SESSION III: Pop-Up Talks

1) Simon Collander-Brown, DSTL
2) Anant Prakash, BP
3) Simon Cook, Southern Water Services
4) Rosalind West, DEFRA
Specialist: Jan Kwakkel
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Problem Statement

• How do we plan for the Future Requirements for Defence?

• Complexity of problem
  • Uncertain context
  • Knowledge of system is incomplete
  • Some systems are inherently uncertain
  • Systems change in response to our decisions
  • Systems change in response to other peoples decisions
  • Others may be trying to play the system to gain advantage
  • Others may be trying change the system to gain advantage
Approach

• Currently use “scenario” planning
  • Build small numbers of plausible futures
  • Complex analysis to identify which factors drive outcomes
    • Any shortfalls in capability
  • Process designed to tie in key decision makers
Results and Feedback

• Current method gives useful results
  • Slow
  • Expensive
  • Doesn’t deal with uncertainty well

• Other methods being examined
  • Generally for simpler systems
    • Shorter time frames
    • No or constrained opposition

• Want to test hybrid methods in near future
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Problem Statement

• What problem did/does your organisation face?
  ➢ Planning price, or oil price assumption

• How was/is this problem complicated by elements of uncertainty?
  ➢ Uncertainty of oil price
  ➢ Risk of sub economic investments and projects
  ➢ Plenty of scenarios, forecasts, predictions and forward strips available – but huge range.
  ➢ Strategic complications – Commitment to dividend. Changing Geopolitics. Sector deflation.
  ➢ Time horizon for typical oil and gas investments to turn cash flow +ve is 8-10 years
Approach

• How did/does your organisation make decisions in light of the uncertainty it faces?
  ➢ Bottom up analysis
  ➢ Price and profit calculations for various assets
  ➢ Deterministic calculations and sensitivities
  ➢ Development of scenarios, portfolio analysis
Results and Feedback

• What decision did your organisation make, and how was this informed by the preceding uncertainty analysis?
  ➢ Allocation of capital: Projects, workforce, capex, opex
• What challenges or limits did your organisation experience in implementing the decision-making process?
  ➢ Uncertainty on realisations
• How were the results of the decision-making process communicated to the ultimate decision makers/insiders/shareholders/public etc.?
  ➢ Complex analysis. Simple charts.
• How could your decision-making process improve?
  ➢ Faster analysis and turnaround, less complexity. Probabilistic considerations.
• How can the research community support improvements in your decision-making process?
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Risk and Uncertainty for Water Resource Planning

Simon Cook
Problem Statement

- Southern Water have a statutory obligation to produce a Water Resource Management Plan for a minimum of the next 25 years
  - Weather Variability and Drought
  - Climate Change
  - Impacts of New Technology
  - Source Behavior and Lack of good historic observations
  - Water Quality
  - Forecasts of Demand (Population Growth, Development, behavior)
  - Environmental Impacts
  - Limits of Resource Models (Data, Computing Power)
  - What Options are Available
  - Where and how should we invest for the future
Approach

- Adopted a stochastic Approach to Weather Variability (Rainfall)
- Multiple Climate Change Scenarios (Perturbations)
- Multiple Growth Scenarios for Demand
- Integrated Monte Carlo Approach for Supply/Demand Balance
  - Target Headroom
  - Accounts for all major sources of uncertainty
- Investment model reflects multiple states of the world
  - Dry, Normal, Intermediate
- Investigated a Real Options approach for no regret investment
- Statutory Consultation Period + Informal engagement with regulators and stakeholders
Results and Feedback

• Weather Generator wasn’t perfect (PET and Bias correction)
• Technically Difficult / Harder to communicate
• High degree of challenge from regulators
  – New and advanced techniques (lack of acceptance/confidence)
  – Southern Water were going it alone
• Approach has informed guidance for next set of Water Resource Management Plans for all companies
  – Better Accounting for uncertainty and risk
• Future Plans
  – Further develop and extend the approach
  – Improve estimates of Resilience (Reliability and Failure models)
  – Extend real options,
    • Better capture customer and environmental preferences
  – Better Environmental Forecasting
    • Sustainability and Resilience
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Identifying priority risks in the 2\textsuperscript{nd} Climate Change Risk Assessment (2017)

Dr Rosalind West
Defra Climate Change Adaptation Team

With thanks to Kathryn Humphrey & the Adaptation Sub-Committee of the Committee on Climate Change
**Problem Statement**

- **The Problem:** How to identify the **most urgent risks** from climate change for government to consider in the next five years.

- **Uncertainties** at every stage:
  1. Assessing the **current and future level of risk**
  2. Estimating the **effect of planned and autonomous adaptation on residual risk**
  3. Assessing **benefits of action in next 5 years**

- **Outcomes** affect national adaptation plans of the UK government and devolved administrations
CCRA 1 (2012)

- 100+ risks and opportunities from climate change in the UK.
- Large programme of external evidence and research work
- 11 sectors

CCRA 2 (2017)

- Identify policy areas: with barriers to adaptation and/or
- where adaptation is most urgent during 2017 – 2022

Key issues for CCRA 2:

- How climate interacts with socio-economic factors in affecting risk
- How the effects of adaptation actions are/could alter risk levels
- How climate change overseas could affect the UK
ASC’s approach to urgency scoring

1. What is the current and future level of risk?

2. To what extent is the risk going to be managed, taking into account government commitments and autonomous adaptation?

   - Significant adaptation shortfall

3. Are there benefits to further action, over and above what is planned in the next 5 years?

   - Yes
   - No

   - Policy intervention
   - Research priority

   - Sustain current action
   - Watching brief

N.B. This method is still a work in progress and subject to change.
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SESSION III: Q & A

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