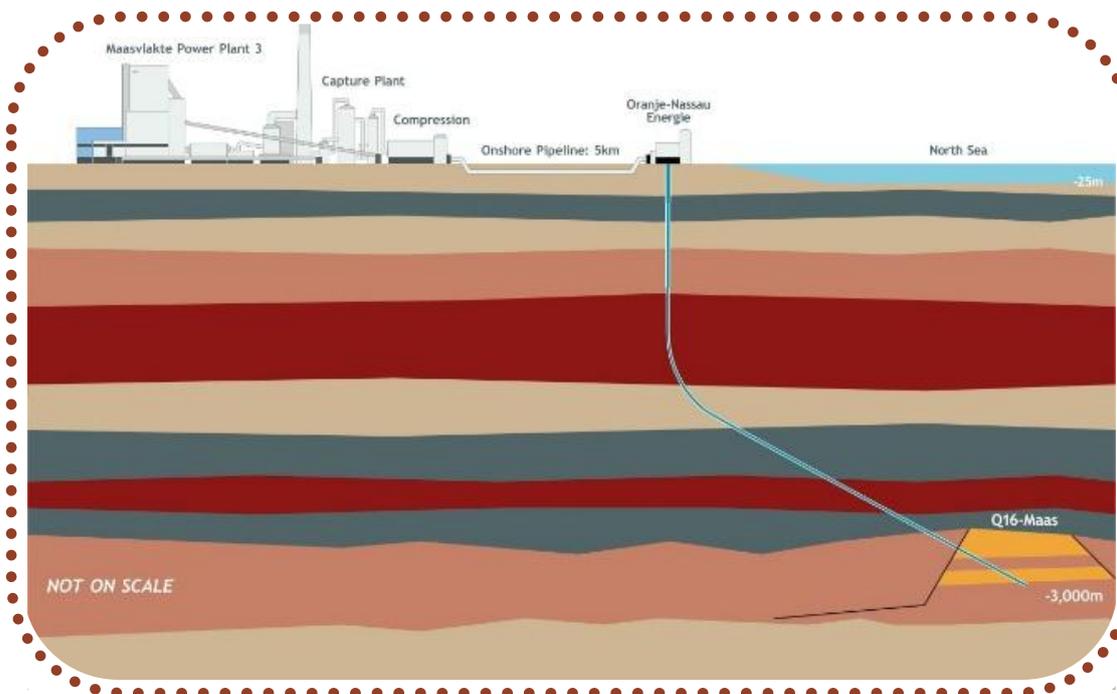


Public Close-Out Report Project Costs and Funding

Rotterdam Opslag en Afvang Demonstratieproject



Maasvlakte CCS Project C.V.

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Public Close-Out Report 8 of 11: Project Costs and Funding

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 Close-Out Report 8 : Project Costs and Funding
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Index of ROAD Public Close-out Reports

No	Title	Scope
1	Overview	Introduce and summarise the public close-out reports.
2	Capture and Compression	Technical report covering capture, compression and power plant integration.
3	Transport	Technical report covering CO ₂ pipeline transport.
4	CO ₂ Storage	Both technical and commercial aspects of CO ₂ storage for ROAD. Subsurface work required to demonstrate permanent storage is described.
5	Risk Management	The risk management approach used by ROAD.
6	Permitting and Regulation	Description of the regulatory and permitting framework and process for the ROAD project, including required changes to regulations.
7	Governance and Compliance	Company structure and governance for Maasvlakte CCS Project C.V., the joint venture undertaking the ROAD Project
8	Project Costs and Funding	A presentation of the projected economics of the project, with both projected income and costs.
9	Finance and Control	Description of the financial and control systems, including the costs incurred and grants claimed.
10	Knowledge Sharing	Outline of the Knowledge Sharing & Dissemination plan as developed by the ROAD project and completed KS deliverables and actions
11	Public Engagement	Description of how ROAD organized and managed the Public Engagement process.

Key Words and Glossary

Key Words / Abbreviations	Meaning of Explanation
The "ACTION"	Scope and project period under the EC-grant agreement
CCS	Carbon Capture and Storage
Dutch State	Ministry of Economic Affairs
EBITDA	Earnings Before Income Tax, Depreciation and Amortization
EC	European Commission
EC-grant agreement	Original EEPR grant facility and amendments
EEPR	European Energy Programme for Recovery
FID	Final Investment Decision
FEED	Front End Engineering Design
GCCSI	Global CCS Institute (Australian)
MPP3	Maasvlakte Power Plant 3 from Uniper
NL-grant agreement	Grant agreement from Ministry of Economic Affairs
P-18.4	Gas field operated by TAQA
Parent Companies	(E.ON) Uniper Benelux BV + (GdF Suez) ENGIE Nederland BV
PoR	Port of Rotterdam
Q-16 Maas	Gas field operated by Oranje Nassau Energy

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1. Management Summary

Project Summary

This report summarises the estimated costs and funding of the CCS demonstration project “ROAD”. The ROAD Project (Rotterdam Opslag en Afvang Demonstratieproject) was one of the largest integrated carbon capture and storage (CCS) projects in the world, aiming to install carbon capture on a coal-fired power station in Rotterdam and store the CO₂ in an empty off-shore gas-field.

The project ran from 2009 to 2017 and was a joint project of Uniper (formerly E.ON) and Engie (formerly Electrabel and GDF Suez). The project also had financial support from the EU EEPR program, the Dutch Government, the Port of Rotterdam and the GCCSI.

In the first phase of the project, 2009-2012, the project was developed to final investment decision (FID) based on using the TAQA P18-4 gas-field as the CO₂ storage location. This required a pipeline of approximately 25km from the capture location (Uniper’s coal-fired Maasvlakte Power Plant – MPP3), about 5km onshore and 20km off-shore.

Unfortunately, the collapse in the carbon price undermined the original business case, and in 2012 a positive FID was not economically possible. The project then entered a “slow-mode” in which activities focused on reducing the funding gap, either by reducing costs or by securing new funding. In late 2014 a possible new funding structure was identified, and explored in 2015 and 2016. This included additional grants for operation and cost reductions. The cost reduction that could be successfully applied was to change storage sink to Q16-Maas, operated by Oranje Nassau Energie (ONE). This smaller field was much closer, with only a 6 km pipeline required. This resulted in a remobilization of the project late in 2016, and development of the new scheme. However, in mid 2017 work was again halted, and formally stopped in November 2017.

Scope of this Report

This brief report describes the estimated project costs and funding during the course of the project, starting with the original expectations when the EU grant was signed in 2010 through to the termination of the project in 2017. The report therefore shows the evolution of cost estimates as the project progressed and the extent of the funding gap that prevented a positive FID.

Report Summary

In 2009, the initial plans for the ROAD Project were developed in response to a call for proposals by the EU. This covered capture of CO₂ from MPP3 for transport to and storage in depleted gas reservoirs of TAQA (and their partners) at P18-4. Because of (1) the high investment for developing the project, (2) the expected negative cash-flows during the operational phase and (3) the high economic risk in both the investment phase and operational phase, it was concluded that the project would only become possible if it was sufficiently supported by grants, providing a reasonable cost and risk profile that allows the Parent Companies to invest in the project.

In April 2010, the funding with EEPR was awarded (signed EC-grant agreement) in accordance with the filed request equalling 46.32% of grants over eligible (investment) costs. In May 2010, the NL-grant was awarded comprising (1) an amount of €75M for funding of the investment phase (2010-2014) equalling 20.3% of eligible investment costs and (2) an amount of €75M for funding of an demonstration phase covering the capture, transport and storage of at least 4Mt CO₂ during a demonstration phase (2015-2019) equalling €18.75 per ton CO₂.

The project steadily progressed during the years 2011 and 2012, however without enabling Parent Companies to take a positive FID. The main reason a positive FID could not be made in 2012 was the fact that CO₂ prices (forwards) had dropped dramatically compared to the earlier assumption of €15 - €35/ton.

Several options for additional funding and/or lower costs have been investigated. The option to change to another gas field for storage in combination with the participation by Port of Rotterdam in the development of

the pipeline for transport would possibly close the financial gap for the construction phase and would allow the Parent Companies to proceed with the project construction phase without further exposure. An additional funding scheme (via a European ERA-NET co-fund) was proposed to support the early operation. Under this structure, amendments of both the EC and NL grant agreement were required.

The amendment of the EC-grant agreement was awarded in November 2016. The revised project economics also included benefits to be received as “Incremental Value or Loss” payment from the owners of the Q16-Maas field, the difference between incremental value arising from additional or accelerated condensate and/or gas production as a result of the CO₂ storage agreement and the associated incremental costs.

Amendment of the NL-grant agreement has been discussed, but not completed.

In June 2017, it has been decided not to proceed with the project. The financial position at that time was:

- Funding of the investment phase uncertain depending from an amended of the NL-grant agreement by (1) extension of the period and (2) the unconditional allocation of almost the full amount of grants to the investment phase.
- Because of the delay caused from the amendment of the NL-grant agreement, uncertainty about the amount of eligible costs under the EC-grant agreement (overrun to 2020 and later years) requiring a new amendment of the EC-grant agreement.
- No firm funding was available for the operational phase (and abandonment costs) others than the latest estimate of about €10M (surplus of the contribution by applicants not needed during the investment phase).

2. Project Summary

The ROAD Project is the Rotterdam Opslag and Afvang Demonstratieproject (Rotterdam Capture and Storage Demonstration Project) which ran from 2009 to 2017, and was one of the leading integrated Carbon Capture and Storage (CCS) demonstration projects in the world.

The main objective of ROAD was to demonstrate the technical and economic feasibility of a large-scale, integrated CCS chain deployed on power generation. Previously, CCS had primarily been applied in small-scale test facilities in the power industry. Large-scale demonstration projects were needed to show that CCS could be an efficient and effective CO₂ abatement technology. With the knowledge, experience and innovations gained by projects like ROAD, CCS could be deployed on a larger and broader scale: not only on power plants, but also within the energy intensive industries. CCS is one of the transition technologies expected to make a substantial contribution to achieving European and global climate objectives.

ROAD was a joint project initiated in 2009 by E.ON Benelux and Electrabel Nederland (now Uniper Benelux and Engie Nederland). Together they formed the joint venture Maasvlakte CCS Project C.V. which was the project developer. The ROAD Project was co-financed by the European Commission (EC) within the framework of the European Energy Programme for Recovery (EEPR) and the Government of the Netherlands. The grants amount to € 180 million from the EC and € 150 million from the government of the Netherlands. In addition, the Global CCS Institute is knowledge sharing partner of ROAD and has given a financial support of € 4,3 million to the project. The Port of Rotterdam also agreed to support the project through investment in the CO₂ pipeline.

In the first phase of the project, 2009-2012, the project was developed to final investment decision (FID) based on using the P18-4 gas-field operated by TAQA as the CO₂ storage location. This required a pipeline of approximately 25km from the capture location (Uniper's coal-fired Maasvlakte Power Plant – MPP3), about 5km onshore and 20km off-shore.

Unfortunately, the collapse in the carbon price undermined the original business case, and in 2012 a positive FID was not economically possible. The project then entered a “slow-mode” in which activities focused on reducing the funding gap, either by reducing costs or by securing new funding. In late 2014 a possible new funding structure was identified, and explored in 2015 and 2016. This included additional grants for operation and cost reductions. The cost reduction that could be successfully applied was to change storage sink to a newly developed field, Q16-Maas, operated by Oranje Nassau Energie (ONE). This smaller field was much closer, with only a 6 km pipeline required. This resulted in a remobilization of the project late in 2016, and development of the new scheme. However, in mid 2017 work was again halted, and the grant formally terminated in November 2017.

The ROAD project design applied post combustion technology to capture the CO₂ from the flue gases of a new 1,069 MWe coal-fired power plant (Maasvlakte Power Plant 3, “MPP3”) in the port and industrial area of Rotterdam.

The capture unit has a design capacity of 250 MWe equivalent. During the operational phase of the project, approximately 1.1 megatons of CO₂ per year would be capture and stored, with a full-load flow of 47kg/s (169 t/h) of CO₂. For transport and storage two alternatives were developed as described above: storage in the P18-4 reservoir operated by TAQA; and storage in the Q16-Maas reservoir operated by Oranje-Nassau Energie.

After a competitive FEED process, Fluor was selected as the supplier for the capture technology in early 2011. The plant was fully engineered, and long lead items contracted for, ready for an FID in early 2012. All the necessary permitting was completed, with a permit for the capture plant being granted in 2012. Following the delay to the project, an updated design was developed with Fluor in 2017 incorporating lessons learnt from research and development in the intervening years, changes to the MPP3 site, and the impact of the changes to the transport and storage system. A revision to the permit was under development when the project was halted.

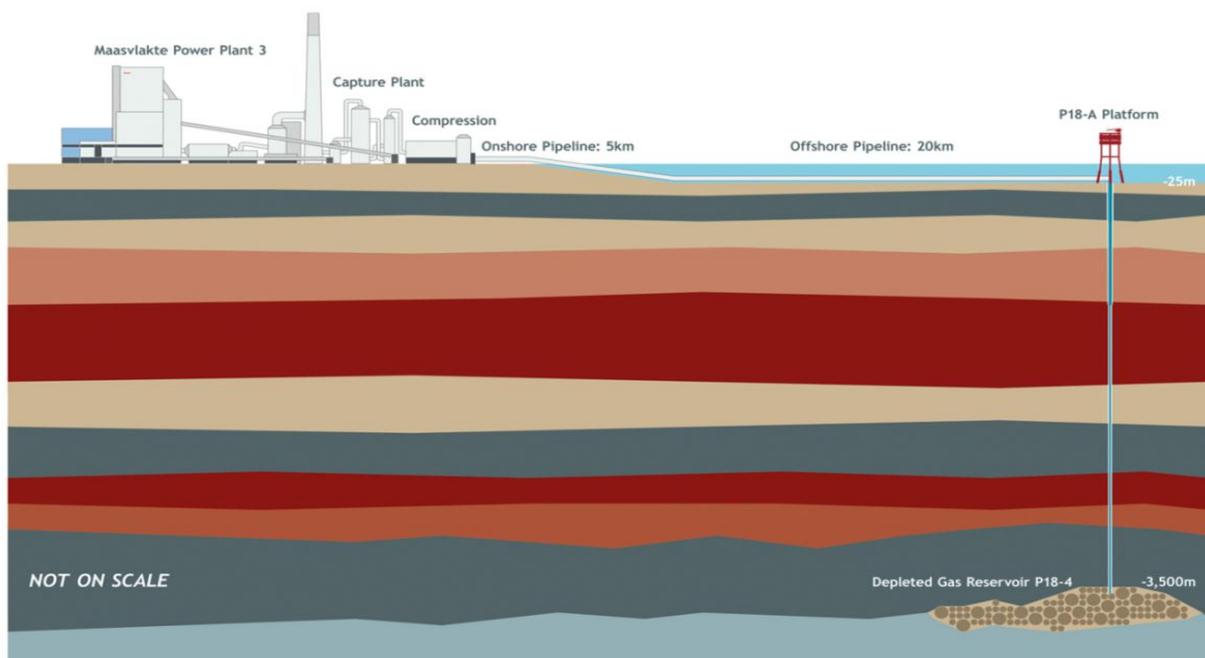
For storage in P18-4

From the capture unit the CO₂ would be compressed and transported through a pipeline: 5 kilometers over land and about 20 kilometers across the seabed to the P18-A platform in the North Sea. The pipeline has a transport capacity of around 5 million tonnes per year. It is designed for a maximum pressure of 140 bar and a maximum temperature of 80 °C. The CO₂ would be injected from the platform P18-A into depleted gas reservoir P18-4. The estimated storage capacity of reservoir P18-4 is approximately 8 million tonnes. Figure 2.1 shows the schematic illustration of this.

P18-4 is part of the P18 block which also includes the larger P18-2 and also a small field, P18-6. These depleted gas reservoirs are about 3.5 km below the seabed under the North Sea about 20km from the Dutch coastline, and have a combined CO₂ storage capacity of around 35 Mt.

The ROAD Project with storage in P18-4 was fully developed for FID at the end of 2011, including all engineering, regulatory and permit requirements. A CO₂ storage permit was granted in 2013, the first such permit in Europe. Unfortunately, a positive FID was not possible due to funding problems, and in 2012 technical project development on P18-4 was halted.

Figure 2.1 Schematic overview of the ROAD Project using storage in P18-4



For storage in Q16-Maas

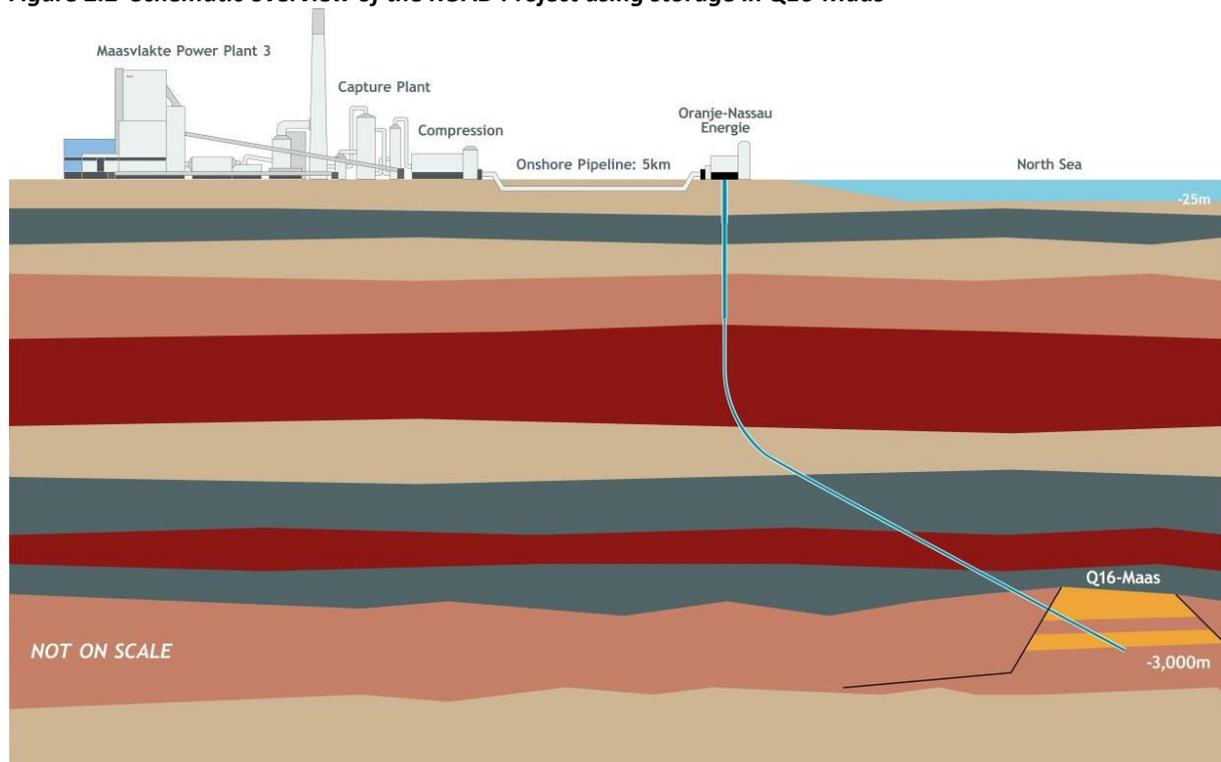
From the capture unit the CO₂ would be compressed and transported through a pipeline over land to the current ONE-production site Q16-Maas (Figure 2.2). The selected pipeline design would have a transport capacity in excess of 6Mt/year. It was designed for a maximum pressure of 40 bar although in the first phase, operation at 20 bar was planned. Final compression to injection pressure (around 80 bar) would be at the injection site.

The Q16-Maas reservoir is located just off-shore from the Maasvlakte, and is reached by a long-reach well, drilled from on-shore. The well is about 5km long, and travels approximately 3km down to reach the reservoir depth, and 3 km horizontally (off-shore) to reach the reservoir location. The reservoir is relatively new (production started in 2014) and was not due to finish production until 2022. Therefore this scheme involved the drilling of a second well to accelerate gas production and so allow CO₂ injection to start in 2020. This

second well would also allow co-production of modest amounts of condensate (and possibly natural gas) during CO₂ injection. The estimated storage capacity of reservoir Q16-Maas is between 2 and 4 million tonnes.

This reservoir was identified as a possible storage location only at the end of 2014, with project development running through 2015-2017. Due to funding uncertainties, the work focused on feasibility, cost estimation and concept design to the level required for permitting. Therefore a lower level of detail is available for this storage location, compared to P18-4. It should also be noted that unexpected water production was experienced from Q16-Maas in 2016, leading Oranje-Nassau Energie to issue a revised reservoir model and production plan in May 2017. Since this was only shortly before the ROAD work was halted, the ROAD plans for Q16-Maas were not fully amended to reflect this new production data.

Figure 2.2 Schematic overview of the ROAD Project using storage in Q16-Maas



3. Original Costs Estimates and Funding Resources (2010)

In 2009, the initial plans for the ROAD Project were developed in response to a call for proposals by the EU. This covered capture of CO₂ from MPP3 for transport to and storage in depleted gas reservoirs of TAQA (and their partners) at P18-4. The estimated capital investment for capture, transport and storage of CO₂ was then calculated at €408M in nominal values based on an investment period of 2009-2014. This estimate was based upon high level evaluations and/or non-binding quotes. The uncertainty on this investment estimate was estimated at 15%, so potential additional impact on funding of €61M.

Operations and maintenance costs were estimated at €10M per annum.

For other operational costs (missed electricity income because of the energy consumption by the capture installation against abatement costs (CO₂ certificates)), a wide range of scenarios between electricity prices and CO₂ emission prices have been taken into account. From there, a theoretical CO₂ price have been calculated that would be required for having a net present value zero for the project (2009 - 2035). The CO₂ price required to have zero EBITDA during operations would be €35-€50 per tonne depending on the electricity prices.

On the same basis, an EBITDA for the operational years was calculated for two combinations of electricity and CO₂ prices, which were observed right before (2008) and during the economic crises (2009).

Scenario	Prices power / carbon	EBITDA (at price level 2009)
Pre-crisis (2008)	€85/MWh; €35/ton CO ₂	Minus €11M
Crisis (2009)	€55/MWh; €15/ton CO ₂	Minus €15M

It was not possible to calculate the Internal Rate of Return (IRR) with figures which were all negative.

Based upon above (1) the high investment for developing the project, (2) the expected negative cash-flows during the operational phase and (3) the high economic risk in both the investment phase and operational phase, it was concluded that the project would only become possible if it was sufficiently supported by grants, providing a reasonable cost and risk profile that allows the Parent Companies to invest in the project.

From above, for investment costs €180M EEPR funding was requested and from the Dutch Government an additional amount of €150M was negotiated. The remaining investment costs (€78M) and the operational negative cash flows would be covered by the Parent Companies.

The amount of investment costs for the “Action” for which the EEPR and NL funding was requested equalled €388.6M (project costs less contingency and expected non-eligible costs), divided over the working packages WP2, WP3, WP4 and WP6) and the costs categories A1 (staff assigned to the Action) and A4 (costs of sub-contracting).

In April 2010, the funding with EEPR was awarded (signed EC-grant agreement) in accordance with the filed request equalling 46.32% of grants over eligible (investment) costs.

In May 2010, the NL-grant was awarded comprising (1) an amount of €75M for funding of the investment phase (2010-2014) equalling 20.3% of eligible investment costs and (2) an amount of €75M for funding of a demonstration phase covering the capture, transport and storage of at least 4Mt CO₂ during a demonstration phase (2015-2019) equalling €18.75 per ton CO₂. The agreement provides for the payment of the full amount of €150M during the investment phase (for financing purposes).

Based upon above, project economics for the period 2010-2019 comprising the investment phase and demonstration phase have been calculated at:

	€M	Comment
Investment costs	408	(excluding 15% uncertainty)
Net operational costs	44	(yearly EBITDA based on 4Mt, CO ₂ price of €35/ton)
Total costs:	452	
Less: EC and NL-grant	330	(EC €180M, NL €150M)
Contribution by Parent Companies:	122	

The above calculated contribution from Parent Companies is excluding the risk of higher investment costs (15% uncertainty in estimates) and lower EBITDA during the operational phase resulting from different power and carbon price levels.

In the course of 2010, advance payments were received for the amounts of €45M under the EC-grant agreement and €15.3M under the NL-grant agreement.

4. Amendment of Grant Agreement (2011)

In the course of the second half year 2010, the finance and cost accounting structure for the project has been developed. From there it became clear that the actual costs to be incurred did not fit into the break-downs as included in the grant agreements. For that reason (and to simultaneously update technical and other financial assumptions) EC-grant authority was requested to amend the grant agreement. This request was awarded under the condition that total eligible costs would not differ from the original grant agreement. In February 2011, an amended grant agreement has been prepared. The revised amount of capital investment costs for the project was calculated at €417M (€9M above original estimate, but at much less uncertainty). This amount included a contingency of €28.4M (non-eligible) bringing the eligible costs on the earlier agreed amount of €388.6M as per original grant agreement. This amount of eligible costs has been allocated to the different working packages (6 instead of 4) and costs categories (6 against 2).

Operations and maintenance costs have been updated (€16M against €10M) bringing EBITDA during the operational phase till minus €9M (based on carbon price of €35/ton).

Early 2011, agreement was reached with the Global CCS Institute (Australian) for support to the project of €4M (agreement signed in March 2011) against ROAD to share information over the progress of the ROAD project.

Based upon above, the estimated project costs and funding of the project as included in the amended EC-grant agreement can be summarized as follows:

Costs	€ in Millions	Funding	€ in Millions
A.1 Costs of the staff assigned	9.3	B.1 Revenue from the Action	-
A.2 Costs of purchasing equipment	0.9	B.2 Contribution by applicants	83.0
A.3 Consumables and supplies	0.1	B.3.a Contribution by Dutch State*	150.0
A.4 Costs of sub-contracting	357.0	B.3.b Contribution by GCCSI	4.0
A.5 Travel and subsistence costs	0.4	B.4 Contribution by the EC (EEPR)	180.0
A.6 Any other direct costs	20.9		
Total eligible investment costs	388.6		
Non-eligible investment costs**	28.4		
Total investment costs	417.0	Total funding investment phase	417.0
EBITDA 4 years operations	36.0	Funding by applicants	36.0
Total project costs	453.0		453.0

*) Fully allocated to investment phase, but conditional to 4M/tonne CO₂ storage during operations.

***) Contingency

Total contributions from the Parent Companies for development and demonstration phase are estimated at €119M (€83M + €36M), excluding the still remaining risk of higher investment costs and/or lower EBITDA during the operational phase resulting from different power and carbon price levels.

In July 2011, the amended EC-grant agreement has been approved (and signed) by the EC. Whereas the NL-grant agreement refers to the project details as included in the EC-grant agreement, by informing the Dutch State about the amendment of the EC-grant agreement, the NL-grant agreement was considered implicit being amended as well accordingly.

The project proceeded in year 2011 with anticipated FID in the course of that year.

5. Additional Funding and/or Lower Project Costs (2012-2015)

The project steadily progressed during the years 2011 and 2012, however without enabling a positive FID. The main reason for the inability to take a positive FID in 2012 was the fact that CO₂ forward prices had dropped dramatically from the earlier assumption of in between €15 - €35/ton.

The parent companies asked the ROAD management to seek for additional funding and/or lower project costs in order to close the financial gap arisen from already incurred delay in timing at that time and the lower CO₂ price expectations. Many options for additional funding have been investigated in the period between mid-2012 and end-2015.

a) *Funding by Port of Rotterdam (PoR)*

PoR has been requested to participate (financially) in the development of the infrastructure for transport (the pipeline). Different scenarios have been discussed and prepared to enable PoR to invest €15M in ROAD at risk. By the end of 2013, it was verbally agreed that PoR would contribute €15M in the development of the pipeline, most likely by a loan agreement for the amount of €35M, of which €15M only becomes repayable if volumes of CO₂ transported exceed the planned amount for the ROAD demonstration phase.

b) *NER 300*

An application for additional funding under the NER300 grant facility has been prepared for filing. Under this facility, up to 50% of net operating costs during the demonstration phase might have been come eligible, reducing the foreseen negative EBITDA significantly for those years. However, this grant would have required ten years of operation, increasing the duration of the operating period significantly beyond the demonstration phase. The foreseen financial benefit from NER300 funding was therefore modest (insufficient to close the funding gap) and the additional risks were significant. For that reason, the parent companies decided not to give ROAD permission to submit the application.

c) *Re-allocation EEPR funds from other projects*

In 2009/2010, 6 projects through-out Europe have been awarded funding under the EEPR grant facility, with funds totaling more than €1 billion. By this stage, 4 of these projects had been cancelled and/or prematurely terminated because of economic or permitting reasons. ROAD asked the EC to re-allocate some of the (un-used) grants awarded to the other projects towards ROAD either by way of increasing the %age grants under the existing grant agreement, or through an additional grant agreement.

The EC concluded that such re-allocation of unused amounts of grants under the EEPR was not possible under existing EC-legislation, and there was insufficient political support for new legislation.

d) *Contributions from other EC-member states and/or Norway*

Partly facilitated by the EC, other EC-member states (UK, Germany and France) and Norway have been approached for funding of the ROAD project. For different reasons, none of the states mentioned above were able/willing to support the ROAD project financially during the investment phase.

However, the idea of an ERA-NET scheme for operational support was introduced in 2014 and did receive support. Proposed funders were the Netherlands, Norway, Germany and the EC for a maximum of €60M.

e) *Far-East investors*

With the use of local network agencies/contacts, potential investors in the Far-East region have been approached for participation in the ROAD project. No investors were found to support the ROAD-initiative as such without requiring a reasonable rate of return on the short term, which would not improve the ROAD project economics for the Parent Companies.

f) Change of capture unit supplier

Based upon the evaluation of bids received during the tendering process for the design, engineering and development of the capture unit and after the evaluation of the FEED studies done by 2 selected suppliers, the EPC contract for the capture unit was awarded to Fluor. Fluor was chosen as most reliable and economic competitive supplier. Because about half of the investment costs relates to the EPC contract, Alstom was given the opportunity to give a competitive alternative for Fluor. The outcome was negative. As the Alstom solution was less well engineered, there was an increase in risk associated with changing supplier, and no significant cost savings were apparent.

g) Change to another storage facility

A significant cost saving could be achieved from the storage of CO₂ in a new and much more nearby the coast but much smaller depleted gas field (Q16 Maas, operated by Oranje Nassau Energie) instead of the P18-4 field 20km out of the coast. This option has been further explored and seemed to be technically and financially a possible way forward for the ROAD project, assuming that the grant agreements would allow such a change in scope and that timelines and other conditions could be fulfilled.

From the above, it was concluded that a combination of the options under **a)** (contribution from PoR) and **g)** (change of storage facility) above would possibly close the financial gap for the investment phase and would allow the Parent Companies to proceed with the project. ERA-NET support as mentioned under **d)** (contributions from other EC-member states and/or Norway) would enable an reasonable operational/demonstration period.

6. Amendment of Grant Agreements (2016)

The EC-grant agreement and the investment phase as defined in the NL-grant agreement both expired as at December 31, 2014. It was concluded that to enable Parent Companies to proceed with the ROAD project, both grants agreements needed to be amended in scope, timelines and conditions. Amendments of the grant agreements have been prepared/proposed based upon:

- Change of storage facility to Q-16 Maas,
- Development and operation of the infrastructure for transport (pipeline) by and for account of PoR,
- FID in 2017 and completion of the investment phase at December 31, 2019,
- NL-grant unconditional from actual volumes of CO₂ captured and stored,
- No liability (exposure) above €50M for each of the Parent Companies.

The recalculated amount of investment costs is calculated at €440M including a contingency of €37.2M. The total project costs includes the amount of €15M being the estimated costs for the development of the infrastructure for transport (the pipeline) by and for account of PoR. Development of costs estimates against 2011 is shown in following table:

Project costs in €M	P18-4*	P18-4**	Q16-Maas	Remarks fo Q16-Maas 2016 figures
<i>WP2 Capture</i>	281,6	286,0	287,7	<i>EPC-contract Fluor plus support</i>
<i>WP3 Transport</i>	58,3	65,0	17,6	<i>Including €15M costs for account of PoR</i>
<i>WP4 Storage</i>	22,4	36,0	54,6	<i>Including 2nd well, but excluding separation unit</i>
<i>WP5 Permitting</i>	1,7	2,0	2,8	
<i>WP6 Dissemination</i>	1,7	1,7	1,7	<i>Q-16 Maas storage license</i>
<i>WP7 Management</i>	22,9	31,3	38,4	
				<i>Including slow-mode 2012 – 2017</i>
Sub-total	388,6	422,0	402,8	
Contingency	28,4	48,0	37,2	<i>Capture €26.4M, storage €10.8M</i>
Total investment costs	417,0	470,0	440,0	

* P18-4 costs estimated in 2011

** P18-4 costs estimated in 2016 including longer slow mode and greater contingency due to need to re-engineer and re-tender.

Already during the investment phase of the project, benefits could be received as “Incremental Value or Loss” payment from the owners of the Q16-Maas field (central estimate €4M, max. €28M). The amounts are calculated as the difference between incremental value arising from additional or accelerated condensate and/or gas production as a result of the CO₂ storage agreement and the associated incremental costs. The amount is based upon latest reservoir models in 2016 and would need to be updated at FID (a major update to the reservoir models was received in May 2017).

Commissioning costs are estimated at €10M comprising additional operational costs associated with commissioning and early operation.

Operations and maintenance costs are estimated at €11.5M. These costs cover capture and transport. The operational costs for the storage facility are covered in the “Incremental Value or Loss” payment. The additional cost to the Q16-Maas owners arising from the CO₂ injection (including additional operating costs) are balanced by accelerated and/or enhanced hydrocarbon production, and the net balance paid as a one-off payment.

Abandonment costs refer to possible “storage liabilities”. These include post-injection monitoring and verification of the storage site, decommissioning of the wells and handover to the state. These liabilities depend on the license, and are not yet known. However, these may be similar to those for P18-4, which were valued at €18M.

Based upon above, the estimated project costs and funding of the revised project as included in the amended EC-grant agreement of 2016 can be summarized as follows:

Costs	€ in Millions	Funding	€ in Millions
A.1 Costs of the staff assigned	18,3	B.1 Revenue from the Action*	28,0
A.2 Costs of purchasing equipment	0,2	B.2 Contribution by applicants	62,7
A.3 Consumables and supplies	0,2	B.3.a Contribution by Dutch State**	150,0
A.4 Costs of sub-contracting	328,7	B.3.b Contribution by GCCSI	4,3
A.5 Travel and subsistence costs	1,3	B.4 Contribution by the EC (EEPR)	180,0
A.6 Any other direct costs	22,7		
Total eligible investment costs	371,4	Total funding of the “Action”	425,0
Non-eligible investment costs***	53,6		
Costs for account of PoR	15,0	Funding from PoR	15,0
Total investment costs	440,0	Total funding investment phase	440,0

*) This is the “Incremental Value or Loss” payment. The value in the table is the highest estimate. In the probable event that the actual income is lower, the contributions by applicants will increase accordingly.

***) Fully allocated to investment phase, and assumed non-conditional to volume of CO₂ stored during operations.

***) Non-eligible costs including contingency

Under the premises that the NL grant agreement would be amended accordingly, the above funding would enable the Parent Companies to take positive FID. The extent (volumes and/or duration) of the operational phase is depending from additional funding ((Horizon 2020/ERA-NET). The Parent Companies had committed together and in total to contribute €100M to the project. Funding which is not needed for the investment phase would be transferred to the operational phase.

7. Funding Gap at Decision to Terminate the Project (2017)

At the time of termination, the “Revenue from the Action” (funding under B.1) has become zero as a result of updated reservoir modelling resulting in no additional and/or accelerated production of condensate and/or gas. Therewith, the estimated “Contribution by applicants” (funding under B.2) had increased till at least €90,7M.

Amendment of the NL grant agreement has been discussed, but not completed.

In summary, the financial position at the time of the decision of termination was:

- Funding of the investment phase uncertain depending from an amended NL-grant agreement by (1) extension of the period and (2) the unconditional allocation of almost the full amount of grants to the investment phase.
- Because of the delay caused from the amendment of the NL-grant agreement, uncertainty about the amount of eligible costs under the EC-grant agreement (overrun to 2020 and later years) requiring a new amendment of the EC-grant agreement.
- No firm funding of the operational phase (and abandonment costs) others than the latest estimate of about €10M (surplus of the contribution by applicants not needed during the investment phase).