

## **The Future of Nuclear Power: The role of nuclear power in a low carbon economy**

**Response by:** Mr Keith Bradshaw,

**On behalf of:** A majority within the Social Responsibility Forum (Energy SubGroup) of Churches Together in Cumbria

### **Part 1: Response by the majority**

#### **Document section - Our energy challenge: climate change and energy security**

**Question: 1. To what extent do you believe that tackling climate change and ensuring the security of energy supplies are critical challenges for the UK that require significant action in the near term and a sustained strategy between now and 2050?**

#### **Response:**

We believe that these two elements are self-evident, although there is a need for balance. Securing the energy supply by more fossil fuel generation would not tackle climate change, and an over-dependence on low-carbon renewables without back-up could jeopardise security of supply.

Para 7 and the general tone of the document imply that growing demand for energy is assumed and that continuing economic growth is taken to be a good thing. It could be argued that economic growth has been the main contributor to the environmental crisis. We would question whether this and energy saving have been taken sufficiently seriously, although we note that later in the document, page 78, reference is made to the energy saving measures that are included in the Energy White Paper.

However, the argument that 'if there is not enough saving we need nuclear power' is a dangerous one in terms of energy security. We believe that nuclear should be part of the energy supply mix anyway, bearing in mind its particular suitability for base-load generation.

We have some comments on the ethical implications of restricting the debate to climate change and security of supply issues, see our response to Question 10 .

#### **Document section - Nuclear power and carbon emissions**

**Question: 2. Do you agree or disagree with the Government's views on carbon emissions from new nuclear power stations? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We agree with the views on carbon emissions, and that the analysis in para 44 is broadly correct. We are generally satisfied that all the relevant factors have been taken into account in arriving at the comparative figures, but accept that they could be changed in detail by future uncertainties in the emissions associated with raw material/fuel transport

To achieve overall reductions nuclear power must replace existing fossil-fuelled generation. Building new nuclear stations instead of gas-fired ones would only avoid emissions. It is important to distinguish between the two.

#### **Document section - Security of supply benefits of nuclear power**

**Question: 3. Do you agree or disagree with the Government's views on the security of supply impact of new nuclear power stations? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We know from experience that existing nuclear power stations can run at reduced power for various technological reasons, but think that an assumed load factor of 80-90% for new designs is probably realistic, taking into account refuelling and routine shutdowns.

What are the criteria for assessing whether 'supply is sufficient and affordable', para 46? Is 'sufficient' based on needs or wants ie does it mean 'enough to meet rising demand?' If the latter, it is not an environmentally sustainable criterion. This re-emphasises our concern expressed elsewhere on fundamental dangers of over-use and wasting of energy. Also we ask: 'Sufficient and affordable for whom and for what?' To allow the UK and its individual citizens to maintain their current levels of affluence and relative prosperity in the global context?

We agree that a diverse range of energy sources will contribute to security of supply and that different technologies add to security of supply in different ways, eg base load, peak demand. With regard to nuclear power, we agree that it will add to security of supply. However, political stability in some uranium-supplying countries with large ore reserves cannot be absolutely guaranteed, posing a possible risk to UK supplies. This also has implications for transport of fuel and whether or not reprocessing capability should be retained as an option in the UK, see Questions 6, 7 and 14.

#### **Document section - Economics of nuclear power**

**Question: 4. Do you agree or disagree with the Government's views on the economics of new nuclear power stations? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We have no reason to doubt the economic analysis of new nuclear power stations. We welcome the inclusion of waste management and decommissioning in calculating the overall energy cost of nuclear power, and wonder if the same rigour has been applied to other technologies. We are uneasy, though, about total reliance on the private sector for financing new build and its associated waste handling and decommissioning costs. We believe that the Government should consider the possibility of being more proactive in directing energy policy and that 'leaving it to the market' dominated by short-term financial considerations could result in an incorrect balance in our supply. We would like to know what measures are to be taken to ensure the industry does indeed take responsibility for all aspects of the nuclear fuel cycle?

#### **Document section - The value of having low carbon electricity generation: nuclear power and the alternatives**

**Question: 5. Do you agree or disagree with the Government's views on the value of having nuclear power as an option? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We agree with the government's views on Question 5, especially bearing in mind the growing doubts about the ability of some low-carbon renewable technologies both to guarantee supply and reduce greenhouse gas emissions overall. Chapter 5 also acknowledges the high cost of renewables, but despite this, ambitious goals are implicit in the 2050 and 2020 targets for emissions reduction. We note that the government appears less confident about the role of renewables compared with their position in the earlier Energy White Paper

We emphasise that we are not in principle opposed to renewables, but that recent experience and some forecasts, including that in para 5.74, make us less optimistic about their effectiveness in achieving the twin goals of emissions reduction and security of supply. We welcome the apparent greater realism of the Government's position on renewables and the need to consider the possibility that Carbon Capture and Storage will prove uneconomic or technically impracticable.

We realise that while the public agrees about the potential for nuclear power in reducing emissions, there remain very strong reservations and unease about waste management of spent fuel, HLW and ILW. This issue is taken up later in our response.

## *Other Comments*

We note the ambitious EU target for 20% share in total energy from renewables, para 16, and believe it is unlikely to be met, a figure nearer 10% is perhaps more realistic. With regard to para 15, more doubt has recently been cast on the ability of biofuels to cut emissions, and the realisation that huge amounts of agricultural land would need to be devoted to their growth. There is also work that suggests that increased cultivation of oilseed rape, using inorganic fertiliser, to produce biofuels will lead to the liberation of greater amounts of nitrous oxide (a powerful greenhouse gas) as the fertilizer decomposes.

### **Document section - Safety and security of nuclear power**

**Question: 6. Do you agree or disagree with the Government's views on the safety, security, health and non-proliferation issues? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We do not think it is correct to lump together these four issues into one question. The way in which Question 6 is phrased confuses the matter. The risks with regard to non-proliferation are different from the others both in magnitude and nature, although there is some overlap between security and non-proliferation.

We are less concerned about safety, security and health than about non-proliferation.

Some members of our group felt that it is unreasonable to maintain that the UK should be permitted to continue to develop nuclear energy if we at the same time appear to be trying to prevent its development in other countries.

Some argue that if nuclear power is a part of the solution it is a matter of equity that it should be available to all nations. However, we realise that other low carbon technologies, eg solar power would be more effectively employed in different parts of the world from ours.

The point in our answer to Question 3 is also germane here; there is no guarantee that current patterns of political stability and instability will remain as they are through the life time of nuclear plant and waste.

The recent Royal Society Report has drawn attention again to the security of separated plutonium and uranium stocks. Once a certain threshold stock has accumulated in a given store, as much as could be stolen in a smash-and-grab raid, further increases in inventory that may arise from new build do not increase the security risk. Raising the number of sites where such material is stored however, will increase the risk. The risks associated with storage of irradiated fuel discharged from reactors and separated plutonium, uranium and waste are different, in that it is less feasible to divert spent fuel for terrorist uses.

### **Document section - Transport of nuclear materials**

**Question: 7. Do you agree or disagree with the Government's views on the transport of nuclear materials? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We have no reason to doubt the Government's views on this as far as they go. However the risks, or perceived risks, of transporting nuclear raw materials (such as ore) over long distances should be addressed.

## Document section - Waste and decommissioning

**Question: 8. Do you agree or disagree with the Government's views on waste and decommissioning? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

### **Response:**

Yes, we believe there is no viable alternative to deep geological disposal of intermediate and high level radioactive waste, and of spent fuel, but see Question 14. We are responding separately to the DEFRA Consultation on Radioactive Waste Management.

Our main points about the siting and operation of a long-term repository are that:

1. The primary criterion should be geological suitability. The proposed Implementation Framework based on 'willingness to participate' must be operated so as to fully ensure that any final selected site will demonstrably satisfy off site risk (EA) operational safety (NII) and security (OCNS) assessments. There should be no lowering of standards through the use of a volunteerist siting process
2. The Government should retain the option as long as necessary for monitoring and retrieval of the stored waste, although we recognise that retrievability could in principle be exploited by terrorists, and radiation doses to the workforce may increase.
3. The selection of a repository site and its construction need not be delayed until fuel or waste from new build becomes available for storage, legacy wastes need to be dealt with as soon as possible. Similarly, if new build is agreed, it should not be delayed until a repository is commissioned.

**Question: 9. What are the implications for the management of existing nuclear waste of taking a decision to allow energy companies to build new nuclear power stations?**

### **Response:**

Whether the private sector or the state or a combination of the two is responsible for decommissioning, any proposals can only work if they are enforceable. In a future in which the balance of economic power may well continue to shift away from the UK, how can these kinds of commitments be meaningful? We therefore emphasise the importance of point 3 of para 5.35. Provision for decommissioning should be ring-fenced by the Government, if the regulations requiring private companies to finance turn out to be unenforceable. The example from the USA of a small surcharge in electricity bills, per unit used, being devoted to eventual waste management and reactor decommissioning was quoted as a possible model.

**Question: 10. What do you think are the ethical considerations related to a decision to allow new nuclear power stations to be built? And how should these be balanced against the need to address climate change?**

### **Response:**

As we indicated in the answer to Question 1, there is more to the ethical question than the debate on climate change and energy security, para 92. The Government's view of ethics in the document is very limited:

1. Questions of wider energy equity, and the waste of energy in our western societies also arise.
2. Nuclear new build should arise out of real necessity or need in our society, not to provide an excuse for a profligate lifestyle and unlimited economic growth which the document appears to put forward as desirable.
3. Mankind has a wider duty to care for creation.

We believe that although there is an ethical problem related to leaving future generations to 'deal with our waste', a rigorous policy of waste management and disposal in the light of today's best science would minimise this burden, while providing for current needs. We cannot tell what technological developments will emerge from more advanced technologies in the future. We can only do our best now.

There is also an ethical responsibility on the present generation to work with and apply the best science and technology now available.

The Christian faith encourages certain, but not unique, emphases with regard to the integrity of creation and humanity's responsibility for it as stewards or tenants under God. The nuclear debate encompasses such principles, but since they are not confined to Christian belief, these matters need to involve a wider clientele.

Although people often point out the ethical problems associated with more nuclear power, there is a significant ethical challenge in having less, by not allowing nuclear power stations to be built: namely that emissions will increase and supplies will become less secure with a consequent growth in fuel poverty and social deprivation. This is touched on in para 93 of the document.

#### **Document section - Environmental impacts of nuclear power**

**Question: 11. Do you agree or disagree with the Government's views on environmental issues? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We welcome the planning procedure reforms if they avoid duplication of generic questions being debated for every nuclear power station application. Nevertheless care must be taken not to expose the system to accusations of short-circuiting the procedure. The siting of all types of power plants are subject to some kind of environmental constraint and potential objection. The decisions should be made by the appropriate environmental bodies, not by the agencies charged with ensuring energy policy is delivered. Other values are also important.

The comparisons of relative areas in para 103 of the document are interesting but incomprehensible to the ordinary citizen. It might have been worth giving the dimensions in miles of a square of the same area. A further point is that in principle the wind farm area can be used for something else as well, eg agriculture or livestock.

Other aspects of the environmental consequences are commented on at Questions 8 and 10. The decision about whether to reprocess, Question 14, has significant environmental implications.

#### **Document section - The supply of nuclear fuel**

**Question: 12. Do you agree or disagree with the Government's views on the supply of nuclear fuel? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

#### **Response:**

We agree in general.

Although the known supplies of appropriate grade of uranium ore appear to be sufficient for new build, we raise the question of whether there will still be enough to accommodate a likely marked expansion in nuclear power worldwide.

The Government's view is taken in the context of no reprocessing, which could restrict or endanger the supply in the event of nuclear power growth, see response to Question 14.

Currently the UK holds over 50,000 tonnes of depleted and recovered uranium, which would be sufficient, with added enrichment, to provide about 2000 reactor years' operation assuming 1000-MW units. The 100 tonnes of plutonium currently in store should be used to make MOX fuel, as recommended by the Royal Society Report issued last month, and the 60 reactor-year's worth would provide a useful buffer. New generation reactors are suitable for this type of fuel.

#### **Document section - Supply chain and skills capacity**

**Question: 13. Do you agree or disagree with the Government's views on the supply chain and skills capacity? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?**

**Response:**

We welcome the implications of the Government's views for the economy and industry of West Cumbria. After many years' neglect of the maintenance of skills and new employment, we need to make this up quickly, not just in the field of decommissioning but in reactor technology and operation.

**Document section - Reprocessing of spent fuel**

***Question: 14. Do you agree or disagree with the Government's views on reprocessing? What are your reasons? Are there any significant considerations that you believe are missing? If so, what are they?***

**Response:**

Excluding reprocessing is contrary to the principles of sustainability and recycling. We believe it is premature to foreclose the option of reprocessing when there remains uncertainty about future supplies of fresh fuel and when first use of nuclear fuel uses only 1% of the potential energy in uranium as mined.

We can see, however why the Government has done this – it believes that excluding reprocessing removes the main public objection to the further development of nuclear power, i.e. the splitting up of fuel into its constituent parts with the consequent need to deal separately with three broad waste streams: LLW, ILW and HLW, and the transport of spent fuel to a central reprocessing plant.

We would like the option to be retained, particularly since the fuel in the likely design of new build reactors will withstand storage for decades, and in any case it has to be stored to allow the bulk of the radioactivity to decay and transported before final disposal.

**Document section - Our proposals on nuclear power**

***Question: 16. In the context of tackling climate change and ensuring energy security, do you agree or disagree that it would be in the public interest to give energy companies the option of investing in new nuclear power stations?***

**Response:**

We are not against private sector involvement, and they should be given the option of investing. But, as we have indicated above, we believe the Government should be prepared to take a more active role if the marketplace does not yield a sustainable and effective energy policy. There should also be effective and enforceable safeguards with regard to financing waste management and decommissioning.

***Question: 17. Are there other conditions that you believe should be put in place before giving energy companies the option of investing in new nuclear power stations? (for example, restricting build to the vicinity of existing sites, or restricting build to approximately replacing the existing capacity)***

**Response:**

Site selection should be a two stage process. First to establish key criteria to be applied through an objective technical and environmental assessment process, and then to take into account issues of local willingness to "host" nuclear power facilities. The "criteria" should cover grid connection issues / costs, the presence of relevant skills, as well as application of the proximity and waste minimisation principles. They should include 'high level' local siting requirements (including prospects for economic and community enhancement) and a clear national statement on the implications of sea level change and flooding risks. They should be used by prospective developers, local communities and local planning authorities working together in an open and transparent fresh site identification process - even if this means using previously undeveloped land. The criteria themselves should only be established after open and transparent consultation - and not be presented as a "given" by government.

In other words, it would be inappropriate to first identify localities on the basis of likely local acceptance because of high levels of unemployment or other vulnerability, and then to look for the best technological and environmental fit within those predetermined search areas. The existence of an earlier nuclear site may be good planning precedent, but should not obscure consideration of factors which may have come to light in relation to local geology or sea level rise, for instance since the initial decisions were made. Sea level rise and climate change are particularly relevant to most of the existing English coastal nuclear generation sites - and this issue must be given significant weight, having regard to present uncertainties in forecast ranges for sea level rise, for instance from accelerated Greenland Ice Cap melting scenarios. Reliance on hard coastal defences may be unwise in such circumstances.

Developers should work with local communities on siting opportunities within the pre-established criteria, working through the revised planning procedures and structures, but with due time for open local consultation to take place; see also our response to Questions 11 and 18.

Finally we think that prospective private investment companies should have competent nuclear technical representation at the highest level of management in order that inappropriate decisions should not be taken on purely financial grounds.

### **Document section - Our proposals for facilitative action**

**Question: 18. Do you think these are the right facilitative actions to reduce the regulatory and planning risks associated with such investments? Are there any other measures that you think the Government should consider?**

#### **Response:**

We welcome a staged national approach to planning and siting assessment.

In para 125 we ask 'who would develop the criteria?' for suitable sites.

In paras 133-135, we welcome the note of urgency and the need to act quickly and decisively, if and when a decision is taken to proceed with new build.

## **Part 2: Minority Report**

### **The Future of Nuclear Power: The role of nuclear power in a low carbon economy**

**Response by: Mr Bob Straughton,**

**On behalf of: A minority within the Social Responsibility Forum (Energy SubGroup) of Churches Together in Cumbria**

The following reflects the view of a minority of members within the Social Responsibility Forum (Energy SubGroup) of Churches Together in Cumbria

I cannot go along with what I see from the rest of the Group's response as the approach of mitigating the government's proposals on nuclear new build and waste management. After a lifetime of living with the nuclear industry in Cumbria, relating it to the wider world and my view of our Christian responsibilities within it, I feel that adjusting the government's policies is not in conscience what is required now. I feel our Christian responsibilities should be very different.

However, even if the nuclear path is supported I would still ask you to consider the following and to adjust your support for a new nuclear age accordingly. I have come to a conclusion that Governmental competence and maturity should be a fundamental here and the UK Government fails the test.

**1.** The French government is not hidebound by insisting the Private Sector be responsible for safeguarding the future delivery, safety and integrity of the states' nuclear industry. UK Politics in comparison insists the private sector, even if controlled from foreign states or tax havens by foreign individuals and financiers, will deliver core nuclear operations and long term waste storage.

If we think this is irrational, unsafe and irresponsible, we should not be party to advocating it knowing this is what the government intends.

**2.** Unlike the French government that can act as a powerful central authority advocating what is best for the state of France, in the UK it is politically untenable for Westminster to speak for Wales and Scotland on matters nuclear. Whilst Britain's nuclear waste requiring burial may move to England, it is almost inconceivable it would be permitted politically to move the other way even though geological parameters and sparsity of populations may make it more suitable to look for deep storage in Wales or particularly Scotland.

**3.** In the UK we are locked into a succession of UK governments which have led an electorate to view taxation as a burden which must be reduced for the people's benefit, leading to insecurity and instability on essential funding streams for long term public projects.

A government that cannot take a long term view of its financial commitments on behalf of its population cannot be said to be a suitable advocate of a nuclear industry requiring a stable authority and funding stream for 100s of years ahead, if only to manage the nuclear waste.

The Choice of a deep geological repository The result of the government's waste deliberations may mean a long-disadvantaged insular community like Copeland being the decisive factor in determining where to bury the country's nuclear waste for hundreds and thousands of years.

The consent of a local population should actually play no part. They should not be in a position to speak for future generations.

Being where we are, a safe repository should be identified. The cost of moving the material from where it is now is also irrelevant as the cost of transport while we have a functioning government and economy to fund the movement is nothing compared to the future cost to the whole population if it is put in the wrong place.

My Overall Response to the Future of Nuclear Power I have come to the conclusion that the nuclear path is a 'dead end' for humanity because:

**1.** Any process that causes waste which is toxic for thousands of years is by definition misguided and wrong.

2. When 'mature' democracies cannot devise safe and logical strategies for long term waste management it implies this is a very dangerous technology for less stable and more readily exploited populations, of which the world has so many.

3. Civilian use of nuclear bomb making technology can be interpreted as a fig leaf for the past, current and future nuclear arms race. 50 years of the UK experience indicates to me that this interpretation is more or less accurate.

4. A Christian perspective, love thy neighbour as thyself, the meek shall inherit the earth, all leads me to the view that a Christian simplicity is the answer to the complexities of the nuclear conundrums.

We do need to lead the world to a simpler more sustainable existence. Nuclear is not the way to do that. As Christians in Cumbria we have a special perhaps unique responsibility to spread that message.