

CCS – Failing to pass decision gates

by

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(1) Overview

Socio-economic criteria for climate projects have been used in analysing the value of the climate benefit of a reduction in CO₂. These reports are optimistic, yet CCS demonstration plants are not implemented as expected. Little attention has been devoted to profitability assessments based on commercial considerations. Economic valuation of climate projects, seen from the perspective of the commercial companies which are to implement the projects, is the subject of this article. We examine key economic parameters of 27 oil and gas projects and compare it to a CCS project. We find that the CCS project ranks the lowest and is unlikely to be implemented by a private company. Our findings may explain why it is hard for oil companies to justify climate projects in their portfolios.

(2) Methods

The question we ask is whether an oil company would be interested in investing in a CCS project. A CCS plant could be seen as part of the value chain of an oil company in the sense that gas power plants use gas as an input and petroleum production may use gas generated power as an input. Moreover, the systematic risk of petroleum production and a CCS plant is similar – oil and CO₂-quotas have about the same beta-value.¹ Petroleum projects and a CCS plant also have similar cash flow structure, with high front end loading of costs. The CCS project we analyse would be in connection to a gas power plant partially owned by the Norwegian oil company Statoil.

For a Norwegian CCS project and 27 petroleum projects in the Norwegian Continental Shelf, we undertake the following ranking analyses:

- Net present value
- Internal rate of return
- Net present value index
- Pay-back time
- Return on average capital employed

¹ Emhjellen and Osmundsen (2013),

(3) Results

From all the projects we analyze, the CCS project ranks lowest on project profitability, measured by net present value and internal rate of return. When capital or other input factors are scarce, oil companies apply net present value indexes to rank projects. The CCS project also struggle in comparison with petroleum projects on such rankings, both due to higher capital commitments and lower net present value. In projects with perceived high political risk, oil companies prefer a short pay-back time for projects. We find that the CCS-project has a much longer pay-back time than the petroleum projects. Compared to oil and gas projects, the CCS project has low income relative to depreciations, hence it would also have an unfavourable impact on the company's Return on Capital Employed, ROCE. This is a financial metric used by financial analysts in valuation of companies.

	NPV before tax	NPV after tax/subsi dies	IRR
Valemon	20040	4409	19,5 %
Gudrun	8790	1934	15,3 %
Ekofisk South	15187	3341	16,7 %
Eldfisk II	18870	4151	15,8 %
Yme	3135	690	11,2 %
Martin Linge	17821	3921	18,8 %
Edvard Grieg	16394	3607	18,5 %
Skarv	48947	10768	23,4 %
Knarr	1889	416	10,2 %
Goliat	17463	3842	15,4 %
Gjøa	43813	9639	26,8 %
Vega + Vega sør	21113	4645	34,9 %
Stjerne	6846	1506	41,7 %
Vigdis Northeast	4305	947	33,2 %
Skuld	9907	2180	22,6 %
Visund South	15672	3448	44,0 %
Njord NW Flank	3154	694	48,5 %
Visund North	2661	586	22,4 %
Vilje South	1029	226	32,6 %
Hyme	2289	504	21,6 %
Trym	6226	1370	52,6 %
Oselvar	6461	1421	26,2 %
Alta	1529	336	36,3 %
Marulk	11359	2499	39,7 %
Gaupe	5636	1240	58,5 %
Jette	691	152	14,8 %
Brynhild	972	214	14,0 %
CCS	-5950	-1309	-2,0 %
CCS subsidies	-5950	1	6,3 %

Table 2: Net present values and internal rate of returns

(4) Conclusions

In an attempt to explain the unwillingness of private companies to take on CCS projects, we analyze empirically whether an oil company would be interested in investing in a CCS project. A Norwegian CCS project is compared to a number of petroleum projects at the Norwegian continental shelf. We find many explanations why the CCS project is ranked lowest

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