

Oil, climate and GPFG

Presentation for the expert group on investments in coal and petroleum companies,
18.06.2014

by

Cathrine Hagem, Statistics Norway and CREE – Oslo Centre for Research on
Environmentally friendly Energy.

Presentation is based on

Fæhn, T, C. Hagem, L. Lindholt, S. Mæland, and K.-E. Rosendahl:

Discussion paper 747, 2013, Statistics Norway: *Climate policies in a fossil fuel producing country - Demand versus supply side policies*

Oil, climate and GPFG

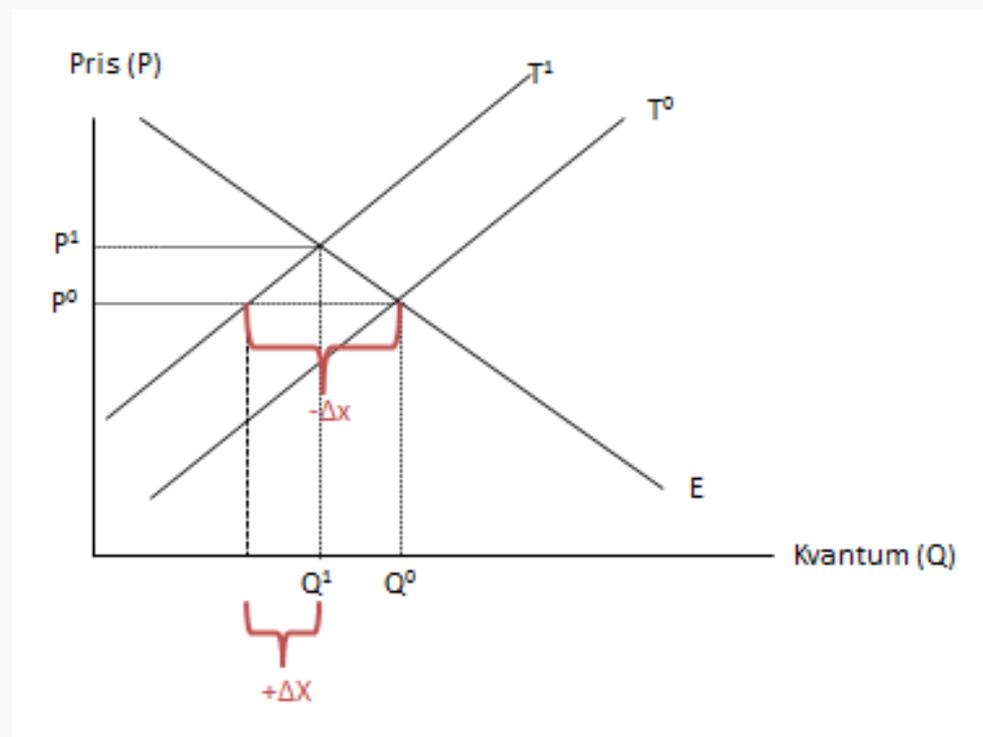
1. Does unilateral investments in increased oil production harm the global climate ?
Yes.
2. Can reduced oil production be cost-effective climate policy?
Yes.
3. Does it matter where the reduction occurs?
Yes.
4. Should the “climate policy” be conducted through exclusion of oil companies or exercise of ownership and exertion of influence?

Oil production causes emissions when extracted and when consumed

- Climate impact of reduced oil investments (extracton) :
 - The final impact on global emissions from (fossil fuel) combustion
 - The final impact on emissions from fossil fuel extraction.

Effects of reduced oil extraction

- Net effect on oil consumption depends on how steep supply and demand curves are
 - Price elasticities
- Extra steep demand curve?
 - Little effect on consumption
- Extra steep supply curve?
 - Big effect on consumption



Effects of reduced oil extraction

- Many empirical studies of oil demand
 - Different conclusions – average around -0.5 in the long run
- Fewer empirical studies of oil supply (outside OPEC)
 - Different conclusions – average around 0.5 in the long run
- What about OPEC?
 - Has market power – how is it utilized?
 - Many studies of OPEC – unclear conclusions
 - Our study: Consider both full and no use of market power
 - ♦ Climate effects are almost the same

Effects of reduced oil extraction

- Summary of oil market effects:
 - Supply and demand have quite the same price responsiveness in the long run
 - Reduced oil production of 1 barrel reduces global oil consumption by about 0.5 barrel
- What about coal and gas consumption?
 - Empirical studies give few insights
 - Model simulations suggest that that global consumption of coal and gas (measured in carbon) increases by respectively 0.10 and 0.09 units for every unit less oil consumed (cross-price elasticities of around 0.08 for both fuels, which we use as our benchmark case estimates)

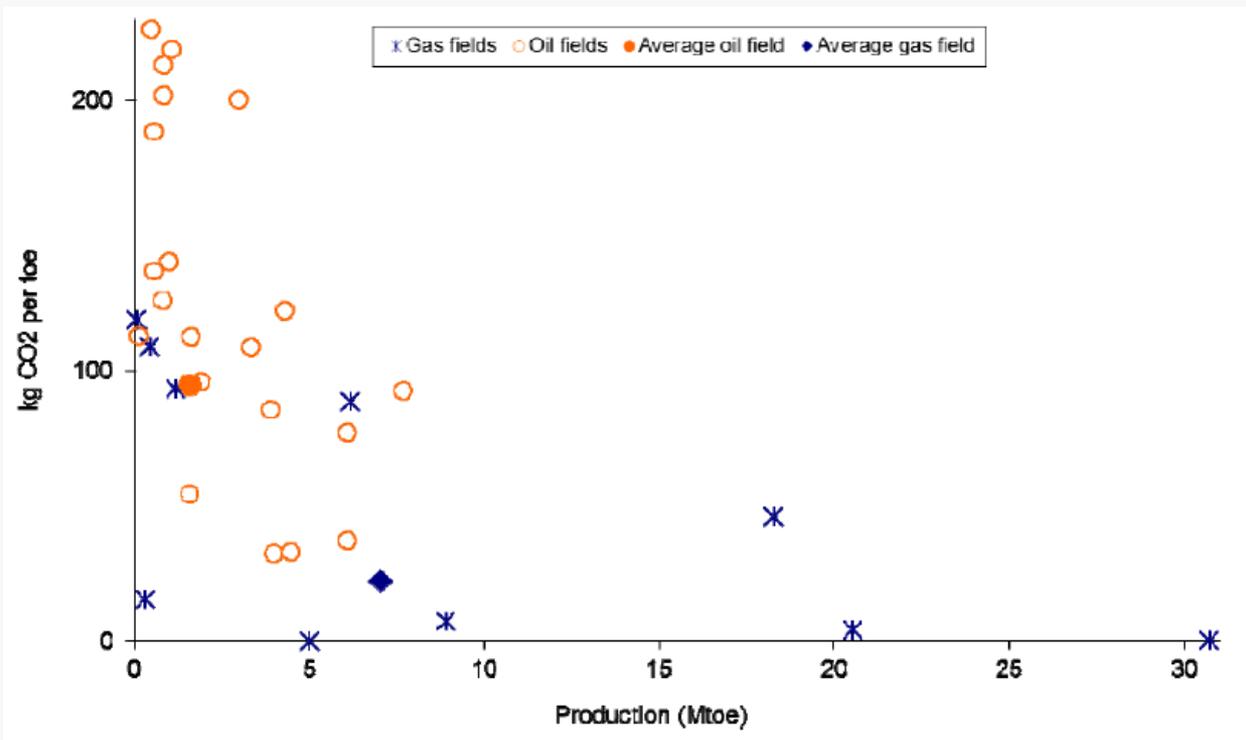
Emissions intensities from extraction oil/gas :

- World average: 160 kg CO₂e per toe (ton of oil equiv.) (5%)

Emissions from using the oil are much bigger (3200 kg CO₂ per toe)

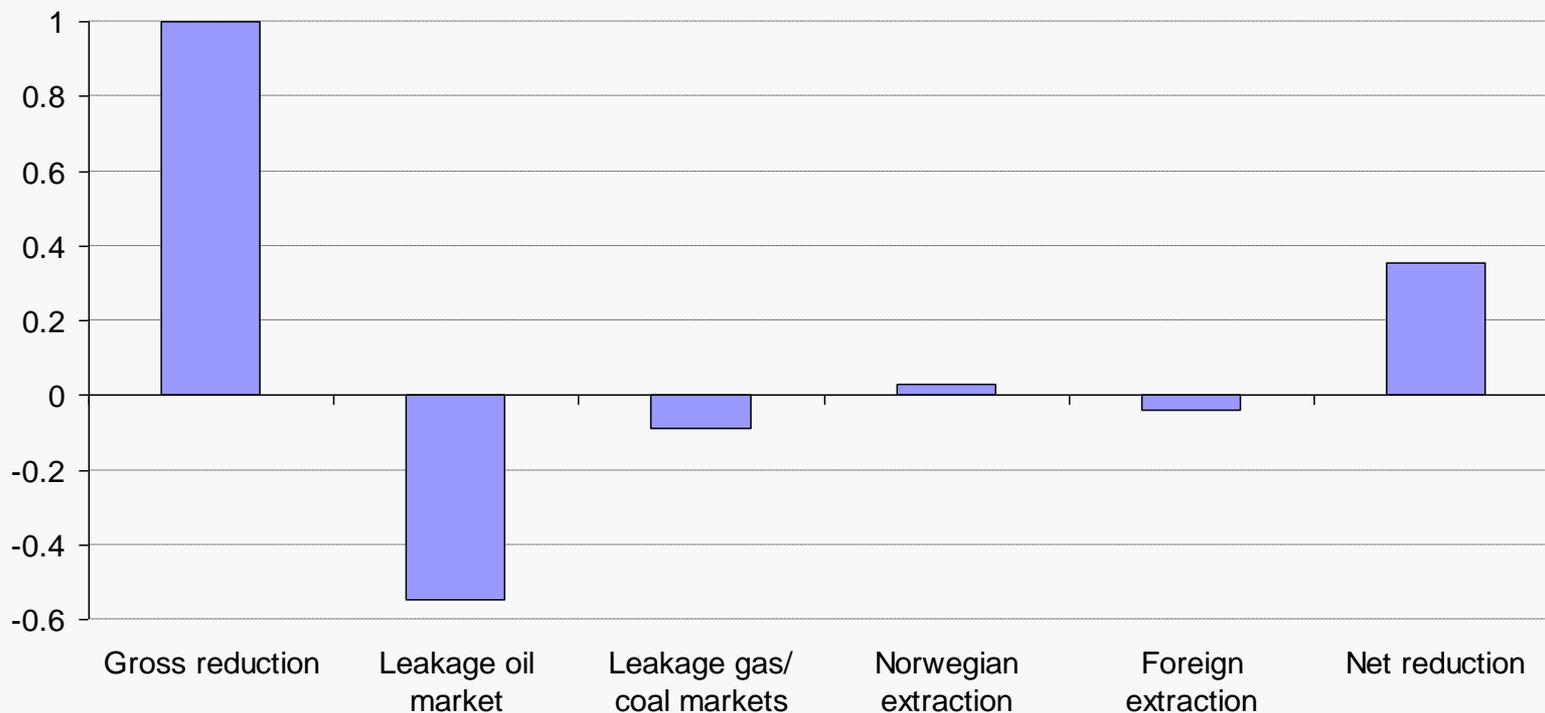
- Regional differences:
 - ♦ Middle East: 50 kg CO₂e per toe (2%)
 - ♦ Norway: 60 kg CO₂e per toe (2%)
 - ♦ Oilsands Canada: 570 kg CO₂e per toe (18%)
- Several oil fields above world average

Emissions per unit extraction of oil/gas in Norway (2012)



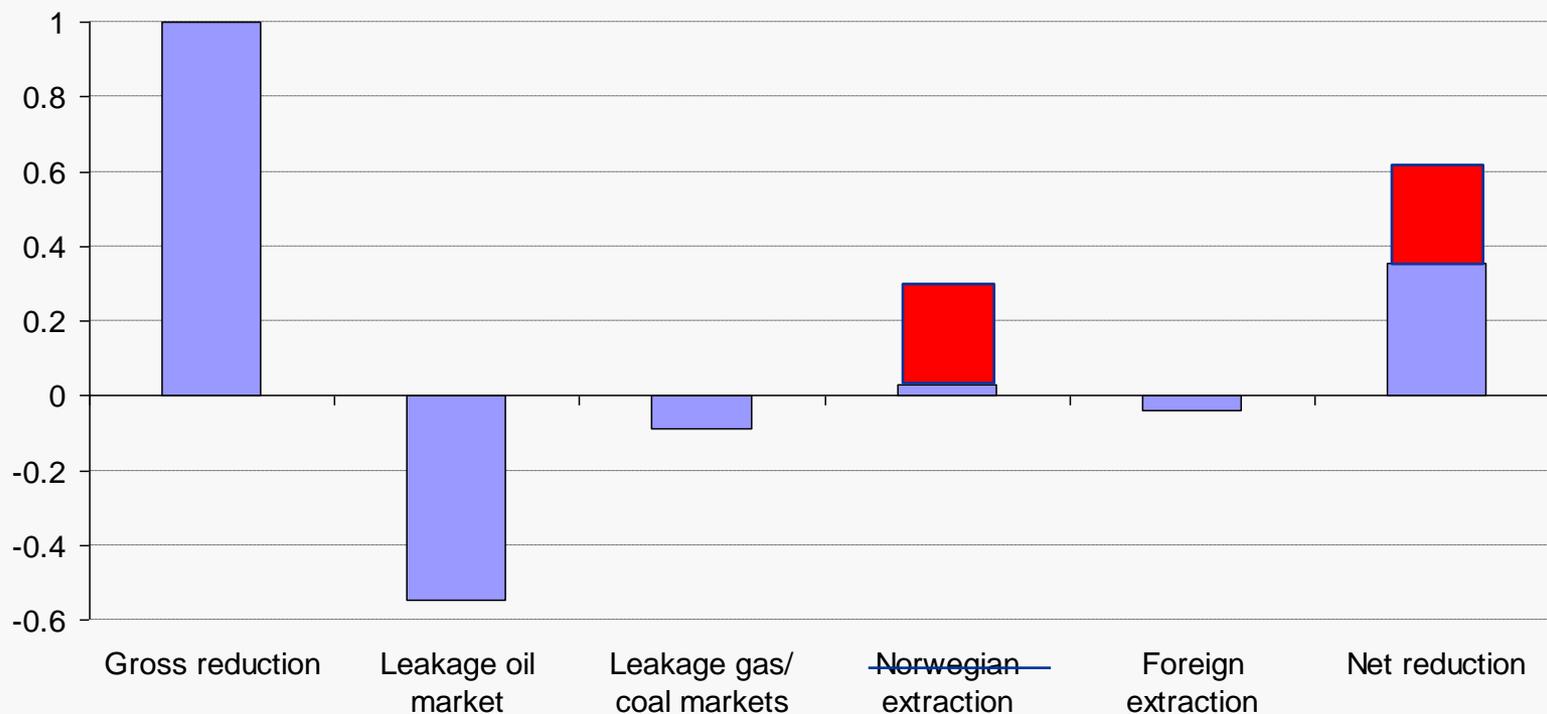
Emission effects of Norwegian oil extraction

- Summary: Effects on global emissions of reducing Norwegian oil extraction by one unit (CO₂-emissions)



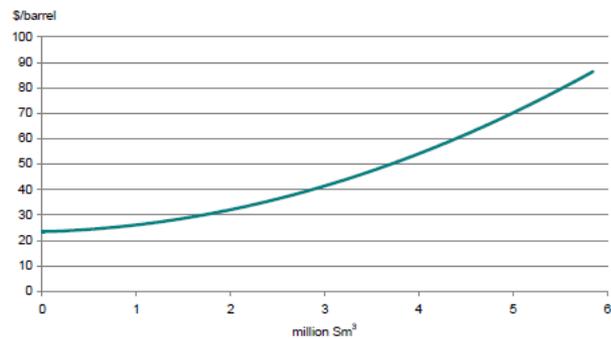
Emission effects of oilsands extraction

- Summary: Effects on global emissions of reducing oilsands extraction by one unit (CO₂-emissions)



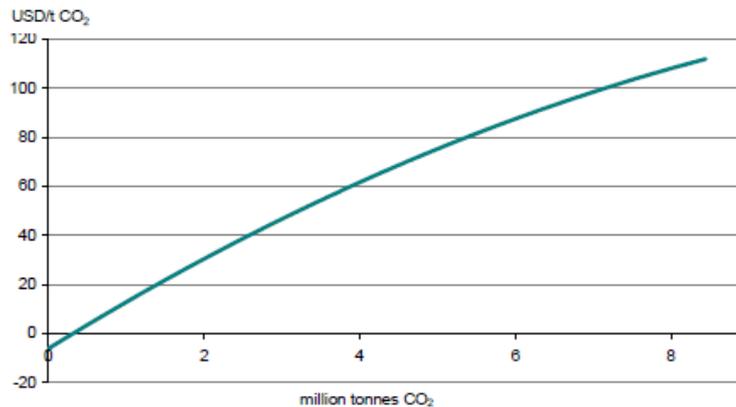
Can reduced oil production be a cost-effective climate policy?

Figure B1. Variable costs and corresponding production for nine Norwegian oil fields 2009-2011¹⁹



Source: Statistics Norway

Figure 2. Marginal foregone profits of reduced oil extraction for Norway



Conclusion

- Reduced oil production can be a cost –effective climate policy.
 - Premature closure of less profitable and emission intensive oil fields (often correlated).
- Exclusion versus exertion of influence?
 - Can ownership induce non-extraction/premature closure of certain oil fields (emission standards)?
 - Can exclusion lead to less global investment in oil extraction?

Thanks

- exclusion of coal and petroleum companies is a more effective strategy for addressing climate issues and promoting future change than the exercise of ownership and exertion of influence. The Group shall also advise on possible criteria for the potential exclusion of these types of companies.