Future wind and marine: comments from an economics perspective

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Outline

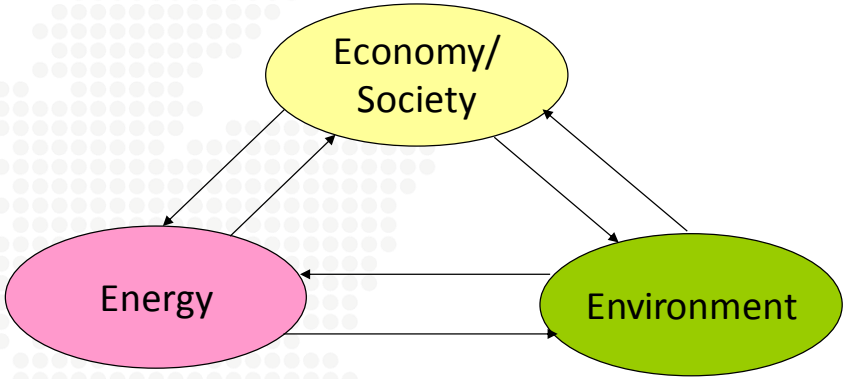
- Current policy developments
- Energy policy and modelling
- Modelling impacts on energy policy goals
- Future plans

Policy developments in the UK

- **Scotland**: *Scottish Energy Strategy (SES)* (December, 2017); and *Onshore Wind Policy* (December, 2017)
- **UK**: *Industrial Strategy (IS): White Paper* (November, 2017) – close the productivity gap
  - Clean Growth – one of the "grand challenges"
  - "We will maximise the advantages for UK industry from the global shift to clean growth – through leading the world in the development, manufacture and use of low carbon technologies, systems and services that cost less than high carbon alternatives."
  - "The move to cleaner economic growth – through low carbon technologies and the efficient use of resources – is one of the greatest industrial opportunities of our time."
- *Clean Growth Strategy (CGS)* (October, 2017)

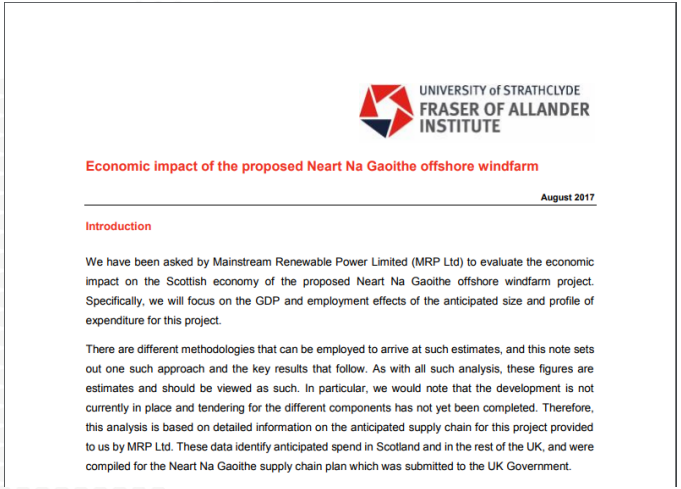
Recognising the interdependence of energy-economy-environment sub-systems

- Changes in the economy impact energy and emissions subsystems (great recession)
- Energy (and climate change) policies impact on the economy e.g. energy efficiency (SES); development (and exporting) of new technologies (wind, marine) (IS; CGS)
- Energy policy goals – TRILEMMA – but at least have to add economy; QUADRILEMA
- Develop modelling systems which can track transmission mechanisms of policy interventions to policy goals: including detail on generation technologies (wind; marine)



Economic modelling: inform future impacts of wind energy

- Typically, adopt multi-sectoral modelling – energy and emissions vary dramatically among (and within) sectors.
- Undertaken various economic “impact analyses” for Scotland and UK (e.g. Neart Na Gaoithe, ORE, and providing methodological advice to Crown Estate Scotland).
- Typically demand-driven analysis – able to capture *all* supply-chain links between project and economy.
- Allows rigorous assessment of “green/ low carbon jobs”
- Can focus in on community impacts



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Economic impact of the proposed Neart Na Gaoithe offshore windfarm

August 2017

Introduction

We have been asked by Mainstream Renewable Power Limited (MRP Ltd) to evaluate the economic impact on the Scottish economy of the proposed Neart Na Gaoithe offshore windfarm project. Specifically, we will focus on the GDP and employment effects of the anticipated size and profile of expenditure for this project.

There are different methodologies that can be employed to arrive at such estimates, and this note sets out one such approach and the key results that follow. As with all such analysis, these figures are estimates and should be viewed as such. In particular, we would note that the development is not currently in place and tendering for the different components has not yet been completed. Therefore, this analysis is based on detailed information on the anticipated supply chain for this project provided to us by MRP Ltd. These data identify anticipated spend in Scotland and in the rest of the UK, and were compiled for the Neart Na Gaoithe supply chain plan which was submitted to the UK Government.

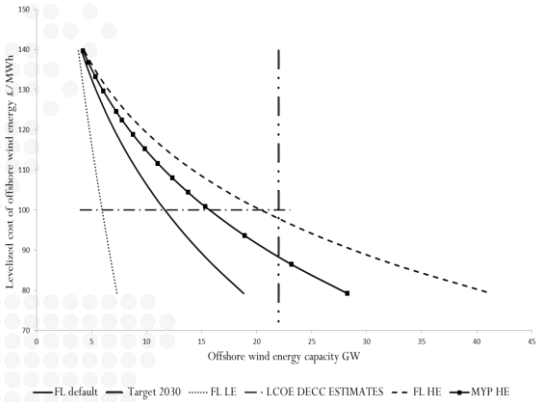
Can also explore likely future impacts of wind energy

- With projections of UK market size, expenditures and local content we can identify scale of possible impacts.
- “Multipliers” for calculating knock-on effects derived from analysis itself, not inappropriately picked “off-the-shelf”
- We are also analyzing “home market” effect in offshore wind;
  - Requires trade costs and agglomeration effects
- Future trade costs and market size will impact on location of supply chain

2035 Impact	Gradual Growth		Accelerated Growth	
	Low Wind	High Wind	Low Wind	High Wind
Demand disturbance (£million)	1,181	2,577	1,751	3,922
Direct FTE jobs	9,091	19,630	13,228	29,059
Direct GVA impact (£million)	463	937	642	1,337
Type II Impact on total production				
£million	5,090	10,991	7,494	16,644
%change from base year value	0.24%	0.51%	0.35%	0.77%
Output Multiplier- Type II	4.31	4.27	4.28	4.24
Type II Impact on GVA				
£million	1,775	3,776	2,575	5,638
%change from base year value	0.17%	0.36%	0.25%	0.54%
GVA Multiplier- Type II	3.83	4.03	4.01	4.22
Type II Impact on Employment				
FTE jobs	38,467	83,164	56,574	125,535
%change from base year value	0.16%	0.35%	0.24%	0.53%
Employment Multiplier- Type II	4.23	4.24	4.28	4.32

Economic modelling: bridging “micro” and “macro” perspectives

- For many policies – e.g. innovation and learning - demand-oriented models insufficient: need a Computable General Equilibrium (CGE) framework.
- Developed UK (and Scottish) CGEs with disaggregated energy system, including offshore wind
- Within these models we can, for example, *explain* the scale of capacity changes as a consequence of private sector investment decisions.
- Can also analyse supply side changes e.g. LCOE reductions, linked to improved productivity in offshore wind sector (micro-to-macro modelling)
- Can track the effects on the macroeconomy and on the energy policy trilemma.



GDP
Employment
Exports

Emissions

Next Steps

- Further develop “home market” effect in trade model and apply to offshore wind (and marine?).
- Update estimates of the economic and environmental impacts of existing offshore wind energy activity, and scale of the opportunities in the supply chain, linking to the goals of energy and economic policy (including distributional effects).
- Quantify impacts on the UK of alternative development paths reflecting; 1) latest cost reductions and projects; 2) possibilities for domestic supply chain; 3) alternative models of learning.
- Link to whole energy systems models to try to improve capture of energy technologies.

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