Dear Prime Minister

Opposition to a new generation of nuclear power stations in the UK

As scientists, engineers and others with expertise in energy or climate issues, we are writing to express our opposition to the construction of a new generation of UK power stations that utilise nuclear fission.

Advocates of a new generation of nuclear power argue that it is essential for our energy security and to help meet our commitments to reduce greenhouse gas (GHG) emissions. They argue that it is cost-effective and safe. We dispute these claims and believe alternative forms of energy development together with measures to reduce energy demand would be much more beneficial. This letter outlines our main reasons.

The potential contribution of nuclear power to tackling climate change is limited
Firstly, because of the lengthy construction phase, new nuclear power stations will do nothing to reduce GHG emissions for at least ten years – arguably the most critical period in which to act. Secondly, although nuclear power stations produce little carbon dioxide directly during operation, once the full lifecycle (e.g. power station construction, uranium ore refining, decommissioning) is included, the total GHG emissions become significant. Since sources of high-grade uranium ore are limited, these lifecycle emissions would grow, because the energy required to mine and refine the ore would increase as sources start to become depleted. This problem would rapidly become more serious if nuclear power were further expanded internationally, which is currently looking likely. Thirdly, nuclear power is a relatively inflexible energy source – only able to supply electricity and not well suited to meeting variations in load on the grid. As such, it will be of little help in tackling the main reasons for the UK's high GHG emissions: inefficient transport and buildings.

Nuclear power will do little to enhance energy security
Nuclear power is not an indigenous source of energy. The UK would remain dependent on imports of limited uranium ore to maintain nuclear capacity and these, just like other fuel imports (e.g. natural gas), would be subject to political insecurity. Nuclear power is also a highly centralised energy source – being dependent on a small number of large, complex plants. As such, it is vulnerable to technical problems, sabotage or terrorist attack in ways that smaller, more decentralised sources are not.

The economics of nuclear power are not favourable
The upfront investment needed in order to construct a new generation of nuclear power stations would be very high compared with many alternative options – hence government support for nuclear power would almost certainly lead to a reduction in investment in these alternatives. Furthermore, the huge long-term costs for power station decommissioning and waste management are unique to the nuclear case (as are the costs of insurance against a major accident), and these would need to be publicly underwritten. We believe that many current economic assessments of nuclear power do not take due account of the environmental and other indirect costs and long-term

uncertainties of this option. The historical economic performance of the UK nuclear industry leads us to have serious concerns about future performance.

Nuclear power creates unique and serious health, environmental and safety problems
The generation of electricity using nuclear fission creates waste materials which are extremely hazardous due to their very high radioactivity. While the amounts of waste are comparatively small in volume, they nevertheless have to be kept isolated from the biosphere for timescales which dwarf that of human civilisation. Although the scientific understanding of engineering and environmental aspects of waste management has improved significantly in recent years, we still have serious doubts about the ability of the nuclear industry to safely store and/or dispose of nuclear waste given the massive timescales. We also believe that nuclear facilities (reactors, waste storage facilities etc) pose a very serious risk due to the possibility of terrorist attack.

Nuclear power creates nuclear weapons proliferation problems
Because there is much overlap in the technology and expertise which make up the civil and military nuclear sectors, we believe that the continued use of nuclear power will increase the opportunities for the spread of nuclear weapons. Possibly the biggest proliferation concern of a UK decision to opt for a new generation of nuclear power stations is that it will send a message to other nations (especially developing countries) that they should expand nuclear power as well. Given the greater insecurity of the nuclear fuel cycle in other parts of the world, this would likely create serious risks as the current cases of Iran and North Korea demonstrate. The problem is further exacerbated by that fact that the UK remains a nuclear weapons power, and there have historically been very close links between military and civil programmes in this country. The weapons proliferation risk would be considerably increased if plutonium-fuelled 'Generation IV' reactors (as proposed by the nuclear industry as a means of extending the energy output from limited uranium supplies) were ever built.

The alternatives to nuclear power offer far more potential
We firmly believe that if the huge upfront investment and ongoing government support that would be required by a new nuclear power programme were to be made available to (for example) energy efficiency measures, renewable energy technologies, community combined heat and power plants, and microgeneration, it would achieve greater near- and long-term emissions reduction with better energy security, while providing economic benefits, especially in terms of job creation and export income – without the drawbacks. Recent UK government action has failed to deliver the degree of investment and support needed to promote successful innovation and deployment of these options – which is why they have not to date performed as well as in other countries where the support has been greater and more reliable. In addition, other technological measures such as coal gasification and carbon capture and geological storage should be explored further (but not at the expense of energy efficiency and renewable energy). Economic and political measures to encourage lifestyle change should also be vigorously pursued.

Nuclear power utilising fission is a limited, inflexible, expensive and potentially dangerous energy source which creates unique problems. Alternatives – with proper

government support – can deliver low carbon, secure and safe energy. We therefore strongly urge the UK government not to decide in favour of a new generation of nuclear power stations but rather to invest the resources and research effort into alternatives.

Signed