



ROAD Project Update

Presentation at the CO2GeoNet Open Forum

San Servolo, Venice, 10th May 2016

Andy Read

Update on ROAD

- The Project as now constructed
- The proposed funding solution
- The local / national context
- Project next steps and forecast timeline

ROAD Partners

- **Maasvlakte CCS Project C.V.** is a joint venture between:

- Uniper Benelux
- ENGIE Energie Nederland

- In **co-operation** with:

- Oranje-Nassau Energie
- Havenbedrijf Rotterdam

- With financial support from:

- European Commission (EU)
- Dutch Government
- Global CCS Institute



Co-financed by the European Union
European Energy Programme for Recovery



Government of the Netherlands



GLOBAL
CCS
INSTITUTE



Power plant

Output: 1 070 MWe

Efficiency: 46%

Capture ready



Fluor Capture plant

Technology: post combustion

Size: 250 MW equivalent

Capture rate: 90%

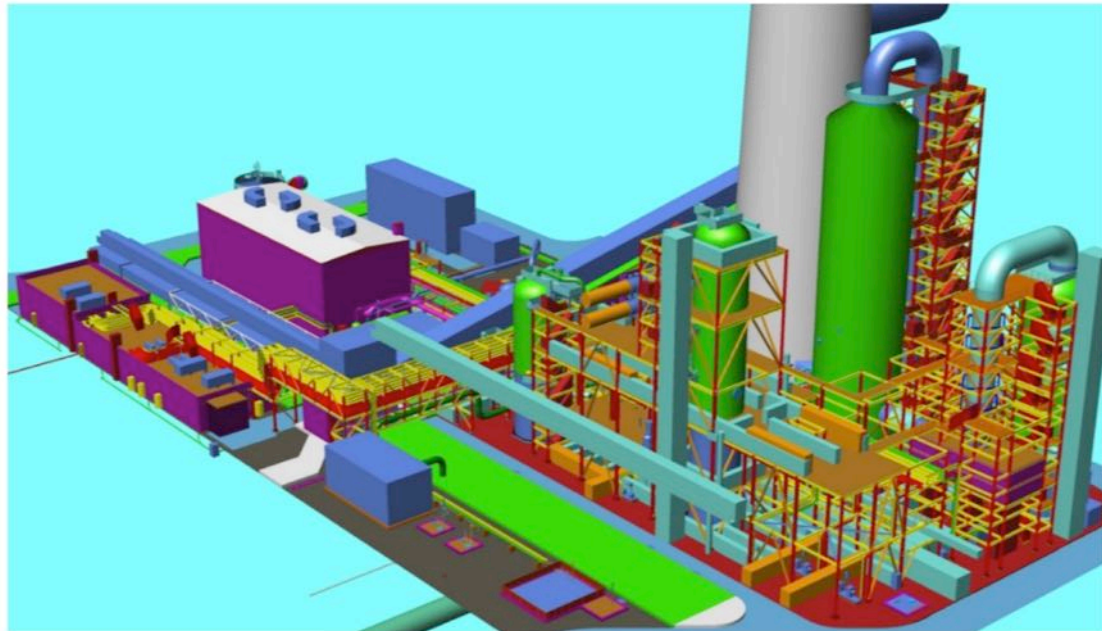
CO₂ capture: 1,1 Mt/yr

North Sea

-25m

000m

NOT ON SCALE



Pipeline Route ROAD - ONE



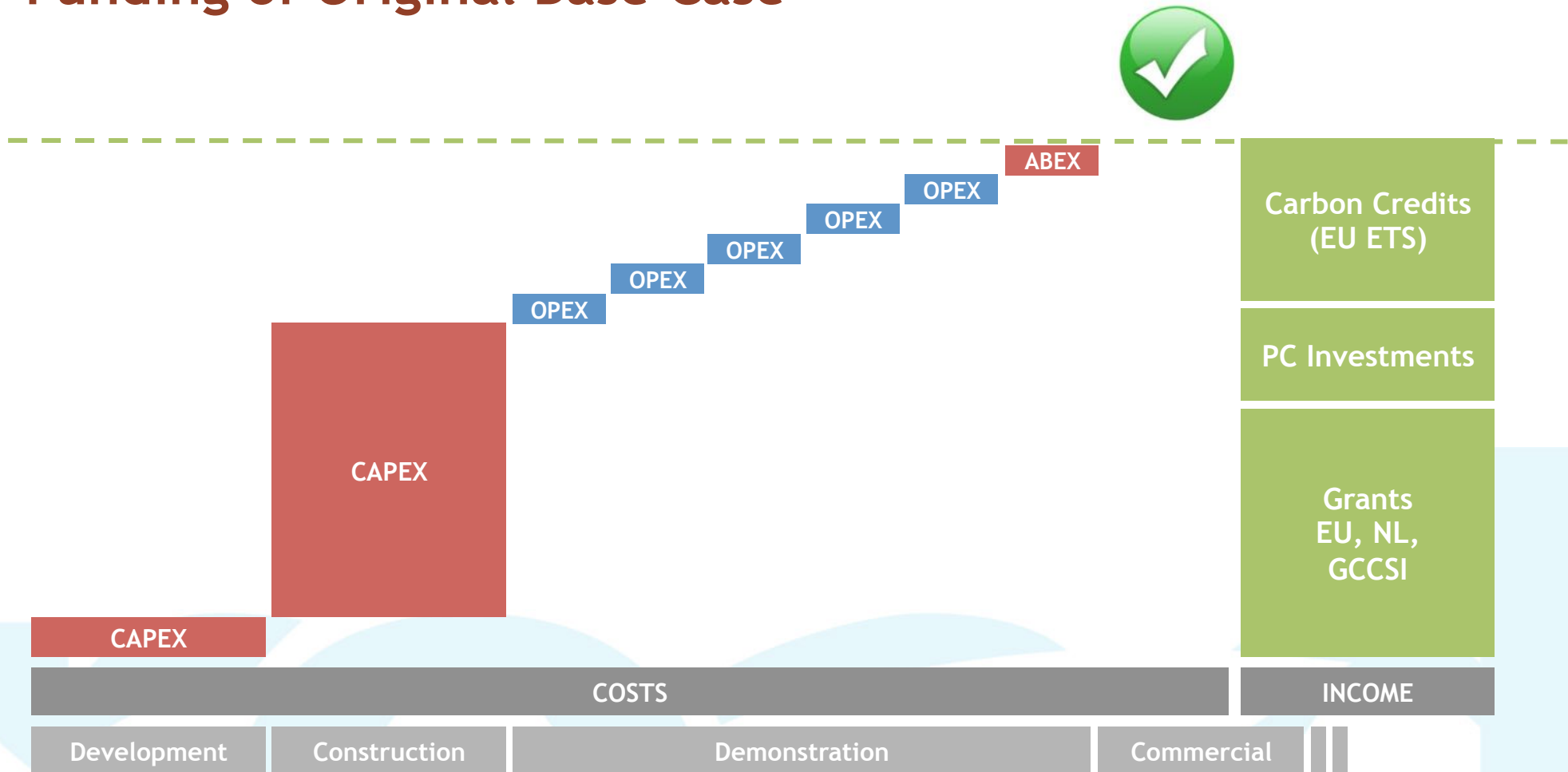
Storage Location



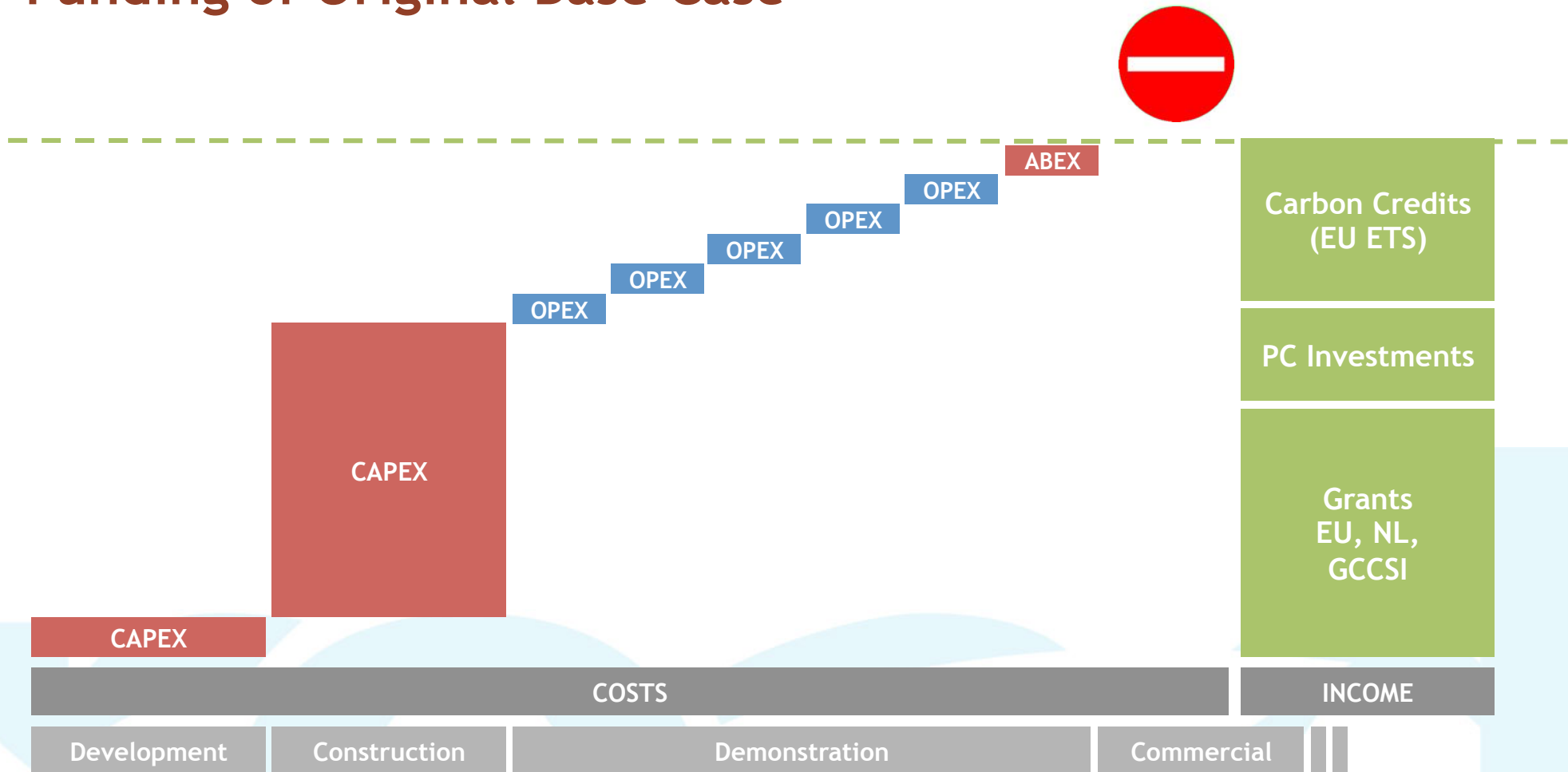
Overview P18-4 & Q16-Maas



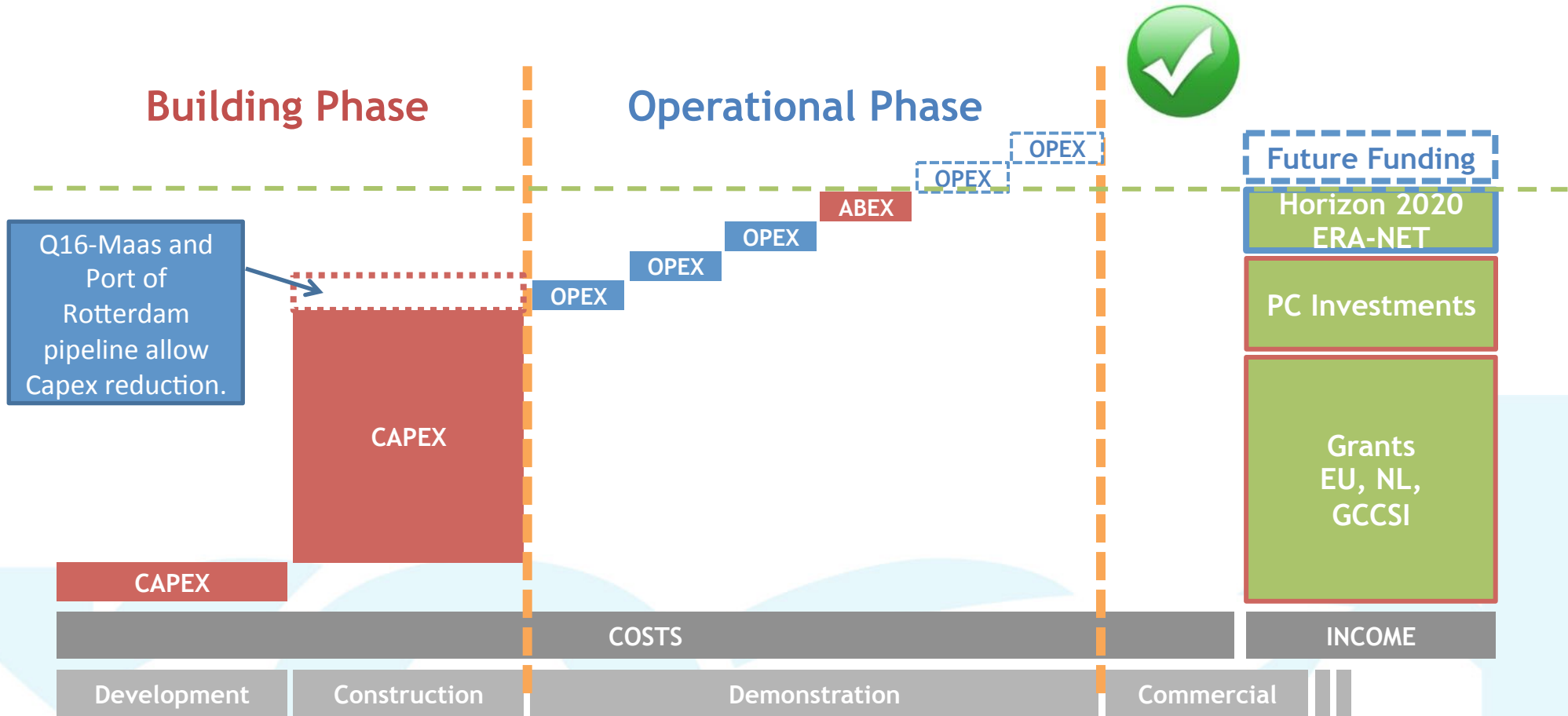
Funding of Original Base Case



Funding of Original Base Case



Proposed Funding Solution: Phased Approach



The National Context 1/3

- Urgenda Case, June 2015 - A civil court ruled that Dutch CO₂ emissions should (must) be reduced by 25% by 2020:
 - Government will appeal the ruling, but in the meantime will comply
 - Resulting campaign from NGOs for complete closure of all coal plant
- Dutch Parliament passed a motion requiring the Government to develop plans to phase out the coal plants.
 - Now a matter of much public debate over costs and benefits
- Biomass co-firing in coal units is also contentious:
 - Part of the 2013 Energy Accord but some politicians strongly oppose it
 - Without it, NL will miss 2020 renewable targets
- Problems with earth tremours in Groningen (north Netherlands) associated with natural gas production mean:
 - Restrictions on existing on-shore Dutch gas production
 - Concern over dependency on imports, and a desire to reduce natural gas demand
- Government is looking at other low carbon options - including district heating and reducing CO₂ emissions from greenhouses

“Heat roundabout” (warmterotonde) proposed... ...with strong synergies to ROAD 2/3

- Aims to deliver heat from Rotterdam industries and from geothermal sources to greenhouses and city areas (houses, offices etc)
- Important for security of heat supply, reduction of CO₂ emissions, local air quality and the regional economy (Rotterdam Port and the greenhouses)
- Combination of both CO₂ and heat is essential for the greenhouses
- Additional CO₂ demand from greenhouses in the Westland is estimated to be at least 250 kt/year
- Heat delivery to the greenhouses alone can save an estimated 450 mln. m³/year of natural gas - approx equivalent to a 350MW CCGT at high load factor.



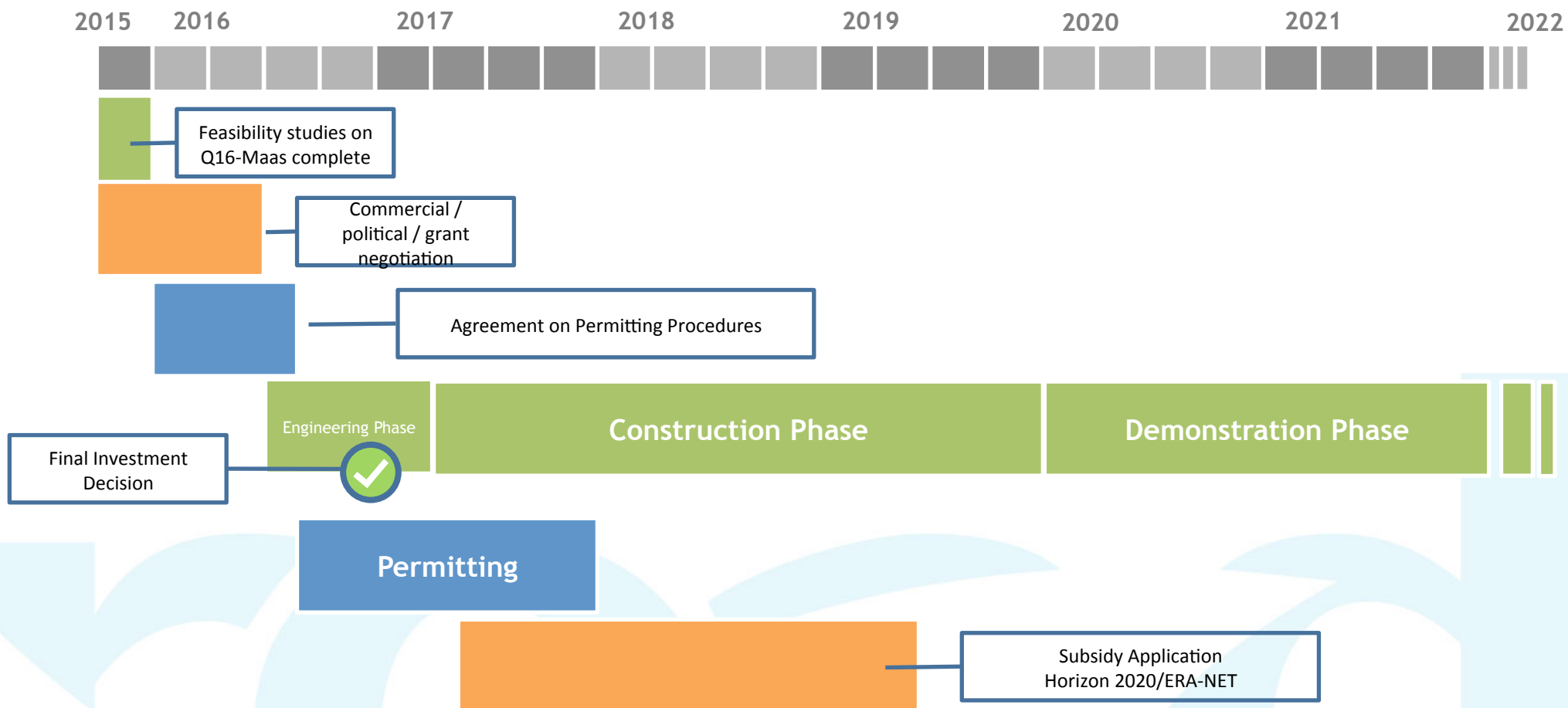
The National Context 3/3

- Proposed (i.e. draft) Government policy announced April 2016 is that:
 - 2 more coal units should close, but the three new units (including MPP3) remain.
 - Co-firing biomass and CCS demonstration (i.e. The ROAD Project) are required.
 - Firm decisions will be taken this year.
- Development of the heat roundabout to continue:
 - this project is not ready for firm decisions yet

Project Next Steps

- Project remobilisation depends on “in principle” agreement over the new structure with all funders / project partners
 - Owners - Engie and Uniper ✓
 - Port of Rotterdam ✓
 - Oranje-Nassau Energie ✓
 - European Union ✓
 - Dutch Government ✓
- FID depends on:
 - Agreement on operation funding (in principle) ✓
 - Some certainty on the future lifetime of MPP3 ✓
 - State aid clearance *Pending finalisation of grants*
 - Re-engineered costs within budget *Pending remobilisation*
 - Clarity on storage permit *In progress*

Planning ROAD



ROAD | Maasvlakte CCS Project C.V.

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