

NORWAY'S EXPERIENCE IN DEVELOPING OIL AND GAS

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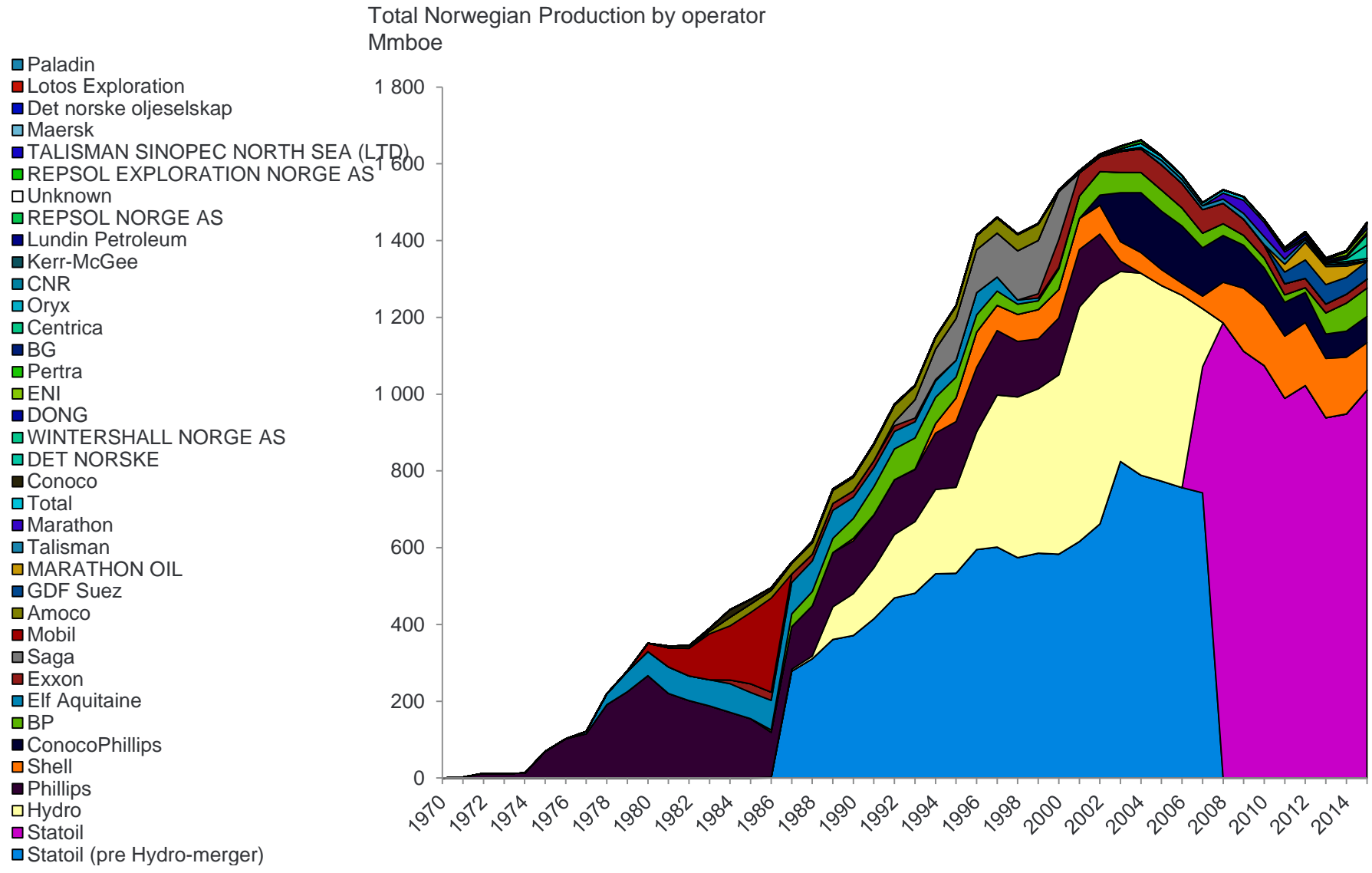
RYSTAD ENERGY

Key elements in the Norwegian model, difficult to copy to other realities

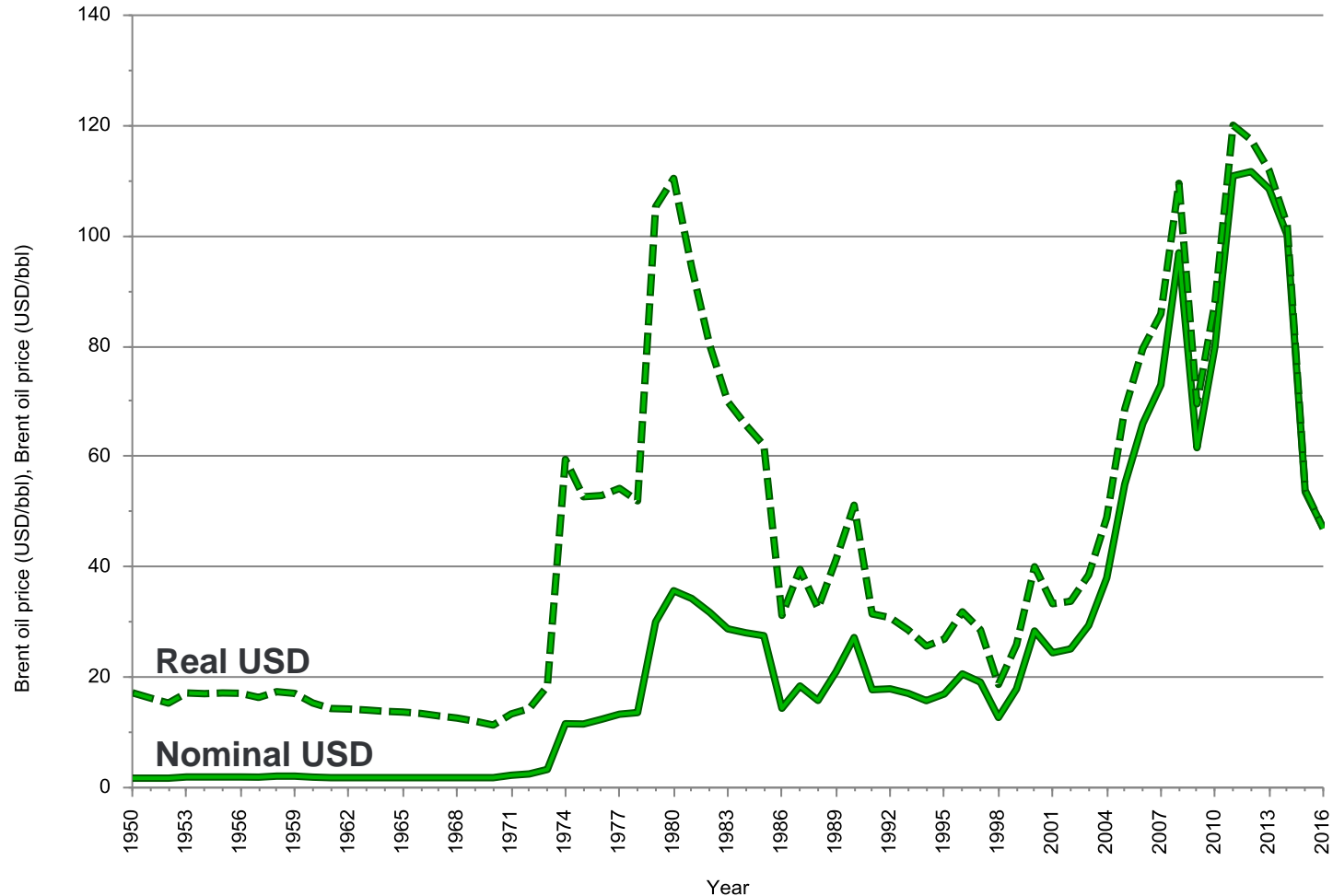
- ✓ National control over the activity should be achieved through regulation and not ownership
- ✓ Political consensus – no change in government Oil and Gas policy with changing government
 - ✓ Broad consensus on taxation
 - ✓ Broad consensus about Statoil ex SDFI in 1985
- ✓ Very limited political influence on Statoil management
 - ✓ §10 decisions an exemption

- ✓ Diversity of operators and use of Technical assistants
- ✓ Stable and efficient tax system and state direct participation (SDFI/Petoro)
 - ✓ Corporate tax
 - ✓ Petroleum tax
 - ✓ SDFI participation
 - ✓ Royalty
- ✓ Development of a competitive local petroleum industry – which should be able to export products
- ✓ Strong and independent institutions
 - ✓ NPD
 - ✓ Norwegian environment agency
 - ✓ Ptil

Diversity of operators was a key parameter for the development of the NCS – 10 operators participated in the first 15 years.



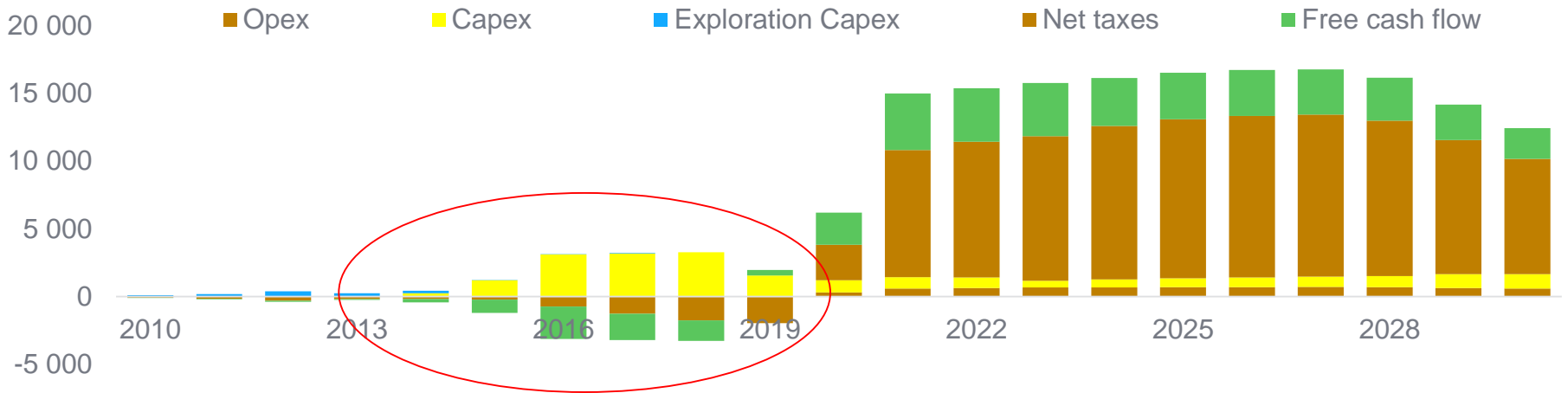
Stable government take system through 40 years, through changing oil prices.



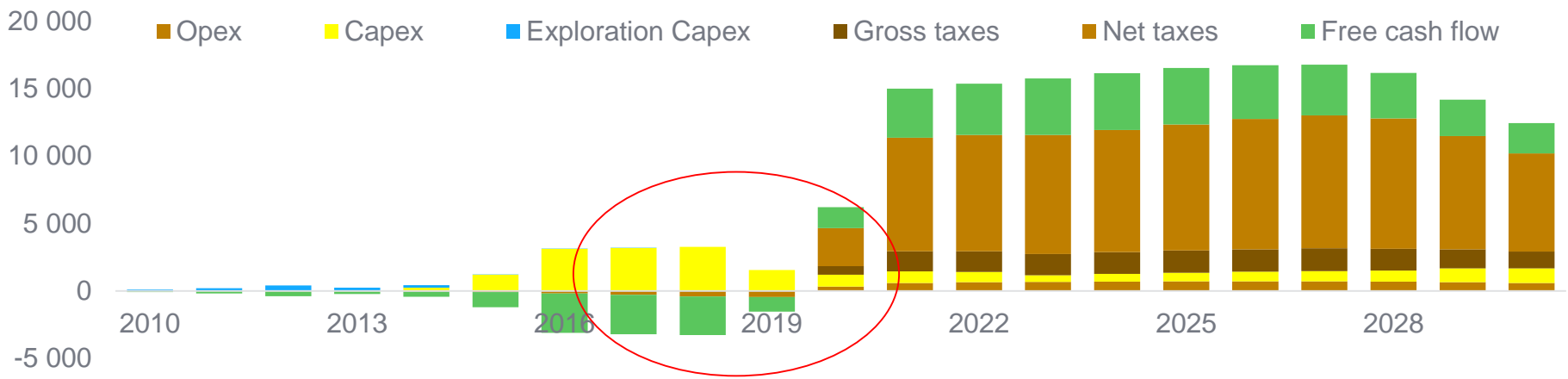
Source: Rystad Energy UCube, version 2016-10-11

The Norwegian petroleum tax is paid later in the lifetime of the project.

Cash flow profile for J. Sverdrup with the norwegian tax regime
MUSD



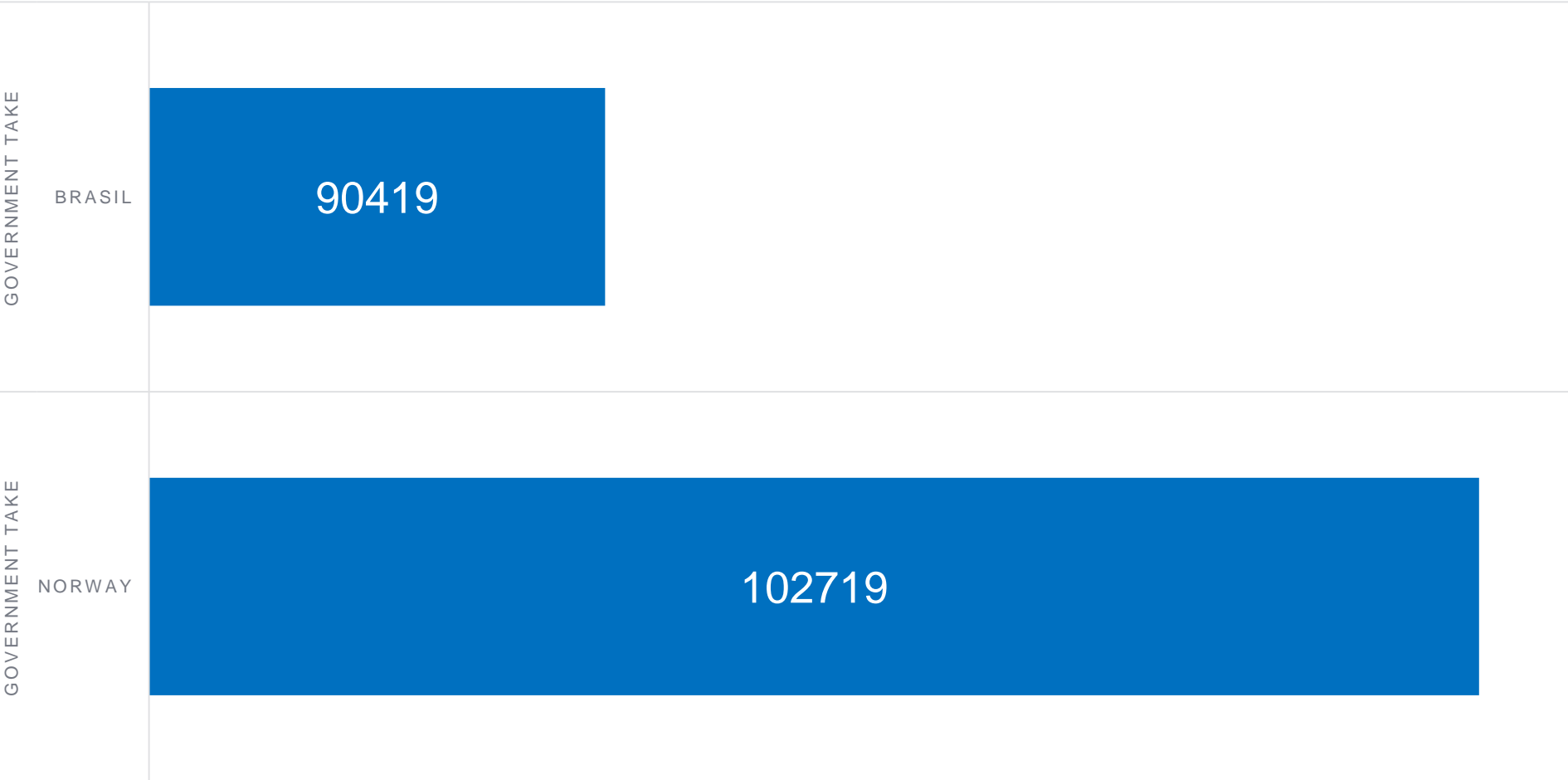
- Cash flow profile for J. Sverdrup with the Brazilian tax regime
- MUSD



Source: UCube

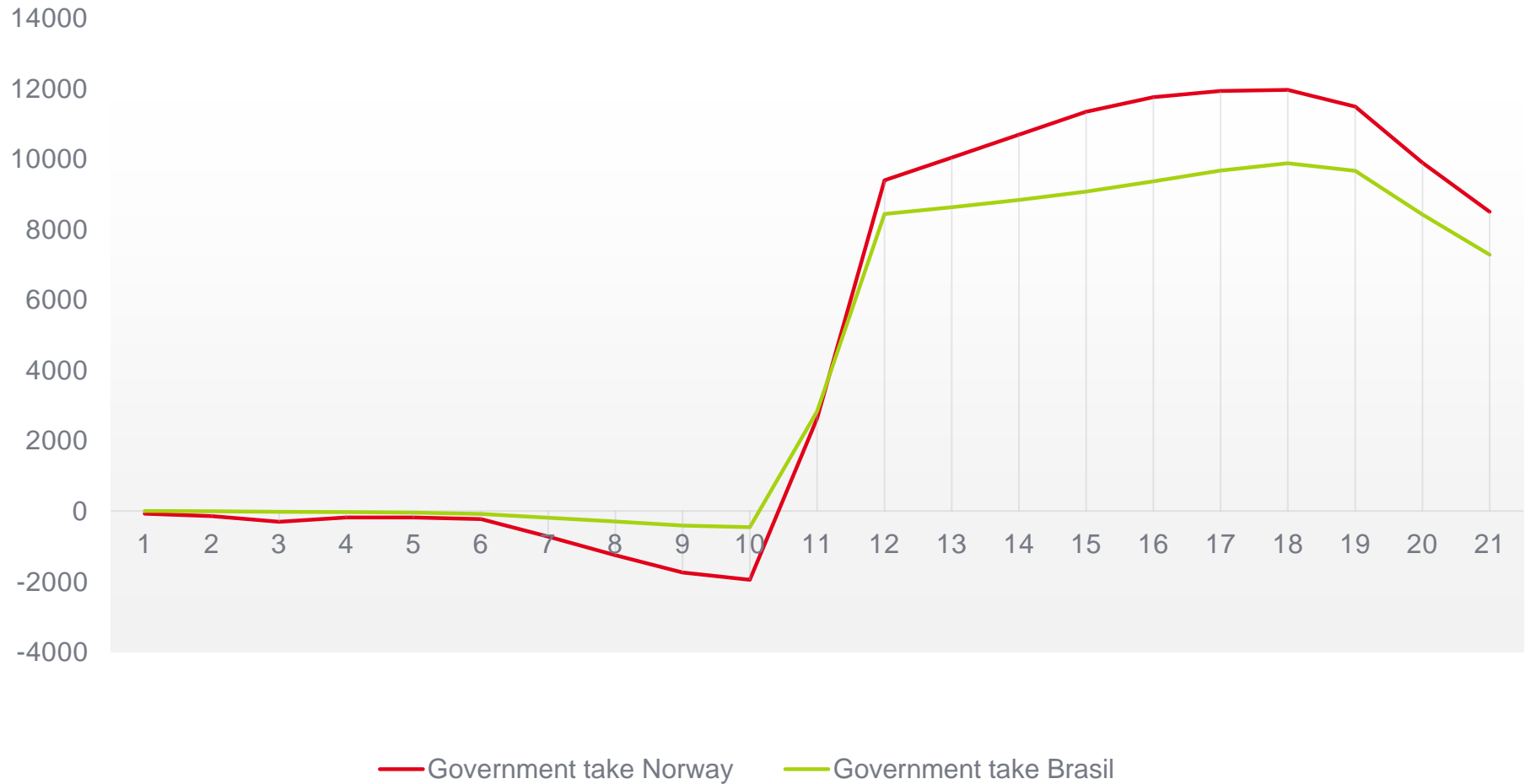
The Norwegian government take captures more revenues, but later in time.

NORWEGIAN PETROLEUM TAX COLLECTS 10 % MORE REVENUES



The Norwegian petroleum tax gives more tax credit in the early face – good for the company net present value

Government take profile in Norway and Brazil per year after first investment



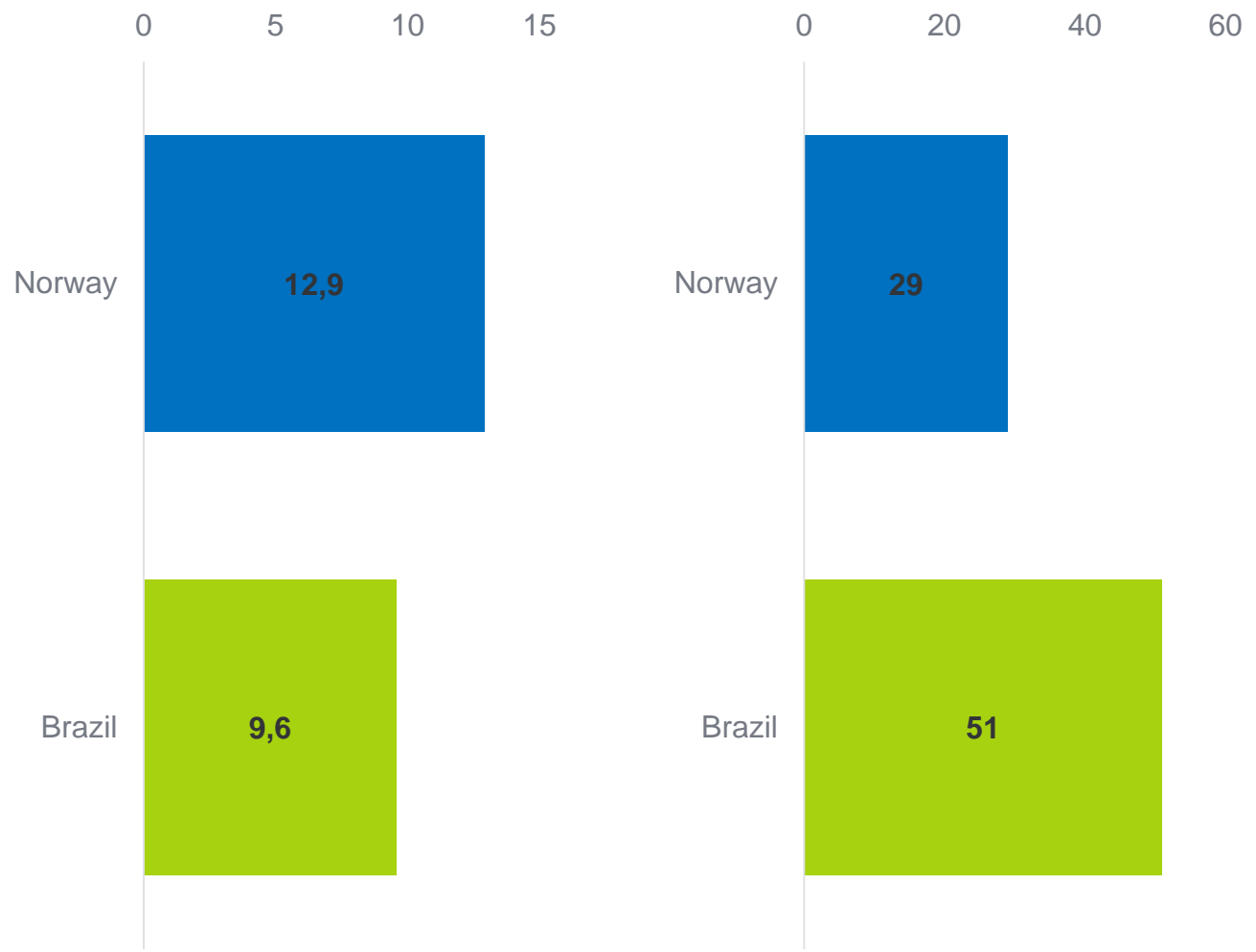
Comparison of field NPV and breakeven price between the Norwegian and Brazilian fiscal regimes

- NPV for J Sverdrup for different fiscal regimes
- MUSD

- Break Even price for J Sverdrup for different fiscal regimes
- USD/bbl

The chart to the right shows the NPV and breakeven price (BE) for the Norwegian asset J. Sverdrup. Both values are given for the fiscal regime in Norway and Brazil.

By comparing these regimes, it is observed that both the value and breakeven are more competitive in the Norwegian region



Source: UCube

Local content was important in Norway too – but the supply industry was developed in order to be competitive and export goods and services after NCS shut down.

- ✓ Few (if any?) formal requirements, but always a push to use Norwegian companies
 - ✓ Long list
 - ✓ Short list

- ✓ 3 requirements to the norwegian companies
 - ✓ Same quality
 - ✓ Same delievery time
 - ✓ Same price (+10%)

- ✓ Very clear understanding that it would not be good for Norway in the long run to create uneconomical employment

- ✓ The net-tax system countered expensive local content, because it reduced future tax revenues
 - ✓ Profit tax means that high costs will reduce tax revenues
 - ✓ Easier to align politicians and civil cervants

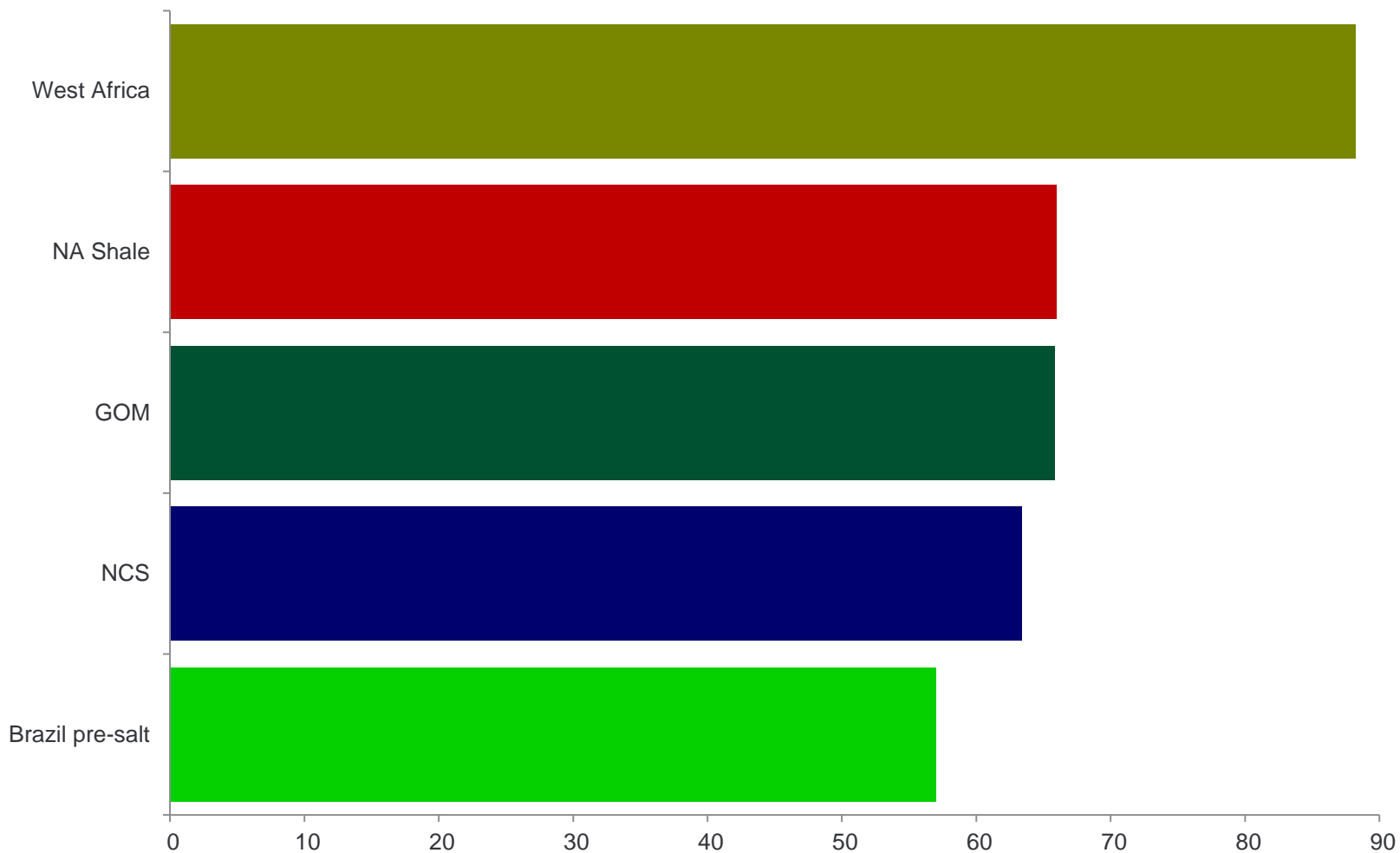
- ✓ The local industry was developed in tecnicallly advanced areas. Norway was already not a low cost country

What about Oil and Gas in Brazil?

Brazil pre-salt is competitive – but not independent of the framework and fiscal terms.

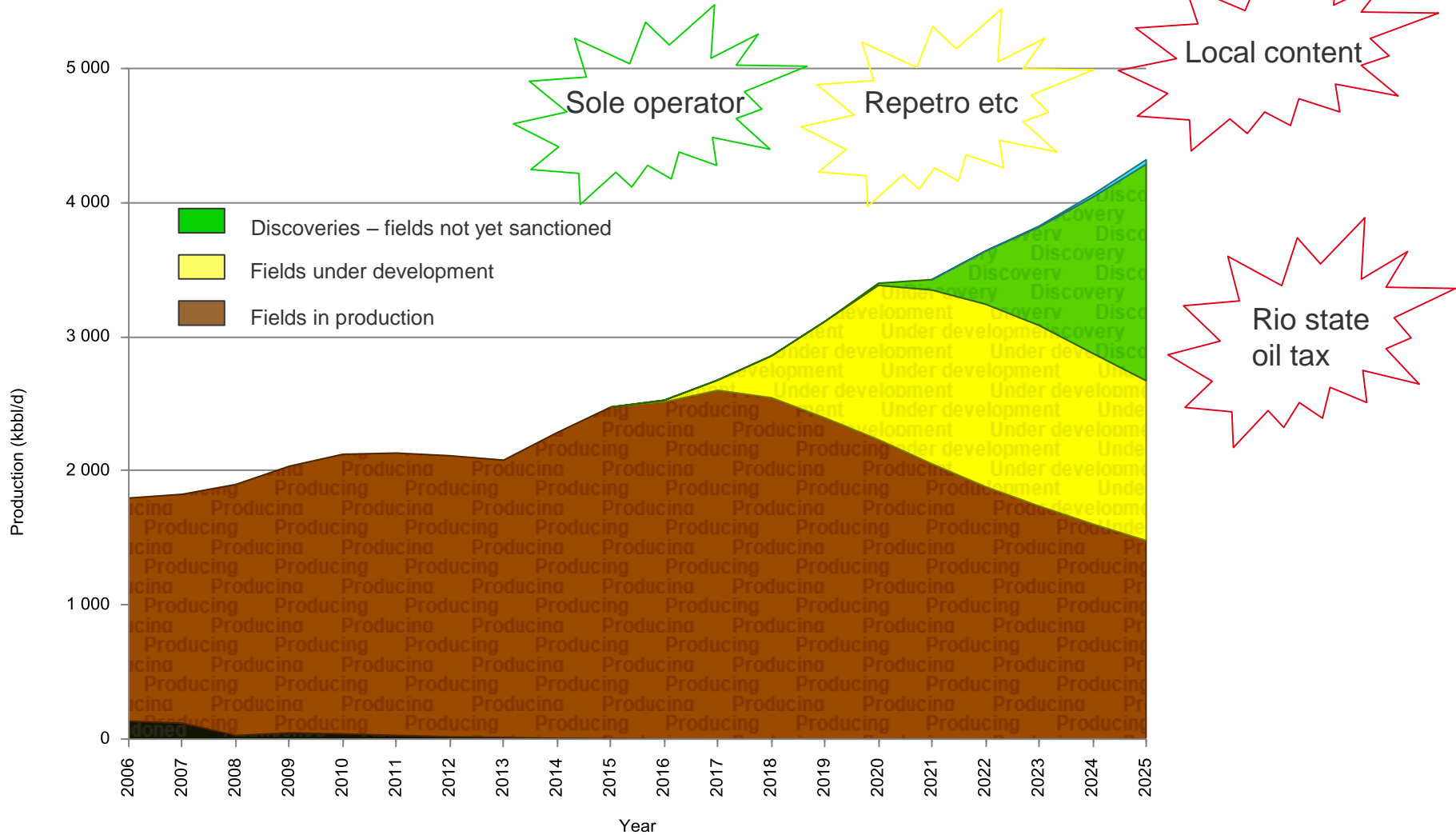
Average breakeven oil price for not yet sanctioned projects in different regions

USD/bbl



Source: Rystad Energy UCube September 2016

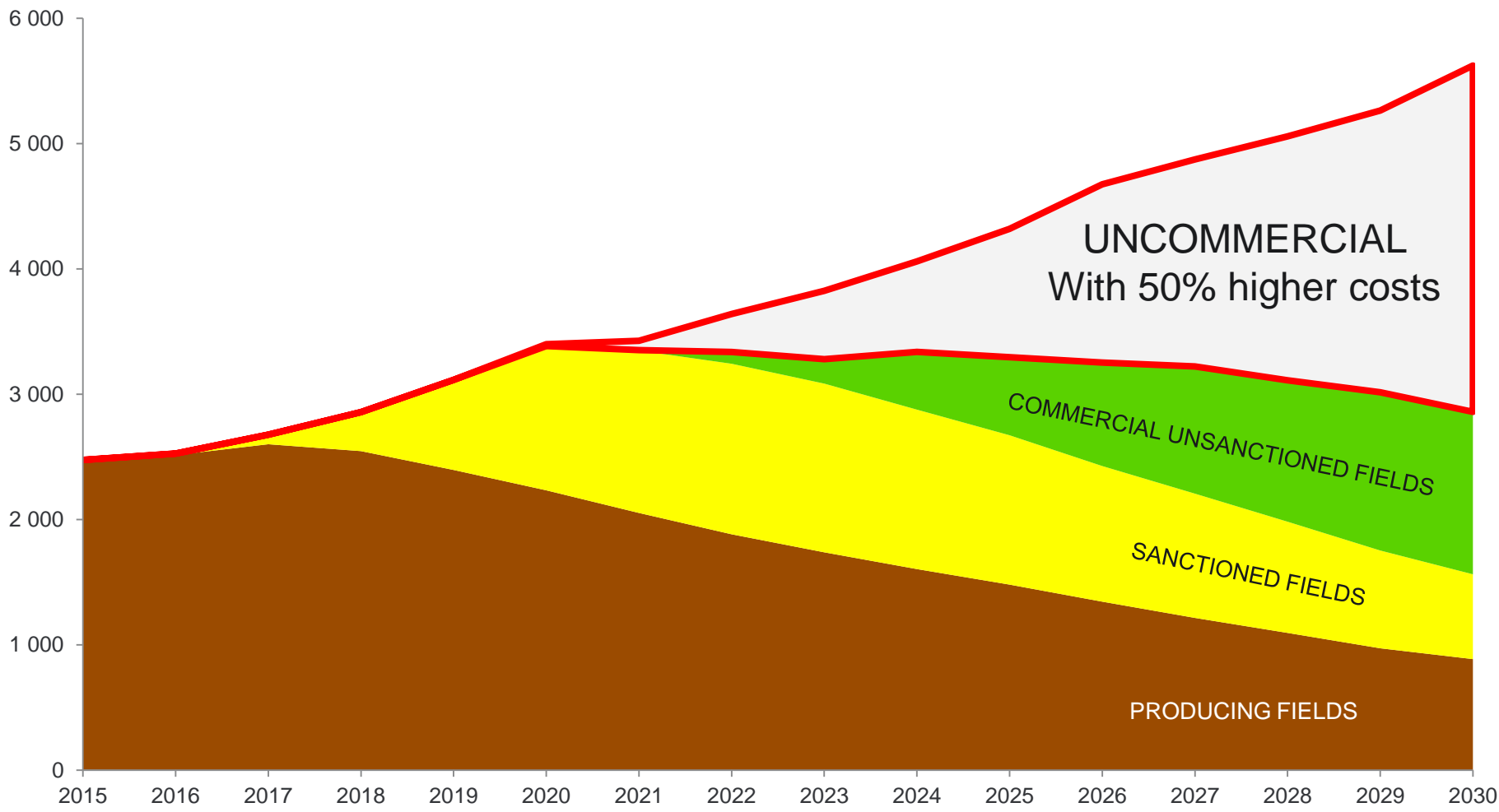
Will new fields be developed in Brazil after 2020 and contribute to growth?



Source: Rystad Energy UCube, version 2016-09-14

If no measures are taken, costs after tax can increase with ~50%. No growth after 2020, new projects will only replace production from mature fields

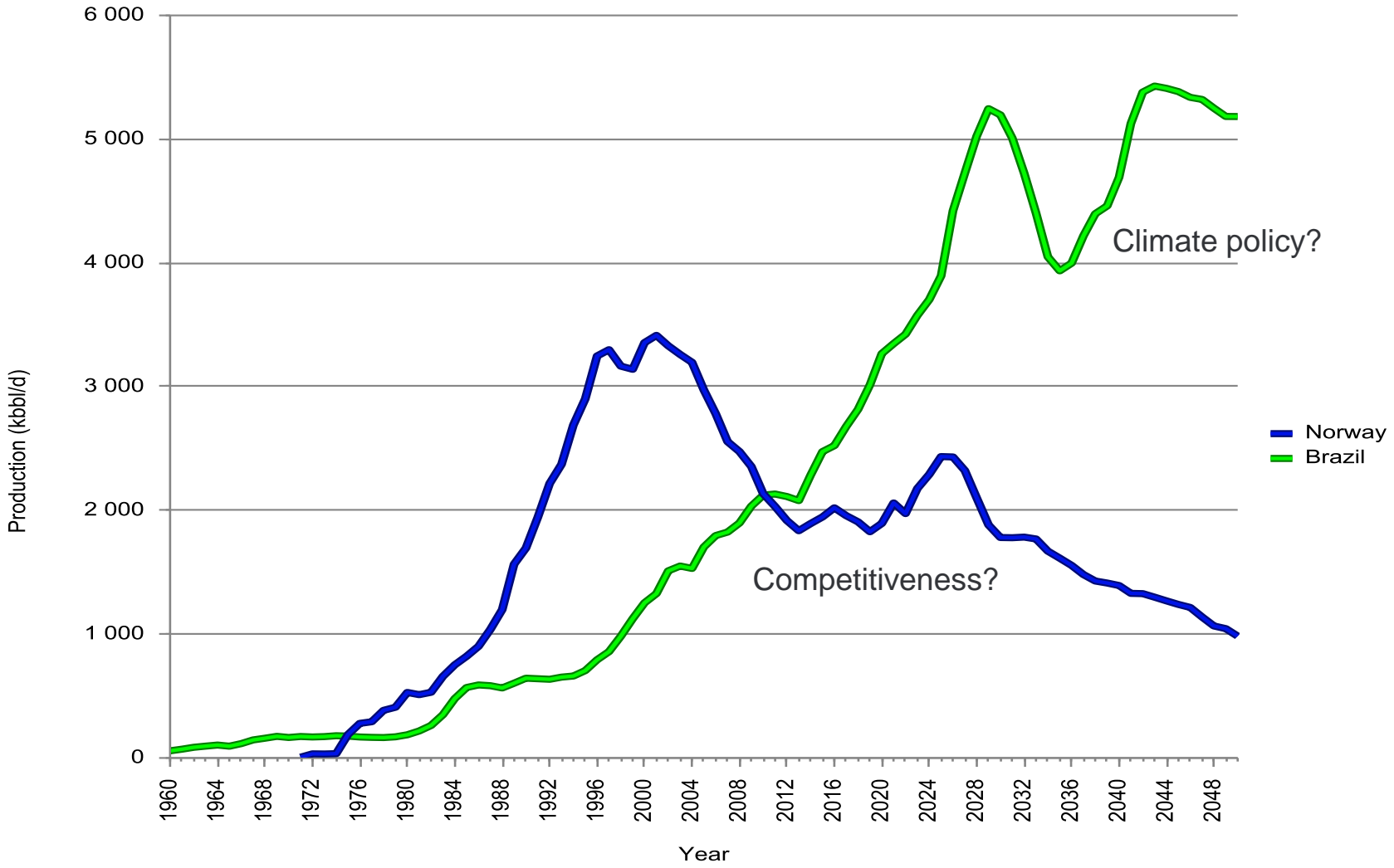
Liquids supply outlook for Brazil split by life cycle
Million bbl/d



Source: UCube September 2016



Is it important whether to grow fast? Can Brasil afford to wait?



Source: Rystad Energy UCube, version 2016-10-11

Can we transfer the Norwegian experience to Brazil ?

Could be considered:

- ✓ *Try to establish a political consensus for the oil and gas policy*
- ✓ *Ensure diversity of operatorship to assist innovation and value creation*
- ✓ *Develop a competitive local industry with ambitions to export goods and services*
- ✓ *Develop independent institutions which can support the government with skilled, unpolitical recommendations*
- ✓ *Simplify the tax system*
- ✓ *Keep the government take stable*

Reasons to be careful:

- ✓ Brazil is much larger and complex
- ✓ Brazil has a more diversified culture and less trust between people
- ✓ Brazil already has a Oil industry and had it for several years
- ✓ It takes time to develop mature, competent, independent governmental institutions