



**UNIVERSITY OF
CAMBRIDGE**

Department of Engineering

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

Renewable Energy: Enabling Private Sector Investment

The UK energy sector, specifically the electricity market, is going through significant change. The drivers for this change are: the increasing demand on the electricity grid due to the electrification of heat and transport, reduction in current supply due to the closure of older or more carbon intensive generation plants, the drive for low carbon electricity supply to meet the UK's legally binding EU energy targets, and the need for the UK to diversify its energy mix to shelter itself from fuel price fluctuations and high dependency on a single source.

UK government has developed a new legislative framework in the form of the 'Electricity Market Reform' document, which is intended to deliver the required change over the coming decades, and needs to provide the right balance between incentive for investment and acceptable consumer electricity prices, with minimal direct treasury funding.

A specific target of 15% of the UK energy needs being delivered from Renewable sources by 2020 is EU directive that has been in place since 2009. Current progress is insufficient to meet this obligation, with the UK missing its interim 2011 target, and subsequent lending & investment continuing to be flat.

This research seeks to identify, what are the key components to an investment decision in renewable generation, and ultimately aims to define an investment decision making tool, for developers and investors in the renewable electricity generation market to be able to consistently assess their opportunities.

The research identifies in any given investment decision in this area, the core disciplines of Finance and Risk Management and how they inter-relate to the project stakeholders. Then through desk based study and semi-structured interviews with industry practitioners, the relative risk in four of the key renewable generation types, off-shore wind, on-shore wind, Biomass electricity & Marine are mapped, and used to inform a quantitative tool for evaluating investment decisions.

Key findings and enablers identified through this research include the need for government to clarify the 'strike price' for each type of renewable technology as the Electricity Market Reform moves the industry from Renewables Obligation Certificates to Contracts for Difference. Reassurance from UK government that the renewed regulatory framework will be consistently applied and retained for a substantial period, thus delivering stability to the market. Also, greater transparency regarding the risks and opportunity in each technology will attract private investment to the market.

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