

City research shows the investment and health risks of new nuclear build are low

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As part of [The SPRing Report](#) published in December 2011, Professor Philip Thomas of the Risk Management, Reliability and Maintenance Group within City's Systems and Control Centre provided comparative analysis of the costs and safety considerations associated with nuclear, renewable and traditional, fossil fuel-based energy options.

Two analysis techniques were used, beginning with the "real options" method, which provides an objective basis for judging when it is reasonable to invest in competing products, when their future price has a high degree of uncertainty. This projected that [nuclear power](#) is expected to become competitive on a cost-basis with gas-powered electricity in 2015, while it will take until 2032 and 2040 for onshore and offshore wind power to reach the same point*.

Secondly, the "J-value" framework was adopted. Developed at City, it offers a common, objective scale to assess the risks posed to human health by various technologies and the amount of money that might reasonably be spent to eliminate them.

This was used to assess the impact that future [power plants](#) built from 2010 to 2070 would have on human mortality, taking the entire fuel supply chain and construction, operation and decommissioning into account**. The research also examined whether health risks would be: posed to industry staff or the general public; immediate or delayed; and due to ongoing operations or major accidents.

Explaining the outcomes, Professor Thomas says: "[Coal power](#) has the highest impact compared with other technologies, mainly as a result of the widespread effect of pollution emissions. Nuclear has the lowest impact, followed by gas and onshore and offshore wind.

"This may seem surprising to some people, but [nuclear plants](#) are generally small, require low volumes of fuel and produce large amounts of energy. This mitigates against many of the safety and environmental risks that are posed by [gas extraction](#) or the large-scale production of steel for the high number of wind turbines needed, for example.

"Even when being most pessimistic about the effects of radiation globally, including after large nuclear accidents, the impact of nuclear power is still lower than or comparable with those from gas and wind."

The *SPRing Report* includes these findings along with other technical, economic, environmental, social and ethical recommendations. These are designed to help government and industry make long-term policy and investment decisions about nuclear power and its place in the wider UK energy mix. It can be downloaded at www.springsustainability.org .

More information: Thomas, P. and N. Chrysanthou (2012). Using Real Options to Compare the Economics of Nuclear and Wind Power with Electricity from Natural Gas. *Nuclear Energy*. Special issue of *J of Power and Energy*. In press.

Kearns, J., et al(2012). Comparative Risk Analysis of Electricity Generating Systems Using the J-Value Framework. *Nuclear Energy*. Special Issue of *J of Power and Energy*. In press.

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