VIEW

Okuma, Japan

Catastrophic events in Japan will severely set back efforts to combat future climate change

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The crisis at the Fukushima Daiichi nuclear power station in Japan will undoubtedly influence public opinion and policy decisions for many years to come. The Three Mile Island meltdown in 1979 was followed by the cancellation of 51 planned US reactors and a similar response has been prompted by the Fukushima emergency. China has suspended approval for nuclear development, Germany has announced the temporary shutdown of seven reactors for a safety review and an early day motion in the British Parliament called for the suspension of plans for a nuclear power programme in the UK.

This news could not have come at a worse time for the international imperative to combat climate change. The reality is that, although unpalatable, nuclear power is about the only carbon-free energy source that can be deployed, at least in the short-term, to satisfy our ever-increasing energy guzzling habits. Worldwide, energy demand is likely to grow by up to 50 per cent over the next 20 years. China is currently building new coal-fired power stations at an average rate of two per week and without its planned 20-fold increase in nuclear power by 2030 this rate will only increase.

The UK's strategy to achieve an 80 per cent reduction in carbon emissions by 2050 relies heavily on the wholesale migration of building heating

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systems from gas boilers to electric heat pumps, together with decarbonising the electricity supply; in other words replacing coal-fired and gas-fired power stations with cleaner alternatives.

During the cold winter of 2010, UK electricity demand peaked at an all-time high of 60GW. Of this only 1GW was provided by renewable sources and 8GW was generated by nuclear power stations. UK generation capacity currently includes 19 nuclear power stations, all but one of which are due to be decommissioned by 2025. If the UK were to shift just one quarter of domestic heating from gas to electric heat pumps by 2030, as proposed by the Committee on Climate Change, then demand for electricity during future cold snaps could double. Without replacement nuclear power, the UK would severely narrow its options with regard to climate change and energy security.

The current fashion, both political and architectural, to bolt micro-renewables onto conventional energy guzzling buildings, will do little to address either energy security or climate change. A recent field trial by The Energy Savings Trust found no instance of a micro-wind turbine in an urban location that generated more than 200kWh per year. In some cases, the electronic controls consumed more electricity from the mains over the course of a year than was generated by the turbines.

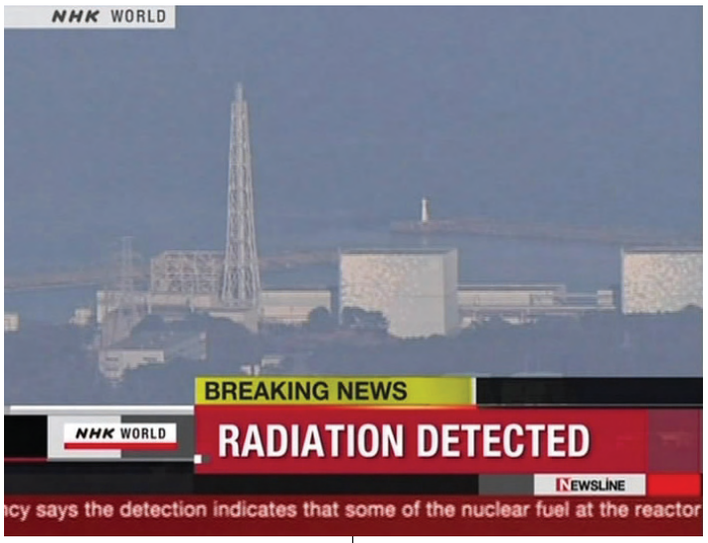
As events in Japan and Libya show, future energy security is a compelling reason for developing passive, low-energy architecture. Passively designed buildings utilise natural light and natural ventilation wherever possible and remain naturally warm or cool, without the need for electricity. Thus passive buildings not only reduce the need to develop fresh infrastructure, but also have important benefits for their occupiers.

An initial outcome of overstretched energy infrastructure will be rolling power cuts, as grid operators struggle to balance demand with available supply. This is now happening in Japan with the loss of a fifth of the national generation capacity. It also occurred inadvertently in London during an exceptionally hot spell in 2006 when local infrastructure could not cope with increased demand from air conditioning. Deep plan buildings quickly become untenable without artificial lighting and air conditioning, but passively designed buildings, with shallow plans and natural lighting and ventilation, continue to be habitable, albeit perhaps with reduced comfort levels.

Architecture must respond to its context and climate zone. Buildings designed for the climate of the US Midwest are inappropriate for the Gulf States or South East Asia. Buildings conceived without regard for the local climate or passive design principles rely entirely on energy to make them habitable and so inculcate a culture of energy dependency.

While earthquakes are common in South East Asia, there is also seismic activity in a zone running from South Eastern Europe, through the Middle East, to the Himalayas spanning Northern India and China. Countries here are looking to nuclear energy either to drive economic development or as an alternative source to previously abundant oil.

It is therefore imperative that developed nations share knowledge and technologies with developing nations. But this should not be limited to ways of producing safe nuclear power in potentially unsafe regions. It should also involve cultivating appropriate forms of low-energy architecture, which will enable economies to grow while minimising the demand for energy, whether through new nuclear power or the worse alternative – coal.



Previous page_ **A protest against nuclear power in the Philippine capital Manila after the Fukushima event**
Left_ **The devastated nuclear power plant at Fukushima**
Below_ **Japanese medics checking radiation levels of evacuees from the area around the power plant**

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