

Shale gas is one of the least sustainable ways to produce electricity, research finds

January 15 2018



Credit: CC0 Public Domain

Shale gas is one of least sustainable options for producing electricity, according to new research from The University of Manchester.



Taking into account a range of sustainability aspects and assuming that they are all equally important, the research found that <u>shale gas</u> overall ranks seventh out of nine electricity options. The study also found that:

- Shale gas ranks between the fourth and eighth relative to other electricity options
- To become the most sustainable option, large improvements would be needed
- This includes a 329-fold reduction in environmental impacts and a 16-fold increase in employment
- An electricity mix with less rather than more shale gas is more sustainable

The major study, which is the first of its kind, considered environmental, economic and social sustainability of shale gas in the UK and compared it to other electricity generating options. These were coal, nuclear, natural gas, liquefied natural gas (LNG), solar photovoltaics (PV), wind, hydro and biomass.

The study, published in *Science of The Total Environment*, compared shale gas and the other electricity options against 18 sustainability indicators. Of these, 11 were environmental, three economic and four social. Examples of the indicators considered include <u>climate change</u> <u>impacts</u>, environmental pollution, costs of electricity, creation of jobs and public perceptions.

The Government believes shale gas has the potential to provide the UK with greater energy security, growth and jobs. And it is "encouraging safe and environmentally sound exploration to determine this potential".

But the researchers found that for shale gas to be considered as sustainable as the best options, such as wind and solar PV, huge improvements would be needed.



This includes a 329-fold reduction in environmental impacts and 16 times higher employment in the sector.

The environmental and social sustainability of shale gas would also need to improve by up to a 100 times for it to compete with domestic <u>natural</u> <u>gas</u> and imported LNG.

Prof. Adisa Azapagic, from the School of Chemical Engineering & Analytical Science, says: 'Many countries are considering exploitation of shale gas but its overall sustainability is disputed. Previous studies focused mainly on environmental aspects of shale gas, largely in the US, with scant information on socio-economic aspects.

'To address this knowledge gap our research, for the first time, looks not only at the environmental impacts but the economic and social aspects of shale gas as well. This enables us to evaluate its overall sustainability rather than focusing on single issues, such as water pollution, traffic and noise, which have dominated the debate on shale gas so far.'

Whilst the current Government and industry are keen to develop shale gas, Scotland has banned fracking and in the rest of the UK there is strong opposition. This comes from numerous stakeholders, including non-governmental organisations (NGOs), local residents and activists across the country.

The impacts on the environment from fracking are the main argument against the exploitation of shale gas. But its supporters highlight improved national <u>energy security</u> and economic development as key benefits.

Prof. Azapagic, Professor of Sustainable Chemical Engineering, added: 'The results of this study clearly show that, assuming equal importance of the environmental, economic and social aspects, shale gas ranks



seventh out of the nine electricity options, which means most other options for electricity generation are more sustainable.

'The results also suggest that any future <u>electricity</u> mix would be more sustainable with a lower rather than a higher share of shale gas.'

The research team say these results can now help inform UK policy makers, industry, NGOs and consumers. They will also be of interest to other countries considering exploitation of shale gas.

More information: Jasmin Cooper et al. Sustainability of UK shale gas in comparison with other electricity options: Current situation and future scenarios, *Science of The Total Environment* (2017). DOI: 10.1016/j.scitotenv.2017.11.140

Provided by University of Manchester

Citation: Shale gas is one of the least sustainable ways to produce electricity, research finds (2018, January 15) retrieved 27 April 2024 from <u>https://phys.org/news/2018-01-shale-gas-sustainable-ways-electricity.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.