

Schoonebeek; redeveloping the largest onshore oil field in North-Western Europe

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Michael Lander

- Ir. - University of Delft (Mechanical Engineering)
 - MBA - University of Bradford
 - RPP - Association for Project Management (APM)
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- NAM - Nogat Onshore Treatment Plant (Holland)
 - F3 Offshore Platform (Italy / Offshore)
 - PDO (Oman) - Butane Plant (Oman / Yibal)
 - Yibal Concept Engineering (Oman / Yibal)
 - Shell International - Graduate Recruitment
 - Shell Technology Ventures, Twister Venture
 - Jacobs - Business Development Manager
 - SEIC - Sakhalin Engineering Manager OPF
 - Shell International - Engineering Manager, Major Projects
 - NAM - Schoonebeek Project Executive
 - Shell International - Front End Development Manager FLNG

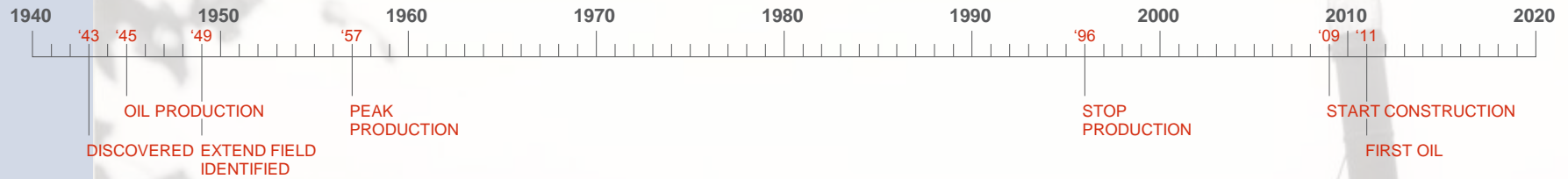
The Schoonebeek Project **Safety Moment**

Key Safety themes;

- **HSE Leadership**
- **Supervisor Mindset**
- **Permit to Work**
- **Unsafe Act Reporting**
- **Life Saving Rules**



History Schoonebeek Oil Field



Project overview



Project Purpose

The Schoonebeek EOR Project revives oil production by injecting steam into the reservoir; heating the oil to lower the viscosity to allow pump off.

Scope Summary

- 18 Well Sites with 73 wells (44 Prod, 25 Steam & 4 Obs).
- Treatment Facilities (3,400 m³/d Oil & 12,500 m³/d Water).
- Combined Heat and Power Generation (365 t/h Steam, 120 MW Electricity)
- Ultrapure water supply, Connection to Power grid & Gas grid.
- 45 km Infield Pipelines, 44 road crossings.
- 22 km Oil Export Pipeline.
- 70 km Water Export System.
- 6 Water Injection Sites (Twente).

Project overview – scope elements

Ultrapure water supply



Emmen

Heat & Power and Oil Treatment Plant



Water injection



Twente

Power export



Steam

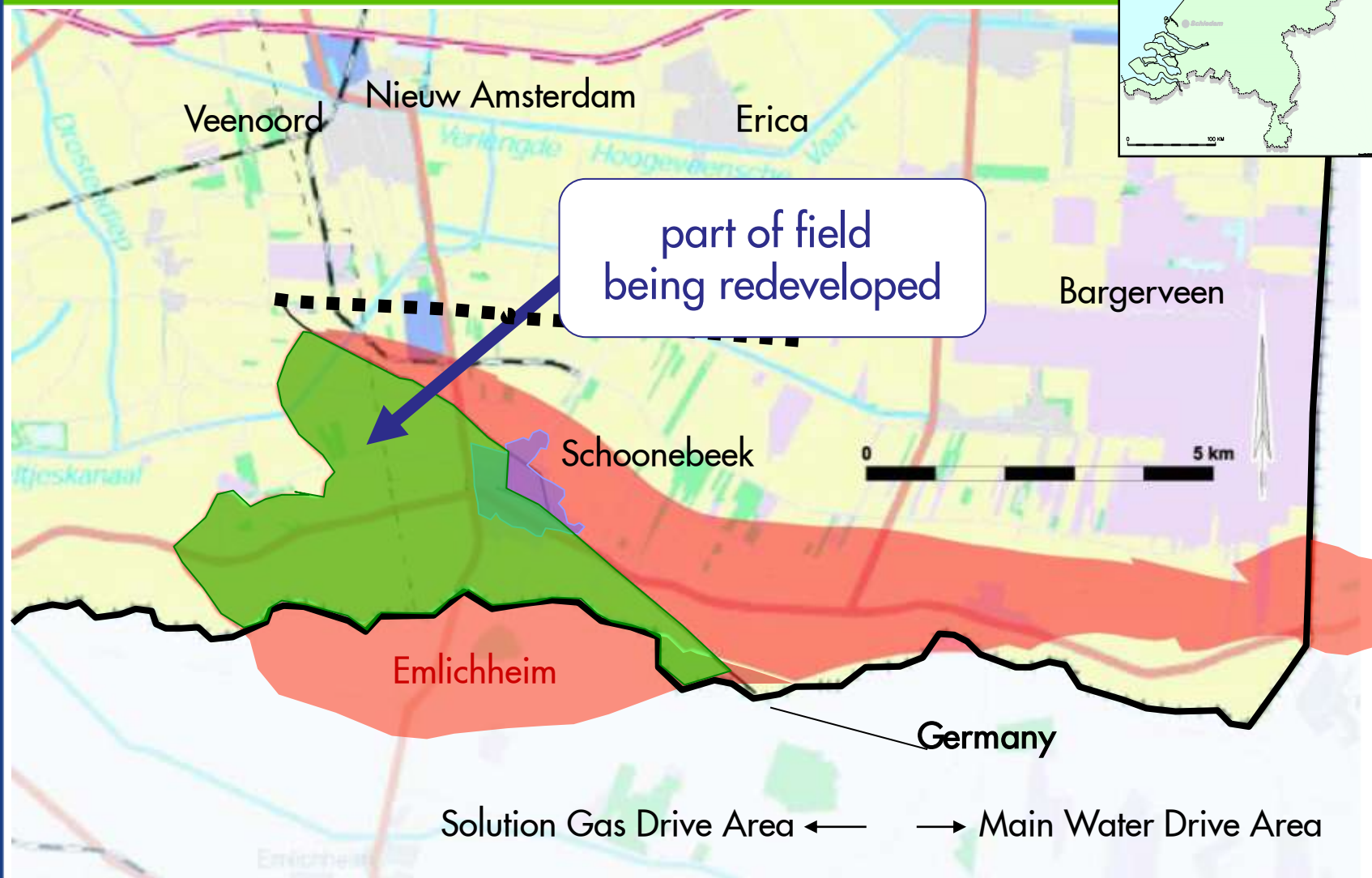
Oil/water/gas

Oil Export



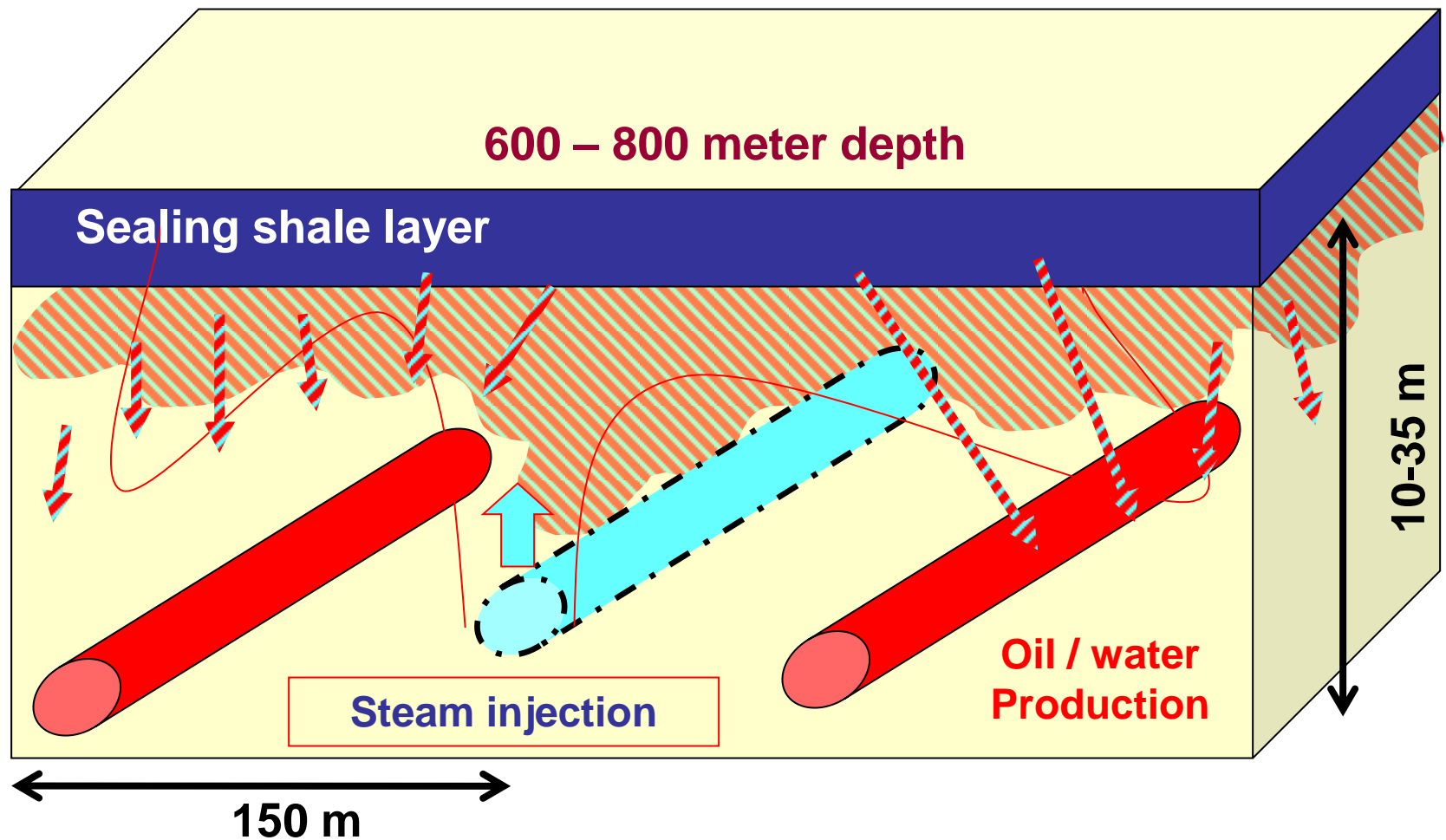
Lingen
(BP Germany)

Reservoir

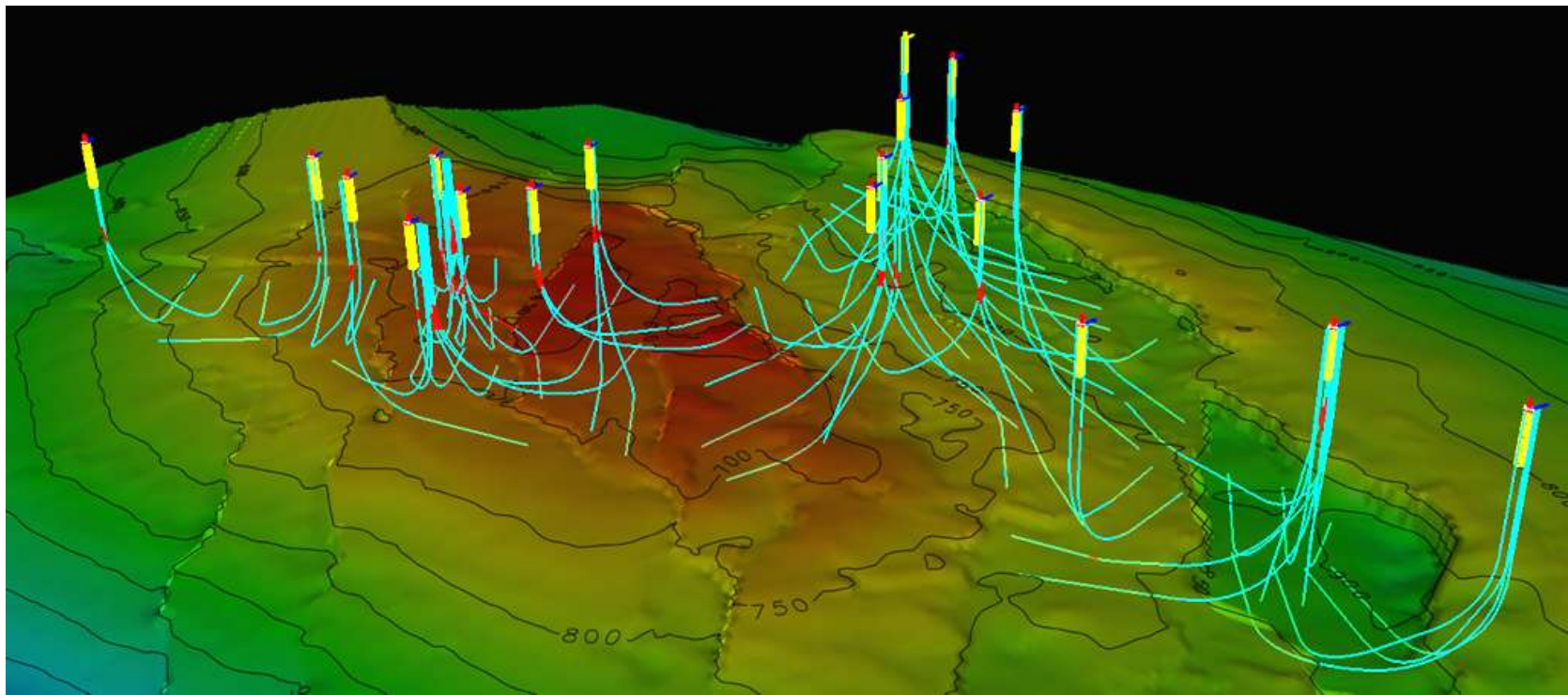
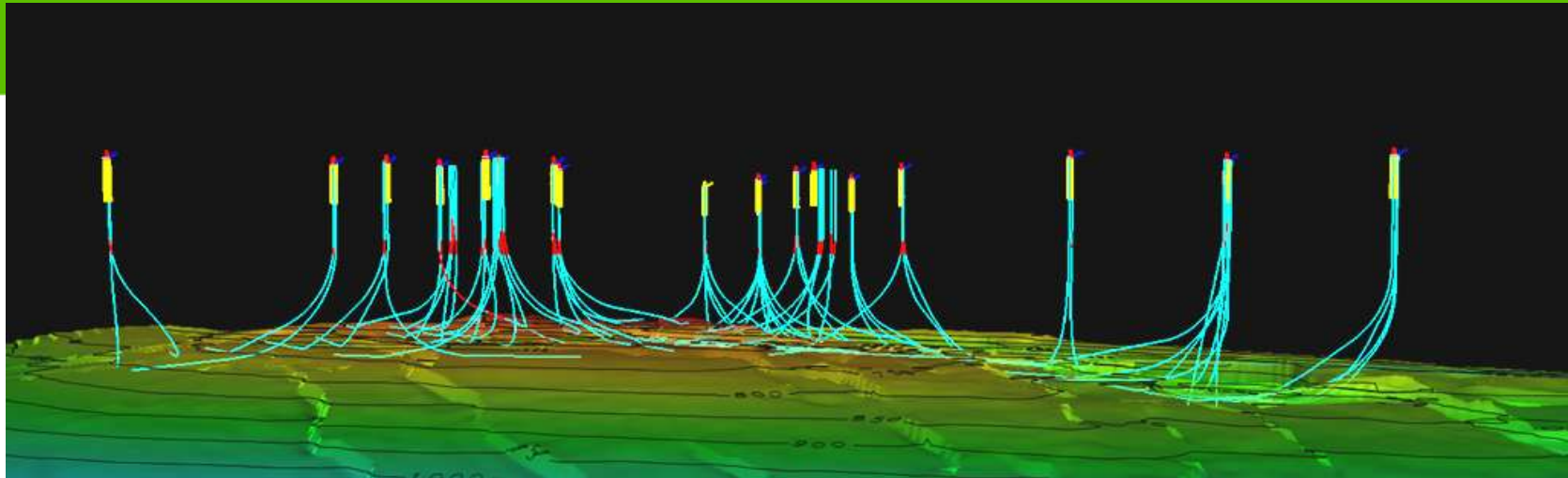


Project volume: approx. 120 mln oil barrels

Steam injection in horizontal wells



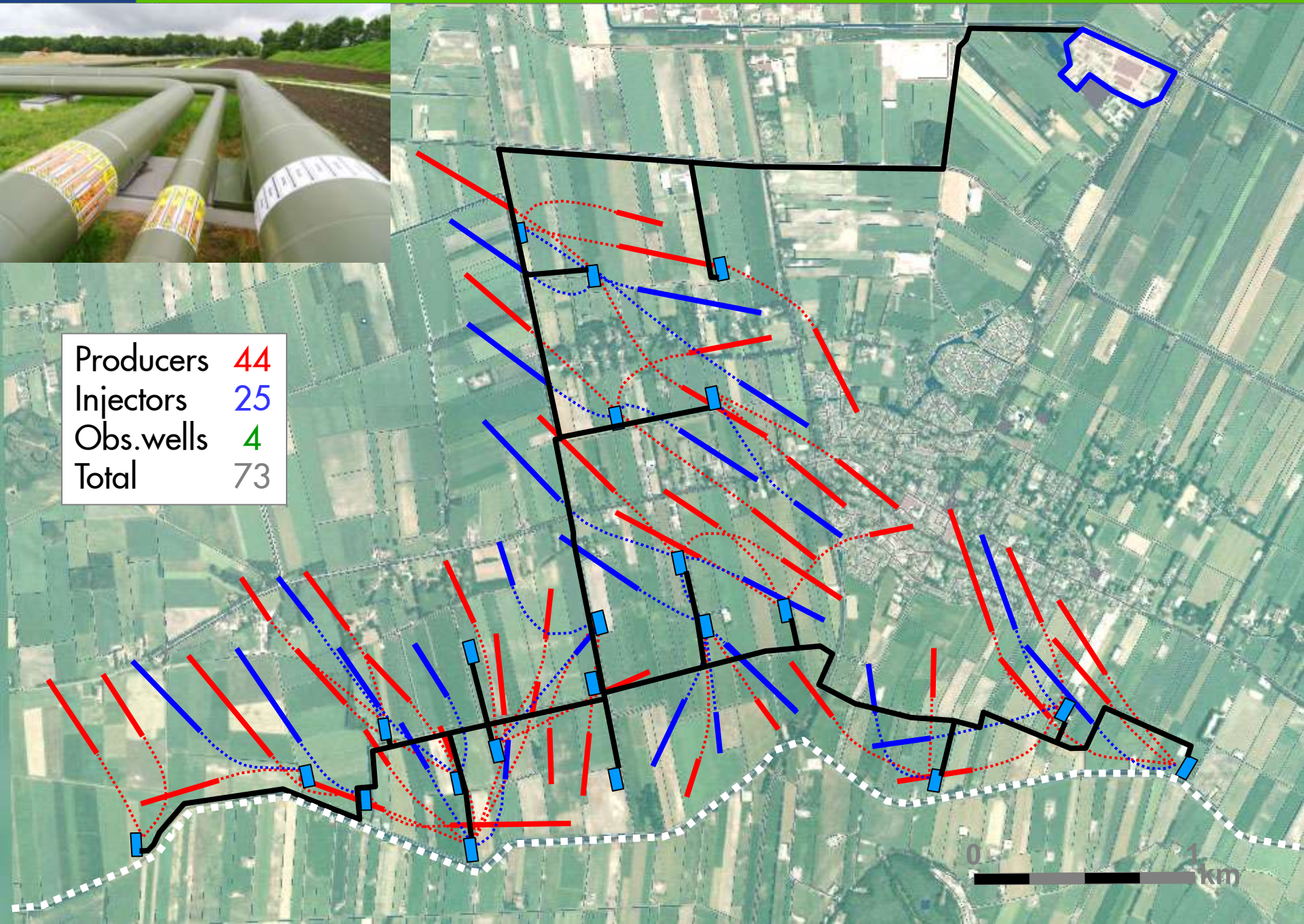
Planned Well Trajectories



Infrastructure



| | |
|-----------|----|
| Producers | 44 |
| Injectors | 25 |
| Obs.wells | 4 |
| Total | 73 |



Project overview

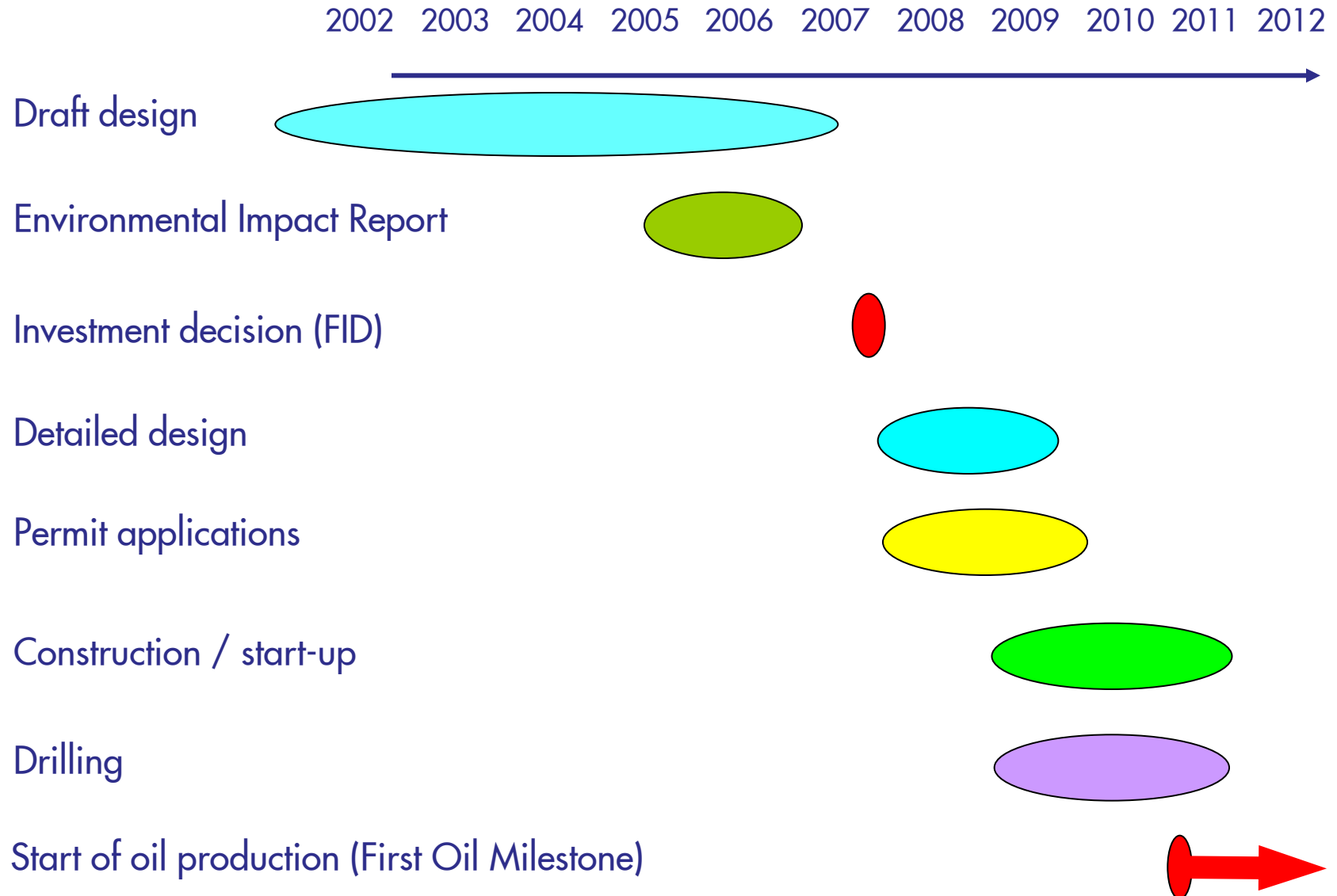
Execution Model Surface Facilities

- One large EPC contract; target price mechanism.
- Four well known contractors;
 - Jacobs Engineering – Leiden,
 - Stork Technical Services – Utrecht,
 - Visser Smit Hanab (VSH) – Papendrecht,
 - Yokogawa – Amersfoort,selected to execute project as an Alliance (SRT).
- Contract award; December 2007.

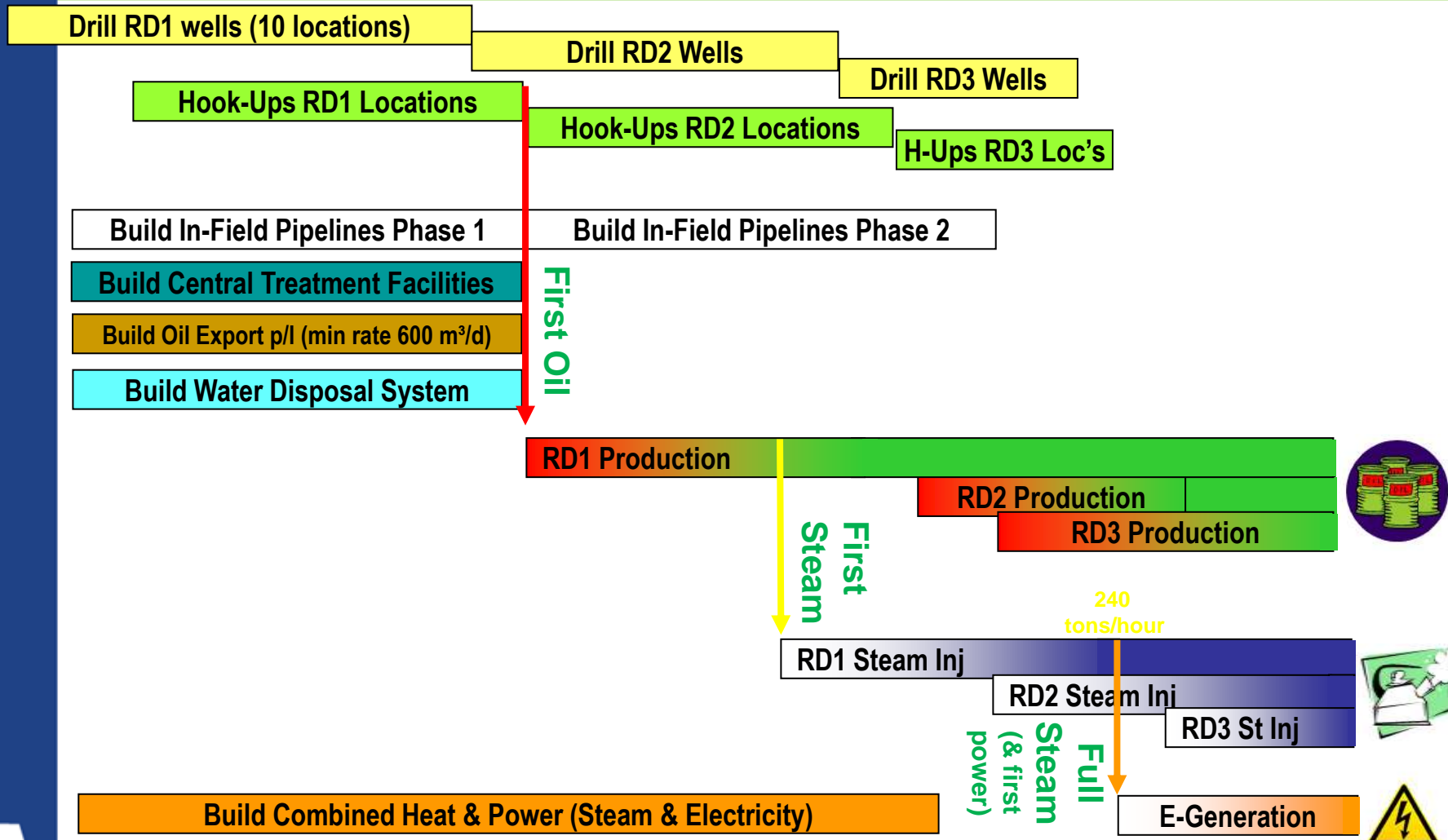
Execution model copied from the successful GLT Project.



Timeline



Schoonebeek Production Start-Up





NAM Site – current situation Cogen plant & oil treatment



Infrastructure



Infrastructure





From nodding donkeys to long stroke units

1947-1996

250 nodding donkeys



2011

40 long stroke units



Compact drilling rig



Communication with local residents



Project dimensions

- Oil production: 20.000 barrels daily
- 18 production sites
- 73 wells
- Total length 73 drillings: 105 km
- 40 long stroke units
- 15 km in field pipelines
- 22 km export pipe line to Germany
- Cogen plant: 120 MW → (90% for public net)

Wrap up

- NAM can produce another 120 million barrels (20.000 barrels daily) from one part of the field over the coming 25 years or so.
- Thanks to modern techniques, we'll be converting some of the mineral resources of the Netherlands into valuable products for everyday use
- The project is one of the most advanced oil production ventures in Europe.
- At peak some 900 people were active on sites to realize this project
- Many local contracts, during construction/drilling 2000 man years & 50 permanent staff in production phase

Thank You



Extra Slide: Life-Saving Rules – what are they?

