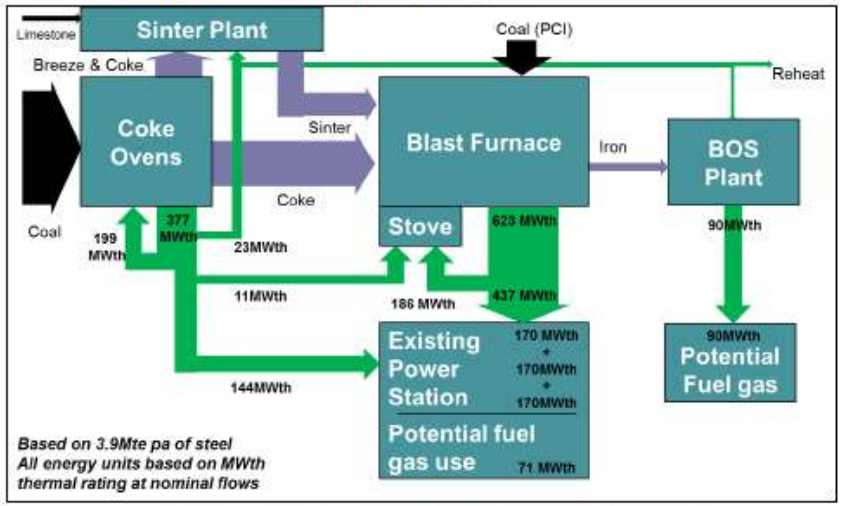
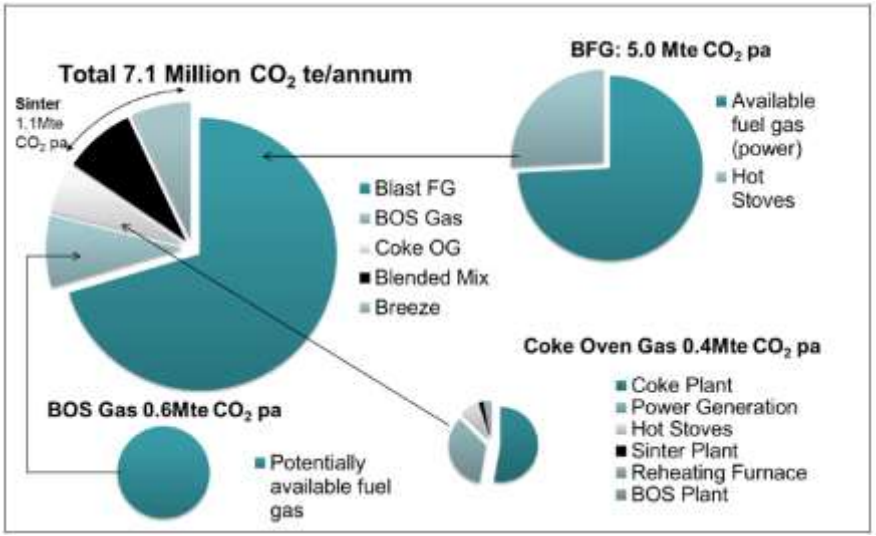
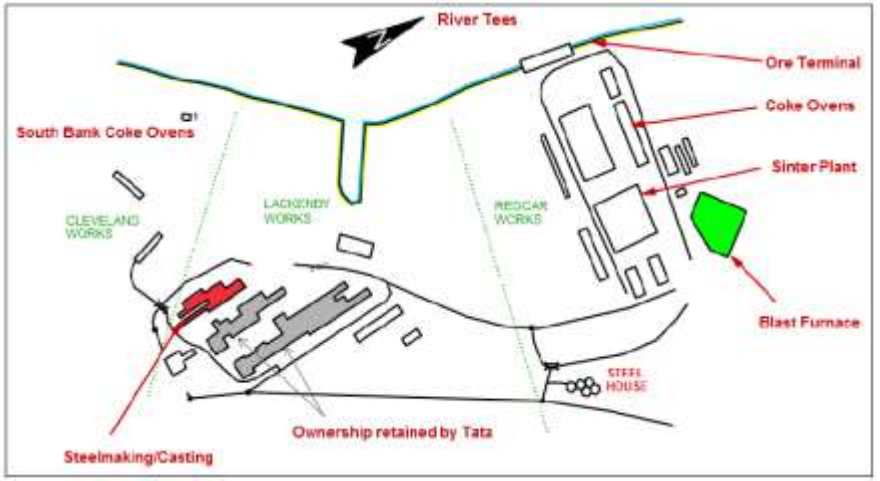


Figure 3-5 Primary Energy Flows through the Redcar Steelworks





Challenges

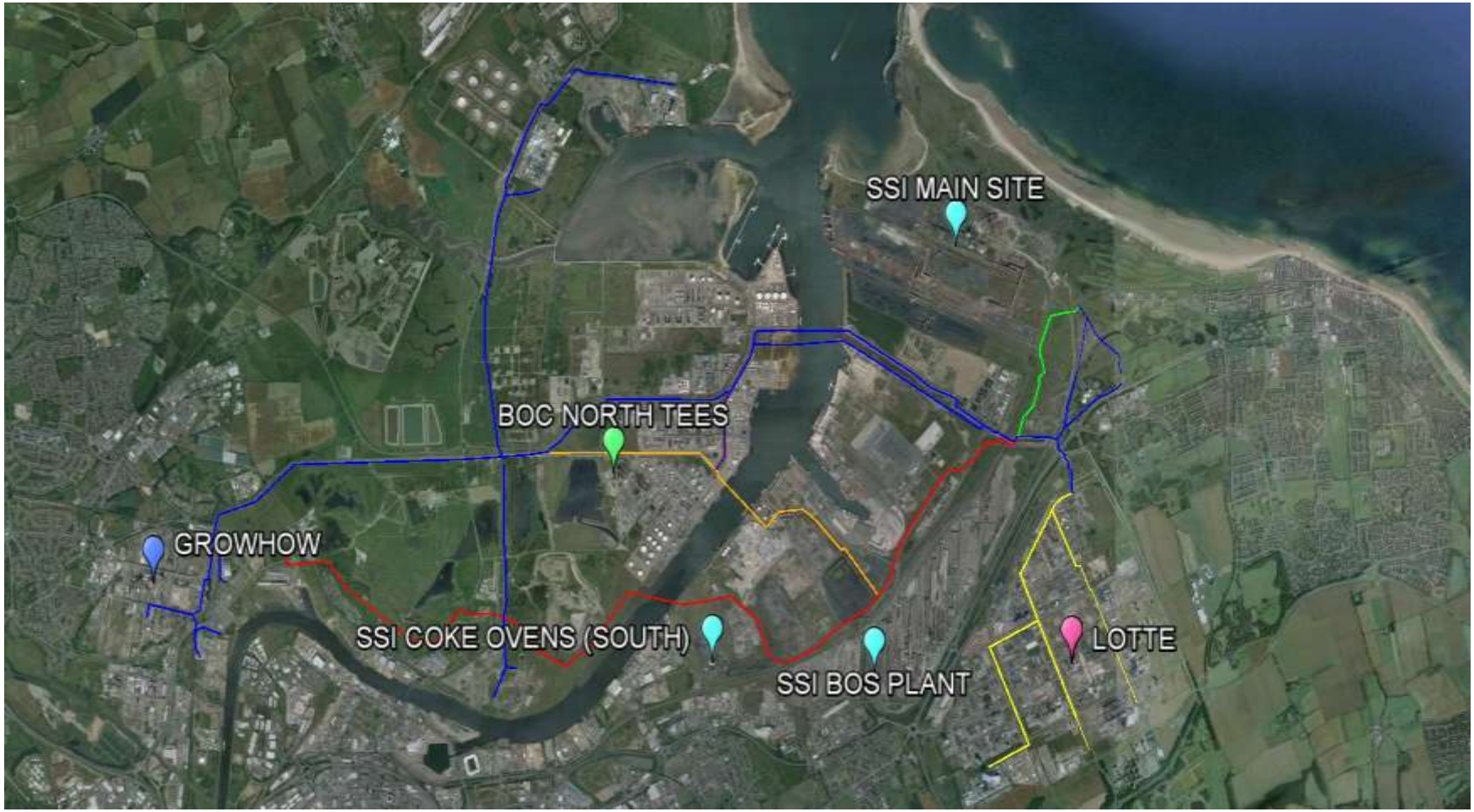
- Diverse point source in a steel works
  - Compatible technology
- For SSI
  - Addressing some of the more “problematic” streams/processes
  - Cost
  - Retrofit – can the work be done on plant that is significantly old?
  - Space & distance in site
- Different challenges
  - All sites are different
  - What do you do for major existing plant?
    - Reluctant to modify
    - What can we do to reduce carbon input?
  - What technology is coming forward (ULCOS, DRI)
  - Need to address more challenging emissions

Network

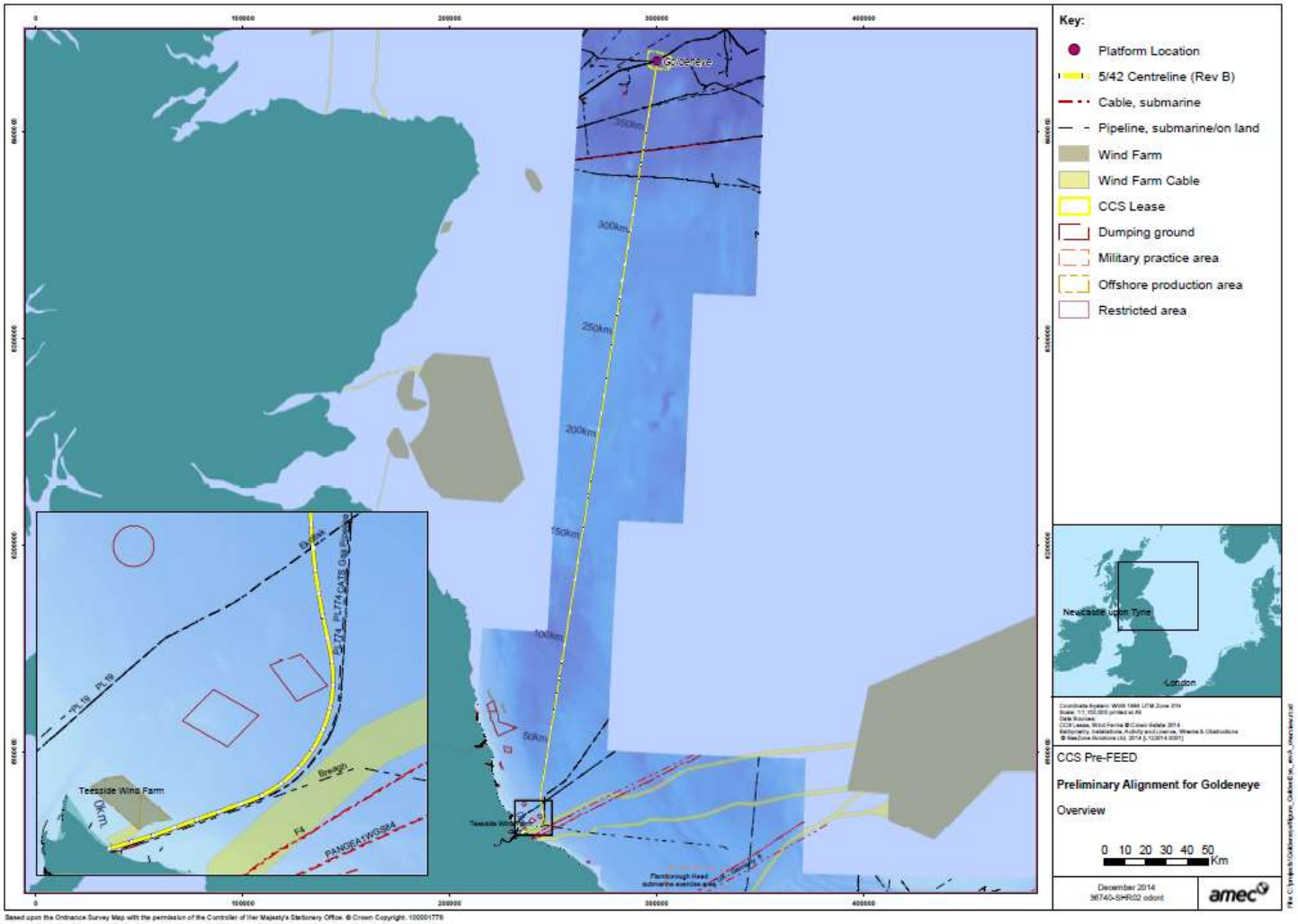
What we did

- Two cases
  - 5 million tonnes/year CO2
    - Consider 4 core sites
  - 15 million tonnes/year CO2
    - Consider all sites
    - Scenario modelling on what could happen.
    - Right sized for end use of 15mmtpa
- Defined pressure regime and entry specification
- Area definition, route determination using in house framework
- Offshore options
  - 5/42 SNS Nation Grid Carbon White Rose
  - Shell Goldeneye
  - Selected landing area, orientated onshore network to offshore entry point
- Other key points
  - Minor design concepts – booster, line connection
  - Costs for both, most detailed undertaken so far

Onshore


SSI MAIN SITE
BOC NORTH TEES
GROWHOW
SSI COKE OVENS (SOUTH)
SSI BOS PLANT
LOTTE

Offshore


Key:
Platform Location
5/42 Centreline (Rev B)
Cable, submarine
Pipeline, submarine/on land
Wind Farm
Wind Farm Cable
CCS Lease
Dumping ground
Military practice area
Offshore production area
Restricted area
Goldeneye
350km
300km
250km
200km
150km
100km
50km
0km
Teesside Wind Farm
Bregin
F4
PANGEA1WGS84
Flamborough Head
Newcastle upon Tyne
London
CCS Pre-FEED
Preliminary Alignment for Goldeneye
Overview
0 10 20 30 40 50
Km
December 2014
amec

Key issues

Things to consider

- Access on Teesside is excellent
  - Considered 5 clear route options
  - Still some areas of difficulty
    - Congestion
    - Urban issues on Teesside aren't a problem
    - Potential impact on other users (low temp release)
  - Targeted re-use of existing service corridors
- Detailed route assessment
- No major obstacles – area designed for inter-site connection to common services
- Focused on accurate costs
- In network terms
  - Future challenges – portfolio of emitters
  - Steel works to plasma gasifiers to biofuels and combustion EfW plant
  - How as a network to do you optimise that?

Key Issues

Things to think about

- Network
  - Deployment
    - Rate
    - Size
    - How do you cost vs. right size without a driver for people to join
- Offshore
  - Considered existing sites only – better options?
    - Access to information
    - Access to risk issues
  - Impact of storage on upstream emitters
- Flexibility
  - Concerns raised on composition in network
  - Impact of downstream on network
  - No info provided on storage performance
    - impacts on operations
    - impacts on economics for emitters
  - Deployment limitations
    - storage composition requirements defining capture plant

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