UNFCCC side event SB46

Quantitative models: From the basic to the highly complex

Methodologies for assessing impacts of mitigation actions

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Overview

- Introduction to ‘modelling approaches’
- Options for obtaining modelling expertise
- Two examples

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Why do people do modelling?

- We cannot do macro-level experiments…
- … but we are faced with complex questions
- Models provide a simplification of reality
- They can quantify impacts, trade-offs, expected future gains, level of “risk”
- Sometimes they identify unintended consequences
  - check assumptions/theory
- Recently…
  - computing power has increased
  - better data have become available

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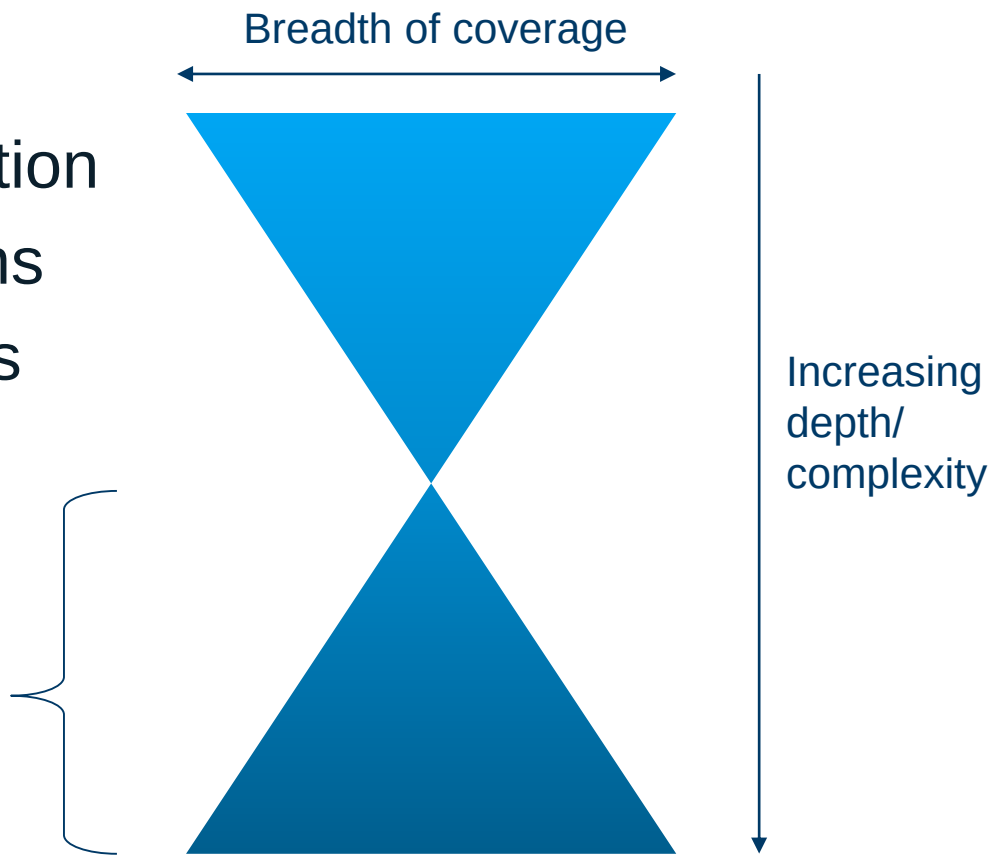
Types of quantitative ‘modelling’

- Simple analysis
- Econometric estimation
- Systems of equations
- Input-output analysis
- Partial modelling
- General modelling
- General modelling



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Introduction

- We are often asked the following question by groups interested in starting modelling:

Is it better to develop our own modelling tool or to contract out modelling work?

- There is no easy answer to this – it needs some careful thought! But the three main options are:
  - develop a model for use in-house
  - licence an existing model
  - contract out modelling work

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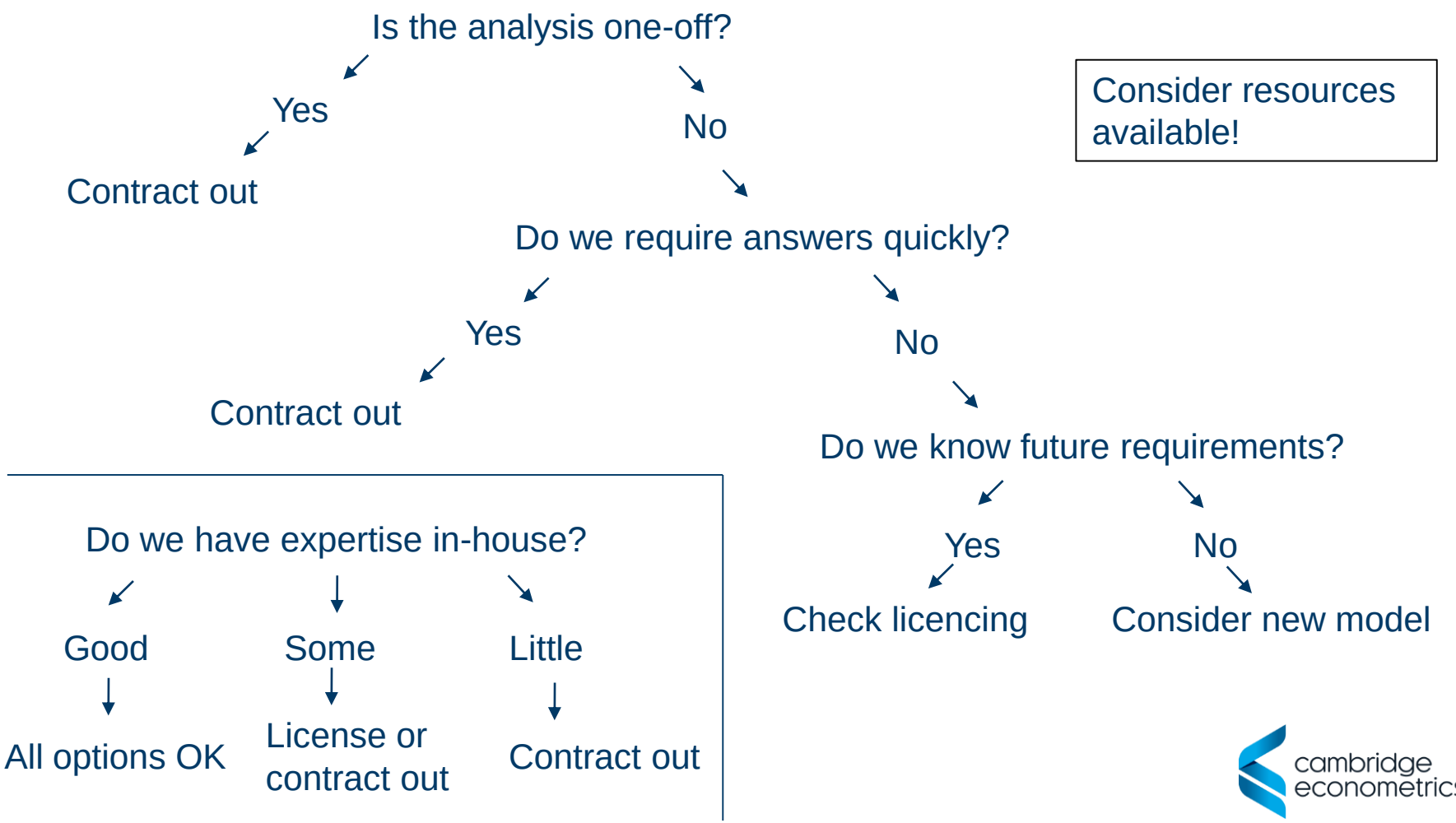
Summary Flow Chart



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Example 1: Modelling in Azerbaijan

- Part of a study to assess decarbonisation and diversification in production in Azerbaijan
- There is limiting existing modelling capacity – but available data for economic production and energy consumption

SIM4NEXUS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 689150 SIM4NEXUS

Example 1: Modelling in Azerbaijan (cont.)

- The available data can be combined (at relatively low cost) to form a basic modelling framework
- This can be used to assess e.g:
  - types of activity that would be required to replace oil production
  - effects of reducing domestic energy consumption on production
  - which policies might best help Azerbaijan in transition

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Example 2: Modelling in India

- Many global energy-economy models already cover India, and several national models exist
- But a lot of policy is determined at state level and previously no models separated the states
- The E3-India model was created, based on state-level data to give information to state-level policy makers

e3-India

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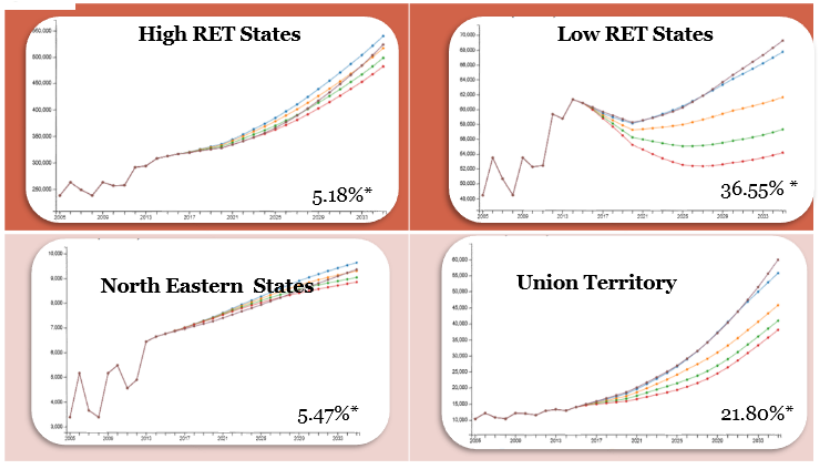
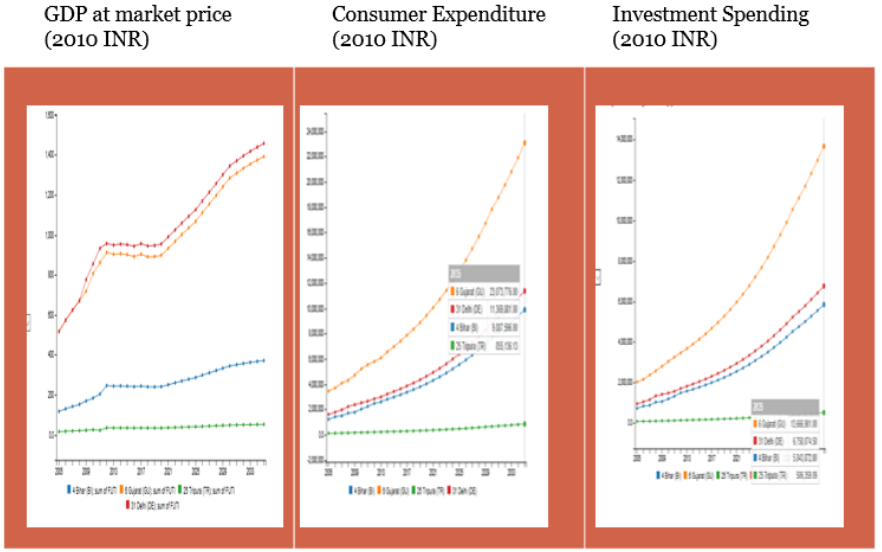
Example 2: Modelling in India (cont.)

- The cost to build the model was relatively high but the tool will now be available to researchers in India and permanent capacity has been developed





e3-India

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Conclusions

- Quantitative analysis can play an important role in both planning and assessing policies
- It is not always necessary to use large and complicated tools – it is possible to gain insights even with limited time and data
- There are three main options for developing modelling capacity, each with its own benefits – a preliminary scoping exercise can help to identify which option is most suitable

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