Three decades of scenario planning in Shell: experience and possible extension in the future

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Motivation

Changes, triggered by unexpected events, can occur abruptly and have very negative consequences...

... or they can create new opportunities like opening new...
Motivation

- conditional opportunities
- Holding options is risky
- dependence on external environment
- Forecasts based on the past are unsuitable

"Prediction is very difficult, especially if it's about the future."

--Nils Bohr, Nobel laureate in Physics
Bad forecasts

International Crude Oil Prices,
Actual and IEW Medians

Source: International Energy Workshop; Part 1: Overview of Poll Responses
Scenarios at Shell

Scenarios vs Forecasts

The Present

The Path

The Future

Forecasts

Current Realities (mental maps)

Multiple Paths

Alternative Future Images

Scenarios

For more info on Shell scenarios see:
www.shell.com/scenarios
Scenarios and the aspired portfolio
“The picture’s pretty bleak, gentlemen.....The world’s climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut”
Real options (r.o.)

- Real options right, but not the obligation, to take an action

- acquired through investment

- they are a valuation methodology

- A alternative to Discounted Cash Flow (DCF) methodology
Real options– example and limitations

The four phases of oil exploration

timeline

Early Exploration | Late Exploration | Development | Exploitation

decision | decision | decision | decision

Option on option on option on underlying asset
Option on option on underlying asset
Option on underlying asset
underlying asset

But…
- underlying financial asset?
- valuation uncertainties
- ‘price-taker’?
- guidance of history
Scenarios and real options:

1. Help identify real options

2. Evaluate real options and linked uncertainties:
   1. Endogenous: project related, relatively easy to identify and evaluate.
   2. Exogenous: socio-economic-political environment

   - Scenarios provide the volatility
   - They can help identify, create, evaluate and time a r.o.
Growing exogenous uncertainties

Outliers: China, India, Venezuela, Equatorial Guinea, Angola, Nigeria
Example: the US natural gas market
Example: the US natural gas market

Qualitative casual thinking on the US natural gas market

- CCGT emerges as the better generation technology
- More investment in CCGT plants
- Increase in demand for natural gas
- Natural gas price increases and becomes more volatile
- Natural gas is favoured over petroleum as fuel for power plants
- Natural gas is favoured over alternative fuels for domestic heating
- Cheaper US gas reserves deplete
- People are becoming more health conscious
- US States adopt greengas reduction policies for powerplants
- Natural gas is favoured over alternative fuels for domestic heating
- Cheaper US gas reserves deplete

Historical behavior of source uncertainty

Endogenous factors

Exogenous factors

Discontinuity

Potential future behavior of source uncertainty
Conclusions

- Scenarios not fully used for investment decisions
- Real options are difficult to apply
- Increasingly uncertain business environment

Scenarios and real options:

  - As a tool to identify real options
  - As an alternative way of evaluating real options

- Help close the gap finance vs strategic planning