Spatial Modelling of the Energy-Land-Water Nexus: Challenges and Opportunities

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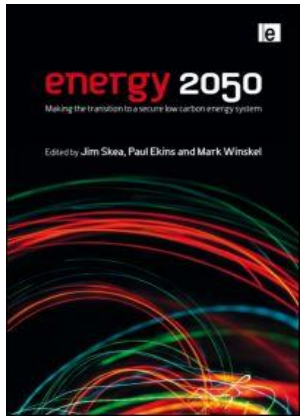
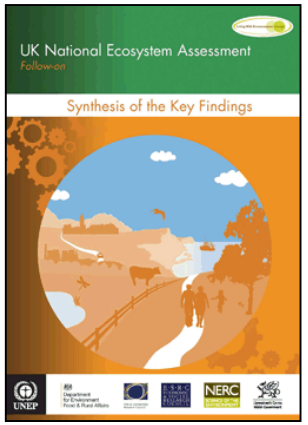
The Energy – Land – Water Challenge





Decarbonising the UK Energy System

Incorporating Natural Capital and Ecosystem Services into Decision Making

Global Context

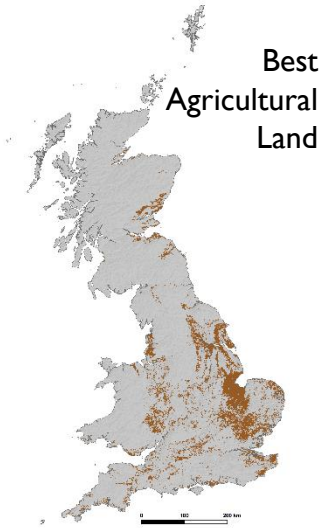
Greenhouse Gas Emission Reductions

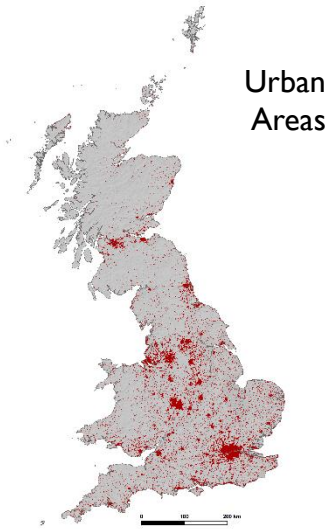
Cimate Change Act (2008)

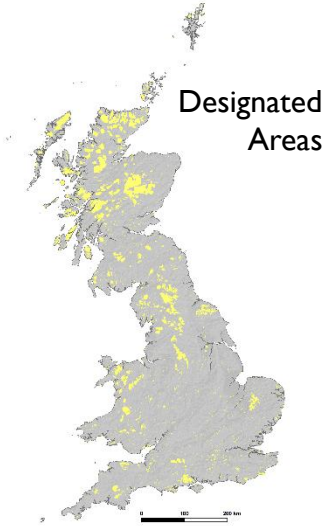
Securing the Value of Nature

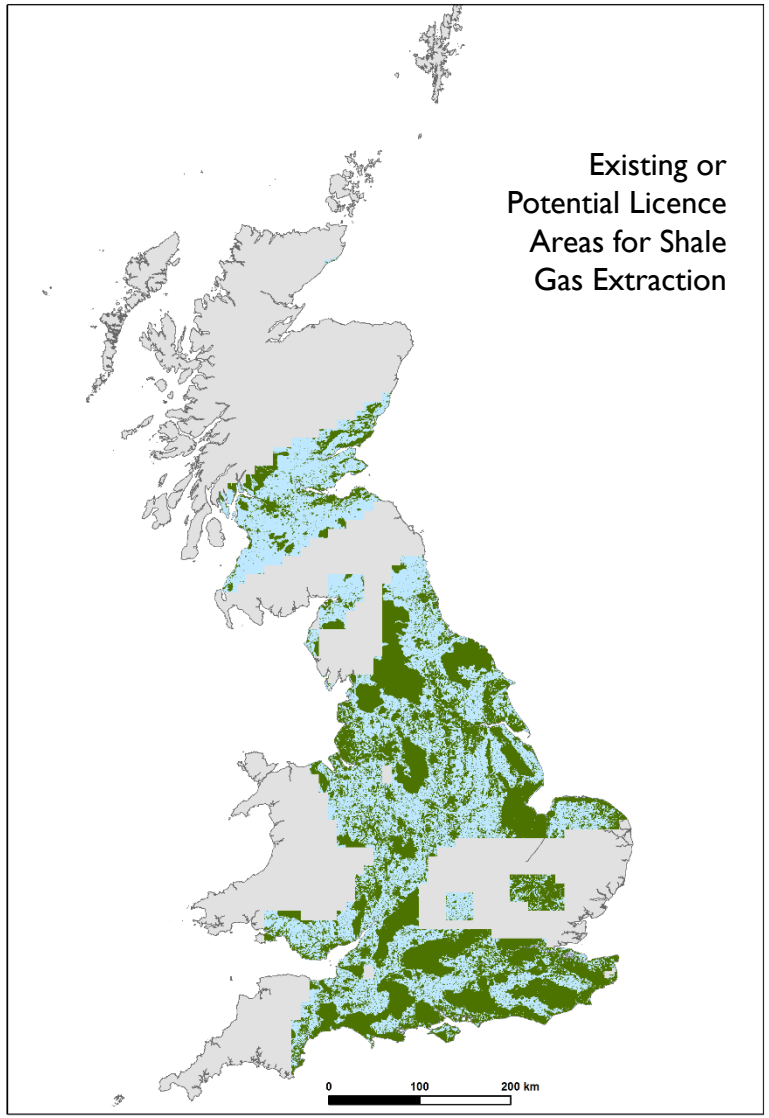
Natural Environment White Paper (2011)

The Need for a Spatial Perspective





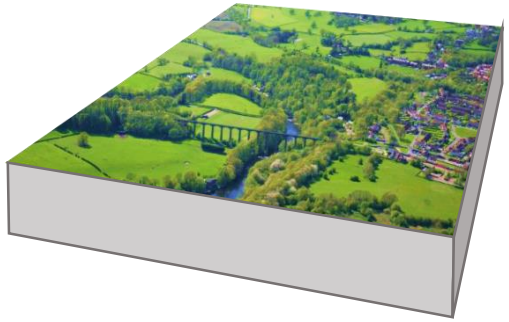




Licence areas = 50% of GB

Area after excluding 4 potential constraints = 24%

Valuing Land Use Change



Land Use:

Market Goods:

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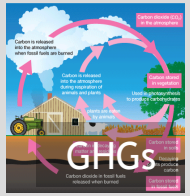
Non- Market Goods:



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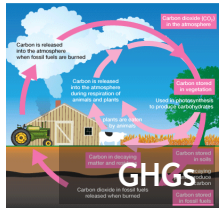
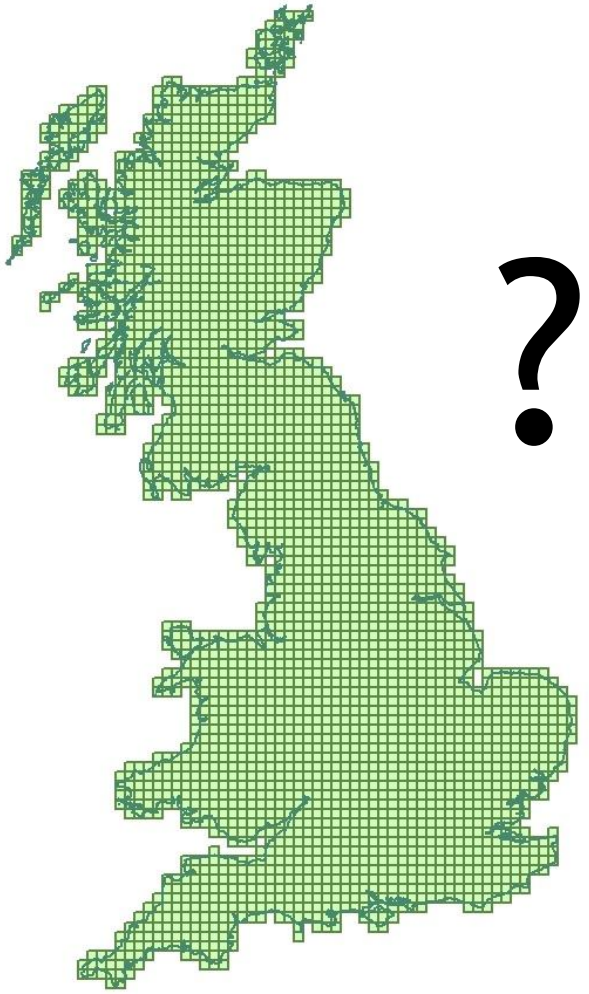
The Research Question





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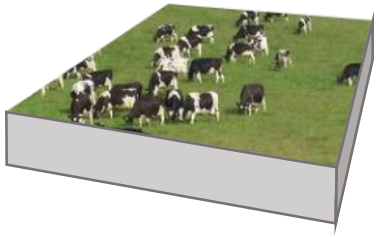
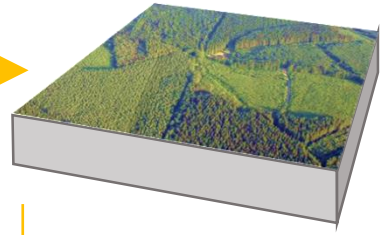
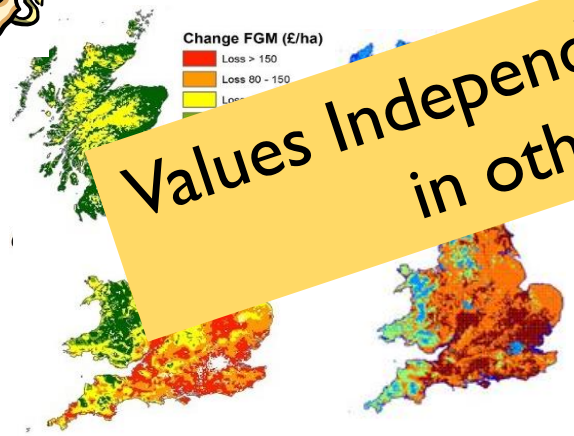
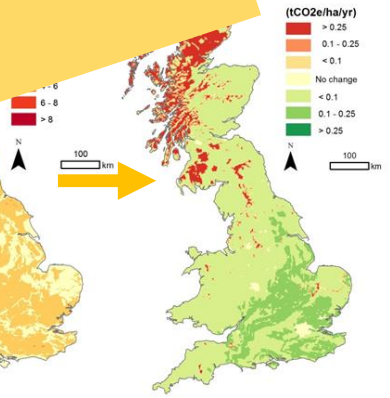
Policy Appraisal

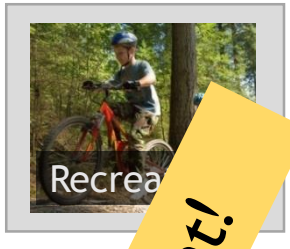


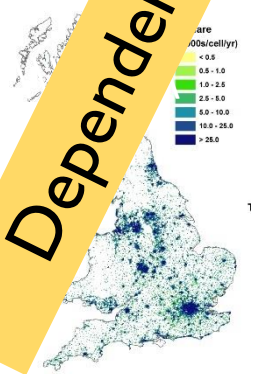






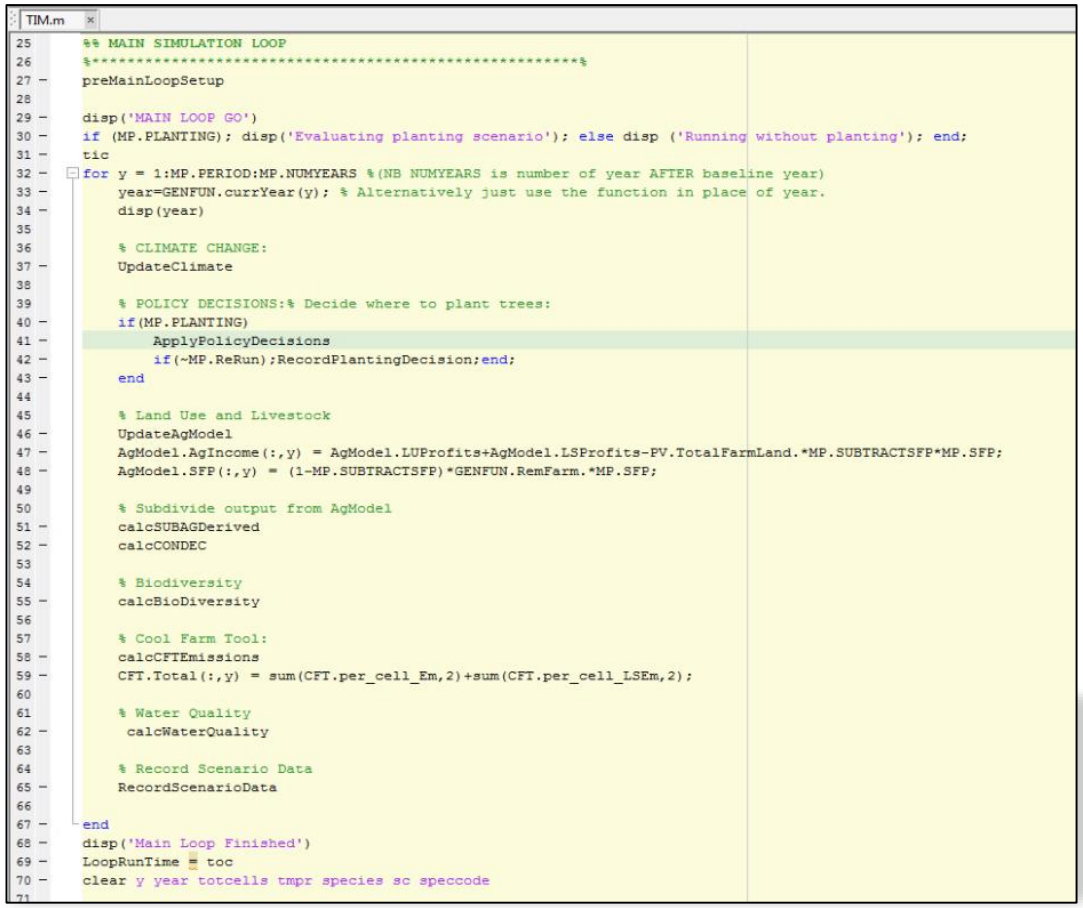
Values Independent of land use in other cells



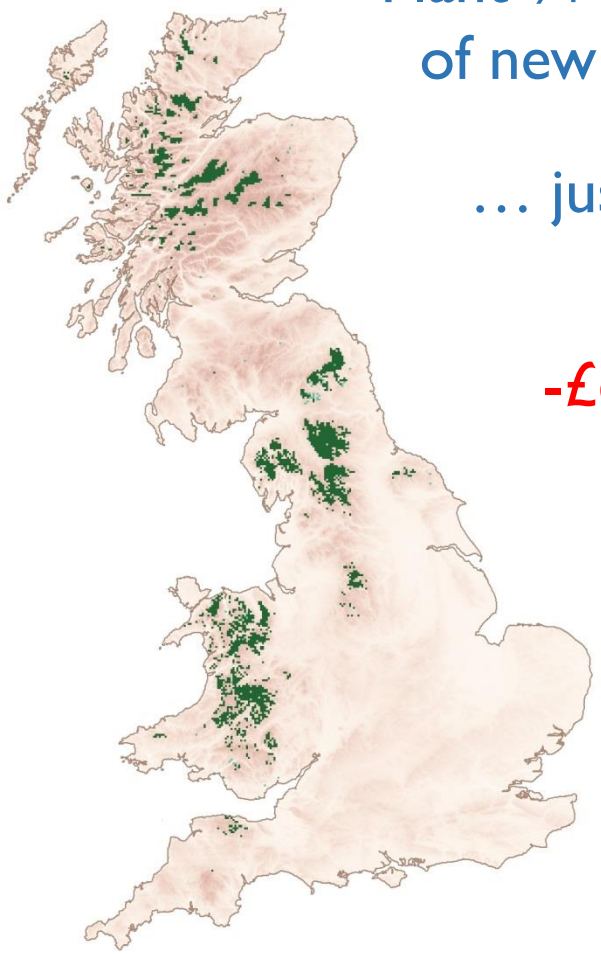


Dependent!

The Integrated Model (TIM)



Farming vs Forestry

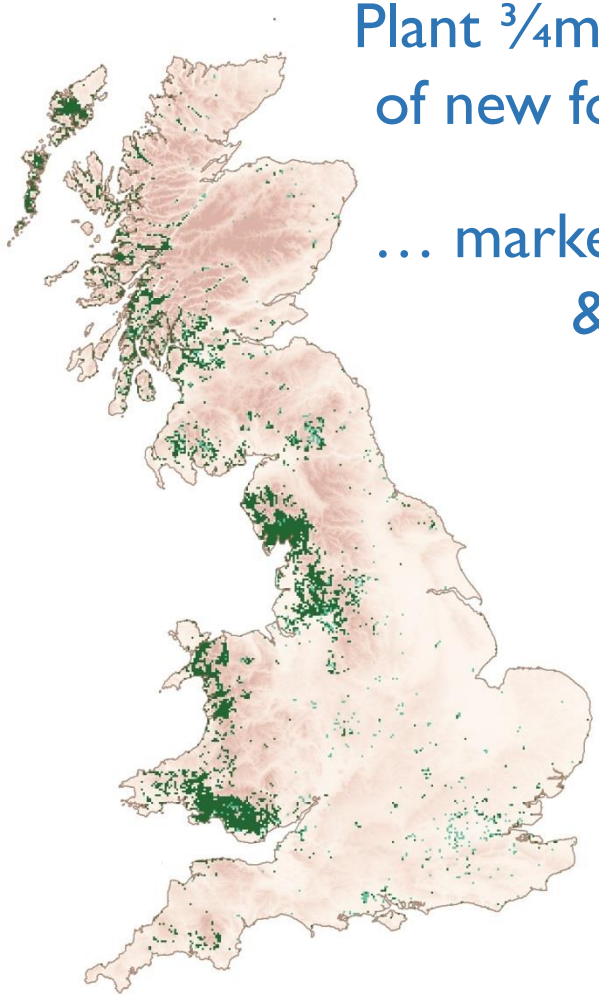


Plant ¾ million ha of new forest …

… just market goods

-£65 million per year

… and Carbon ?

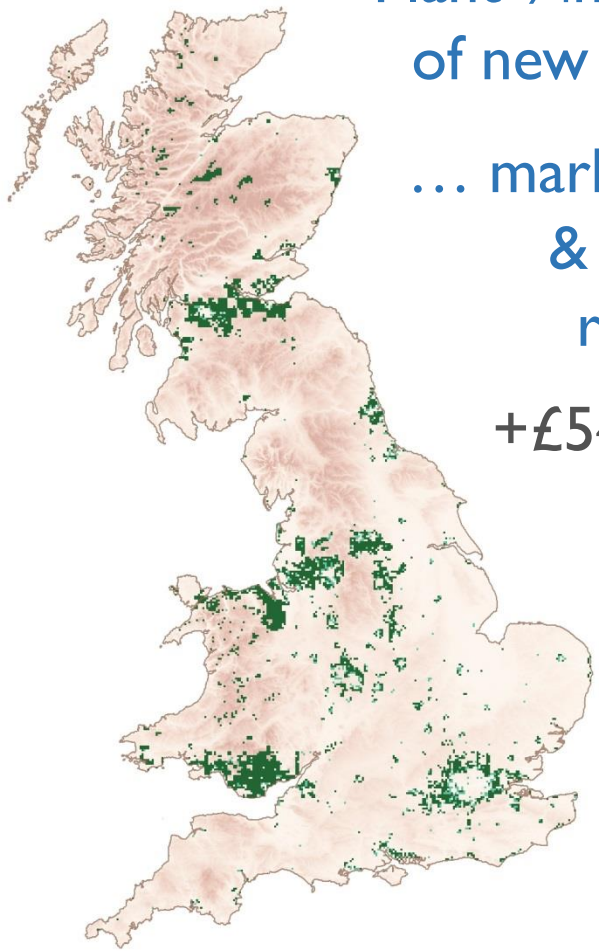


Plant ¾million ha of new forest …

… market goods & carbon

Positive Value

… and Recreation?



Plant ¾million ha of new forest …

… market goods & carbon & recreation

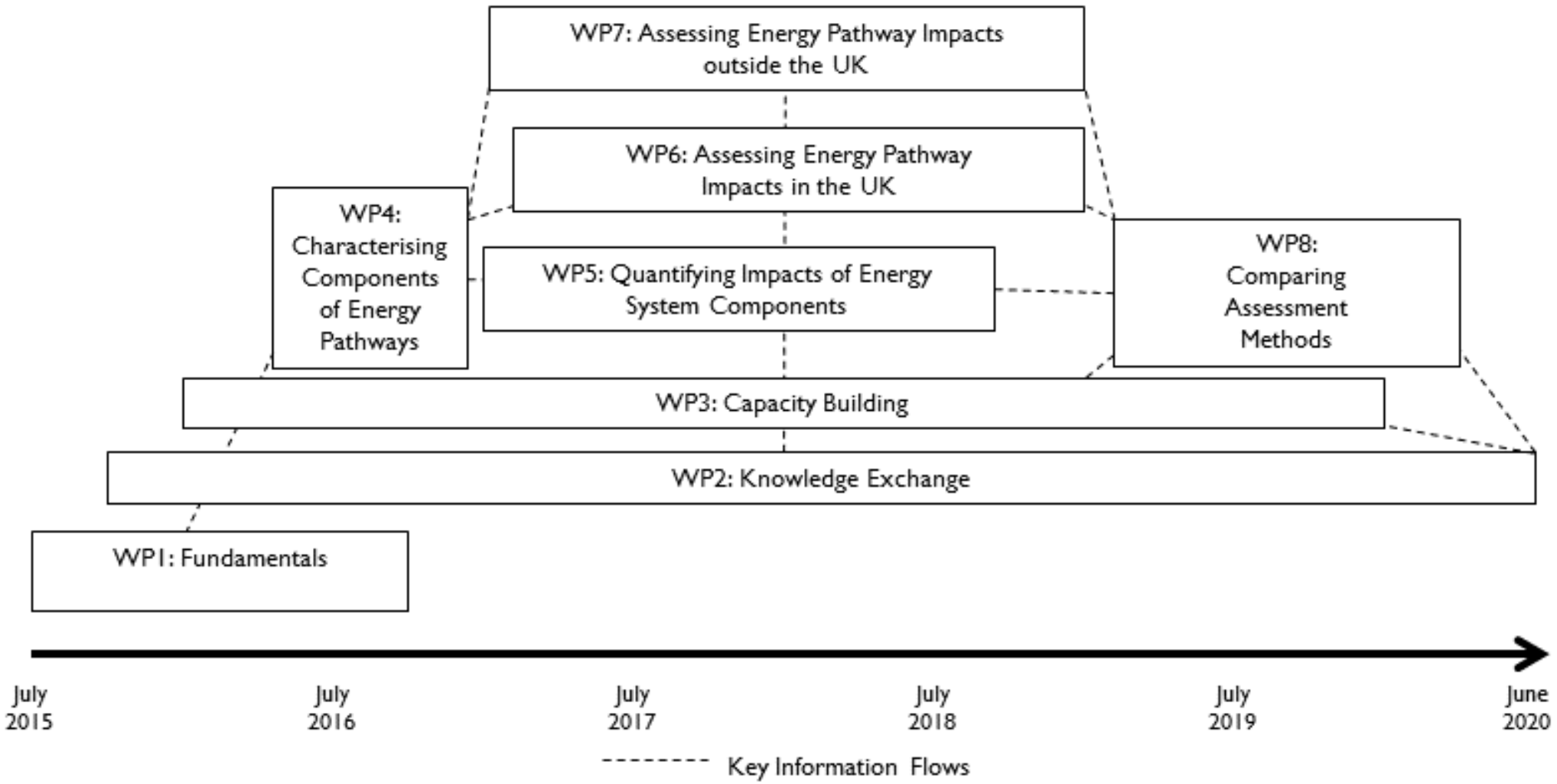
+£546 million per year

The ADVENT Project

The NEAFO spatial modelling approach will be extended to include the implications of prospective UK energy pathways as part of the new ADVENT (ADdressing Valuation of Energy and Nature Together) project.

ADVENT is funded by NERC and runs from 2015-20 as a 'grand challenge' associated with the UKERC Phase 3 Research programme. It involves a consortium of six partners.

Programme of Research



Integration of Pathway Evaluation