Department of Energy & Climate Change

Modelling in DECC an Overview

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Introduction

- Overview of modelling landscape
- Some examples
- Modelling strategy
- Modelling Quality Assurance
- Challenges

# Overview of the modelling landscape

Background

- Modelling is a key part of DECC's evidence base
- Central to
  - setting the UK's carbon budgets
  - assessing the impact of policies on emissions, energy markets, households, businesses and the wider economy

Modelling Objectives

- Effective in supporting evidence-based policy making

- Accessible for policy teams, open to all and trusted by the department and wider stakeholders

- Coherent and coordinated

- Consistent and transparent in the use of assumptions

- Efficient in the use of resources

Overview of the modelling landscape
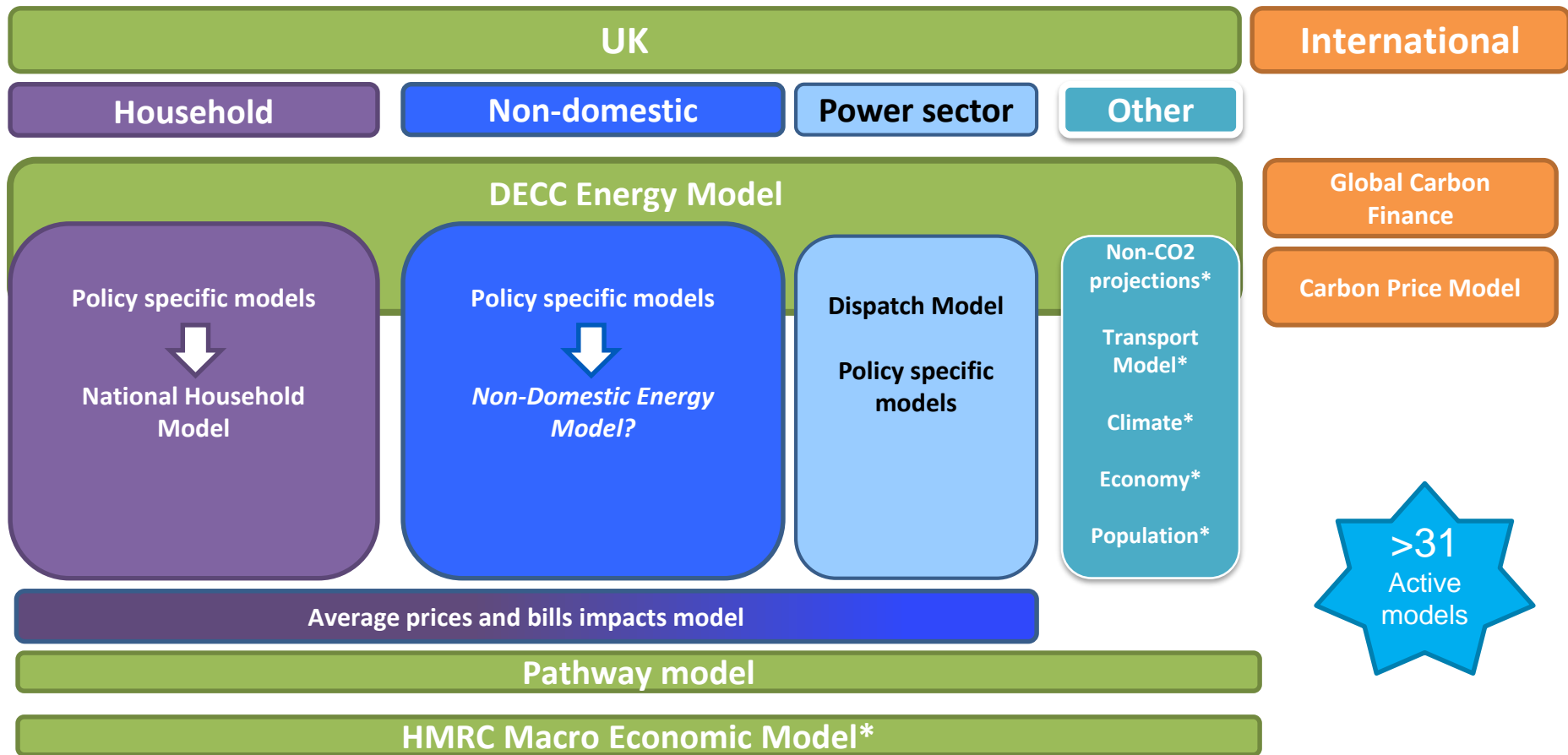
Carbon Budgets / Long term pathway

Least cost optimisation tools

- We have used MARKAL, ESME

- Transition to UKTimes

Process

- Build evidence base

- Develop model and constraints

- Develop least cost trajectory
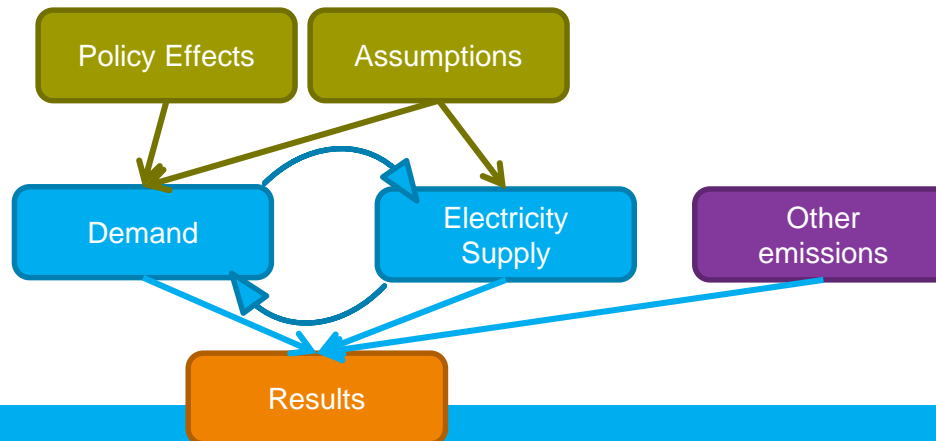
- Relax or introduce constraints to gain insights

Energy and Emissions Projections

Econometric plus other models

- DECC developed core

- Links to electricity despatch

- Projects the

  - effect of policy on carbon budgets

  - energy demand

Process

National Household Model

Policy simulation

- Domestic energy modelling software
- Energy calculator
- Data driven

Policy modelling – effect of

- Energy demand - GB housing stock
- Installing energy efficiency measures
- Consumer choice
- Fuel prices over time
- Weather conditions over time
- Housing stock change
- Heating schedules
- Financing

```
(policy name: " Choice on install of heat pumps"

    (target name: "Urban houses"
        group: (group.filter
        (any
            (house.morphology-is Urban)
            (house.buildyear-is above: 1920)
            (house.has-boiler)))


        exposure: (schedule.time-series
                    (expose on:01/01/2015 (sample.proportion 0.2))
                    (expose on:01/01/2016 (sample.proportion 0.3))
                    (expose on:01/01/2017 (sample.proportion 0.8))
                )

    action: (choice

        (finance.with-subsidy
            subsidy: 100
            counterparty: JR

        (measure.heat-pump
            cop: 2.2
            cylinder-insulation: 50
            type: AirSource
            cylinder-volume: 110)

        )
        (finance.with-subsidy
            subsidy: 500
            counterparty: JR
            (measure.heat-pump
                cop: 2.2
                cylinder-insulation: 50
                type: GroundSource
                cylinder-volume: 110)

        )

    select: (select.minimum
                (house.emissions)))
```

Modelling strategy

Modelling forum to encourage

- collaboration
- skills

Publish models

- constructive challenge
- improve quality

Assurance process

- standardise and support
- measure progress metrics
- harmonise assumptions and inputs

Model Quality

Modelling Quality Assurance

- Changed environment for models in government

- Increased focus on assurance

- Demonstrating application

- Applies to all
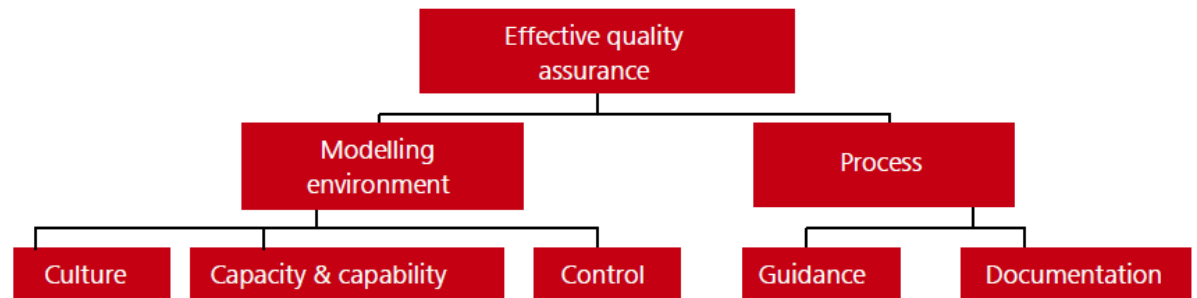
Challenges

Harmonising model inputs

- Data

- Assumptions

- Feedback

Model integrity

- Assurance

- Spread sheets

Knowledge management

- Staff movement

- Document storage and search

- Transparency