

Petroleum and knowledge – The Norwegian experience

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The issues

- Developing human resources for the petroleum industry
- Managing continuity of knowledge in a cyclical industry
- Training for managing practical problems
- Training for strategic management

Historical overview

- When the international oil industry approached Norway in the 1960s, there was little insight into petroleum matters, but a record of controlling natural resources (hydropower and fish)
- Within a generation Norway built one of the world's larger petroleum industries
- Norway is also a major exporter of petroleum-related technology and goods and services
- Norway emerges as a relatively successful case of cooperation between private and public interests

Situation in Norway in 1970

- Industrialised economy:
 - Heavy industry based on hydro-electricity
 - Shipping
 - Shipbuilding
 - Mechanical industry
- High level of education
 - Skilled workforce
 - Entrepreneurial culture
 - Scientific competence

National strategy and objectives

- To control all phases of the activity
- To gain insight into technology, markets and operations
- To favour national interests over foreign investors
- To draw on foreign investors' insight (IOCs)
- To gain value added in the entire value chain, including the supply industry
- To invest in specialised education

The technology and industry cooperation

- A more comprehensive programme of technology and industry cooperation was introduced in 1979, embodying:
 1. Projects between Norwegian industry and foreign oil companies "*Industry cooperation*"
 2. Projects between Norwegian research institutions, universities and foreign oil companies "*Technology cooperation*"
 3. Bilateral cooperation with foreign governments

Technology cooperation

- Agreements between Norwegian research institutions and *foreign* oil companies, contributing funding, personnel and competence, directly related to petroleum.
- Three types:
 1. 50%-agreements
 2. Effort agreements
 3. Good will agreements

The procedure

- Targets on sums and shares, no specification of contents or suppliers
- Protective frame, but flexibility and competition without central planning
- Inter-ministry coordination poor
- Even if the outcome was arbitrary and many projects were of limited value, the total effect was a quick and comprehensive build-up of Norwegian petroleum-related competence

The significance of Norway's experience

- A strong oil producer state with clear industrial objectives can benefit from the presence of IOCs
- Norway had a far better point of departure than most other oil exporters
- Norway shows the salience of developing knowledge as a basis for value added as well as control of activity

A critical view

- The protection of the supply industry was carried too far for too long time; by the early 1990s, the Norwegian share of supplies was above 90 per cent; now it is around 50 per cent
- The research and development effort was essentially applied; it has not been matched by a corresponding effort in basic research that is required for an industrial cluster with a long-term competitiveness; funding has been fragmented and institutions are insufficient

The present

- Relatively good supply of petroleum engineers, geologists etc., but recruitment cyclical, dependent on oil prices
- Some ideological version to petroleum careers
- Need to include renewable energy
- Poorer supply of economists, lawyers, etc., with insight into petroleum matters
- Managerial crunch as leading personnel that has been in the industry for decades, ages and leaves
- Newcomers have fresh views, but limited experience

The challenges

- Secure managerial competence
- Educate personnel with relevant economic and financial insight, as well as petroleum lawyers
- Secure recruitment
- Secure continuity of employment and prevent loss of competence as the industry consolidates

The efforts

- Relevant technical and scientific education at major universities
- Relevant economic education at major business schools
- Government and industry sponsored research programmes
- Cooperation with foreign institutions

BI Norwegian School of Management

- Graduate programme in energy economics
- Executive energy management programme with IFP and ESCP (France)
- From 2010 EMBA in energy with IFP and Nanyang University (Singapore)
- Further plans include Azerbaijan, Russia and Latin America