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Wind farms play key role in cutting carbon emissions, study finds

Wind farms have made a significant impact in limiting carbon emissions from other sources of power generation in Great Britain, a study shows.

Power from wind farms prevented the creation of almost 36 million tonnes of greenhouse gas emissions from sources such as coal and gas, in a six-year period – the equivalent of taking 2.3 million cars off the road, analysis of nationwide output shows.

The figures from 2008-2014, analysed in the most accurate study of its kind to date, suggest that a greater investment in wind energy could help meet Scottish and UK government targets for carbon emissions reduction.

Engineers from the University of Edinburgh analysed National Grid figures for the power generated by various sources including wind, coal and gas. Their data detailed generator energy output figures for every half hour, creating a comprehensive picture of how demand over time was met by power from the various sources.

Their study improves on previous estimates because it uses real, rather than estimated, energy output figures and takes into account the inefficiency of individual conventional generators, researchers say. The calculations are complex because energy demand is met from a mix of sources at any one time, and when output from wind turbines increases, a number of different conventional sources may need to decrease their outputs.

The study demonstrates that government estimates for carbon savings underestimated the benefits from wind farms. Over the six year period, 3.4 million more tonnes of greenhouse gases were saved than thought – the equivalent of taking an extra 220,000 cars off the road.

Engineers say their methodology could be applied to give accurate estimates of possible future emissions savings for energy developers, planners and policymakers. They suggest wind power generation could play an increasingly important role in the future energy mix, which could also include carbon capture and storage, marine and nuclear power.

The study, published in *Energy Policy*, was supported by the Engineering and Physical Sciences Research Council.

Dr Camilla Thomson, from the University of Edinburgh's School of Engineering, who led the study, said: "Until now, the impact of clean energy from wind farms was unclear. Our

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findings show that wind plays an effective role in curbing emissions that would otherwise be generated from conventional sources, and it has a key role to play in helping to meet Britain's need for power in future."

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