

# **British Wind Energy Association response to the 2005-06 Renewables Obligation preliminary consultation document**

The British Wind Energy Association welcomes the opportunity to respond to the UK Government's Review of the Renewables Obligation. With over 320 members, BWEA is the largest renewable trade association in the UK, and it represents the industry which should provide the majority of the energy counting towards the target of 10% renewable electricity by 2010 and the 20% aspiration for 2020. BWEA hopes, therefore, that its response is given due consideration by Government, as its members will be doing the lion's share of the business conducted under the RO. A full listing of BWEA members can be found on the Association's website, [www.bwea.com](http://www.bwea.com).

The RO is vitally important to the sustained health of the wind industry in the UK. In turn, the health of the RO is dependent on retaining investor confidence in the mechanism, which would be best served by introducing as little change as possible. However, the Association realises that some change may be necessary in order to facilitate the smooth operation of the RO and to more easily achieve the Government's renewable targets. BWEA has addressed the proposals in the consultation document against these two general principles, though they are in tension.

One of the key components of the UK's renewable plan is the development of offshore wind; BWEA has welcomed indications from DTI that a key factor in its thinking around the Review is the need to support this technology. It must be noted, however, that given the restricted terms of reference for the Review – which BWEA lobbied for and welcomed, for investor confidence reasons – there will need to be extra resources channelled into the sector outside of the RO mechanism if objectives for offshore wind are to be met. Were sufficient funds not forthcoming for offshore, then supporting its development would require changes to the RO such as differential distribution of the buyout fund or banding, which would undermine the fundamental principles of the RO and seriously endanger investor confidence.

The rest of this response will address the questions set out in the consultation document in order.

## **Effectiveness of the Renewables Obligation to date**

***Q1: We welcome your views on our assessment of the impact of the Renewables Obligation and on whether your experience correlates with that assessment.***

***Q2: We would welcome your views on the cost of the Obligation to consumers thus far.***

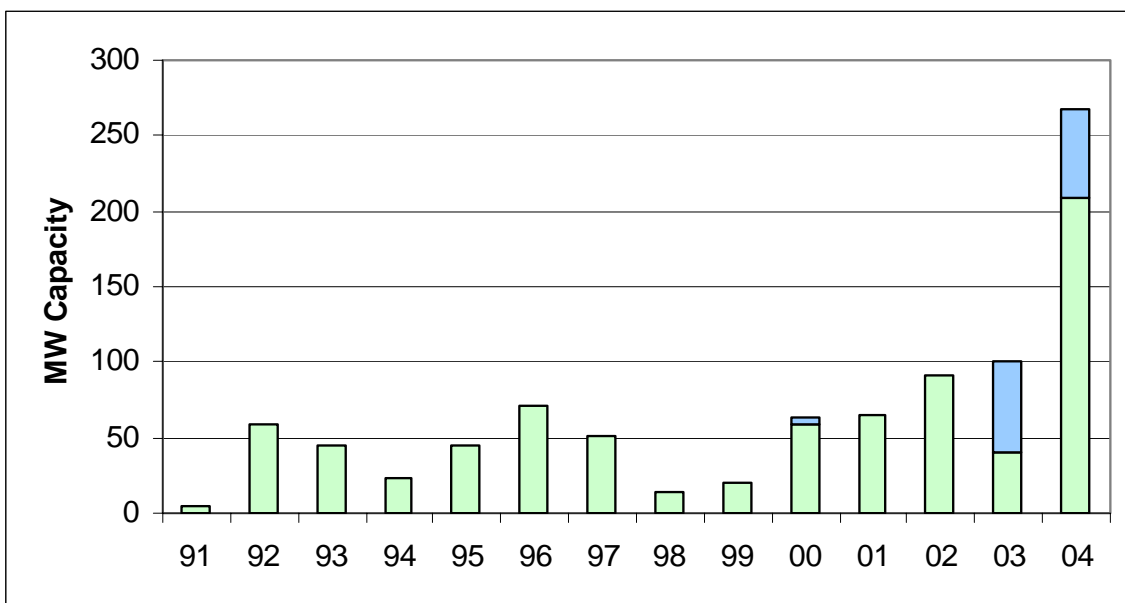
**Q3: We welcome views both from electricity suppliers and electricity consumers and their representative bodies.**

**Q4: What is your assessment of the Obligation's effectiveness in assisting the delivery of new projects?**

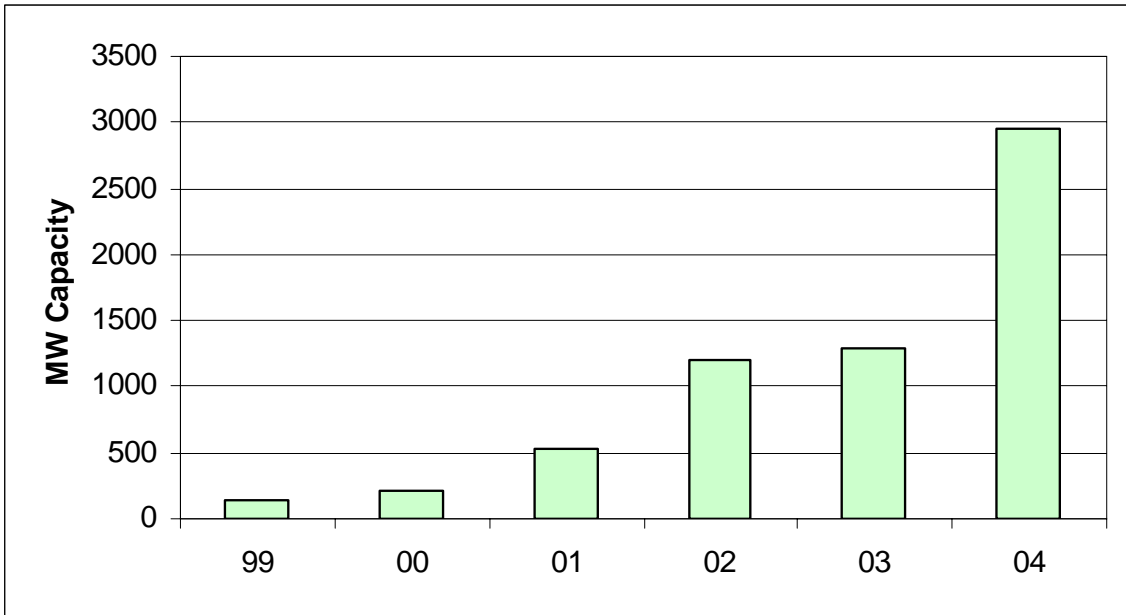
**Q5: What is your assessment of our ability to meet the 2010 target?**

Q1: The assessment set out in the consultation document is a reasonable summation of the effect of the RO so far. The Obligation is stimulating generators to invest in new renewable capacity, especially wind. Figures 1-3 show that effect, in terms of capacity built – which last year more than doubled over 2003, to more than 250MW – and projects entering the planning system and gaining consent. All these measures show a distinct upward trend from around 2002, the year the RO was introduced. This trend is continuing, as there will be a further doubling of wind power installation in 2005 over 2004, with over 500MW currently under construction; the UK will this year join the wind power 'elite', the group of countries with more than 1,000MW installed, which currently has seven members.

The RO is also working as expected to bring forward the cheapest, most mature technologies, particularly landfill gas and onshore wind. Higher cost, more long-term technologies such as offshore wind, wave and tidal stream will need extra resources, which must be provided outside the RO structure. BWEA agrees that the structure of the RO will ensure undershoot of the Obligation levels due to the 'cliff-edge' issue, and that this is not necessarily a problem as long as development continues to be driven forward. BWEA also concurs that other factors such as planning delays are as much responsible for the undershoot of Obligation levels as the fear of a ROC price crash.

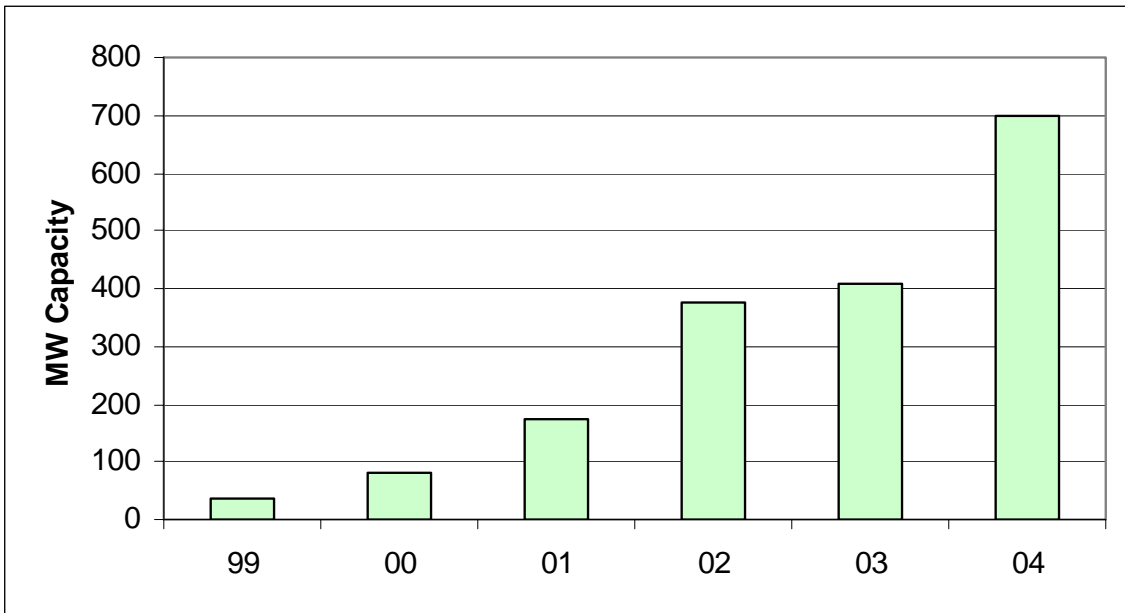


**Figure 1. Wind power capacity built in the UK 1991-2004 (blue = offshore)**



**Figure 2. Planning submissions for wind power development in the UK 1999-2004**

Q2: The cost to consumers of the RO is acceptable thus far, and will continue to be so as, even though the Obligation will be rising and thus the amount of money spent on renewables will increase, it will still form only a small portion of consumers' bills. Value for money is the question: as construction of wind turbines takes off, we will see more generation sharing the available pot of money, and thus providing more renewable energy per pound of support. The cost of the RO should also be put into the perspective of rising power prices due to the higher cost of gas, which makes the cost of the RO a smaller proportion of consumers' bills. Renewables will also be replacing power from other sources, which will provide a countervailing reduction in price pressure on the wider power market. Finally, use of renewable energy avoids the external costs that other forms of power generation impose on society, most notably the cost of global warming due to carbon dioxide emissions. While this benefit is difficult to quantify, it must always be kept in mind when assessing whether the cost of the RO is acceptable to consumers.



**Figure 3. Wind power capacity consented in the UK, 1999-2004**

Q3: Not applicable.

Q4: The delivery of renewable energy projects is as much about non-RO issues as it is about the effectiveness of the RO. The Obligation is working well in terms of stimulating development activity (see answer to Q1) through providing an economic incentive to build. The provision of a clear economic framework has given confidence to the finance sector to fund renewable generation projects, to the point where transactions of many millions of pounds particularly for wind farm projects are relatively commonplace. This increased level of comfort in the City is benefiting other renewable technologies, as bankers and private equity players are more willing to pursue opportunities after having positive experiences of financing wind projects.

Q5: The 2010 target is achievable – the wind resource available in the UK is alone more than sufficient to gain 10% of our power – but barriers outside the RO need to be addressed if the UK is to meet this challenging objective. The recent National Audit Office report on support for renewables identified five key areas where action is required, and BWEA is keen to underline that these issues need to be resolved. These are: planning difficulties; the need for timely grid reinforcements; the importance of robust wholesale power prices to bolster the RO; stability of Government policy; and the requirement for additional support for technologies currently approaching convergence with the RO, such as offshore wind. Of these barriers, BWEA would highlight the need for strategic investment in the grid infrastructure if 10% is to be reached and growth maintained after that. But of prime importance is the scheme which makes investing in renewables financially attractive, and the RO has been successful on that score. The non-financial barriers are not in the scope of the Review but will be key to delivering the target. It is important to note the difference between the Government's target of 10% (which includes large hydro and the biomass portion of mixed wastes) and

the 10.4% Obligation level in 2010-11 (which does not include these resources). BWEA wishes to see the UK come as close to the 10.4% of RO-eligible generation as possible, though of course the structure of the RO will likely ensure that the Obligation level is a ceiling rather than an achievable target. In any case, getting to the 10% target will require a significant contribution from the Round Two offshore wind projects, which need extra resources outside of the RO.

## **Energy from Mixed Wastes**

***Q6: Views are invited on ILEX's analysis, in particular:***

***Q7: Do you agree that existing regulatory drivers in the waste management area will incentivise a substantial increase in waste generation anyway?***

***Q8: Are the principal barriers to greater energy recovery from mixed wastes structural (planning/perception etc) or economic?***

***Q9: Do you agree with ILEX's analysis of the potential impact on the Obligation of extending ROC eligibility to more EfW?***

***Q10: Views are invited on the options for changing the eligibility rules for electricity generated from wastes and their advantages and disadvantages?***

***Q11: Are there other considerations beyond those above which should influence decisions in this area?***

***Q12: Views are invited on the alternative options presented on page 25.***

BWEA is neutral on the general issue of support for the use of mixed wastes as an energy source. The Association's main focus is to ensure that any changes proposed by Government have minimal impact on investor confidence and hence the development of technologies already within the RO. BWEA is concerned that, even with compensating increases in the level of the Obligation (which will increase the cost to consumers even further), making the biomass portion of mixed wastes ROC-eligible will disrupt the market and impact investor confidence. The Association has a clear preference for keeping the eligibility rules for waste unchanged and encouraging development in this sector through other means.

Q7: Not qualified to judge.

Q8: Not really qualified to judge. However, as the extra income from ROCs would equate to only 10-15% of the income stream for such projects, it seems unlikely that inclusion in the RO alone will stimulate massive amounts of new capacity. It may bring forward a limited quantity of marginal plant, but at the cost of providing windfall profits to projects that would happen anyway. Non-economic barriers will continue to make Energy from Waste (EfW) plants difficult to build, and therefore relying on this form of energy to meet

renewable targets is risky as well as fraught with political difficulty: wind power, which is a much more popular form of energy than EfW, attracts controversy and criticism of Government for reliance on it; these problems would be much worse for a major programme of new waste-burning power stations.

Q9: If RO eligibility were to be extended without altering the profile of the Obligation, then it would have a negative impact on higher-cost technologies already within the RO, particularly offshore wind. How much the level of the Obligation would have to change to accommodate a new supply of ROCs from EfW is a tricky question: if set too low, then the ROC price would be impacted since the recycling value would be reduced as the gap between supply and demand narrowed; if set too high and/or less supply of ROCs materialises from EfW than expected due to non-economic barriers (eg planning), then there is deadweight that will go to all RO eligible generators that have managed to construct capacity. In either case uncertainty would be increased, impacting investment in the higher-cost renewables.

As the analysis from Ilex indicates, without compensating rises in the level of the RO, ROC prices will be depressed by at least £6/MWh and possibly much more. This will have a direct impact on the viability of offshore wind. The alternative of raising the RO level results in extra costs to the consumer of up to £500m in 2021 alone, and thus a great deal more across the life of the Obligation. This is a high price to pay for a form of energy that, if the Ilex analysis is correct, would happen anyway: 9TWh out of the projected annual contribution from EfW of 11TWh in 2021 would thus be receiving ROCs unnecessarily, and showing little extra benefit for the additional cost to the consumer.

Q10: BWEA would prefer option (A) – maintaining existing eligibility rules – out of the three main options discussed in the condoc. The analysis from Ilex indicates that much of the capacity that would be awarded ROCs under options (B) and (C) would be built without this incentive, thus providing poor value for money. In general, BWEA is looking for the RO Review to deliver only changes which are absolutely vital – and the evidence presented in the condoc does not indicate that the case for change has been made. BWEA is willing to look at other alternatives which may boost Energy from Waste without impacting on the RO. BWEA is looking with interest at the RPA's proposal for 'neutral treatment' of waste as a possible means to provide this boost.

Q11: The prime consideration in making this decision should be maintaining investor confidence in the RO overall. Whilst this would be best achieved by leaving the eligibility rules as they are, any changes must be accompanied by compensating measures so that confidence is not affected too much.

Q12: Option (D), amending the 98% rule, appears to be an unnecessary change to the rules, with little benefit, while option (E) is a possible limited

change that BWEA might consider acceptable. Since the latter will only be exploited in a small number of installations, it will likely not impact on the ROC supply-demand balance significantly, but may also come under fire from figures in the waste industry for the same reason. BWEA would like to see an assessment of the additional supply of ROCs that CHP projects burning waste could provide before making a final judgement on the issue.

### **Lower Cost Renewable Technologies**

***Q13: Views are invited on the analysis provided by Oxera and Enviros.***

***Q14: Would it be possible to reduce the support that the Obligation gives to new landfill gas projects without a significant impact on the future level of deployment of landfill gas project?***

***Q15: We do not think that the analysis suggests a clear-cut case for decreasing the support that the Obligation provides for onshore wind, but views are invited on the above analysis and extent to which some onshore wind economics are viable without the full support of the Obligation.***

***Q16: Views are invited on the whether NFFO 3, 4 and 5 projects should be eligible for the Obligation when their contracts expire?***

***Q17: Is it important to distinguish between different technologies?***

***Q18: Should there be additional requirements (eg refurbishment) before former NFFO 3, 4 and 5 projects would become eligible for further support from the Obligation.***

***Q19: Would it be practical to devise rules to limit ROC-eligibility of ex-NFFO projects, without inhibiting continued operation and possible future expansion, of those projects?***

***Views are invited on the general issue of lower cost renewable technologies within the Obligation. In particular:***

***Q20: Does the analysis provided by OXERA and Enviros correlate with your understanding of the economics of the lower cost renewable technologies?***

***Q21: Would it be possible to reduce the support that the Obligation gives to any of the lower cost technologies without a significant impact on the level of renewable generation for the most economic projects?***

***Q22: Views are invited on the 'Policy Options' for handling the transition to market for lower cost technologies and in particular the option of granting ROC eligibility to new projects in some technology areas for a certain period of time or a certain volume of generation.***

***Q23: Are there other possible approaches for tapering support for lower cost technologies?***

***Q24: What practical issues may be raised in devising and implementing such rules?***

Q13: The cost curve for onshore wind that Enviro's has calculated appears to say that resource is much smaller and higher cost than other respected analyses. Even if Enviro's took a more 'realistic' view of the 'developable' resource than previous analyses, the answers they reached appear to be belied by the amount of onshore wind projects in planning or that are being actively scoped and readied for planning applications. BWEA is pleased to be working with DTI in revisiting this work with a view to producing a more realistic cost curve upon which to base any change in policy. BWEA has deep reservations about the work performed by Enviro's for this consultation and has written a critique of the research, which is attached as Appendix 1.

Q14: BWEA is not qualified to judge how a reduction in the support available to new landfill gas projects under the RO would affect future deployment. However, with relatively little landfill resource left to develop, the 'cost' of changing eligibility for this resource (in terms of investor confidence in the system overall) would be greater than the benefit of reducing support for this technology. The remaining undeveloped capacity could be left in that state were RO eligibility reduced for new landfill gas projects, when it would be beneficial to fully develop all the available resource.

Q15: While BWEA disputes the analysis (see answer to Q13) upon which the condoc bases its conclusion that there should be no decrease in support for onshore wind, the Association agrees that there should be no change in eligibility for reasons of investor confidence. Onshore wind has had the benefit of the RO for only three years, and the industry is still in its infancy in the UK. While wind benefits from other countries' investment in the technology over the past 25 years, it is still a fledgling sector in Britain and needs assurance of support for some years yet.

BWEA recognises, however, that onshore wind is one of the technologies that will converge with the cost of power from fossil sources first, and thus that there will have to be a pathway to exit from the RO for this technology at some point. Any proposal to remove or reduce eligibility of onshore wind should be in the context of either extending the profile of the RO beyond 2027 for certain technologies (offshore wind and wave/tidal in particular), and/or when the price of carbon under the EU ETS or the wholesale price of power on the open market rises above some preset level which allows onshore wind to compete with other power sources. Once the chosen metric – carbon or wholesale price – has reached a pre-agreed trigger level, Government should begin a formal process to set the conditions for phasing out onshore wind from the RO, in the light of prevailing costs and the remaining available resource. Such a strategy would give certainty on the way forward while ensuring that developers can proceed with projects in the knowledge that they will be fully eligible for the RO.

Q16: BWEA strongly believes that NFFO 3, 4 & 5 projects should continue to be eligible for the RO when their contracts expire. To remove them from

eligibility, which is effectively what Government is proposing in the condoc, would be a retrospective change which would have a corrosive effect on investor confidence and would impair the value of investments made since the advent of the RO, in reliance on current policy that declares NFFO projects eligible. In fact, the mere fact the Government is considering a retrospective change that harms existing investment is affecting the confidence of some BWEA members and is causing them to slow down or suspend investment decisions. Apart from the clear precedent set for NFFO 1 & 2 projects (which are eligible), what the proposal would mean is projects that are built under the RO now would get over 20 years of support, while a NFFO project built now would get only a maximum of 15 years of support – and, while this support is at a fixed price and thus in theory very bankable, it is at a lower level than is available under the RO and projects would in fact not fly financially without the ROC ‘tail’ at the end of the NFFO contract.

Many BWEA members, including several leading City financiers, are also very concerned that removal of NFFO projects from RO eligibility is a violation of the grandfathering principle: these developments attract ROCs (though the owner of the project does not see them), and if they are to be excluded from the RO then this would set a bad precedent, and thus engender doubt in players’ minds. This could lead to mistrust of Government promises on grandfathering for projects currently in the RO when any proposals for an exit strategy for onshore wind are put forward. This removal of eligibility would also run directly counter to the terms of reference for the Review, which state that projects currently eligible for ROC would be unaffected by the Review.

It is also important to note that currently unbuilt NFFO projects would not get a full 15 years of fixed-price support: the clock started ticking before now, so that NFFO projects may have as little as 10 years or less left on their contracts. It is also not the case that market participants have made an unwarranted assumption regarding future ROC eligibility: Ofgem assesses applications for economic termination of NFFO contracts on the basis that projects will get ROCs once the NFFO contract expires, and the rules on site sterilisation depend on similar calculations.

Such a change also threatens investor confidence. By our estimate, since the start of the RO NFFO projects worth over £500 million have been sold to new owners, had their debt refinanced or have been or are currently being built based on current law which provides that they are eligible for ROCs at the end of their NFFO contract. Were the Government to retrospectively deny ROC status to NFFO projects, these investors would face losses, and potentially defaults under the financing arrangements. We could also expect a wave of applications for economic termination of unbuilt projects, thus delaying their development, if they get built at all. This is no time to delay about 100MW of unbuilt, consented wind projects when there is a need to get MW in the ground quickly.

If DTI wishes to consider case studies of what the proposal to revoke ROC eligibility implies for particular projects, they should refer to the submissions by Falck Renewables (referring to the Cefn Croes and Whinash projects) and by Beaufort Wind/Englefield Capital (which details the impact on the portfolio financing of eight projects totalling 104MW). BWEA also supports the initiative of several developers and financiers which calls for Government to indicate at the earliest possible opportunity that the proposal to revoke ROC eligibility for NFFO contracted projects will not be pursued any further.

In passing, it should be noted that unbuilt NFFO projects are being brought forward with capacity exceeding their contracted output. The developer must therefore secure a separate PPA for the above-NFFO output, entailing separate cabling and metering. This is surely an unnecessary burden, and DTI should bring forward proposals which allow sites with NFFO contracts to be developed to their maximum sensible capacity without such encumbrances.

Q17: All NFFO projects should be fully eligible for the RO at the end of their contracts irrespective of their technology.

Q18: Were refurbishment or repowering to be a requirement of RO eligibility at the end of a NFFO contract, there would be a perverse incentive to unnecessarily take down equipment which could have a continued life beyond the end of the contract period. In the extreme, there could be arrangements where NFFO project owners swap machinery from one site to another in order to claim repowering and thus be eligible for the RO.

Q19: This would add unnecessary complication to the RO for very little return, and would still have the effect of inhibiting the development of unbuilt NFFO sites.

Q20: No, in the case of onshore wind. See answers to Questions 13 and 15.

Q21: In the near term, no. Onshore wind projects are currently being developed on the basis of full eligibility and BWEA welcomes the Government's commitment to apply any 'exit strategy' only to projects developed later. This 'grandfathering' of rights for existing and near-term projects is essential if confidence in the market is to be retained. As the price of carbon rises and possibly also gas, thus firming the wholesale price of electricity on the market, then there may be an argument for reducing support for onshore wind in a phased manner. The question should be thoroughly examined only when the price of carbon or wholesale power has reached a trigger point, as set out in the answer to Q15.

Q22: The BWEA would prefer limits on eligibility, were they to be imposed, to be in the form of an energy volume cap – known as a 'full load hours' limit in other countries. This would enhance certainty of income to developers in the early years of projects, when debt is being repaid. This would also provide an equitable compensation mechanism for both high and low wind speed sites,

and would therefore retain the welcome feature of the RO that it allows a wider spread of onshore wind projects to be developed than was possible under the old NFFO system. A time-only limit would expose developers to risk from the variability in wind from year to year.

Proposals for any reduction of eligibility for onshore wind should be in the context of base power prices, as noted above, so that only if the price of carbon and/or the wholesale price reaches a certain level would any plan for RO eligibility reduction be triggered. The introduction of any exit strategy for lower cost renewables would have to be carefully crafted if there is not to be difficulty at the tail end of the RO, leading up to its planned demise in 2027. Investment in new RO-eligible capacity will stop some way in advance of 2027 if it is higher cost than wholesale power price due to lack of time to recover the cost of capital, and the contribution of any exiting technologies is also likely to drop off before 2027. Were the RO profile to remain flat for the back-end of the system, then there would likely be a windfall profit for owners of projects still in the RO – the supply of ROCs would be in decline and thus there would be increased recycling revenues. While there should be enough time between now and 2027 to efficiently manage the end of the RO, it is important to note that any exit strategy will have an impact on the ROC supply-demand balance at the end of the system's life. It is also interesting to note that the 'guaranteed headroom' suggestion discussed below could allow for a gradual tailing off of the RO were ROC-eligible supply to decline in the lead-up to 2027.

Q23: Technologies that are being phased out of the RO might be awarded ROCs for only a proportion of their output, but this may be regarded as banding by the back door, which would be against the terms of reference of the Review. Output limitations as discussed in the answer to Q22 would also avoid disruption to development as the end of the RO is approached in 2027 – were partial ROCs to be awarded, then in the last few years of the RO development would be inhibited as the limited benefit of partial ROCs for a short time would result in lower income for developers. BWEA does not have any further alternative suggestions for a feasible phase-out strategy to add to those discussed above.

Q24: Putting an output limit on technologies being exited from the RO should not pose insurmountable practical problems, as Ofgem already records the output of eligible projects and so it should not be difficult to note when the threshold has been reached.

## **Obligation Levels beyond 2015/16**

***Q25: The Government is interested in views as to whether an announcement of an increase in the Obligation level beyond 2015/16 at this stage would make a material difference to the financing and economics of longer-term renewables projects.***

- Q26: The Government is also interested in evidence that supports these views. What considerations are most relevant to ensuring the successful development of these projects?**
- Q27: Views are invited on all of the issues above and the arguments for and against a further extension of Obligation levels beyond 2015/16 at this stage.**
- Q28: Views are therefore invited on the scope for alternative approaches to handling future decisions on Obligation levels.**
- Q29: Are there approaches which do not involve such long term decision making by Government but could provide the market with additional confidence that the Government would increase Obligation levels “when the time came”, and thus increase confidence about long-term ROC prices and reduce developers’ and financiers’ concerns about the potential for a “cliff edge” in ROC prices?**
- Q30: What would be the impact of an amendment to primary legislation of the kind described above? Would it improve developers and financiers views of the risks of investing in larger or longer term renewable energy projects, such as dedicated biomass power stations or Round 2 offshore wind farms? Are there disadvantages to an approach of this kind?**

Q25: While projects that are in the final stages of development and thus will be built in the next 2-3 years would not be affected by a decision not to extend the RO level beyond 2015-16, projects following after would see a limited time of rising demand for ROCs, and thus will find financing more difficult. Were no decision made now, either to extend the profile or put in place a mechanism which keeps market confidence high, then the Government would have to revisit this issue in 2-3 years’ time, with all the uncertainties that this would entail. This issue particularly affects the Round Two offshore wind projects, which will not start construction until 2007 at the very earliest, and whose building will be spread over the period to 2012 or beyond. Any decision to invest in these projects will be held back until there is certainty over the level of the RO post 2015, as investors will need to be persuaded that these high-risk projects will be capable of earning a suitable return. Without the assurance of significant recycle value for ROCs, then offshore developers will find securing finance difficult. Also, until the level of the Obligation after 2015 is resolved, developers may slow down their work on achieving consent for sites, as there would be too much uncertainty to press ahead urgently on these projects.

It should be noted that any conclusion on the shape of the future profile of the RO beyond 2015-16 would be affected by implementation of an exit strategy for certain technologies. While exit strategies are unlikely to have any practical effect on ROC supply before around 2020, beyond that date there may be a falling off of supply as projects start to reach their output limit (were that route to exit be chosen). BWEA does not have a worked out

analysis of this possible effect, but merely notes that it is an interaction that will have to be considered.

Q26: When the profile of the RO levels off, the risk of ROC supply completely meeting the Obligation increases in as far as projects continue to be built. Should this happen, then the recycling value of ROCs would drop to zero, and thus expected income would be at risk. Developers and their financiers would be rightly cautious, particularly for lower-margin projects like offshore wind, which would need some level of certainty for a longer period to justify the significant investment they represent.

Q27 & 28 The BWEA would strongly prefer a definite decision on the level of the RO out to 2020 at least, with the profile increasing at 1% a year so that the Obligation reaches 20.4% in 2020-21. However, given that the RO is still in its infancy and that 2015-16 is still ten years away, the Association would be satisfied with a mechanism being put in place which would fix the level for each year a suitable time in advance. One such mechanism could be a rolling target, with the level set 5-10 years ahead. This would allow for some flexibility to adjust the RO to changing circumstances. Another approach is the 'guaranteed headroom' proposal which is discussed in the answer to Q29. While this is not BWEA's preferred approach, it is not without interest, and is discussed further below.

Q29 & 30: The Government has raised the possibility of having the level of the RO set from year to year after 2015-16, with the level for a year set so that the 'headroom' between expected generation and the Obligation is a fixed amount, say 2%. This idea has some attractions, as it would provide a floor to the recycling value of a ROC, reducing price risk for generators and suppliers, thus allowing for more debt to be leveraged into projects, and in turn leading to increased equity returns. These developments would be welcome.

BWEA has some concerns over the practical implementation of the proposal, however, as it would further complicate the RO, and considers that the extra certainty provided by this proposal over simply extending the profile or implementing a rolling target would be marginal. For these reasons it would not be the Association's preferred option, though it would be an acceptable development were the Government to decide that this is how the level of the RO is to be set beyond 2015. Before being more enthusiastic in our support for this option, some more clarity on how headroom might be managed would be necessary – would the guarantee be time-limited (eg to 2020) or capped (eg the level would not be allowed to rise above 20%)? If the Government is aiming at 20% of power from renewables would the RO level be allowed to rise to 22% if the headroom guarantee was 2%? These and other questions will have to be answered. Assurance would also be required that, if this proposal were to be implemented, the Obligation level would never be set lower than the previous year's Obligation.

While guaranteed headroom would enable higher gearing of offshore wind projects, and thus improve equity returns, it would not be a solution in itself to the 'funding gap' for the sector. It would guarantee high returns for lower-cost renewables, however, which Government may consider a high price to pay for a partial solution for offshore wind – though if an exit strategy for cheaper technologies had been agreed and implemented then this would be less of an issue.

### **Combined Heat and Power and the Renewables Obligation**

***Q31: Views are invited on the findings in the Impax Study, specifically:***

***Q32: To what extent would the proposal for CHP exemption lead to more CHP capacity? If supported, should the proposal apply to existing schemes (or would this provide windfall gains)?***

***Q33: To what extent would the proposal help meet the 10 GW 2010 target for CHP?***

***Q34: What impact do you think there would be on renewables?***

***Q35: What impact do you think there would be on the costs to consumers?***

***Q36: Do you think the proposal is practicable?***

***Q37: What would be your preferred mechanism for supporting CHP?***

***Q38: What are the advantages and disadvantages of linking support for CHP to an instrument designed to encourage renewables?***

Q31-33: BWEA is not qualified to respond to these questions.

Q34: Without careful handling, any attempt to support CHP in the way described in the condoc would have a negative impact on renewables, by reducing the demand for ROCs. Even with adjustment of the RO levels to accommodate this effect, there would be uncertainty and additional complexity in the renewables market while the new system was adjusted to. As with any change to the RO, there would be a risk to investor confidence, so BWEA would strongly prefer for this proposal to be rejected.

Q35: Clearly there would be an additional cost to consumers of providing this support to CHP while keeping support to renewables unaffected. While the amount of money would be relatively small compared to the overall cost of the RO, it would still add to the burden. It would amplify the additional cost to consumers of the RO, rising as the RO level rises.

Q36: It would appear possible to implement the proposal were the Government to decide to do so. However, it would add extra complexity and uncertainty to the RO, which would militate against smooth operation of the renewables market.

Q37: BWEA is sympathetic to the plight of CHP and is distressed to have to be responding negatively to a proposal which could give the CHP sector a much-needed stimulus. However, a solution more tailored to the needs of CHP would be preferable, perhaps involving a CHP Obligation modelled on the RO. While not having a mechanism to offer which could provide the support CHP requires, BWEA urges DEFRA to urgently bring forward proposals that would do so.

Q38: The clearest disadvantage of the proposed mechanism is that it links support for CHP to renewables. It is not a priori obvious why the rising support for renewables, out to 2015 and possibly beyond, should also increasingly benefit CHP. Developments such as the EU ETS should start to provide CHP with significant extra income in the next ten years, yet CHP would also be gaining increasing income from this RO exemption as well.

### **Operation of the Renewables Obligation Certificate (ROC) Market**

***Q39: Views are invited on the current levels of liquidity in the ROC market and how much importance should be attached to encouraging greater liquidity in the market***

***Q40: Views are invited on the issue of ROC revocation and alternative approaches.***

***Q41: To what extent are the current rules on revocation in the Obligation a deterrent to ROC trading? How significant a problem is this bearing in mind the very low levels of ROC revocation to date?***

***Q42: Would it be possible for the market to develop solutions to the (low) risk of ROC revocation –eg through insurance products?***

***Q43: How effective are the current rules in deterring fraud? How effective would the alternative approach be? Would it be more or less effective?***

***Q44: Views are invited on the practicality of the option to allow non-suppliers to present ROCs (outlined in paragraphs 7.12 to 7.16); its potential impacts on the operation of the renewables obligation and the ROCs market; and any impact on costs to consumers.***

***Q45: Views are invited on the issue of a market operator for the Obligation and what roles a new organisation might valuably perform in relation to the operation of the ROC market and administration of the Obligation.***

***Q46: Views are invited on how an appeals mechanism might practically operate in a way which added value and overcome the concerns outlined in paragraphs 7.20 to 7.25.***

Q39: The levels of liquidity in the ROC market are currently very low and unlikely to rise without changes. It is not immediately apparent that increased liquidity is necessary for BWEA members to go about their business, however. Wind developers will generally be looking for long-term PPAs with

creditworthy counterparties on which to base financing deals. Some players might be drawn into the market on a merchant basis (selling the output of generators on the open market without the backing of a PPA) were there to be a more liquid market in ROCs, but the available returns would probably not justify the risk for owners of capital, and thus the extra money drawn into the sector would be relatively small. An additional benefit of a liquid market in ROCs would be the production of reliable forward curves for ROC prices, though perhaps no more reliable than the estimates that market players currently make. On balance, the need to maintain confidence of current investors and those close to investing is more important than the benefit of bringing some extra risk capital to the renewables market and providing more accurate price signals.

Q40-43: BWEA would prefer to remove the ability of Ofgem to revoke ROCs, with another means found to punish fraud – which in any case is very low if not non-existent in the ROC market, showing that current rules are very effective in preventing fraud. Since the levels of both trading and ROC revocation are very low, it would not hurt much to abolish revocation and it may well stimulate additional trading. While the market may bring forward insurance products or similar to guard against revocation risk, it would be much simpler to abolish revocation and find a different solution.

Q44: The proposal set out in the condoc does not appear to be workable or desirable, though ways to widen the pool of customers for ROCs would be in principle desirable.

Q45: BWEA considers that Ofgem is performing the role of RO operator and administrator satisfactorily and would be content for it to continue in this role. There are arguments for the proposal to hand operation and administration of the RO to an independent market operator, and BWEA finds some of these attractive. However, on balance the Association believes that the disruption caused by setting up a new structure probably outweighs the additional benefits to be gained by moving to a new system, at least in the short- to mid-term. A return to this question at a later date may be appropriate, however.

Q46: An appeals procedure would be desirable, bringing an extra level of accountability and assurance that if an administrative mistake were to be made by Ofgem there would be a procedure to correct it. As the ROC market grows and the amounts of money at stake rise, then having independent adjudication on contested decisions will become more important.

## **Administration and other detailed technical or definitional issues**

***Q47: Views are invited on bringing forward ROC issuing and its potential benefits and possible disadvantages***

***Q48: Views are invited on the option to allow the Article 4(10)c declaration to be submitted by generating stations on a one off or annual basis.***

***Q49: Views are invited on the option to allow generating stations to notify Ofgem only where input electricity exceeds 0.5% of gross output or exported electricity.***

***Q50: Views are invited on the potential for alternative arrangements for measuring biomass fuels for both dedicated biomass plants and co-fired plants. Any arrangements would need to be able to provide rigorous and readily auditable confirmation to Ofgem in relation to the calorific value and volumes of biomass being used in the plant each month.***

***Q51: Views are invited on whether the proposed changes to the timetable for supplier compliance would be useful and possible to simplify the current system in the ways described above***

***Q52: Views are invited on the desirability and practicality of aggregating supply across several licences.***

***Q53: Views are invited on shorter Obligation periods.***

***Q54: Views are invited on the benefits of the changes for smaller generators and any practical issues associated with their implementation***

***Q55: Views are invited on the potential benefits of this change and whether a sale and buy back agreement is necessary to provide evidence that electricity from small generators is usefully supplying customers in the UK.***

***Q56: Views are invited on the need for an amendment to the Obligation for fossil fuel generating stations with dedicated renewables generating sets.***

***Q57: Views are invited on storage and the policy goals set out above***

Q47: Bringing forward the issuing of ROCs would be beneficial, improving the cash flow of generators and reducing requirements for working capital. It would also aid in business planning. BWEA cannot see any disadvantages to this change.

Q48: The Association supports the proposal that Article 4(10)c declarations should be submitted on an annual or one off basis. Submitting the declarations on a one off basis would be preferable to an annual basis.

Q49: The Association is strongly supportive of the proposal to allow generators to notify Ofgem only when input electricity exceeds 0.5% of gross output. The current arrangements are cumbersome and unnecessary. They increase the administrative burden of participating in the Obligation.

Q50: As BWEA members by definition do not use biomass at their generators, the Association does not have a position on this question.

Q51: The proposed changes to the timetable for supplier compliance should speed up the time between the end of the obligation period and the recycling of buyout payments. This will increase cash flow to ROC holders, and decrease the risk of supplier default impacting upon the size of the buyout fund.

Q52: The Association supports the proposal to aggregate supply across a number of licences. The Government should ensure that aggregation does not allow suppliers to avoid paying the buyout on some of its supply and that in the case of default responsibility for default is clear and traceable.

Q53: Shorter Obligation periods would improve cash flows for generators, but this should be balanced against increased complexity and administration requirements. The other main argument for shorter periods, to mitigate effects of possible supplier default on the buy-out fund, has been at least partially obviated by the recently implemented measures for mutualisation of shortfalls. There might also be issues related to seasonality of supply over six-month or three-month periods given that the Obligation level would be the same across a whole year, though this would be balanced by seasonality in power demand.

Q54 & 55: BWEA supports the proposals to change the RO for smaller generators.

Q56: While logic dictates that generating sets dedicated to biomass should be awarded ROCs outside the co-firing rules, BWEA is concerned that allowing this change would result in large generators flooding the market with ROCs generated using imported biomass materials, which would have a limited net environmental benefit. Before making a decision on this matter, BWEA recommends that DTI undertake analysis to calculate the likely effect of this change on the ROC demand-supply balance.

Q57: While it seems unlikely that the proposed rules on storage will be used in the near future given the 30% losses incurred in the operation of pumped storage stations like Dinorwig, the BWEA welcomes the attempt to get the issue clear well ahead of time. In due course, BWEA would not want to see the use of storage hindered by administrative rules that would prevent ROC-eligible power from getting the benefit of the RO through having been stored.

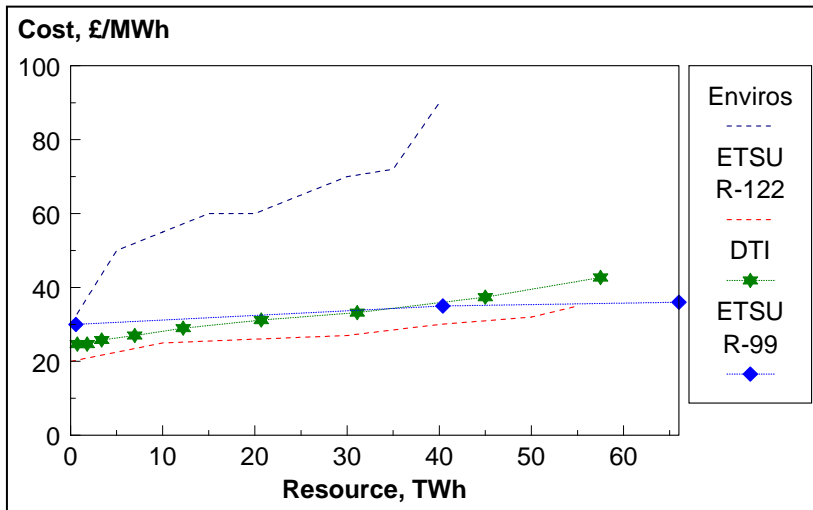
# Appendix 1

## BWEA critique of the Enviros report on lower-cost renewable technologies

The following notes relate to the document: "The cost of supplying renewable energy" by Enviros Consulting Ltd, particularly Chapter 3 "Onshore Wind"

### *Resource cost curves for onshore wind*

- The cost-resource curve for onshore wind (Figure 3.6 in the Enviros report) is unique, quite different from those in three other studies, all of which applied quite stringent siting criteria – see Figure A1.1. It implies the costs of exploiting onshore wind are much higher than previously thought. The earlier studies suggested, for example, that around 20TWh might be available at £30/MWh or less; this report suggests that the corresponding cost is about £60/MWh. The data from the earlier studies shown here used cost and financing assumptions similar, or more severe, to those used by Enviros.
- The key to the differences seems to be that Enviros assumes the higher wind speed sites will "run out" very quickly, and so developers will be forced to move to lower wind speed sites.



**Figure A1.1 UK wind cost-resource curves**

**Sources of data in Figure. Data estimated "by eye", except where points are plotted**

- ETSU R-99 A review of the UK onshore wind energy resource, 1996
- ETSU R-122 New and renewable energy: prospects in the UK for the 21<sup>st</sup> century, 1999
- DTI: Modelling carried out for economics paper No 4. Options for a low carbon future, 2003

Further analysis of the assumptions made by Enviro reveals likely reasons for the differences between their results and the earlier studies, and other issues that need to be examined:-

- Enviro cites a summary of the Regional resource studies<sup>i</sup>, as the initial source of their resource data. This raises further queries:-
  - The resources identified in the Regional resource studies are, at least in part, time-dependent. They estimate possible scenarios for 2010 (some for 2016 as well). It is possible that more high wind speed sites may be developed at a later date – or earlier.
  - A spot check in one region suggests that at least one estimate of the onshore target may be out of date. OXERA quotes 115MW for the “High” estimate for SE England. A later “Regional potential” was 120MW (160MW by 2016)<sup>ii</sup>. Later still, the regional target for all renewables was raised from 450MW to 620MW<sup>iii</sup>. A breakdown by technology of the latter, from inspection of pie charts, suggests the regional wind target is now about 170MW (220MW by 2016). This suggests that for the SE region, the OXERA resource can be increased by almost 50%.
- Enviro assume that Weibull distributions can be used to describe spatial variations in mean wind speed across a region as well as to describe time-dependent variations about a mean. Is there any evidence to support this assumption?
- We know there are about 4,500MW of wind projects in the Scottish planning system. Is it likely that about 3,500MW of this will be at wind speeds below 7m/s? (Enviro indicates that only ~1,000MW is available at higher winds in Scotland.) The more recent Garrad Hassan Resource study confirmed the ETSU estimate of 11GW in Scotland<sup>iv</sup>.

This explains the apparently high costs predicted by Enviro. It appears to be based a very pessimistic assessment of the resources available. It may be noted that no other study has looked at resources or costs below about 6.5m/s, and that the derivation of the resources available at these low wind speeds needs to be justified more rigorously.

### **Implications of estimates**

Inspection of the Enviro data in Figure A1.1 suggests the average cost of exploiting 30TWh of wind (75% of the 10% target) would be about £50-55/MWh. This may be a “very worst-case” scenario, but needs better justification, and the existence of other, less costly predictions should be acknowledged. It also makes estimates of wind generating costs from other sources look optimistic – see Table 1.

### **Use of data from ETSU studies**

Although ETSU R-99 does carry out sensitivity studies, there do not appear to be sufficient data to determine “answers” for combinations of variables relevant to present-day conditions. Key issues are:-

- The minimum separation between wind farms; an 11km separation reduces the resource by 25-40%, and a 15km separation reduces the resource by 40-55% approximately.
- On the other hand ETSU’s reference “planting density” of 9MW/sq km may have been a little cautious, although they did carry out a sensitivity analysis using 18MW/sq km. As machines have grown larger, fewer are needed, so wake effects are less severe, and five diameter spacings are quite common. Based on machines currently available, this suggests a planting density of around 12-15MW/sq km.
- Quite a few wind farms with less than ten machines (ETSU’s “minimum farm size”) have been built, and some with more than 100 have been built or planned.

Overall, these three issues, at least qualitatively, may cancel out, suggesting that the ETSU R-99 “base case estimate” may still be valid, and provide an “upper bound” of the resource available at over 7m/s. This is 58TWh.

A lower bound is more difficult to judge, as the ETSU “minimum case” puts all the variables at the “worst case” end of the spectrum. A 15km separation may be realistic, but not necessarily universal. Seven turbines per sq km, on the other hand (4.2MW/sq km) for all wind farms, is unrealistic. Besides, it is impossible to quantify how planning attitudes would affect the lower bound.

### *Generating cost estimates*

The cost assumptions used by Enviro are generally in line with recent industry data. Adding up the cost components suggest installed costs are in the range £769-782/kW. Although this is quite close to the current average<sup>v</sup>, the range is quite wide – from £625/kW to over £1,000/kW – with some developers claiming costs to be closer to the upper end of the range. However, some quoted costs do include operation and maintenance cover for up to 5 years.

Operation and maintenance costs also vary. Adding up the various components quoted by Enviro suggests an annual total of around £35/kW. This is higher than the value quoted by Oxera (£15/kW)<sup>vi</sup>. It is also about double the estimate of the Danish Energy Authority. Although some UK charges do not apply in Denmark, it seems doubtful that these account for all of the difference.

The estimates of capacity factor do not appear to make allowances for availability, array losses, and electrical losses, which, between them, add up to 8-12%. Using data from machines currently on the market suggests net

capacity factors are around 49% at 9m/s, (cf 47%, quoted by Enviros) falling to 35% (cf 39%) at 8m/s, 28% at 7m/s (cf 31%) and 22% (cf 26%) at 6m/s. This may mean that the estimates of generating costs at the lower wind speeds are optimistic.

### *Future costs of onshore wind*

The assessment of future costs of onshore wind appears to be based on a single reference, and a progress ratio of 92% is used. (This is the ratio of future costs to present costs, after a doubling of global wind capacity.) However, one recent and particularly authoritative study suggests lower progress ratios may be appropriate (around 81%)<sup>vii</sup>. The existence of alternative estimates should be acknowledged, and sensitivity analyses carried out to show what impact this might have on future generation costs.

**Table A1.1 Generation costs for onshore wind**

Source	Price, 2004 p/kWh	Test discount rate, %	Depreciation, yr	Notes
<b>UK</b>				
NFFO5	<b>2.72 up</b>	Discretionary	15	
SRO3	<b>2.12 up</b>	Discretionary	15	
PIU	<b>2.6-3.1</b>	Not quoted	Not quoted	
Oxera <sup>viii</sup> , 2003	<b>2.8-4.0</b>	8-10	15-20	
Oxera <sup>ix</sup> , 2004	<b>3.1</b>	?	20	Includes 0.2p/kWh for balancing?
DTI <sup>x</sup> , 2003	<b>3.1<sup>xi</sup></b>	15	20	Installed cost £530/kW
From first principles	<b>3.2-5.7</b>	8	15	Assumes £750/kW; winds 9.5-6.5m/s
<b>International<sup>xii</sup> (price base 2003)</b>				
United States	<b>2.9</b>	10	20 (?)	£618/kW
Denmark	<b>3.6</b>	10	20	£590/kW

### *Conclusions*

- Planning consent applications in Scotland, plus updates of resource estimates for the SE, and for Scotland suggest that the initial source data for the resource estimates is very pessimistic. The resource available at any given price therefore should increase significantly.
- ETSU's "base case" estimate of the resource available at over 7m/s (58TWh) includes assumptions that are generally still valid today, although some may be optimistic (wind farm separation), others pessimistic (maximum and minimum wind farm sizes, planting density)

- A “lower bound” estimate cannot be derived from the ETSU data, and is, any case, dependent on non-technical factors, principally planning policy

---

i Oxera (2002) Regional Renewable Resource Assessment

ii South East England Regional Assembly, 2002. Harnessing the elements

iii Government Office for the South East, 2004. Regional Planning Guidance for the South East.

iv Garrad Hassan and Partners, 2001. Scotland’s Renewable Resource

v Based on analysis of data in Power UK’s “Power Station Tracker”

vi Oxera, 2005. The performance of the UK Renewables Obligation and Capital grants scheme.

vii Juninger, M, Faaij, A, and Turkenburg, W, 2005. Global experience curves for wind farms. Energy Policy 33 (2005) 133-150

viii The Non-market value of Generation Technologies

ix Results Of Renewables Market Modelling

x Economics Paper No 4

xi Taken from supporting data; text quotes 2.1 p/kWh for 10% tdr and 15-year life

xii International Energy Agency. Projected costs of generating electricity, 2005 update