



EUROPEAN COMMISSION

Brussels, 26.03.2009  
C(2009)2237

**Subject: State aid N 590/2008 – United Kingdom (Scotland)  
Renewables Obligation – Introduction of a banding mechanism and  
specific support to wave and tidal stream generation**

Sir,

The Commission wishes to inform the United Kingdom (UK) that, having examined the information supplied by your authorities on the matter referred to above, it has decided to raise no objections to the aid.

#### **PROCEDURE**

1. By letter dated 11 November 2008, the UK notified the Commission, according to Article 88(3) of the EC Treaty, of alterations to State aid scheme N 504/2000<sup>1</sup> for Scotland.
2. The changes for Scotland are supplementary to the N 414/2008 scheme which was notified by the UK as a modification to the Renewables Obligation (RO) scheme N 504/2000 (introduction of a banding mechanism) and approved by the Commission<sup>2</sup>.
3. As regards wave and tidal stream generation, the UK authorities have notified the present Renewables Obligation scheme for Scotland (the "Scottish RO" hereinafter) with higher levels of support for wave and tidal stream generation in order to maintain the support for which is currently provided by the Marine Supply Obligation (MSO) mechanism, approved by the Commission in its decision N 851/2006<sup>3</sup>. The

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<sup>1</sup> Approved by the Commission on 28 November 2001. OJ C 30, 2.2.2002, p. 15.

<sup>2</sup> Approved by the Commission on 11 February 2009, not yet published in OJ.

<sup>3</sup> Approved by the Commission on 19 March 2007, OJ C 100, 4.5.2007.

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current MSO foresees that a fixed share of the Scottish RO is allocated to purchases from wave and tidal stream generators. It also foresees higher buyout price (175 and 105 £/MWh for wave and tidal stream respectively). The new Scottish RO will lead to the termination of the current MSO.

4. In the notified case, the Commission asked the UK authorities for further clarifications by letter dated 12 January 2009. The UK authorities submitted their replies on 23 January 2009.
5. As the UK authorities notified the very same amendments to the scheme N 504/2000 as in case N 414/2008 applicable for the territory of the UK, which were approved by the Commission, the present decision will only assess the particular amendments of the Scottish RO scheme which were not assessed under the scheme N 414/2008 i.e. higher support levels to wave and tidal stream generation.

## **DESCRIPTION**

### *Objective*

6. The objective of the present measure is to develop the potential of wave and tidal resources in Scotland. According to the UK authorities, Scotland has 10% and 25% of the European wave and tidal potential respectively, which corresponds to a total capacity of marine renewable electricity sources of 21.5 GW.
7. The UK authorities mentioned that the objective of 31% of Scotland's electricity demand coming from renewable sources by 2011 is already met due to the capacities installed, consented and under construction. They now intend to reach the 2020 objective of 50% of Scotland's electricity demand coming from renewable sources.

### *The Renewables Obligation Certificates*

8. The scheme obliges all electricity suppliers in the UK to ensure that a fix proportion of electricity supplied is produced from renewable sources of energy. Suppliers can meet this obligation either by supplying power from renewable generating stations, or by purchasing green certificates (Renewables Obligation Certificates – hereinafter referred to as “ROCs”) or by paying a buyout price which is adjusted annually by a price index. All proceeds from buyout payments are collected in a fund and recycled to suppliers in proportion to the number of ROCs they present.
9. Under the N 504/2000 regime, one ROC was provided for every MWh of electricity produced from renewable sources. The new N 414/2008 regime introduces banding of the ROCs in the UK: levels of support are differentiated according to the production technology. It aims at encouraging technologies which are further from commercial development and more expensive (e.g. offshore wind, tidal, wave, biomass) while maintaining support to current mainstream technologies (e.g. onshore wind). Therefore it keeps the latter at 1 ROC per ROC eligible MWh, while the former enjoy up to 2 ROCs per MWh. Finally, some technologies are banded down at 0.25 ROC/MWh (e.g. landfill gas), as the previous levels could lead for new installations to overcompensation.
10. As regards the present scheme for Scotland, all technologies are banded as specified in decision N 414/2008, except for wave and tidal stream generation which are banded up at 5 and 3 ROCs per MWh respectively. This means that the support under

Scottish RO is by 3 ROCs higher for wave and 2 ROCs higher for tidal stream as under the RO scheme. Additionally, the UK authorities foresee to limit the support to wave and tidal stream to the first 75 MW of new capacity built. In case the installed and foreseen capacities are above this level, the UK authorities announced their intention to initiate an emergency review of the support level.

11. Table 1 below presents the banded levels of support per technology applicable under the Scottish RO:

**Table 1 – Banding of ROCs per technology, in ROCs per MWh**

<b>Technology</b>	<b>Level of support ROCs/MWh</b>
– Landfill gas	0.25
– Sewage gas – Co-firing of biomass	0.5
– Onshore wind – Hydro-electric – Co-firing of energy crops – Energy from Waste with CHP – Geopressure – Co-firing of biomass with CHP – Standard gasification – Standard pyrolysis	1.0
– Offshore wind – Dedicated biomass – Co-firing of energy crops with CHP	1.5
– Tidal impoundment (e.g. tidal lagoons and tidal barrages) – Geothermal – Solar photovoltaic – Microgeneration – Advanced gasification – Advanced pyrolysis – Dedicated biomass with CHP – Dedicated energy crops with CHP	2.0
– <b>Tidal stream</b>	<b>3.0</b>
– <b>Wave</b>	<b>5.0</b>

*Source: Draft Renewables Order (2009) Scotland*

12. As mentioned above, the support levels are identical to those presented in case N 414/2008 for all technologies except for wave and tidal stream. For the latter, the UK authorities commissioned a report from consultants (the "SQW Report" hereinafter)<sup>4</sup> to set the ROC levels so that generators receive the same level of support in the new ROC scheme as under the MSO scheme.
13. Under the MSO, special buyout prices are foreseen for wave and tidal stream generation: £175/MWh for wave and £105/MWh for tidal stream. The value of a ROC varies according to the degree of compliance with the obligation i.e. the smaller the degree of compliance with the obligation the higher the recycling of the buy-out fund and therefore the higher the value of a ROC. As the obligation under the MSO is set each year 30% above the predicted level of output and assuming this predicted output is achieved, this implies that the values of the Marine ROC (or MROC) are 227.50<sup>5</sup> and 136.50<sup>6</sup> £/MWh for wave and tidal stream respectively, 30% of the obligation being redistributed from buy-out fund.
14. Under the new RO scheme approved by the Commission, the buyout price is set at £35.76 for 2008-2009. Assuming a degree of compliance of 80%, the value of a ROC under the RO would be £45<sup>7</sup>. The number of ROCs granted per MWh for wave and tidal stream under the Scottish RO has been computed so that the value of these ROCs equals the value of the MROC under the MSO scheme. Therefore 5.06 ROCs are needed under the new ROC scheme to equal 227.50 £/MWh under the MSO scheme for wave. Similarly, 3.03 £/MWh are needed for tidal stream to equal 136.50 £/MWh<sup>8</sup>.
15. The SQW Report also conducts a sensitivity analysis: for instance, for wave generation, if compliance with the MSO varies from 80% to 110% (with 80% compliance with the RO under the new scheme), the number of ROCs varies between 4.6 and 6.4 ROCs/MWh. Therefore, according to the UK authorities, the number of future ROCs for wave and tidal generation has been set at central values with respect to the main assumptions (e.g. compliance with the MSO or with the RO).

#### *Other provisions*

16. Generators will be eligible to ROC support provided they fulfil the following conditions:
  - Wave and tidal stream should correspond to the definition set out in the Scottish RO;
  - They should be situated in Scotland or in the Scottish area of the Renewable Energy Zone (between 12 and 200 nautical miles);
  - They should have received no support under the existing capital and revenue support schemes for wave and tidal stream energy granted by UK authorities or governmental bodies, such as the Wave and Tidal Energy Scheme (WATES) or the Marine Renewable Development Fund (MRDF).

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<sup>4</sup> See SQW Energy, *Modelling Changes to the Renewables Obligation*, 2008.

<sup>5</sup> 175\*1.30.

<sup>6</sup> 105\*1.30

<sup>7</sup> £35.76 / £45.00 = 80%.

<sup>8</sup> £45\*5.06=227.50£/MWh and £45\*3.03=136.50£/MWh

17. As for the review mechanism, Article 33 of the draft Renewables Order (Scotland) 2009 foresees that the authorities will commence a review of the banding levels in October 2010 and at subsequent four yearly intervals. They might also review the levels at any time in cases where market conditions evolve (e.g. if the charges for network operation change).

*Duration*

18. The new regime should enter into force on 1 April 2009 or from the Commission's approval, and should apply until 31 March 2015.

*Budget*

19. The annual budget is GBP 37 million. It corresponds to the income forecast for wave and tidal stream generators, which was established by the UK authorities on the basis of the sales of ROCs as presented in Table 2 below:

**Table 2 – Annual budget of the support scheme to wave and tidal generation**

<b>Technology</b>	<b>Wave</b>	<b>Tidal Stream</b>
Installed capacity (MW)	37.5	37.5
Capacity Factor	30%	30%
Annual Output (MWh)	98,550	98,550
Banding (ROCs per MWh)	5	3
Total number of ROCs	492,750	295,650
ROC value (£ per MWh)	47	47
<b>Total income (£m)</b>	<b>23</b>	<b>14</b>

*Source: Scottish government*

**ASSESSMENT**

**Existence of aid**

20. The scheme has already been considered a state aid scheme covered by Article 87(1) of the EC Treaty under Commission decision of N 504/2000 of 28 November 2001. The currently notified amendments do not alter this conclusion.

**Legality of the aid**

21. The Commission notes that the changes will come into effect after the approval of the Commission. The UK authorities have fulfilled their obligation according to Article 88(3) of the EC Treaty by notifying the aid measure before its implementation.

## Compatibility of the aid

22. The scheme was first approved by decision on 28 November 2001 in case N504/2000<sup>9</sup>, under the 2001 Community guidelines on State aid for environmental protection<sup>10</sup> which expired on 1 April 2008. The 2008 Community guidelines on state aid for environmental protection (hereafter Environmental Aid Guidelines)<sup>11</sup> entered into force since then.
23. As stated above, the Commission has already approved the introduction of banding for the UK in its decision N 414/2008. The same support levels will apply for Scotland through the Scottish RO scheme, except for its specific higher levels of support to wave and tidal stream generation. As support to production from other renewable energy sources have already been declared as compatible under Commission's decision in case N 414/2008, the compatibility assessment will therefore be limited to the higher support levels to wave and tidal stream generation,.

### *Renewable electricity sources*

24. The definition of the renewable electricity sources eligible for aid in the 2008 Environmental Aid Guidelines encompasses wave and tidal stream generation.

### *Aid to suppliers*

25. The changes introduced by Scotland with respect to the original scheme N 504/2000, i.e. introduction of a banding regime, constitute an aid to suppliers as a supplier of one MWh of energy produced from sources eligible for more than one certificate will get proportionally higher payments from the buyout fund per MWh produced as a supplier entitled to only one certificate.
26. As concluded in its decision N 414/2008, the Commission takes the view that aid to suppliers is necessary to run the system, limited and about 80% of support transferred to the generators of electricity from eligible renewable sources.

### *Aid to generators*

27. As regards aid to generators, the Commission will assess the scheme on the basis of point 110 of the 2008 Environmental Aid Guidelines, which lays down the conditions under which certificates which allow producers of renewable electricity to benefit indirectly from guaranteed demand for their energy, at a price above market price for conventional power, can be allowed when they constitute State aid. These conditions are the following:
- Support must be essential to ensure the viability of the renewable energy sources concerned;
  - Support does not in the aggregate result in overcompensation;
  - Support does not dissuade renewable energy producers from becoming more competitive;

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<sup>9</sup> OJ C 30, 2.2.2002.L 283, 27.10.2001

<sup>10</sup> OJ C 37, 3.2.2001.

<sup>11</sup> OJ C 82, of 01.04.2008, page p. 1.

– Support is limited to duration of 10 years.

*Support must be essential to ensure the viability of the renewable energy sources*

28. The Commission agrees with the UK authorities that a banded RO will allow developing further renewable generation, in particular with respect to technologies further from commercial development such as wave and tidal generation.
29. The Commission also acknowledges that without public support wave and tidal stream generation would not be considered by private investors, in view of the financial and technological risks of such projects. Therefore it appears necessary to support these technologies to ensure that they remain viable and achieve their potential in Scotland.

*Absence of overcompensation*

30. In order to verify whether there is no overcompensation in the aggregate, the Commission needs to verify that the revenues of the generators do not exceed the costs of production and a reasonable benefit in aggregate of the scheme i.e. over time and over technologies. These revenues include the ROCs, the wholesale electricity price, and other revenues such as those derived from Climate Change Levy Exemption Certificates (LECs).
31. The UK authorities are of the view that the levels of support in to wave and tidal stream generation in the UK scheme N 414/2008, which are set at 2 ROCs/MWh, are insufficient to encourage these technologies at the moment. These levels have been set on the basis of cost estimates performed by Ernst & Young<sup>12</sup>, which indicates the following production costs over time:

**Table 3 - Predicted production costs, preferred banded RO scenario, wave and tidal stream generation, £/MWh**

	2010	2015	2020
Wave	124-282	104-237	96-217
Tidal Stream	121-232	101-195	93-179

*Source: Ernst & Young*

32. The UK authorities pointed out that the Ernst & Young report has a much wider focus than wave and tidal stream generation only, since it encompasses all technologies supported under the RO. They quote more specific studies, such as the production cost estimates performed by AEA/Poyry for the UK authorities<sup>13</sup> (the "Poyry Report" hereinafter). The Poyry Report reckons that after taking into account wholesale electricity prices and other revenues (e.g. from LECs), specific extra support to wave and tidal should be in the range of 120-270 and of £90-150 £/MWh for wave and tidal stream respectively. This extra support would enable to achieve rates of return in the order of 8-10%<sup>14</sup>. It implies that 4.5 and 2.3 extra ROCs/MWh,

<sup>12</sup> Ernst & Young, *Impact of banding the Renewables Obligation – Costs of electricity production*, report prepared for the DTI, April 2007, pp. 39-42.

<sup>13</sup> AEA and Poyry, *Additional Support for Marine Energy in Scotland, Volume 2*, 2007.

<sup>14</sup> The Internal Rate of Return (IRR) is the interest rate that makes the net present value of all cash flow (investments, operating costs and income) equal to zero. In the scheme at hand IRR are calculated

or 5.5 and 3.3 ROCs/MWh in total would be necessary to cover the costs of wave and tidal stream generation respectively. Therefore the level of support offered under the RO scheme approved by the Commission in its decision in case N414/08 would result according to these calculations in undercompensation of wave and tidal stream sources.

33. The UK authorities also indicate that developers and investors currently lack practical experience to determine precisely the operating costs of wave and tidal stream generation, and that cost estimates vary widely as a result. The usual key assumptions for such estimates include component, installation and maintenance costs, but also differences in sites and technologies, cost of raw materials, deployment vessels and cost of capital. The UK authorities mentioned that the latter assumptions evolve quickly and might explain the differences in total cost estimates.
34. The Commission shares the view of the UK authorities that at this stage, cost estimates for wave and tidal stream generation are necessarily subject to large variations, since the market is not mature enough and since many key cost factors (such as technology) have not been developed at a commercial scale yet.
35. As for the cost estimates, the Commission takes the view that the ROC levels for wave and tidal stream generation have been set on the basis of fair assumptions (e.g. for compliance with the Scottish RO) and will lead to reasonable profit margins. Whereas the level of support specified in the decision N414/2008 would undercompensate wave and tidal stream technologies. Additionally, evidence from the Oxera report<sup>15</sup>, based on the Ernst & Young data, suggests that individual banding for wave and tidal stream would lead to levels of 4.5 and 3.9 ROCs/MWh respectively, which does not differ significantly from the levels of 5 and 3 ROCs/MWh set by the UK authorities.
36. The Commission also notes that the UK authorities ensured that they will regularly review the costs of the technology in order to ensure that technologies are not overcompensated over the duration of the scheme. In that respect, the cost estimates provided for in the Ernst & Young report (see table above) suggest that cost are likely to decline in the future for both wave and tidal stream generation.
37. Finally, the Commission notes that no other public support such as capital grants will be given to wave and tidal stream generators which will receive ROCs. However wave and tidal stream generators will benefit from other revenues like LECs as described above.
38. Therefore it takes the view that even if the system may overcompensate generators in the beginning of application of the scheme, the market mechanism and the adjustments made in accordance with the commitments made by the UK will prevent in the aggregate of the duration of the scheme overcompensation.

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from the balance of operating revenues and costs in each year over the return period of normally 15 to 20 years.

<sup>15</sup> Oxera, *Reform of the Renewables Obligation*, report prepared for the DTI, May 2007, Scenario 1, p.18.



Support does not dissuade renewable producers to become more competitive

39. The UK authorities expressed that they will regularly review the levels of support, as mentioned above.
40. Additionally, the SQW Report reckons that if the wave and tidal stream capacity reaches its foreseen potential (i.e. 80 MW by 2014-15), the introduction of banded ROCs instead of the MSO would lead to a reduction in the UK ROC price of up to 1.5% and a reduction in renewable output of up to 1.3% in a given year. The effect on renewable energy generated from other sources than wave and tidal appears as limited.
41. Accordingly, the Commission takes the view that support will not dissuade producers from becoming more competitive over time, thanks to the review mechanism, and with respect to technologies, in view of the limited crowding-out effect of support to wave and tidal stream.

Limitation of the duration to 10 years

42. Finally, point 110 requires that the scheme be limited to duration of 10 years. The Commission can conclude that this provision is satisfied since the scheme will be valid until 31 March 2015.

*Conclusion*

43. Taking the above assessment into account the Commission considers the notified measure, encompassing support to wave and tidal stream generation and support to production from other renewable energy sources, compatible with Article 87(3)(c) of the EC Treaty.

**DECISION:**

44. On the basis of the foregoing assessment, the Commission has accordingly decided not to raise objections against the notified measure, since it fulfils the conditions to be considered compatible with the EC Treaty.
45. The Commission reminds the authorities of the UK that, in accordance with Article 88 (3) of the EC Treaty, plans to refinance, alter or change this scheme have to be notified to the Commission pursuant to provisions of Commission Regulation (EC) No 794/2004<sup>16</sup>.

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16 Commission Regulation (EC) No 794/2004 implementing Council Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 [now 88] of the EC Treaty; OJ L 140, 30.4.2004, p.1.

46. If this letter contains confidential information which should not be published, please inform the Commission within fifteen working days from the date of receipt. If the Commission does not receive a reasoned request by that deadline, you will be deemed to agree to the disclosure to third parties and to the publication of the full text of the letter in the authentic language on the Internet site:

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Yours faithfully,

For the Commission

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