



# POWER GENERATION BY RENEWABLES



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# IMechE Seminar Publication



## Power Generation by Renewables

**Organized by**

the Energy Transfer and Thermofluid Mechanics Group of  
The Institution of Mechanical Engineers (IMechE)

**Co-sponsored by**

the Power Industry Division



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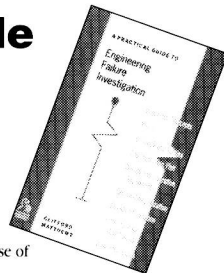






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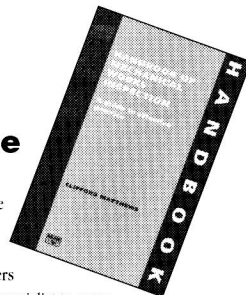
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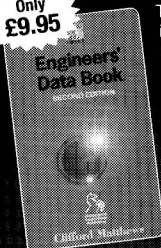
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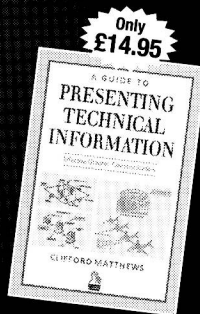
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## Keynote Papers



## Market opportunities for renewables

**T DUFFIN**

AEA Technology Environment, UK

### Synopsis:

The challenging target aimed for by the UK Government, to produce 10% of electricity requirements from renewables by 2010, has focused many minds. In combination with the climate change levy, which will come into force in 2001, many companies are very seriously appraising their energy consumption and energy sourcing in order to identify options for mitigating the financial burden of the levy. Estimates so far suggest increases in the region of 0.5p per kWh. CHP facilities and electricity generated from renewables have been exempted from the tax, and so a golden opportunity exists for expansion in the renewables market<sup>1</sup>. As an energy user buying electricity from a company supplying renewable energy is the simplest means of avoidance of the charges. Where investment and on site facilities can be considered installation of a wind turbine, for example, could be an option for larger energy users particularly where electricity load demands can be matched up to anticipated productivity.

This paper will summarise market developments in renewables since the announcement of the climate change levy, and will question if increased demand from consumers will enable developers to make long term commitments for market growth now that the NFFO has been removed.

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<sup>1</sup> Since the time of writing the synopsis the figure of 0.43p/kWh for electricity has been set after criticism from industry. In addition, the biggest energy users (polluters) have negotiated 80% discounts in the levy. So is this any more a golden opportunity?



The renewable energy scene is moving very fast at the moment. In the week before the conference two key developments were announced:

1. The European Commission was expected on Wednesday 10<sup>th</sup> May to back a draft directive with a system of "indicative national targets" to double the share of energy consumption produced from "renewables" to 12 per cent by 2010.
2. Next month it is expected that the Royal Commission on Environmental Pollution will report that the Kyoto targets for greenhouse gas reductions are inadequate, instead recommending a 60% reduction in greenhouse gas emissions.

### Scene Setting

Renewable energies have come a very long way since the re-awakening of interest in the early 1970s and oil starvation of the western world. The drivers supporting renewables have changed many times in the last three decades –

- Energy security – diversity of supply,
- Reduction in pollution
- Creation of employment opportunities
- Global warming, climate change mitigation.

But one thing has remained constant – the claim that there is a huge market opportunity just around the corner, that renewables will be economic if only there was just slightly greater market share, critical mass, economies of scale and another year of government support. I quote:

*For residential space and water heating applications in central United States solar systems are currently cost competitive with electric energy and within a factor of 1.5 of being cost competitive with gas and oil fuelled systems. In these same locations ... .. large-scale ground based solar electric plants are within a factor of 4 of competing with electric plants fuelled with conventional energy sources. There are good reasons for believing that many of these solar-powered systems may become economically attractive in the years to come. ....*  
[Perspectives on Energy - Issues, Ideas and Environmental Dilemmas - Eds Lon C. Ruedisili & Morris W. Firebaugh. OUP 1975]

Readers may be surprised to know that this text was published 25 years ago.

Why should it be any different at this time? Is it any different at this time? Is there really a golden market opportunity for renewables?

I believe there is a market for renewables, however, this is not a golden opportunity – at least, *not yet* in the UK. The market has just gone through another major convulsion as NFFO has ended and been replaced by a suppliers' obligation and

Climate Change Levy exemption. Added to this is the fact that NETA is due to begin operation later this year.

We should not overlook that underlying these changes is the fact that the most significant potential for irreversible global environmental damage – global warming and climate change – is widely accepted to be man-made. Next month it is expected that the Royal Commission on Environmental Pollution will report that the Kyoto targets for greenhouse gas reductions are inadequate and even the 20% UK domestic aim from the Labour party manifesto is not sufficient to avoid damaging climate change. They are expected to recommend a 60% reduction in greenhouse gas emissions. This would be a very significant market driver.

We should take this opportunity to look at the challenges the renewables industry faces in the light of recent changes and how they could address those issues.

#### **Some changes since the Synopsis was Written:**

Since the synopsis was written a number of important changes have occurred in the UK:

- The Climate Change Levy has been defined and the levy set: 0.43 p/kWh for electricity, 0.15 p/kWh for gas and coal, oil and transport fuels taxed as before.
- Electricity from renewables and CHP have been granted CCL exemption under certain circumstances.
- NETA has crystallised and gives no preferential treatment for renewables nor for smaller players in the market.
- A suppliers' obligation is being discussed – potentially setting a target for renewables – 5% by 2003 (likely to be met, mainly through NFFO schemes) 10% by 2010.

#### **The Climate Change Levy**

In March 1999 the Customs & Excise Consultation Paper suggested that the Climate Change Levy might be 0.6p/kWh for electricity, and 0.21p/kWh for gas and coal. However, the largest energy users in industry (i.e. those with the greatest responsibility for pollution) have negotiated a significant reduction in the levy.

The current level set is at 0.43 p/kWh for electricity, 0.15 p/kWh for gas and coal, oil and transport fuels taxed as before. In parallel, electricity prices are falling<sup>2</sup> for various reasons (partly due to greater use of CCGTs replacing old coal stations, some 2400MW came on line in 1998 alone with the cumulative total exceeding 15000MW in 1999 and as long-term coal contracts come to an end). The result is that the CCL just about keeps pace with falling electricity prices for large users.

In addition, IPPC industries have negotiated discounts of 80% in the levy by putting in place agreed targets for energy efficiency measures.

On the positive side enhanced capital allowances – avoiding corporation tax - may be available to help renewables projects.

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<sup>2</sup> Some are reporting 20% reductions in electricity price being offered.