

Response from Stop Hinkley
to the
National Policy Statements on
Energy and Nuclear Power

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The Stop Hinkley response to the Government's consultations on its Overarching Energy National Policy Statement (EN-1) and for Nuclear Power Generation (EN-6).

Introduction

Stop Hinkley is a local campaign group committed to shutting down the existing reactors at Hinkley Point and preventing new ones being built. We began campaigning in the mid eighties when the prospect of a new reactor was on the cards. Our group took an active part in the 14 month Hinkley C inquiry with an office at the Cannington College site of the inquiry.

Since the subsequent decision by the Conservative Government not to go ahead with the power station on economic grounds we have continued to campaign against the continued operation of Hinkley A and B and Oldbury in nearby South Gloucestershire.

Hinkley A indeed closed well ahead of expectations following our vigorous campaigns on safety and health grounds in 2000. The Chief Executive of BNFL, Sir Norman Askew told me directly that their early closure decision had been entirely due to our campaign and their loss of public confidence.

One or other of the twin reactors at Oldbury station was shut for a period of five years during an extensive investigation into the severe corrosion of the graphite reactor cores at the plant which we highlighted.

We have also highlighted a similar core corrosion problem at Hinkley B power station together with significant boiler corrosion after a long period on non-inspection. We have been waiting for more than six months for minutes of meetings where decisions were taken not to fit a third safety system on the ageing reactor which we applied for under the Freedom of Information Act.

We believe that nuclear power is not safe and produces significant health effects in the nearby population. So in this submission we make our case against the building of two massive nuclear reactors next to the existing operating and decommissioned reactors.

Process issues

Our group has various concerns over the DECC consultation process, the contents of the DECC supporting papers and the proposals and instructions for the Infrastructure Planning Commission. We note that the Environmental Law Foundation has objected to the consultation.

We call for a public inquiry into the consultation.

The role of the Energy and Climate Change Select Committee

We note that a new Early Day Motion (545) has been drawn up relating to the timetabling of the committee's hearings before the end of the DECC consultation and the shortness of that timetable. We agree with the sentiments of the proposer of the motion if, as it appears, the committee will not be able to effectively scrutinise the DECC consultation process and responses.

In respect of this we hope that the Government will abide by an agreed timetable that suits all ECC members.

Our group has contacted some Members of Parliament asking for their support for the EDM.

The DECC Hinkley Point consultation event

On November 19th a three day event occurred near Bridgwater in Somerset organised by DECC to give local people a say in the consultation on the National Policy Statement. In principle this should have been a good idea: two days to have a look at an exhibition and a Saturday morning session to hold a public meeting and hear peoples' views.

Unfortunately the event was a missed opportunity. The chosen venue was nearly two miles on the wrong side of Bridgwater from the communities most likely to be interested. It was held in a relatively unknown location near a motorway turn-off.

Most people who might have attended the event live in villages in West Somerset nearer the power station or Burnham-on-Sea where health concerns are a sensitive issue. Public transport is very limited in West Somerset and people from much of West Somerset would have needed to change buses once or even twice to get near the venue.

On the DECC website notices, no information was given on how to access the site by public transport: simply a link to the venue's website, which itself gave no specific directions even for drivers.

One colleague from Stop Hinkley bicycled from Bridgwater to the location on the opening day and could not find it, for some time cycling around. A very small notice had been pinned outside the building but there were no signs from the main road. Another colleague went by car and drove round in circles before eventually discovering it.

It seems odd that a Government Department responsible for mitigating the effects of Climate Change should choose a venue that forces people into their cars when plenty of venues are available in Bridgwater town centre, accessible by foot for many and public transport for others.

I raised the inadequacy of the venue location at a meeting of NGOs with DECC officials a few days earlier on December 17th, offering to help find a suitable location if needed.

My colleague who went along on the opening day of the exhibition found the hall empty apart from numerous DECC officials who seemed to compete with each other to talk with him. During the three hours he stayed, explaining in detail his objections to nuclear power, only one other 'member of the public' was registered. This was Simon Dunford, the EdF

Project Manager for Hinkley Point C! (Meanwhile outside the policeman allocated to marshall the crowds had no bigger a job than to guard my friend's bicycle!)

This leads on to another weakness in the planning for the event. Any publicity about the event had been so insignificant that it seemed to have passed most people by. At the 17th November DECC / NGO meeting, we were told that the event could not have been announced before the National Policy Statement, which came out just two weeks prior to the DECC Hinkley event. In that case the meeting should have been set for a later date.

There was too little notice and too little publicity given to the important event. Overall it gave the impression that DECC did not really want to engage in local discussions.

Given that the DECC meeting was mixed up in timing with lots of EdF planning consultation meetings, people would be forgiven for letting this one go.

The public meeting on the Saturday was reasonably well structured with short presentations and time for questions and debate but not well attended with about twenty to twenty five participants. The mood of the meeting was very much opposed to the project, with one exception, the chair of the Hinkley Site Stakeholders' Group who was more neutral in his comments.

Following our complaints, DECC issued a notice by email and some publicity saying they were holding another new event on 27th January, but for just for two hours, not three days, in Stogursey. Again it was not a central position for a public event affecting villages and towns at least from Minehead to Burnham-on-Sea. It is a long way off the A38 which runs parallel to the coast but five or six miles inland with clusters of bigger towns dotted along it.

It is our feeling that DECC were forced to hold this second, shortened event due to the complaints about the first, not because they thought they should consult more widely, which should have been the reason.

Having said that, the event was well attended. The mood was predominantly critical of the project with views ranging from worries about the major issues of nuclear waste and local discharges to the likely traumatising of local villages through the infrastructure of new hostels, lorry parks and huge park-and-ride sites. No-one spoke in favour of the power station, except DECC.

Colleagues in Bristol, which is just 35 miles from Hinkley Point and 12 miles from Oldbury nuclear power station, have complained that no consultation events have been planned for the city. People from Bristol were actively involved in the previous Hinkley C Public Inquiry in 1988-89 and many feel left out of proceedings geared to just very local communities.

Other large towns where a meeting would be appropriate include Taunton (the county town), Minehead, Weston-super-Mare, Burnham-on-Sea (where excess breast cancer and infant mortality has been recorded) and Glastonbury.

Bristol City council were due to debate a motion objecting to the building of Hinkley Point C on 19th January and calling for the Government to provide a public event to debate the issue. In the end the motion was not called due to lack of time.

We note that the Energy Minister Lord Hunt was told by the Energy & Climate Change Select Committee that DECC had made a fatal error in "only allowing the Nuclear NPS to have site-specific consultations". (ECC hearing November 10th)

I haven't had feedback from all local sites but I gather people in Hartlepool were furious to have a meeting thrust on them with just three days' notice.

At the opening of the Stogursey meeting a DECC official declared that the decision in principle to go ahead with nuclear power had already been taken so this meeting was just going to be about local issues. This underlines the fact that no local consultation meetings were set up during the Government Energy Review in 2007-08 when peoples' views should have been sought on the principle of nuclear power, especially as the Government at that time was saying local people are used to reactors and would be inclined to support new nuclear build. So this suggestion was not tested.

Responses from DECC officials at the Hinkley public meeting were also a concern. One person asked what would happen if uranium supplies were to run out due to the number of new nuclear plants being planned or constructed world-wide. He was told by a DECC official that market forces would come into play and that higher prices for uranium would enable a market economy to go to greater expense in extracting uranium from lower grade ore or even from the sea. He said this had been the case in the seventies when oil prices had gone up, enabling oil companies to exploit more difficult oil-fields.

The disturbing thing about this logic is that the massive carbon cost of this more difficult extraction was not even referred to by the official who had worked for the oil company Shell before coming to DECC. Uranium extraction from low grade ores requires extensive use of fossil fuels. Indeed the open-cast uranium mine in central Australia contributes ten percent to their national carbon emissions. It is also, incidentally the largest man-made hole on earth.

People employed in key positions of the UK department responsible for mitigating Climate Change should have an altogether different mind-set, which should be generally helpful to the climate issue. This point applies equally to the more parochial question described earlier of locating venues which reduce the need for travelling or at least allow access by public transport instead of by car.

The following extracts from a report by Dr Richard Lawson on the Bridgwater DECC meeting echoes our concerns over the local consultation process and the underlying attitude of DECC officials:

Notes from DECC "Consultation" on Hinkley C, 21ST NOVEMBER, 09

On Saturday I attended a DECC "consultation" on the plan to build a new nuclear power station at Hinkley Point in Somerset.

We had very short notice, and the conference venue was given as "Near J24 on the M5". I could not find it on Multimap, so though it must be a massive well signed centre that I couldn't miss. Wrong. Drove round the vicinity of J24 and finally arrived 10 mins late. Others had the same problem.

As expected, government officials - civil servants - were presenting. My heart sank. Civil servants dwell extensively on the process, and avoid the product if at all possible. Mark Higson was pleasant, polite, unassuming and was skilled, like all government officials, in the art of using an awful lot of well chosen, professional, communicative words to say as little as possible in the available time.

This is from my notes:

UK needs 60 GW electricity by 2025.

35GW will come from renewables, 25 from nukes (NP), from 10 new stations (NPS).

Consultation: top challenges to NP:

- 1. Security (terrorist attack)*
- 2. Nuclear waste*
- 3. NP funding crowding out renewable funding*
- 4. Flooding of NPS sites*

No substantive attempt to was made to address these issues.

Full report: (1)

DECC officials contravening Government guidance on entertainment:

Stop Hinkley is concerned about the following report that DECC officials have accepted lavish entertainment from nuclear companies, giving the impression they could be in the pocket of those companies. One might be forgiven for thinking the DECC officials' enthusiasm for nuclear power may be in part accounted for here. The report is abbreviated for brevity:

“Civil Servants lived the high life courtesy of nuclear lobby”

Independent on Sunday, 24 February 2008

Mandarins running the public consultation on new power stations were wined and dined at top venues

“Breakfast at the five-star Goring hotel, lunch at Ascot, drinks at the Ritz - it's all in a day's work, it seems, for some of the civil servants in charge of nuclear policy.

Mandarins carrying out the Government's public consultation into nuclear power were wined and dined at some of London's top restaurants and hotels by organisations with a vested interest in new power stations, The Independent on Sunday can reveal.

Civil servants working in the nuclear consultations and liabilities unit at the Department for Business, Enterprise and Regulatory Reform (BERR) were given free meals, drinks and gifts more than 50 times in the period preceding and during the consultation into nuclear power that ran from May until October 2007.. ...

...Cabinet Office guidance to civil servants on entertainment states: “You need to ask yourself some commonsense questions: for instance ... whether the

entertainment is lavish, on a scale which you could not personally afford; whether you are accepting too much hospitality from the same source; and, if your post is prominent, whether just your attendance at an event may be open to interpretation as a signal of support.”

<http://www.independent.co.uk/news/uk/politics/civil-servants-lived-the-high-life-courtesy-of-nuclear-lobby-789185.html>

The revelations angered MPs. “This is entirely inappropriate behaviour by civil servants,” said Norman Baker, the Lib Dem MP for Lewes. “Civil servants should not be accepting hospitality from a group they should be regulating.”

The impression given by DECC officials at local and national consultations is very much one of promoting nuclear power. This report does nothing to allay fears that officials are biased in favour of an industry from whom they are prepared to accept expensive gifts in kind.

In summary we are not convinced about the authenticity of the DECC consultation as viewed from a local perspective. Decisions seem to have been made which reduce the options for local public involvement in the bigger questions around building more nuclear power stations and bias the outcome in a particular direction. DECC officials appear to have the promotion of nuclear power higher up their agenda than either consulting local people or mitigating climate change.

We now address the consultation questions in order:

Q.1 STOP HINKLEY RESPONSE TO OVERARCHING ENERGY NATIONAL POLICY STATEMENT (EN-1)

Do you think that the Government should formally approve the draft Overarching Energy National Policy Statement?

No. Please read on.

The Need for Nuclear Power

Various authors and groups have described how it is possible to meet our future energy needs without resorting to nuclear power. These included the report of the 2003 Energy Review which came down strongly against nuclear power. Secretary of State Patricia Hewitt said that we would be mad to go down that route.

The Sustainable Development Commission in their 2008 report “Is nuclear power the answer?” (2) endorsed that view, saying that for example UK carbon reduction would be a mere four percent even if all nuclear generation was replaced. They contended that a concerted programme of renewable energy supported by sufficient energy conservation measures would have the net effect of providing all our needs.

The theme was elaborated in another SDC report: “Nuclear power in a low carbon economy” (3)

Government advisor and former Friends of the Earth Director, Professor Tom Burke CBE also outlined his views in “Decoding Nuclear Nonsense, 2, the real evidence” (4) where he suggested the two key Government principles behind backing nuclear power: its ability to help climate mitigation and to bridge the energy gap were flawed. He elaborated on his views at a public meeting at Bridgwater town Hall on 6th January 2010.

As nuclear power now produces just 13 percent of the UK's electricity (DECC figures for 2008) and the Government aims to produce thirty percent by renewables by 2020 it seems very logical that we don't need to endure the risk of nuclear new build.

Combined heat and power

EN-1 concludes that the progressive technology of Combined Heat and Power should not be applied to nuclear power stations due to the risk of contamination. But this risk can easily be eliminated by the use of secondary or tertiary heat exchange units.

There is likely to be considerable resistance from promoters for nuclear power stations to include CHP. DECC have stated that it is technically possible, (DECC public discussion, Thornbury event 6.2.10), therefore it should be a requirement. The NPS should go further and make it a requirement that energy companies ensure that nuclear power stations are, at the very least, combined heat and power (CHP) –enabled, allowing for potential future district heating schemes for new developments if there is currently insufficient demand. Potential future energy demands should be identified via early consultation with the relevant local planning authority.

If there is currently sufficient demand, the developer should ensure that a district heating network is installed and either set up, or employ an Energy Services Company to run the scheme. We note that coal powered power stations are required to apply CHP to units with greater capacity than 300 MW.

Paragraph 4.6.4 currently states *“To be viable as a CHP plant, a generating station needs to be located close to industrial or domestic customers with heat demands. This is likely to mean within a distance of up to 15 km. For industrial purposes, customers are likely to be intensive heat users such as chemical plants, refineries or paper mills. CHP can also be used to provide hot water and space heating, including for district heating networks, and for light industrial users such as commercial greenhouses. A 2009 report for DECC on district heating networks concluded that cost effective district heating networks would be where there was a demand for 200 MW of heat within 15 km of a generating station”*.

Economic viability of new nuclear power

A 14 page report by investment company Citigroup came down heavily on the risks of nuclear new build from a financial position. The suggestion here is that plants cannot be built without some form of public subsidy which the Government has from the beginning said it will not allow. The prospect of half-built stations emerges, which we believe will be disastrous from the point of view of investment into more appropriate technology such as renewables, smart electrical grids and energy conservation measures.

The headlines of the report are listed here:

“New Nuclear – The Economics Say No, UK Green Lights New Nuclear – Or Does It?” 9 November 2009 (5)

□ **Green lighting new nuclear?** — The UK government today announced a fast-track planning process for new nuclear power stations. 10 sites have been approved for possible development. The government is presenting today's announcement as

providing the green light for a major new nuclear programme, which it says is needed to meet climate change and security of supply targets.

□ **But no financial support has been offered** — The government has not announced any direct financial support for new nuclear. The government still seems to expect the private sector to take an unacceptable level of risk, in our view.

□ **The five big risks** — Nuclear power station developers face five big risks: Planning, Construction, Power Price, Operational, and Decommissioning. The government today has sought to limit the Planning risk. While important for encouraging developers to bring forward projects, this is the least important risk financially.

□ **The three Corporate Killers** — Three of the risks faced by developers — Construction, Power Price, and Operational — are so large and variable that individually they could each bring even the largest utility company to its knees financially. This makes new nuclear a unique investment proposition for utility companies.

□ **No where else in the world** — Government policy remains that the private sector takes full exposure to the three main risks; Construction, Power Price and Operational. Nowhere in the world have nuclear power stations been built on this basis.

□ **Nor will they be built in the UK** — We see little if any prospect that new nuclear stations will be built in the UK by the private sector unless developers can lay off substantial elements of the three major risks. Financing guarantees, minimum power prices, and / or government-backed power off-take agreements may all be needed if stations are to be built.

The remit of the Infrastructure Planning Commission

We have a particular concern that the IPC has been set a remit in the National Policy Statement which excludes examining the question of on-site spent fuel storage. The European Pressurised Reactor (EPR) favoured by Electricite de France for Hinkley Point, as well as the Westinghouse AP1000 under consideration for other sites such as nearby Oldbury, will 'burn' the uranium fuel in an especially intensive way. This 'high burn up fuel' has specific handling problems when it is removed from the reactor in that it is so hot and so radioactive that it will be required to be stored under water in mechanically cooled ponds for one hundred years before it can be handled for preparation for eventual 'disposal'. (We use quotation marks here as we do not believe that nuclear waste can be disposed of in the usual meaning of the word due to its toxic longevity). With the expected sixty year operating life of the EPR this would mean the nuclear fuel will be at Hinkley, for example, for at least **one hundred and sixty years**.

There are complex problems associated with having a spent-fuel storage plant on a site such as Hinkley Point:

The fuel canisters are more likely to splinter or corrode due to heat and radiation, producing a potential local contamination issue.

The plant would be a potential terrorist target extending long after the nuclear power station itself has closed down.

Because the power station would have ceased generation there would be no more income stream for the company, in this case EdF, rendering removal or even safe monitoring of the dangerous spent fuel less certain.

So Somerset and other counties with a new reactor may be left with a de facto nuclear dump.

At some future stage EdF may decide to build a centralised spent-fuel processing factory to prepare the fuel from several sites for 'disposal'. This could be Hinkley.

If the highly radioactive spent fuel is moved in the future from other sites eg Sizewell, to Hinkley then this has profound implications to many local communities in Somerset and across the country through which the highly radioactive fuel will be transported.

The local community should be in a position to raise their concerns and objections to this eventuality so the IPC should be allowed to make a judgement on the question.

We are aware that the Conservatives have suggested they may make changes to the IPC terms of reference should they take power after the forthcoming election. Whoever holds office, we would like to see a more open and democratic process. This should include:

Ministerial accountability and the eventual decision on nuclear power stations resting with the Secretary of State.

Hearings for all members of the public who wish to make a statement.

Hearings to be held near the relevant site but also at nearby big towns and cities (The 1988-98 Hinkley C inquiry held sessions in Cardiff but still finished in 14 months – not as long as the Government has suggested that public inquiries on major projects take)

The ability to cross examine experts from Government, the nuclear industry and put forward our own expert witnesses and legal representatives.

Government energy policy

The draft Overarching National Policy Statement for Energy (EN-1) does not set out clearly what the criteria are for pushing utilities in a certain direction with regard to deciding the future generation mix.

EN-1 suggests the UK might need a generating capacity of around 100GW by 2020, of which around 43GW is expected to be new capacity. 26GW of this would need to be renewable to meet the UK target of providing 30% of electricity from renewables by 2020. 17GW would be other types of electricity generation. By 2025 these figures could increase to 35GW and 25GW respectively.

EN-1 says the precise mix will depend on decisions by the utilities. However, it specifically encourages the nuclear industry, quite prominently, (para 3.1 page 13) to contribute as much as possible towards meeting the need for 25GW of non-renewable capacity by 2025, but only mentions briefly that offshore wind has the potential to provide an extra 25GW by 2020 (para 3.4.4 page 23).

Similarly, small-scale renewables are only expected to provide 2% of electricity – or around 4GW (para 3.3.18 page 20). This compares with the 12% which the European Photovoltaic Industry Association expects to be able to provide with just solar PV across Europe. (6) And the Chief Executive of National Grid, Steve Holliday, says that 15% of the

country's electricity production could come from so called "embedded generation" in homes and offices by 2020 as micro-generation becomes increasingly viable after the £9 billion rollout of "smart meters" for every home in Britain. (7) This higher figure will include micro-CHP as well as small-scale renewables.

Stop Hinkley believes the arguments in EN-1 on energy efficiency and decentralised energy as alternatives to new large scale electricity generation are weak and vague. (paras 3.3.16 to 3.3.19 pp19-20) The document claims that energy efficiency savings are likely to be limited and offset by increases in the use of electricity for heating and transport. It also claims that decentralised and community energy systems are 'unlikely to lead to significant replacement of larger-scale infrastructure'.

Unlike nuclear, energy efficiency and renewables are not encouraged to aim high.

If the generation mix is not being left to the market, but utilities are being pushed in certain directions, EN-1 should set out clearly the criteria being used in decision-making about the mix. This is particularly important given that both EDF and Eon have asked the Government to set a maximum contribution for renewables – at around the 30% level - so as not to constrain nuclear. (8) The criteria should set out the Government's priorities for electricity generation, for example stating the need to meet its sustainable development objectives by not generating radioactive waste or carbon emissions.

Obviously, in order to meet the Government's climate change objectives one criterion is going to have to be that the electricity generation should be low carbon. Para 2.3.2 of the Nuclear NPS (EN-6) claims that emissions from the nuclear cycle are around 7 - 22gCO₂e/kWh. However, a recent meta-study which looked at 103 lifecycle studies concluded that the figure is more likely to be around 66g CO₂e/kWh - worse than all the renewable alternatives, including solar PV. (9) If this is the main criterion being used to direct utilities in a certain direction then the Government needs to commission an independent investigation into what the real emission levels are. In particular, it needs to investigate whether, with increasing demand for uranium, ore quality will decrease causing emissions from the whole nuclear cycle to rise substantially before the end of the life of proposed new reactors. (10)

We note that EN-1 allows the market to decide where to site nuclear power stations without any geographical guidance from the Government for example on specific areas where electricity should be generated with some priority, being near centres of electricity consumption. But this lack of guidance could be taken advantage of by energy companies who might make use of this lack of guidance in siting coal or gas-fired power stations on otherwise unblemished coastal sites where their fuel could be easily delivered, regardless of other constraints. As EN-1 implies the IPC should give priority in planning consent to major infrastructure programmes the EN-1 guidelines are too vague.

Landscape & visual impact

Hinkley Point is on the edge of an Area of Outstanding Natural Beauty. The profile of the proposed reactor buildings will be several times bigger than the existing reactors and the site will be 500 acres, four times the size of the existing two reactor sites. West Somerset draws thousands of visitors and tourists who will be put off holidaying in the area due to the ugliness of the concrete development which can be seen from miles away from the beautiful Quantock Hills as well as the picturesque coastal road.

EN-1 (taken together with EN-6) offers little support for landscape issues, so that if a site is listed in EN-6, it would not be possible to refuse development consent on landscape grounds. In stating that neither local landscape designations nor visibility from a nationally designated areas (such as AONB) should be reasons for refusing consent, the NPS as it stands effectively selects a site with no serious consideration of the potential visual impact.

4.24 Landscape and Visual impacts

4.24.6 IPC may grant permission for development within nationally designated landscapes – AONBs National Parks etc if it is in the public interest. The tests are different again including national interest, impact on the local economy, the cost of developing an alternative site, or proposal and the detrimental affects on the landscape/ recreational opportunities and the extent these could be moderated. It is unclear why this test differs so substantially from that applied elsewhere – e.g. the simpler test in 4.18.14.

4.24.12 The wording implies that it would be rare for an adverse impact on the landscape would be so damaging that it would not be offset by benefits (including need) of the project. The balance of this section appears to be wrong.

Review period for sites & NPS

We suggest that any list of sites, or indeed the whole NNPS, must be reviewed after at least five years.

This is important as it impacts on:

- what real plans the proposed developers of the sites have - and if they aren't making applications whether the reactors could really be 'deployed' by the cut-off date of 2025

- blight - not only on house prices, but also a development left hanging in the air may deter others (e.g. renewable operators) from applying for grid connections etc in the same region

- CO2 reduction targets and whether new nuclear plants will actually be operational in time to contribute towards current Govt targets.

Q.2 Does the draft Overarching Energy National Policy Statement provide the Infrastructure Planning Commission with the information it needs to reach a decision on whether or not to grant development consent?

No. EN-1 gives no indication of priority (geographical) areas for new energy infrastructure provision, nor does it seek to steer investment away from certain areas where such developments would be undesirable. The approach leaves it entirely to the market to decide where proposals for new electricity generating infrastructure might be brought forward. As discussed above this policy is wide open to abuse by energy companies.

Q.3 Does the draft Overarching Energy National Policy Statement provide suitable information to the Infrastructure Planning Commission on the Government's energy and climate policy?

No. Please read on.

Low carbon energy policy

Part 3 of EN-1 (Need for New Energy Infrastructure) focuses almost exclusively on electricity, rather than looking at heating and transport as well. The trouble is that electricity only provides around 18% of UK energy demand. (11) Transport and most space heating are provided by other sources of energy. Nuclear power provides around 13% of UK electricity (DECC 2008 figures), which only amounts to about 5% of total energy. Allowing for losses at the power station, nuclear power's current contribution to the UK's final energy consumption is only 3.6 % (80 TWh/y out of a final consumption of about 2,250 TWh/y). (12)

Therefore, replacing nuclear reactors will save only around 4% of the UK's carbon emissions. EN-1 makes no attempt to put proposals for new reactors into perspective in this way. The Government has said elsewhere that it challenges the view that 4% is not worth bothering with, and that it has to look across all forms of energy, especially because there will be a greater need to start using more electricity for transport and heating. (13) However, the IPC will need to be absolutely sure that by approving new nuclear reactors it is not going to negatively impact on the ability to deal with the other 96% of emissions.

The UK Government's Sustainable Development Commission (SDC), (14) Warwick Business School (15) and the Environment Agency (16) have all warned that a decision to proceed with new reactors could seriously undermine the development of a low carbon energy system.

SDC points out that, even with a doubling of nuclear capacity from current levels, cuts of at least 50% would still be needed from other measures if the UK is to meet its climate targets for 2050. (17) So it is important that our capacity to implement other carbon abatement measures is not damaged by any decision to go ahead with the construction of new reactors. SDC says a new nuclear programme would give out the wrong signal to consumers and businesses, implying that a major technological fix is all that's required, weakening the urgent action needed on energy efficiency. A new reactor programme will require "*a substantial slice of political leadership ... political attention would shift, and in all likelihood undermine efforts to pursue a strategy based on energy efficiency, renewables and more CHP.*" (18) Sir Jonathon Porritt, former chair of the Commission, says nuclear power is already seriously diverting attention from the hard decisions required to solve the UK's energy challenges. (19)

Furthermore, Warwick Business School argues that, far from complementing the necessary shift to a low carbon economy, the scale of the financial and institutional arrangements needed for new nuclear stations means they would fatally undermine the implementation of low carbon technologies and measures such as demand management, and therefore will ultimately undermine the shift to a true low carbon economy. (20)

If the Government is to meet its target to reduce carbon emissions by 80% by 2050, AND eliminate fuel poverty by 2016, it will need to implement a set of policies which can cut emissions from the domestic sector by 80% by 2050. Every house will need excellent insulation and some form of Low and Zero Carbon Technology – micro-generation or community heating schemes. This means carrying out installations in all of the UK's 25 million dwellings over the next 40 years or 625,000 dwellings every year between now and 2050. (20)

Clearly, there are strong policy synergies between the need to reduce fuel poverty and the need to reduce carbon emissions. Brenda Boardman, Emeritus Fellow with the Lower Carbon Future at the Environmental Change Institute at Oxford University – the person who in many ways can be said to have identified and defined fuel poverty says:

“The real challenge is to make sure that both sets of policies focus on both sets of priorities, at the same time.” (21)

Whereas the Government seeks to provide more electricity-fuelled transport capacity this is at odds with recommendations from the environmental transport lobby group, Transport 2000 who argue the case for improved public transport capacity as a means for reducing fossil-fuel dependency.

EN-1 needs to be re-written to take this into account. Attempts to tackle fuel poverty through fuel pricing policy as suggested by EN-1 have failed for 30 years.

Q.4 Does the draft Overarching Energy National Policy Statement provide suitable direction to the Infrastructure Planning Commission on the need and urgency for new energy infrastructure?

Energy efficiency, decentralised energy

The question should be asking whether EN-1 provides suitable direction to the IPC on the need and urgency to reduce carbon emissions whilst maintaining security of supply. The NFLA believes the answer to this question is that it does not provide suitable direction.

To tackle climate change, the speed with which carbon abatement measures are introduced is important. Para 3.5.2 refers to the urgent need for low carbon forms of electricity to contribute to the energy system, but makes it clear that the earliest a new nuclear reactor could start contributing is 2018. By 2025 a new nuclear programme might have reduced UK emissions by 4% compared with what they would have been without new reactors.

Unless we make significant progress before 2025 then the chances of meeting the required targets will be very slender indeed, because the cumulative emissions between now and 2025 will be so high that greater reductions requiring huge additional investment will be needed after 2025 if there is to be any hope of keeping the global temperature increase below 2°C. And it will be much more difficult to achieve the required 80% cuts in carbon emissions by 2050. (22)

http://www.nuclearspin.org/index.php/Nuclear_is_not_the_Answer_to_Climate_Change#endnote_nomor2

During the period when reactors are being constructed, capital is tied up and therefore unavailable for investing in alternative carbon abatement techniques, yet reductions in carbon emissions do not begin until the reactor is operational. Because nuclear investments are also inherently slower to deploy, then such investments also retard carbon displacement. Spending on energy efficiency measures can be put into effect much more quickly. (23)

http://www.nuclearspin.org/index.php/Nuclear_is_not_the_Answer_to_Climate_Change#endnote_lov1

The UK Association for the Conservation of Energy, for example, says if one new nuclear reactor is operating by 2020, it could be delivering perhaps just over one million tonnes of carbon saving. In contrast energy efficiency "could save around 25 million tonnes of carbon through cost-effective energy efficiency measures" by that date. (24)

The Energy Savings Trust has said that the UK could save one third of its energy output at nil net cost to the consumer through concerted energy conservation measures.

http://www.nuclearspin.org/index.php/Nuclear_is_not_the_Answer_to_Climate_Change#endnote_ace

Similarly, decentralised energy can be installed quickly without needing complex regulatory processes. Keith Barnham, Emeritus Professor of physics at Imperial College says the most significant feature of the newer wind turbine and PV systems is that they come in small units and can be installed very quickly - much shorter lead-in times than the 10-year wait for nuclear stations and installations can grow exponentially. (25)

EN-1 fails to express the urgency with which we need to start reducing carbon emissions. The failure of the Copenhagen Conference to come up with a legally binding set of climate targets means all public agencies must redouble their efforts to open up new fronts at the local and grassroots levels to reduce carbon emissions.

The 2003 Energy White Paper promised a "step change" in policies and programmes to deliver energy efficiency with local authorities to taking the lead, acting as catalysts for change. (26) The UK is still waiting for this step change. Energy efficiency schemes implemented by local authorities have the potential to make dramatic carbon savings quickly. The trailblazing work of a few local councils, such as Worthing, Manchester and Kirklees, is beginning to show how grassroots campaigns can be turned into effective action. Worthing Council for example has succeeded in saving 72 percent of its carbon emissions through energy-saving and use of renewables. A groundswell of actions by individual communities led by local authorities will need all the financial support they can get from national government. But if the Government is focused on getting new nuclear reactors built to the exclusion of building a local decentralised energy system, then it will be difficult for local authorities to continue this exciting leadership role, and without the central government support these schemes will never be ambitious enough or at the scale required to meet carbon abatement targets.

The Local Government Association (LGA) agrees that local government is pivotal to delivering the step-change in CO₂ emissions reductions required. (27) The scope for local authority action is significant. Through delivery of services such as transport, planning and housing as well as through their influence on all sectors of the community, local authorities can make reductions in emissions from corporate activities and through stimulating savings in the wider community. Such action can help to deliver joint social, economic and environmental aims and link together initiatives to maximise their impact.

Q.5 Do the assessment principles in the draft Overarching Energy National Policy Statement provide suitable direction to the Infrastructure Planning Commission to inform its decision-making?

Sustainability

Part 4 of EN-1 on Assessment Principles and Generic Impacts lacks a coherent message. Given that, rather surprisingly, none of the Appraisal of Sustainability documents appear to include a definition of sustainability, it would make sense to give the IPC some direction on assessing the 'sustainability' of an energy infrastructure project.

The Government has previously defined sustainable development as development which enables all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without compromising the quality of life of future generations. (28) This is open to wide interpretation, particularly where a process which produces dangerous nuclear waste is involved.

Further clarity is provided by an organisation called 'The Natural Step' which sets out four principles of sustainability. (29) These explain that sustainability must involve the elimination of our contribution to the progressive build-up of both substances extracted from the Earth's crust and substances produced by society. In other words, the UK should be aiming for a goal of zero production of all toxic/radioactive and/or persistent or bio-accumulative substances. Any production of such substances is likely to compromise the ability of future generations to satisfy basic needs and enjoy a better quality of life. Obviously these four principles represent the ideal to strive towards, but it is difficult to see how anything other than renewable energy can even begin to approach this ideal. The IPC should be directed accordingly.

Q.6 Does the draft Overarching Energy National Policy Statement appropriately cover the generic impacts of new energy infrastructure and potential options to mitigate those impacts?

Climate impacts

The risk of sea level rise and flooding to energy infrastructure developments on the coast is dealt with in several places (para 4.20 & 4.22). Para 4.8.6 only requires applicants to take account of the latest UK Climate Projections, but does not specify whether they should take into account high medium or low emission scenarios. (30) This is a fast moving area of research. For example, recent study published in the Proceedings of the National Academy of Sciences (31) has predicted that global average sea levels are likely to rise by between 75cm and 190cm by 2100 – three times faster than official predictions of the Intergovernmental Panel on Climate Change (IPCC) which estimates a maximum rise of 59 centimetres by 2100 (32) (and compared with around 40-50cm in the UK's high emission scenario climate projections).

Given the uncertainties involved in predicting sea-level rises, applicants (and the IPC) should be required to consider the most up-to-date climate projections and to take a precautionary approach. In some cases the mitigation of flood risk to a given site may have an adverse effect on the flood risk elsewhere. If measures are required on nearby land not owned by the applicant, EN-1 does not make clear how these measures might be implemented.

It has been found for example that offshore sand-dredging near Sizewell in Suffolk has led to coastal erosion up and down the local coastline. It is thought that emplacing sea defences in one area can lead to the quicker destruction further along the local coastline. A full assessment should be undertaken of the potential impacts of sea defences and wharfs on the neighbouring coastline.

Socio-economic impacts

EN-1 mentions “the changing influx of workers” during the different lifetime phases of a large energy infrastructure project, which may alter the demand for services and facilities. (para 4.27.3) Few adverse effects are mentioned, and an applicant is only expected to describe the socio-economic impact. Short duration, capital intensive construction projects have been shown to seriously distort the local labour market. Often the bulk of those employed are from outside of the area. After the project is completed many migrant workers remain in the area compounding local employment problems. (33) Applicants should be required to implement mitigation measures to avoid these problems.

A local campaign group has been set up in a village near the Hinkley Point proposals. The Save Cannington Action Group claims that their village will be ‘traumatised’ by the influx of several thousand workers to build Hinkley C. See this local newspaper article:

“Cannington villagers’ uproar over Hinkley plans” Bridgwater Mercury, 21st December ‘09:

http://www.bridgwatermercury.co.uk/news/bridgwater_news/4814109.Cannington_villagers_uproar_over_Hinkley_plans/

Q.7 Do you have any comments on any aspect of the draft Overarching Energy National Policy Statement not covered by the previous questions?

The IPC is required to have regard to any local impact report submitted by a relevant local authority. The IPC should also encourage local authorities to submit reports on alternatives to the applicant’s proposal.

Any new energy infrastructure project will have an opportunity cost - the cost of forgoing the alternative outcomes that could have been purchased with the same money. This is not reflected in EN-1. This particularly impacts on local authorities who, in the case of new nuclear reactors, could achieve far more if the money were spent instead on energy efficiency and renewables.

The proponents of nuclear power argue that, because climate change is serious we need to promote renewables, energy efficiency *and* nuclear power. This suggests the UK has infinite sources of finance to spend on large numbers of energy projects, which is clearly not the case, and particularly so given the extent of the public finances and a worldwide economic recession.

A scarcity of resources means anything that is spent on nuclear power will not be available to be spent on other energy projects. Since tackling climate change is an urgent priority, so the UK, as a nation, needs to spend its limited resources as effectively as possible. There should be some recognition in EN-1 of the need to assess the effectiveness of spending decisions compared with alternative spending scenarios. It is imperative that we maximize the carbon reductions achieved with every pound spent. Investing in expensive nuclear power is not cost effective. Energy efficiency can be up to seven times more cost effective. So investment in new reactors effectively worsens climate change because each pound spent is buying so much less of a ‘solution’ than if it were spent it on energy efficiency measures. (34)

STOP HINKLEY RESPONSE TO NUCLEAR NATIONAL POLICY STATEMENT (EN-6)

Q.16 Do you think that the Government should formally approve (‘designate’) the draft Nuclear National Policy Statement?

No. The following pages will demonstrate why Stop Hinkley believes EN-6 is not “fit for purpose”.

Q.18 Does the draft Nuclear National Policy Statement provide suitable direction to the Infrastructure Planning Commission on the need and urgency for new nuclear power stations?

It is important that the IPC considers problems occurring around the world with regard to reactor construction projects taking longer than scheduled and going over budget. If reactor construction fails to result in the replacement of existing capacity because of construction delays then it will be impossible for the Government to meet its climate change commitments.

Paragraph 2.5.6 continues: *“France has already demonstrated that it is technically feasible to build nuclear power stations at the rate that would be needed in the UK if new nuclear power stations were to be constructed on all 10 sites listed in this NPS by the end of 2025 ... it is, therefore, important for the IPC to consider and grant consent at a rate that is consistent with the rate at which energy companies may wish to build new nuclear power stations”*.

It is also important for the IPC to consider problems occurring around the world with regard to reactor construction. Finland’s Olkiluoto 3 reactor was supposed to be the showpiece of a nuclear renaissance, for example. Its modular design was supposed to make it faster and cheaper to build. After four years of construction and thousands of defects and deficiencies, the reactor’s €3 billion price tag has climbed at least 50%. And while the reactor was originally meant to be completed in summer 2009, Areva, the French company building it, and TVO, the utility that ordered it, are no longer willing to predict when it will go online. (35)

In March 2006 EDF expected the second EPR reactor at Flamanville in France to cost €3.3bn, (10% more than the contracted Olkiluoto in Finland price) and the lead-time to be 54 months instead of the 48 month period forecast for Olkiluoto. But this increased to €4bn in 2008. (36)

Problems are not confined to Europe. Country after country has seen nuclear construction programmes go considerably over budget - for example, completion costs for the last ten Indian reactors have been 300% over budget. (37) China's Tianwan project began commercial operation in June 2007, more than two years later than planned. The Chinese regulator halted construction for almost a year on the first of two Russian-designed reactors while it examined welds in the steel liner for the reactor core. In Taiwan, the Lungmen reactor project was five years behind schedule. Difficulties included welds that failed inspections in 2002 and had to be redone. The World Energy Council says construction times for new reactors have risen from 66 months in the mid-1970s to 116 months - nearly ten years - for completions between 1995 and 2000. The unproven designs being proposed for the UK are likely to lead to more potential delays.

If reactor construction fails to result in the replacement of existing capacity because of construction delays or public opposition, the IPC needs to be able to assist with the implementation of an alternative plan. Gordon MacKerron, former Chair of the Committee on Radioactive Waste Management (CoRWM), puts forward a worst-case scenario that following a commitment to nuclear new-build there is a sterilisation of non-nuclear investment and then the nuclear programme itself stalls. Such a scenario is far from a remote chance - the last time a UK government committed to 10 nuclear stations (Margaret Thatcher's in 1979) only one station was built, Sizewell, and then only after 15 years. If that were to happen again, carbon dioxide emissions would continue to increase.

(38) Similarly, Bridget Woodman, formerly of Warwick Business School, suggests a “nightmare scenario” in which a commitment to new reactors leads to a stalling of renewables and combined heat and power stations, but nuclear power fails too, leading to an inevitable rise in carbon emissions. (39)

Another former CORWM member, Professor Andrew Blowers of the Open University, warns that nuclear power provides the illusion of a solution. He says: “*It is this business-as-usual aspect of nuclear that is its most insidious characteristic. ... The danger is that by focusing on nuclear we refrain from recognizing the scale of the challenge we face and shirk our responsibility for dealing with it*”. (40)

Q.19 Do you agree with the Government’s preliminary conclusion that effective arrangements will exist to manage and dispose of the waste that will be produced by new nuclear power stations in the UK?

No. The Government's conclusion that effective arrangements will exist to manage and dispose of waste produced from new nuclear power stations is not supported by the evidence. EN-6 is, therefore, not 'fit for purpose'.

The Government’s confidence that it will find a suitable site in a community which has expressed a willingness to host a site is misplaced. The three Cumbrian authorities looking into whether or not to volunteer will not finish the first round of consultation until 31st March 2010, and will not look at the radioactive waste inventory until later in 2010. The full extent of the new reactor programme is still unknown and may require a second deep geological disposal facility. Cumbria may yet decide against hosting a deep geological disposal facility, or it may decide it is only willing to host a facility for legacy waste, which was CoRWM’s expressed recommendation as new build waste brought in completely different ethical questions. The fact that the Government has explicitly stated it is prepared to “*explore other approaches*” i.e. override a Community’s wishes – if the voluntarism approach to disposal does not work has completely undermined the voluntary approach and suggests that Cumbria could be forced to accept waste whether it wants to or not. (41)

The Government says because it is satisfied effective arrangements will exist to manage and dispose of the waste produced by new reactors “*the IPC need not consider this question.*” (para 3.8.20) Consequently the need to store spent nuclear fuel at the reactor sites for up to **160 years** is not even going to be examined by the new IPC. No information is given on how this waste might be transported away from reactor sites eventually, and whether facilities might be required in future for, for example, encapsulating the waste. The public living around the proposed nuclear sites are to be given almost no say on whether their area should be allowed to become a *de facto* nuclear waste storage site for the foreseeable future. This is in sharp contrast to the voluntarist approach recommended by the Committee on Radioactive Waste Management.

The Government cannot assume that waste produced by new reactors can be safely disposed of - along with legacy waste - in a deep geological disposal facility, because a whole host of issues connected to disposal have yet to be resolved. Technical problems associated with a disposal facility are legion and most are recognised by the Environment Agency, thereby making any assertion of confidence in the disposability of radioactive waste premature. (42) Thus, the assumption that adequate arrangements for the long term management of radioactive waste from new reactors will exist when required is highly questionable.

If the Government is dropping its voluntarist approach to nuclear waste management and moving back to the previous decide-announce-defend position it should state this clearly. Under the Planning Act 2008 the Nuclear NPS consultation appears to be the last chance to challenge the principle that new nuclear reactors should be built at the ten proposed sites, and that these reactors should be permitted to generate spent nuclear waste fuel which may be stored on the sites for up to 160 years. The Justification consultation quotes the International Commission on Radiological Protection (ICRP) Publication 77 which states that:

“Waste management and disposal operations are an integral part of the practice generating the waste. It is wrong to regard them as a free standing practice that needs its own justification.” (43)

In other words, the disposal of spent fuel and nuclear waste from new reactors may well be subject to no further public scrutiny after 22nd February 2010. The Government needs to explain what the process will be should an application for permission to construct a deep geological disposal facility be received. It looks likely that, as things stand at the moment, the IPC will be simply told that the strategic question of whether nuclear waste should be disposed of in a geological repository has already been decided and that any planning application only needs to be examined with regard to local planning issues. There will effectively be no Nirex Inquiry Part 2. In other words, Cumbria, or anywhere else, could be forced to accept a geological disposal facility against its will without even so much as a public inquiry.

An example of the huge amount of work still needing to be done on nuclear waste disposal research:

From CoRWM (Oct 2009) Research doc (44)

A review of the fundamental research required to advance geosphere understanding sufficiently to enable reliable radioactive waste disposal is provided by

DePaolo and Orr (2008) who conclude that:

“A deep understanding of the fundamental physical and chemical processes that control migration of chemical constituents underground is essential for safe and effective sequestration ... of radioactive waste.

Building that understanding will require a new generation of experiments and computational models... new laboratory and field techniques and perhaps most importantly, a continuing supply of broadly trained geoscientists”

DePaolo and Orr (2008)

DePaolo DJ and Orr FM, 2008. Geoscience Research for Our Energy Future, Physics Today 61 [8] 46-49. **Source:**

CoRWM Report to Government

Q.20 Does the draft Nuclear National Policy Statement appropriately cover the impacts of new nuclear power stations and potential options to mitigate those impacts?

No. Our group strongly objects to the building of a new nuclear power station at Hinkley Point, or elsewhere, on several important grounds:

- health risk to the local population;

- health risk to a much wider population in the event of a serious accident or act of terrorism;

- that dangerous nuclear waste from the reactors will be stored on site for at least 160 years and having at present no ultimate repository site to be sent to;

- and on the basis that these risks do not need to be faced as there is no need for nuclear power.

I will expand on these and other issues in the following pages.

Health risks to local people

As mentioned earlier, health issues are a vital concern to many who live downwind from Hinkley Point and our group has commissioned several epidemiological studies showing excess breast cancer and infant deaths in the area. The local health authority pointed to Hinkley as a likely link to a 24 percent excess of leukaemia in young people in West Somerset in a seventeen year study in 1988. This paper has never been challenged.

The EN-6 DECC document allots extra space dealing with the health subject in the Hinkley Point section. We assume this is some measure of sensitivity to local feelings on the issue. But the section skims over the local debate on health issues which includes questions over the South West Public Health Observatory's use of different wards to supposedly 'replicate' Professor Busby's 2008 study showing a threefold excess of infant mortality in coastal wards downwind from Hinkley. The SWPHO said there was no significant infant mortality excess having, we feel, diluted the statistics by included some wards which were less likely to be affected.

We are bringing up these arguments in our submission to the DECC consultation but want to say here, as a process comment, that it would be helpful to see the results of a forthcoming study by the Committee on Medical Aspects of Radiation in the Environment (COMARE) into the very large German Government KiKK study into childhood leukaemia near nuclear power stations.

This important study showed a doubling of leukaemia within five kilometres of all reactor sites. COMARE expects its report to be ready in the spring but respondents will not have a chance to scrutinise it before the end of the DECC consultation, particularly the '**Justification**' process which will decide on the ramifications of new nuclear build on health effects.

On that point we believe that the current Secretary of State, having already made his views known about new nuclear power, cannot be seen as an arbiter and decision-maker on the Justification question. The call for a public inquiry has so far been turned down but we believe this decision should be reviewed.

The following commentary by Richard Bramhall from the Low Level Radiation campaign puts clearly the case that there is a serious flaw at the heart of the advice on the health effects of radiation. The International Commission on Radiological Protection seems most at fault here.

"Much of the evidence about health risk from radiation is post-Chernobyl, which ICRP entirely ignores in formulating its advice. A substantial book full of evidence suggesting that this oversight might be foolish is free to download at <http://www.euradcom.org/publications/chernobylinformation...htm> . See also <http://www.llrc.org/health/subtopic/russianrefs.htm> and a new book just published in the Annals of the New York Academy of Sciences (see <http://www.nyas.org/Publications/Annals/Detail.aspx?cid=f3f3bd16-51ba-4d7b-a086-753f44b3bfc1>). This latest one includes a review of studies of the deaths attributed to Chernobyl fallout in Europe; they total nearly 1 million up to 2005.

The ICRP approach treats radiation as if it were homogeneous. That's like regarding all poisons as if they were of equal toxicity, weight for weight. "How much poison do you think would kill you?" asks the idiot. "Well it depends what poison you're talking about", says any half-way intelligent person. In terms of radiation exposure, the idiot question is "What dose is safe?", and the intelligent answer is " that depends; where is the radiation coming from? .. is it a source stuck on my DNA? ... is it stuck in my lymph nodes? is it delivering all its energy into a tiny bit of me and leaving all the rest unirradiated?"

The nub of the issue is that there are some kinds of radiation exposure which it is valid to regard as uniform, homogeneous, well-averaged, evenly distributed in the body (however many synonyms one needs). Examples are x-rays and cosmic rays.

But there are other kinds of exposure which are never evenly distributed, so that all their damage is concentrated into microscopic volumes of tissue. Hot particles are one example and there are many others. In these circumstances, the CERRIE committee advised in 2004, the very concept of dose may be meaningless at the cellular and molecular level.

So there is a massive caveat that should be posted on any expression involving the word "dose". One of the main reasons the nuclear establishment sticks to using dose is for the administrative convenience of lumping all kinds of exposure together. Well that's just not scientifically valid.

Here, <http://www.llrc.org/wobblyscience/subtopic/singtonsaspirin.htm> , is an example of the kind of nonsense scientifically illiterate journalists spout because they don't understand these caveats.

If you want to see the history of how the radiation protection community got stuck in the "average dose" model, look at www.llrc.org/switcheroo.htm.

ICRP has recently admitted [<http://www.llrc.org/health/subtopic/icrpabdicates.htm>] that their risk model cannot be used for post-accident exposures.

By inescapable extension neither can it be used for routine releases of the same radio-isotopes, and operators can't use it to demonstrate compliance with regulations expressed in terms of numbers of cancers per year, which is what they're actually required to do. The big questions are "Where will they get their advice in future? Will it stand up under scientific examination?" The nuclear lobby may be able to dupe the occasional journalist and some of the public but the investors and the courts are another matter. If operators go ahead in spite of the evidence there will be huge bankruptcies on the asbestos model (only far larger).

*The idea has been put forward that fear of radiation is a greater risk than radiation-induced diseases. What WHO and IAEA **have in fact** said about the fear factor is in the Report of*

the Chernobyl Forum (where they were the lead agencies). The report cites [4] a small number of studies where "Chernobyl exposed" populations had higher rates of "mental health symptoms, medically unexplained physical symptoms and subjective ill-health". The mental health symptoms were "mostly subclinical and did not reach the level of criteria for a psychiatric disorder", but they had "important consequences for health behaviour, specifically medical care utilisation and adherence to safety advisories." In other words, these people took up a lot of time at the advisory centres set up to help them.

Big surprise then. Doctors call them "the worried well". Their subjective and subclinical presentations are no basis for dismissing the increases in clinical diagnoses of conditions such as cancers, congenital malformation, stillbirth, cataracts, and so on and on reported by many workers in the affected territories. One of these scientists observes "We have seen, since the accident, clear and diverse effects of irradiation in plants over time ... we bear in mind that these late effects in plants could not be related to 'radio-phobia'." [5] The radiophobia thing is just absurd, unscientific spin. "

Footnotes see references: (45, 46, 47, 48, 49)

Local health studies

We outline here some of the epidemiological studies which point to excess cancer and leukaemia in communities near nuclear power stations

"Leukaemia incidence in Somerset with particular reference to Hinkley Point" Dr Cameron Bowie, Somerset Health Authority 1984, '87, '88. The three reports studied leukaemia incidence in West Somerset, finding a 24 percent excess in those aged under 24 years over a seventeen year period, suggesting a link to Hinkley Point. There was a suggestion in the reports that accidental unrecorded discharges might have accounted for the higher numbers recorded.

(As these reports are not available on the internet due to their date of publication, we attach them with the posted version of this submission)

Having our own doubts about the ICRP model, discussed above, Stop Hinkley decided in 1999 to commission a local cancer mortality study. The Office of National Statistics were able to provide figures of cancer deaths for all the Somerset wards and we asked Dr (now Professor) Chris Busby to examine the figures and see if they correlated with radioactive discharges from Hinkley Point.

"Breast cancer mortality and proximity to Hinkley Point nuclear power station 1995-98" Dr (now Professor) Chris Busby Green Audit 2000. Found an 89 percent excess of breast cancer deaths on Burnham-on-Sea north over a four year period. Follow up studies later confirmed the excess. (50)

We asked the South West Cancer Intelligence Service for details of cancer *incidence* as opposed to deaths in the area but they were reluctant to provide the figures, saying they were concerned about the confidentiality of individual cases. We argued that many people might actually want more information to help them ascertain what factors might have been involved in their illness. In the end we decided to set about our own doorstep survey, visiting the homes of about 3,000 people in Burnham North electoral ward. Stop Hinkley funded the survey and analysis while members of Parents Concerned About Hinkley

undertook the door-to-door health questionnaire. Dr Busby of Green Audit analysed and published the results:

“Parents Concerned about Hinkley survey, 2002” doorstep survey by volunteers analysed by Dr Chris Busby. 100% response from 30% of Burnham north population between 1996 and 2001 showed: leukaemia incidence 2.7 times the England & Wales average; breast cancer 98% above average; kidney cancer 4 times average; cervix cancer 5.5 times average. A Government committee wrote off the study saying wrongly it was a 30% response of a 100% population and therefore unrepresentative. (51)

In 2004 we issued the following press release:

“Burnham breast cancer rate still high” 10th Jan 2004

Breast cancer in Burnham and surrounding towns is a fifth more prevalent than the national average, according to a scientist and campaigner who has studied new figures provided by the Cancer Intelligence Service.

Dr Chris Busby from Green Audit has examined the latest figures published by the South West Cancer Intelligence Service (SWCIS) and confirmed that, in thirteen years between 1990 and 2002, breast cancer registrations were 21 per cent higher than should be expected.

Last month SWCIS updated its annual cancer rates for Burnham North and South, Berrow and Highbridge, following its pledge in May 2003, and issued three years' figures on its website. But campaigners are unhappy with the way the statistics were presented, saying the agency spun the figures by presenting them in isolation, thus reducing their statistical significance. They say in best practice, the last three years should have been added to the previous ten years' figures to give increased statistical power.

Ironically the text of the SWCIS report warns about interpreting long-term trends on the basis of just three years' data but then goes on to say the figures provide reassurance. The one-page report shows local breast cancer to be almost ten per cent higher than average in three recent years 2000 to 2002 but says this is not statistically significant. Dr Busby added this fresh data to previously published SWCIS figures for 1990 to 1999 to give more meaning to the total.

Chris Busby said: “It is a very wrong use of epidemiology to take an isolated short period some considerable time after the main exposure and use it to argue there is no effect. No breakdown is given for individual wards but we might assume from past research that Burnham North would have an even greater incidence rate that has been averaged out in the report.”

Jim Duffy, campaigner from Stop Hinkley said: “This confirms once again the breast cancer link to an environmental cause. If we believe the agency figures then the effect might be reducing slightly. This trend may continue with the closure of Hinkley ‘A’ as has happened near American decommissioned nuclear power stations. But no marks go to SWCIS for their trustworthiness, just when their Director has been appointed to COMARE, supposedly the country's top research unit on the health effects of radiation.”

PCAH spokesperson, Julian Plested said: “We're very concerned about the figures but not surprised as they confirm the findings of our doorstep survey. We should now turn our attention to Hinkley ‘B’ which may possibly contain cracks in its reactor core. If this is the

case it could lead to a large accidental release of radiation on top of its routine discharges.”

Jim Duffy, Stop Hinkley Coordinator

The following article was published in 2008 highlighting a Stop Hinkley commissioned Green Audit report on infant mortality near Hinkley Point:

“N-PLANT CANCER FEARS HIGHLIGHTED”

Western Daily Press, 1st March 2008

Infant mortality is almost three times more likely to occur in Severn Estuary towns and villages downwind of Hinkley Point power station than inland parts of Somerset, a report says. Details of the study by Dr Chris Busby, of Green Audit, which was supported by a former director of the South West Cancer Registry, were aired last night on the BBC's Inside Out West programme.

Using Government figures, Dr Busby found there was an almost three times greater risk of infant mortality between 1996 and 2001 in the estuary wards of Brean, Berrow, Burnham, Highbridge, Huntspill, Combech and Pawlett, compared with inland wards.

The rate of deaths in under one-year-olds was found to be 10 per 1,000 compared with 3.5 per 1,000 further inland. Campaigners said the findings added weight to the theory dangerous radioactive particles discharged into the sea and air at Hinkley were ingested by residents downwind from the power station.

Neonatal deaths (in children up to 28 days old) were also found to be high, particularly in Burnham North during the period 1993-98 at six times the rate expected.

Dr Chris Busby was commissioned by campaign group Stop Hinkley to follow up earlier cancer studies that had shown high numbers of breast cancer and leukaemia in the area near contaminated mudflats between Hinkley and Burnham-on-Sea. Dr Derek Pheby, former head of Cancer Registry, said the findings were significant.

Jim Duffy, spokesman for Stop Hinkley, said: "The tide is turning with more scientific support for the compelling evidence that radiation is harmful to local communities and particularly to vulnerable infants.

"COMARE, the Government watchdog assigned to monitor health trends near nuclear plants should now be disbanded." (52)

The health officials at South West Public Health Observatory argued that children were safe near the power station but in later ‘replicating’ the Green Audit study they added one electoral ward and removed another from the study population. We believe these unpublicised changes affected their results.

In the same year a very large childhood cancer study was undertaken in Germany:

“Leukaemia in young children living in the vicinity of German nuclear plants”, Kaatsch, 2008 International Journal of Cancer (KiKK report). A very large German

Government study showed more than doubling of leukaemia in children living within 5 kilometres of nuclear power stations with an effect as far away as 50 kms. Created a public outcry and many pregnant women moved away from nuclear plants.

“Breast cancer incidence in Burnham-on-Sea, 1994 – 2004. Further evidence of effects from radioactive discharges from Hinkley Point nuclear power station”, Prof Chris Busby, Green Audit 2008. This study over a lengthy period showed five extra women per year in Burnham were registered with breast cancer compared with the national average. Over 50 women during an eleven year period seem to have contracted breast cancer as a result of Hinkley radioactive discharges. (Study not yet published – paper copy enclosed with this submission)

The above studies seem to confirm what a lot of local people suspect: that living near Hinkley Point, especially in coastal and estuary areas downwind of the plant carries a health risk. We have had reports that patients in oncology departments in Bristol have discovered that others in the waiting room came from Burnham or nearby, against all statistical expectations.

It should be pointed out that the 1988 Somerset Area Health Authority report above, which was never challenged, only covered upwind areas of West Somerset and Bridgwater. Their catchment area did not include Burnham-on-Sea which was part of the Weston-super-Mare catchment at the time. Had the study covered the downwind towns, we suspect the figures would have been even more disturbing.

Summary of health objections

The difficulty with the conventional approach to radiation risk is that the model does not allow sufficiently for *internalised* radioactive particles. The International Commission on Radiological Protection who advise on this, base their predictions on Hiroshima survivors but a single blast of radiation should be treated differently from long term exposure to inhaled particles. So experts predict low, statistically insignificant health effects. When these turn out to be higher than expected in epidemiological studies, they wrongly say it cannot be connected to the radiation. This is an unscientific approach, based on expected outcomes not on real outcomes.

The Committee Examining Risks from Internal Emitters (CERRIE, 2004) reported that radioactive ‘dose’ is now irrelevant, so radioactive discharges measured in millisieverts will not accurately predict whether individuals will be harmed. They also recommended that regulators should recognise that children are particularly vulnerable.

We submit that two very large nuclear reactors pouring radioactive particles into the Bristol Channel will result in continued excesses of cancers in the area. We support Sedgemoor District Council’s request for EDF to conduct a Health Assessment of the vicinity. We would be very prepared to assist with the design of such a study, for example basing it on data on a post-code basis which would furnish more pin-point information than much broader electoral ward data.

Nonetheless we believe there is sufficient information to reverse the proposals to construct two or even one nuclear power stations at Hinkley.

EN-6 is not fit for purpose because the examination of the KiKK study being carried out by the Committee on Medical Aspects of Radiation in the Environment (COMARE) has not

been completed in time for this consultation, and has not been subjected to an independent critique.

The individual site Appraisals of Sustainability (AoSs) deal with human health in more detail than the main EN-6 report. The recent work of COMARE is discussed, along with the German KiKK study. (See for example paragraphs 4.41 – 4.47 in the Bradwell AoS – ref 12) Para 4.46 mentions that COMARE is currently undertaking a review of childhood cancers around nuclear power stations with particular reference to the KiKK study. It doesn't mention, however, that the results of this study will not be available until after this consultation has ended.

It is not acceptable for something as important as the COMARE review to be published after this consultation has closed.

Q. 21 Do you agree with the Government's preliminary conclusion on the potential suitability of sites nominated into the Strategic Siting Assessment, as set out below? You can respond in general terms on the assessment as a whole, or against one or more specific sites.

Topography and health effects

Still in respect to health issues, in a meeting facilitated by the Environment Council at Hinkley Point in 2001, the BNFL epidemiologist acceded in theory that the local topography around Hinkley Point could be problematic. This was in response to our contention that radioactive particles accumulate on the 50 hectare mud-flats upwind of Burnham-on-Sea. Although this phenomenon applies to Hinkley it should also apply to other estuarine sites where nuclear power stations could be built, particularly those with a high proportion of mud to which the particles are more prone to attach. Initial studies seem to show a breast cancer excess in Maldon near Bradwell upstream along a tidal river which would bring in radionuclides on the tide. The effect was not found in Burnham-on-Crouch whose tidal river is downstream of the plant and therefore nuclides would not be swept up the river Crouch to the town. Oldbury seems to have the health effect on nearby Chepstow which has tidal currents which would theoretically create this impact, as well as communities directly downstream from the plant on the Avon side.

Risks from a serious accident or terrorism

We believe that there are real safety risks associated with operating a European Pressurised Reactor (EPR). We note the recent misgivings of the Nuclear Installations Inspectorate Generic Design Assessment team with regard to the Control and Instrumentation systems in the EPR design. Nuclear Consultant John Large has written in some detail about the risks to an EPR from an aircraft attack as well as the consequences in terms of fallout in the event of a containment by-pass accident.

We note that the NII has described their concerns in the strongest terms possible about the vulnerability of the Westinghouse AP1000, slated for Oldbury and Wylfa, to an aircraft terrorist attack. (53, 54, 55)

We are not convinced that the EPR is immune from the same threat, which we will outline below. On the grounds that effective landscaping can reduce the accuracy of an aircraft attack on the plants, we contend that the spoil from excavations should be built up not just on the south side of the station, as proposed by EdF to mitigate the visual and noise impacts, but in each compass direction. However we feel the residents of the village most affected should be given a choice in an official referendum.

We explore the safety issues below.

Regulator criticisms of the EPR design

Stop Hinkley issued the following press release on 27 November 2009:

Safety regulator slams reactor design

The Nuclear Installations Inspectorate (NII) today announced they have major concerns over key aspects of the safety systems in the EPR reactor proposed for Hinkley Point. They state they would not issue a license for the reactor unless the Control and Instrumentation system is fixed. A top nuclear consultant suggests the error could hold up the UK nuclear project by up to three years.

In their Part 3 Report of the Generic Design Assessment, the safety regulators claimed that in the Control and Instrumentation system the computerised shut-down systems were not sufficiently separated from the normal operating systems. Consequently they aired their concern that a fault could affect the performance of crucial safety systems. They raised a 'Regulatory Issue' or red flag over the issue, the highest warning they can give to a nuclear operator.

The Control and Instrumentation system, if not acceptable, could be replaced with a version from an older reactor the 'N4' but the N4's control system was itself found to be faulty and so it used an even older version from an earlier reactor, the '1300 MWe' built in the 1980's. EdF have suggested using a hard-wired system to replace the computerised control of the safety systems but this is an early proposal with no detail attached.

The NII pin-pointed other areas of concern with the reactor design:

- More work was required on the prevention of cracks in the fuel cladding due to thermal stress. This is very important as the 'high burn up fuel' which will be deployed in the EPR is hotter and more radioactive than fuel used in previous Pressurised Water Designs. It is crucial that the fuel is effectively contained within its cladding.*
- Analysis of the human factor in the safety of the reactor was seen as being unclear in the design proposals. This section deals with how workers or others might deliberately or for other reasons sabotage the reactor. EdF were told to put more effort into their arguments to back up their safety claims.*

- *Managing radioactive waste: an assessment on the disposability of the highly radioactive spent fuel arrived too late for consideration for this part of the assessment. Campaigners are keen to examine this area as the spent fuel will be twice as hot and twice as radioactive as from conventional PWRs and will need to stay on site at Hinkley for an estimated 160 years before it can be physically put in 'permanent' containers for eventual movement to a hoped for (but as yet unplanned) Deep Geological Repository.*
- *Design changes: The regulators state they find it difficult keeping track with a reactor design which is not complete. As it is currently being built on two sites in Finland and France, the designs are frequently changed. The regulator has asked for a 'frozen' design as of 2008 but acceded that changes can be incorporated.*
- *Categorisation & classification: The EPR design has been found to be not entirely in alignment with international good practice eg on mechanical systems where there is no classification system for delivery of a safe function.*
- *Exclusions: The regulators have conceded that construction could conceivably go ahead despite outstanding areas of concern but only up to the point where the specific concern becomes relevant. There is some risk to EdF here but also the regulator would be under mounting pressure to give way once the momentum of the project had reached a certain point.*

Jim Duffy, spokesman for Stop Hinkley said:

"This reactor has had an unlucky history. It was based on the earlier 'N4' reactor of which only four were ever built due to thermal fatigue flaws in the important heat removal system. They took between 16 and 19 years to reach operational output."

"Its construction in Finland is nearly four years late with 3,000 recorded building errors(2). The French version is currently two years behind schedule and now the UK regulators are as critical as they can be over the risks with its computerised safety system. EdF may need to apply a thirty year old system to replace it or simply hard-wire it. This is hardly 'state-of-the-art' that EdF boasts of their new reactor design. It makes you wonder how it got approval to get as far as it has in Finland and France."

"We could avoid a great waste of time and money by a change of direction and fully backing renewables before that's too late to help stop climate change."

Jim Duffy, Stop Hinkley Coordinator

A comparison has been made regarding the C & I system that it is like having a fault in your car steering that means the brakes also stop working. It does not inspire confidence that the EPR has got so far without this potentially dangerous fault being rectified. We were very surprised that the normally restrained French nuclear authority ASN were equally critical of the system as well as the Finnish regulators, STUK.

On the issue of human factors, I worked as a psychiatric nurse at Southwood House in King Square, Bridgwater in the 1980's. One of my clients for counselling was a shift manager at Hinkley Point B. Although he did not have a 'mental illness' as such he was very preoccupied with family problems. In one session he reported having made an important mistake in operating the reactor which had led to a discharge of

radioactive gasses. The accident was reported in The Guardian at the time in which Dr John Large suggested it was the worst UK accident since Windscale.

Colleagues reliably informed me at the time that another Hinkley worker with safety responsibilities had Alzheimer's Disease and was effectively being 'carried' by co-workers.

I discussed this event at the Hinkley C public inquiry. I raise the question now as I am still concerned that human factors could contribute to a serious accident at a reactor. The fact that the NII have pointed out the inadequacies of EdF's analysis in this area is of great concern.

John Large reports:

Vulnerability of the EPR to terrorism:

In 2006 a letter from EdF to the French Government was leaked to a French campaigner and consequently published. The letter was on the question of the EPR's vulnerability to a deliberate aircraft attack. John Large was asked to write a report on the contents of the letter. Here is the summary of his report. The full report is available at (56)

The EdF letter referred to is below the report summary.

OPERATIONAL RISKS AND HAZARDS OF THE EPR WHEN SUBJECT TO AIRCRAFT CRASH

SUMMARY

This is a brief review of a confidential EdF document that has been leaked to the public domain in France.

The EdF document relates to the projected performance of the AREVA designed Generation III EPR reactor. The first of this reactor type is presently being built at Olkiluoto in Finland and construction of a second EPR is expected to commence shortly at the established nuclear power station site at Flamanville in France.

In or about 2003 it seems that EdF prepared a statement to the Direction Générale de la Sûreté Nucléaire et de la Radioprotection in response to its request to demonstrate the safety of the EPR design against the deliberate crashing of a large civil aircraft onto the nuclear island. The resulting EdF document endeavours to prove the ability of the plant to withstand such attack and it claims to do so by comparing the footprint and time sequencing of the impact of a small military (fighter) aircraft to that of a large, fully fuelled commercial airliner.

However, this leaked EdF document shows the claim to be flawed in a number of important respects: First, in that the impact signatures of the small military fighter and very much larger commercial passenger aircraft are unlikely, contrary to the reckoning of EdF, to be sufficiently similar in both time span and magnitude for the design resistance of the EPR to an accidental military aircraft strike to equally apply to a passenger airliner intentionally targeted the nuclear island of the plant – indeed, the basis of reckoning the resistance of the built structures is so grossly simplified that it is inapplicable to a real impact situation. Second, the EdF assumption that the 100 or more tonnes of aviation fuel spilt during the moment of impact would ignite and burn itself out within 2 minutes or so is entirely without justification and unproven, with there

being a good possibility that highly explosive vapour would be formed within and around the structures, the deflagration of which could be severely damaging to the EPR building structures and nuclear equipment within. And, quite incredibly, one line of mitigation proposed by EdF is that the terrorist would have insufficient skills to pilot the aircraft onto the intended target, this being quite contrary to the dedicated training undertaken by the terrorists who masterminded the 9/11 attacks.

The EdF document draws on a poorly constructed argument of the resilience of the EPR design against the international terrorist threat – it has been drawn up on the basis that the terrorist has limited knowledge of the EPR plant, little capability to acquire the necessary skills to launch and successfully see through the attack, and that a determined terrorist group will not intelligently and intentionally seek out the vulnerabilities of the EPR design. Not only is it an entirely unjustified postulate that the present military aircraft accidental crash safety case is adequate to cover the damage severity caused by an intentional attack with a large passenger airliner, also the claim that the resulting radiological consequences to the public will be within the existing prescribed statutory limits for accidents cannot be demonstrated at all sound by the EdF document.

Indeed, it has to be hoped that considerably more valid thought and preparation has gone into improving the resilience of the EPR design since the 2003 date of the EdF document and, one might muse, if the paperwork design of the EPR is showing such shortcomings, what of the resilience to terrorist action of the many operational nuclear plants scattered across France and elsewhere in Europe?

Finally, I am not surprised at the hoo-ha generated within the French nuclear industry by this leaked document. This is not because it reveals some highly sensitive details about the EPR design, which it certainly does not, but more because it reflects what seems to be an almost total lack of preparation to defend against the inevitability of terrorist attack. Moreover, EdF admits that it does not consider itself responsible for providing protection against all conceivable acts of terrorism this being, according to EdF, the responsibility of the French state.

**JOHN H LARGE
LARGE & ASSOCIATES CONSULTING ENGINEERS
LONDON**

Bruno Lescoeur
Director Energy Department EDF
Site Cap Ampère, 1 place Pleyel
93282 SAINT-DENIS CEDEX
To The Director of Radioprotection and Nuclear Security
6 place du Colonel Bourgoïn,
75572 PARIS
Paris, August 12th 2003

Dear Sir,

In your letter, you ask me to examine the EPR reactor capacity of resistance to/to withstand an potential commercial plane crash, and then to make any necessary suggestions. Very quickly after the September 11th attacks in the USA, the EDF made a point of analysing the problem and in particular with regards to the conception/design of the EPR.

As you note in your letter, the new project takes into account **resistance** to a military plane crash, which is already a heavy charge. For this, the designers have chosen functional and geographical building plans taking account of such accidents. The project has 4 trains which are completely separate, and a part of the construction is "bunkerised": in particular the buildings containing the reactor and used nuclear fuel, and one building containing 2 of the 4 safeguards trains (electrical and mechanical parts).

The "bunkerised" part, designed to resist to the impact of a military plane, presents a high resistance and especially with regards to perforation: a military plane is considered to be the equivalent of a perforating missile.

All this gives to the EPR an important capacity to resist to the impact of a commercial plane, so no change has been made in the construction plans.

Despite this capacity for resistance to plane accidents, it is nevertheless necessary to note that **EDF is not in a position to ensure resistance to eventual war or terrorist action. Prevention or limitation of such action and its possible results involve State responsibility** In this case

- The controls concerning resistance to such accidents and any necessary supplementary measures are to be considered as outside the (normal) design basis of the building, and I am obliged to place this situation amongst the "Risk Reduction Categories"

- The study of different possibilities concerning an impact should induce **a reasonable response to the risk incurred and will not be able to take into consideration/cover each and every possibility**. Furthermore, the measures should, in my opinion, be in complete coherence with the measures adopted internationally, and should not be too different from the measures adopted for other industrial risks. I also consider that the different scenarios studied, the rules and analysis used to do so should not appear in the security reports immediately available or which could become available to the public.

Precisions concerning this general logic are to be found in the joined annex. And, added to this, in order to decide or control the design basis of the protective construction/shear wall of the "bunkerised" part of the building, it will be necessary to define a reference impact load. This reference, whilst generally covering the case of the sort of planes which could crash in the event of an intentional action, should not be associated directly to a particular

plane nor to a particular speed of impact. It should correspond to a general hypothesis based on criteria and calculation of a general and conventional nature.

For this reason I propose to retain as the reference the impact charge given in the annex which represents the risks reasonably considered possible by the sorts of planes in European skies.

Yours faithfully,

B. LESCOEUR.

Note: [Stop Hinkley emphasis **in bold**]

I was concerned that an inspector representing the Nuclear Installations Inspectorate GDA team at the DECC / NGO meeting on 15th November was not aware of the EdF letter to the French Government referred to above, suggesting the EPR reactor could be vulnerable to certain forms of attack. Our concerns here are obvious. It is not at all clear that the EPR could withstand a terrorist attack. EdF have claimed that in this short time-span they have reinforced the reactor designs to the level that it could withstand such an attack but this seems difficult to believe. In his fuller report John Large goes on to say:

“Obviously, to safeguard against intentional aircraft crash the only effective measure (other than security at the departure airports) is to physically enhance the structure of the building enclosures although, since the fundamentals of the building design are committed to at an early stage of the design process, other than a radical change of the building structures and/or layout (for example, building underground), little can be done to improve the resilience of the existing EPR containment design. There are no apparent signs that the post 9-11 EPR designs have undergone such a radical enhancement.”

Effects of a serious accident at Hinkley C

John Large gave a presentation in Bridgwater in 2008 which illustrated his concerns that the projections for a worst-case accident in an EPR were very probably badly understated and that a fallout plume could contaminate people a long distance from Hinkley.

An accident projected for weather patterns on the day of Chernobyl showed Devon then Wales, Ireland and Iceland becoming covered with the (invisible) radioactive plume. On a second random date Bridgwater was contaminated within an hour, then the Isle of Wight within four hours before the plume moved on to Northern France.

**HINKLEY NO BUILD?
IS HINKLEY POINT A SUITABLE SITE FOR
TWO NEW EUROPEAN PRESSURISED REACTORS (EPR)?
JOHN LARGE, LARGE & ASSOCIATES, CONSULTING ENGINEERS, LONDON
British Legion, Castle Street, Bridgwater Somerset - Monday 13 October 2008**

The present operational nuclear power station at Hinkley Point B comprises two Advanced Gas-Cooled Reactors (AGR) but plans announced (24 September 2008) by EdF at its takeover of the present Hinkley operator British Energy, suggest that of the 4 European Pressurised Reactor (EPR) nuclear plants that it has planned for the UK, two will be built alongside the existing nuclear plants at Hinkley Point, with the other two at Sizewell,

Suffolk.. The first EPR is planned to be in electricity generation by 2017 so, with the expected retirement of the fault ridden and troubled existing Hinkley AGRs within a few years, the spare electricity distribution grid capacity from Hinkley strongly favour this first EPR being commissioned at Hinkley Point.

Compared to the AGR reactors, each of 600MWe capacity, the EPR is rated at about 1,600MW_e generating capacity. With a projected operational life of 60 to 65 years, the EPR nuclear plant is capable of utilizing uranium based nuclear fuel to much higher irradiation (burn-up) levels and also of being fuelled with plutonium based fuel (MOX).

In 1982 the then National Radiological Protection Board (NRPB but now part of the Health Protection Agency) published the results of its comprehensive analysis into a radiological incident at the proposed Sizewell B pressurised water reactor (PWR) nuclear power station. For this analysis it was assumed that a severely damaging incident would rupture the reactor containment dome (containment failure) giving rise to a very significant release of radioactivity into the environment, yielding a maximum of 2,600 (130 probabilistic expected value) or so deaths in the short term and around 31,000 (3,300 expected) deaths in the longer term.

This projection of health detriment assumed that countermeasures would be judiciously implemented, including the speedy evacuation of about 300,000 (24,000 expected) members of public from the locality around the Sizewell site. However, for its mortality and morbidity projections the NRPB relied upon the then ICRP 26 standard that is now superseded by the universally adopted ICRP 60 recommending a x4 increase in the causal effect of radiation exposure, so much so that the 1982 analysis is now considered to be an under-estimate of the potential consequences of such a release.

The next projection for the radiological consequences of a PWR reactor accident carried out in the UK was in 1988 for the PWR nuclear plant proposed at Hinkley Point in Somerset. For this study, obviously in account of the Chernobyl disaster two years earlier, the damage and worse case incident considered to be credible comprised a very limited release of radioactivity with the reactor containment remaining intact throughout and following the incident, thereby constraining the radioactive release to a containment bypass for which no early or longer-term deaths were projected.

For the EPR the designer, AREVA, reckon that the nuclear plant is entirely protected from accidents and malicious acts that could result in significant release of radioactivity. In making this claim AREVA place extraordinary reliance on its failsafe engineered systems and containment, so much so that, in the very worst and most severe incident, the release would be limited to just 0.03% of the reactor fuel radioactive inventory. Put another way, over the six days following the explosion at the Chernobyl Unit N^o 4 reactor, it is reliably estimated that at least 30% of the total reactor fission product radioactivity released uncontrolled into the atmosphere. The equivalent worst case reactor incident release from an operational EPR at Hinkley Point would, according to AREVA, result in no more than (6 x 0.03%=) 0.18% of the radioactive inventory.

John Large will give an illustrated presentation that provides an up to date prediction of the radiological consequences of a severely damaging incident at Hinkley Point, this being the first time since 1982 that a revised radiological impact assessment for PWR has been publicly aired.

Based on EdF's undertaking that two EPRs, will be commissioned at Hinkley Point, the radiological health consequences of these larger nuclear plants will be analysed taking into account upwards revisions to the causal factors linking radiation dose to health detriment,

the larger core mass of nuclear fuel, the increased irradiation or burn-up of uranium fuel rendering it more radiotoxic, and the impact of MOX (plutonium) fuelling, all in account of the lessons learnt from Chernobyl.

The modelling and analysis will draw upon the outcome of highly confidential terrorist attack exercises carried out on nuclear plants in the United States, it will assume the same capabilities of the terrorist to penetrate the security at Hinkley Point, seek out the vulnerabilities of the nuclear plant, and to contrive effective means by which a radioactive release will take place; and for the radioactive dispersion and consequences the European standard COSYMA software has been deployed, together with NOAA satellite data to provide real time imaging of the dispersion and radioactive fall-out in the aftermath of the release.

The analysis and projections for Hinkley Point will be expressed in terms of the risk of any one individual sustaining health harm in the aftermath of a radioactive release and, related to the increased health risk from the larger EPR plant operating with a greater extent of irradiation (burn-up) and/or with a plutonium based fuel core, the need to extend both the range and resources allocated to the local authority off-site plan (under the Radiation (Emergency Preparedness and Public Information) Regulations 2000)

LARGE & ASSOCIATES
CONSULTING ENGINEERS, LONDON
<http://www.largeassociates.com> (57)

Chernobyl

We believe the effects of Chernobyl have been consistently underreported. The agreement by WHO with IAEA to not undermine nuclear power is extremely regrettable in this respect. It is also regrettable that HPA and COMARE do not take on board the findings of studies by Russian and other Eastern European scientists. My own regular visits to Belarus, the country most affected by Chernobyl tell me that many more people were and are affected than the offensive standard figures which are routinely doled out. A similar accident at Hinkley or elsewhere would produce very much more illness over a wider area than we would be led to believe.

- 23 years ago Chernobyl contaminated 21 percent of neighbouring Belarus and 1.5 million of its citizens with radiation.
- Chernobyl's plume was 200 times more radioactive than Hiroshima and Nagasaki combined.
- All the surviving 100,000 liquidators are now reported ill.
- Hundreds have died.
- 1.3 million hectares of Belarus farmland is contaminated.
- Half the Chernobyl radiation contaminated Belarus, Ukraine and Russia...
- Half spread over the rest of the world but was not officially studied.
- A 30 kilometre uninhabitable zone surrounds Chernobyl.
- Taunton is 25 kilometres from Hinkley Point.
- 374 UK farms including 200,000 sheep are still restricted

Chernobyl health predictions

4,000 cancer deaths in Belarus, Ukraine and Russia were estimated in a IAEA/WHO press release in 2005 which was widely publicised. But the actual WHO report predicted 9,000 cancer deaths in those countries, which remained unpublicised. 30,000 to 60,000 cancer deaths worldwide were predicted by an alternative committee of scientists: The Other Report on Chernobyl (TORCH) 2006.

Rosie Bertell, President of the International Institute of Concern for Public Health said:

“Clearly the true damage to health attributable to the Chernobyl disaster has been kept from the general public through poor and incomplete scientific investigation.”

We ask the question, could it happen at Hinkley C or elsewhere?

Extracts from a recent article, drawn from EdF documents, seems to suggest there is a threat:

Industry documents reveal modern reactors more dangerous in an accident than the ones they replace

Independent on Sunday, 8 February 2009 (extracts):

“New nuclear reactors planned for Britain will produce many times more radiation than previous reactors that could be rapidly released in an accident. The revelations – based on information buried deep in documents produced by the nuclear industry itself – call into doubt repeated assertions that the new European Pressurised Reactors (EPRs) will be safer than the old atomic power stations they replace.

Instead they suggest that a reactor or nuclear waste accident, although less likely to happen, could have even more devastating consequences in future; one study suggests that nearly twice as many people (28,000) could die.

Information in the documents shows that they produce very much more of the radioactive isotopes technically known as the “immediate release fraction” of the nuclear waste, because they could get out rapidly after an accident.” (58)

Proximity to civil aircraft movements

Although there is a 2,000 feet high and 2 nautical mile wide radius exclusion zone around Hinkley Point this has been flouted on occasions. Soon after the zone was adopted, the Western Daily Press leased an aircraft and flew it taking photographs over the nuclear plant, with complete impunity. The photos were posted on the front page of the newspaper overdrawn with a target circle, with the obvious implication that terrorists could easily fly an aircraft into the reactor. We would add that deliberately targetting the cooling ponds containing high volumes of very radioactive spent fuel would be much more dangerous, especially given their relative lack of physical protection. (This prevailing condition impacts also on the previous statement.)

We understand the 9/11 terrorists planned to fly into a nuclear power station in Pennsylvania. The July 7th London bombers also possessed plans of a nuclear power station. Hinkley Point is just minutes' flight away from both Bristol and Cardiff airports. A hijack detouring a fully fuel laden airliner could wreak havoc on any nuclear plant. Our group is not convinced by EdF arguments that the EPR could withstand such an attack. It is unlikely the engineering could have evolved in such a short time since 9/11 to protect the reactor buildings.

As discussed above, in August 2003 Bruno Lescouer of EdF wrote to the French regulator to say that the EPR would not fully withstand such an air attack and it was the Government's responsibility to prevent such attacks. The letter was later published by French campaigners.

Proximity to military activity

The firing range at Lillstock off the coast is actively used for military activities. Military aircraft regularly overfly the site. Although EN-6 dismisses any risks from local low flying military aircraft on local target practice it is not inconceivable that a military plane could be used as an attack weapon against a nuclear power station. It was previously unthinkable that suicide bombers would fly airliners into skyscrapers. Post 9/11 we must consider all possibilities.

Proximity to dangerous industrial facilities and operations

The EdF consultation paper seems to brush aside the fact that the planned reactor(s) will be built alongside existing nuclear reactors. Although Hinkley A is currently being decommissioned (very slowly due to lack of funds), Hinkley B is still operating with a licence till 2016. British Energy may wish to extend this date, which may overlap with the predicted start date of Hinkley C.

Should a serious accident occur at Hinkley B this would require the entire evacuation of Hinkley C. As Hinkley B managers have conceded that there are numerous cracks in the graphite reactor cores, this eventuality is more likely than hitherto. The boiler tube system was found also to have age-related cracks which required a seven-month shut down two years ago to effect partially repairs. Welders needed to work in a very radioactive environment to patch up the boiler tubes. Even so the plant is currently operating at 70 percent output to reduce the pressure and temperature in the boiler system

Should a series of tubes fail, the resultant pressure wave could disrupt and distort the reactor core which is in the same housing. This in turn could trigger a nuclear fuel fire through coolant failure at one or several fuel elements.

The risk of not arresting this fuel-fire scenario is strengthened by the fact that the tertiary 'boron beads' shut-down system assumed by many, including EU officials, to be in place, was never built in.

Stop Hinkley requests through the Freedom of Information Act for details of this dangerous anomaly have been rejected. British Energy (part of EdF) has strongly objected to the Nuclear Installations Inspectorate releasing the documents which they acknowledge they possess.

Demographics

We consider the site to be much too close to centres of population. Large towns such as Taunton, Bridgwater, Burnham-on-Sea, Weston-super-Mare and even Cardiff are within a 30 kilometre radius of identical size to the uninhabitable exclusion zone around Chernobyl. Consultant engineers, Large & Associates argue that Areva's confidence in the reactor buildings being proof to a deliberate aircraft attack could be misplaced. As described above, in a presentation in Bridgwater in October 2008 Dr Large showed the plume dispersal of radioactivity should a 'containment by-pass' accident occur. The plume reached Bridgwater in half an hour and northern France in 6 hours, in one scenario. (59)

Emergency Planning Procedures

We believe the Emergency Planning procedures would be totally inadequate to protect or evacuate the local populace in the event of a serious accident or act of terrorism. Potassium iodate tablets, which give some protection against just one form of radiation-induced cancer, are only pre-distributed to those within 3.4 kilometres of the nuclear plant. But a nuclear plume would contaminate hundreds of thousands within an hour or so with no realistic means of them receiving the pills which could prevent just one form of cancer.

We are concerned generally that emergency measures would break down. At Three Mile Island ninety percent of medical staff were not at their posts after the accident.

A police report to the Nuclear Industry Association at Oldbury power station in 2002 said that protective breathing gear had a life limit of just twenty minutes in a contaminated environment. Police officers would in any case be advised to voluntarily abandon their kit as it would panic the local population. We were also told that police officers had a smaller maximum dose in such circumstances than ambulance men and even council officers.

Summary

In view of the serious questions posed by the Large report and the presentation that came with it, we strongly contend that no reactors should be constructed at Hinkley or elsewhere. Should a decision be made to go ahead with the project, then we feel that emergency arrangements must be enhanced to allow better public protection. For example the current practice of pre-distributing potassium iodate tablets just within the 3.4 kilometre radius around Hinkley should be enhanced to take account of the fast pace that weather patterns can deliver radiation to locations much further away. As the Isle of Wight is about eighty miles from Hinkley we suggest the iodate tablets should be pre-distributed to all homes, schools, offices and factories within 100 miles.

Nuclear waste and spent fuel

We are concerned at the prospect of highly radioactive spent fuel being stored at Hinkley Point during and for a long time after the operation of the two proposed EPRs at Hinkley. The fuel will be 'high burn up fuel' which means it must be stored in mechanically cooled water for one hundred years before it is capable of being handled in preparation for the next stage of its management.

This problem so far into the future means we are leaving a serious legacy to future generations. Part of the risk is that of a terrorist attack and we do not know whether terrorism will have become more accurate and sophisticated. Nor do we know whether the economy and social cohesion will have collapsed with unthinkable consequences in terms of managing the hot spent fuel. The fuel management process is not a 'passive' one.

Another issue is that because of the very heat of the fuel, its containment is more likely to splinter or corrode, creating potential local contamination and a headache of a problem to solve.

We support the recent paper submitted to EdF by Hugh Richards of Wales Anti-Nuclear Association which delves into much greater detail on the subject referring to the US regulator's long term concerns about the spent fuel.

We are also concerned that the advice given by the former committee looking into nuclear waste has been ignored. The Committee on Radioactive Waste Management came down against Deep Geological Disposal for new build nuclear waste. This was because, while 'legacy' waste had to be dealt with in some way despite obvious risks, 'new build' spent fuel did not need to be created in the first place as there are alternate means of generating electricity.

CoRWM's proposal that communities should only volunteer to host the Repository looks shakey now that the Government has stated it may force Cumbria or other communities to accept the nuclear waste dump if they do not volunteer. The whole process is very flawed and has produced no results thus far in terms of any agreed permanent site or solution.

We note that West Somerset District Council has a long existing but standing policy to allow any new build at Hinkley not to exceed the current generation output ie of Hinkley A plus Hinkley B. The projected output from two EPRs would greatly exceed that figure.

Flooding, tsunami and storm surge

The Met Office report for EdF on sea level rises seems to give an approximate margin of four metres above mean High Water Springs for the lowest ground on the proposed new site. But the IPCC gave stern warnings about increased coastal sea rise as the probability becomes a certainty of land-based ice melting in areas such as Greenland and the Antarctic. The Met Office predictions must now be out-of-date.

According to the Middlesex University Flood Hazard Research Centre (FHRC) report commissioned by Greenpeace, current storm surges top the sea defences at Hinkley A and B. They also say that the slightly higher ground of the new site is composed of material which is eroding, leaving the reactors potentially exposed as time passes, especially during the decommissioning phase. As the sea line rises, the protective nature of the beach-line fades.

This process is particularly important as the spent fuel stores will contain the cooling high burn-up fuel for an estimated 100 years after the reactor(s) has stopped generating, a potential of 160 years in total.

There are some who are worried that future generations may not have the resources to fund or conduct effective and environmentally contained decommissioning. Thus the highly radioactive fuel and reactor buildings could potentially be left with little protection against the increasing levels of the sea, accelerating in its erosion process.

The precautionary principle suggests that a coastal site during this phase of sea level rise, is a poor position for such radioactive plant. The Hinkley site in particular has many drawbacks.

Report on sea level rise by Institution of Mechanical Engineers:

Dr Colin Brown, director of engineering at the Institution of Mechanical Engineering.

"Climate-change research shows there will be significant increases in storms as global temperatures rise. These will produce more intense gales and hurricanes and these, in turn, will produce massive storm surges as they pass over the sea...the country will also face massive disruption to its transport and energy systems unless it acts swiftly, according to a report - Climate Change, Adapting to the Inevitable - published recently by the Institution of Mechanical Engineers.

Many rail lines run along river valleys that will be flooded with increased regularity while bridges carrying trains and lorries often cross shipping lanes and may have to be redesigned to accommodate rising water levels.

"Power supplies will also be affected," added Brown. "The Sizewell B nuclear plant has been built on the Suffolk coast, a site that has been earmarked for the construction of several more nuclear plants. However, Sizewell will certainly be affected by rising sea levels. Engineers say they can build concrete walls that will keep out the water throughout the working lives of these new plants. But that is not enough. Nuclear plants may operate for 50 years, but it could take hundreds of years to decommission them especially if our social and economic fabric were to break down. By that time, who knows what sea-level rises and what kinds of inundations the country will be experiencing?"

Guardian 8th March 2009

Already the link road to Oldbury nuclear power station in South Gloucestershire has been cut off by rainwater flooding. In 2004 the site was inaccessible to staff who could neither leave the plant to go home. Emergency vehicles would have been stranded out of reach of the plant. The hold up was for four hours. A tsunami occurred in the Bristol Channel in 1607. The event, which was catastrophic, inundated large areas of Somerset, Gloucestershire and the eastern counties of South Wales. Many lives were lost but numbers remain unrecorded. Of topical interest, the tsunami surge carved out a chunk of land in the South Gloucestershire coast which remains to this day: it is used as the cooling water reservoir to Oldbury nuclear power station! If Oldbury were in existence then it would have been inundated. As would Hinkleys A, B and C.

Other issues

Cooling water and the Bristol Channel

We are not convinced by the case made in the EdF documents that the heat plume from cooling water discharges into the Bristol Channel would not have an adverse impact on life in the channel. Although the reactors' electricity output is 1650 MW its heat output is 3500 MW per reactor ie 7,000 MW. The Bristol Channel despite its appearance is very shallow at about twenty metres (less at low water springs). Pouring so much hot water into the channel must have an adverse effect.

We also believe that biocides used in the cooling pipes to stop fouling build-up would also add to the toxic mixture of radionuclides as well as hot water to have a health impact on fish and other organisms.

Cooling towers as have been proposed at Oldbury could be a partial solution but are unlikely to be acceptable given the already **ugly** outline of the proposed plant at Hinkley.

Local fish and shrimp resources have diminished considerably during the operating period of Hinkley A and B. Local 'sledge-fishermen' have reported a 90 percent cut in their catches.

No doubt the raised temperature of the returned cooling water has impacted on this process. But also the use of biocide in the cooling system, which aims to prevent the build-up of limpets, mussels and weed on the inside of the tubing. In a much larger power station, this effect will be magnified. In two giant reactors it will potentially be the death knell of mollusc and fish-life in the vicinity.

These effects are exaggerated by the fact that the Bristol Channel is very shallow, with an average height of only about 20 metres and much lower at Low Water Spring Tides.

Combined heat and power

As the DECC consultation document agrees that Combined Heat and Power is feasible for nuclear power stations, we believe this should be a feature if Hinkley C goes ahead, furnishing hot water to local homes. To reduce any risk of contamination, several layers of cooling pipes could be used. Utilising the excess heat from Hinkley in this way would also reduce the impact of dumping hot water into the Bristol Channel as a proportion of the heat would be diverted to local space-heating purposes.

Areas of cultural, heritage and landscape value

Within the newly formed boundaries of the EdF site exists an ancient tumulus known as Pixie Mound. This should not be touched as part of the development. The views from the Quantock Hills, an Area of Outstanding Natural Beauty (AONB) will be badly affected by such a large scale development. At 218 hectares this is a colossal site and appears about four times or more the area of the existing A and B sites combined. Neighbours of the site, including those who were previously pro-nuclear are finding their amenities lost behind fencing, particularly unwelcome due to the expanded size of the site. Dog-walking,

rambling and horse-riding activities are necessarily being curtailed. There is some uncertainty over whether the coastal path will remain open.

Bridgwater by-pass

We understand the vital need for an Emergency route to and from Hinkley but feel Shurton village would be a poor place to put this. The suggested alternative road from the M25 at Dunball put forward by hundreds of angry Cannington residents would be much more appropriate. We would support this by-pass in the least-best scenario that Hinkley C goes ahead. Cannington residents wishes should be completely respected in terms of their wish not to have their village traumatised by new infrastructure proposed by EdF.

At the same time we understand the OCNS security concerns of having thousands of workers accommodated on site during construction. The risk of sabotage is a real threat especially given the high expected turn-over of workers in the Olkiluoto model. The scale of the project should therefore be cut right back to one reactor built over a much longer time-scale, thus reducing the weight on local communities of so many outside workers. During the construction of Hinkley B many fights and brawls were reported in local villages and Bridgwater.

Summary of concerns about new reactors at Hinkley Point

We contend that the risks of building a new pair of reactors at Hinkley Point are too great, bearing in mind many experts have made the case that we do not need nuclear power. The health risks, though contended by some, have been demonstrated and led in Germany to a decision not to go for new nuclear build. The risks from terrorism are yet to be played out but we do not wish to see Somerset targeted in this way.

The long-term solution to nuclear waste has not been agreed or resolved, leaving us with the prospect of having to guard the spent fuel not just for 160 years but millennia.

We repeat our strong objection stated at the beginning, to this proposal to build more reactors at Hinkley Point.

Q.28 Does this package of draft energy National Policy Statements provide a useful reference for those wishing to engage in the process for development consent for nationally significant energy infrastructure, particularly for applicants?

No. Some colleagues have said they are overwhelmed by the volume of reading involved and felt powerless to respond in a way which reflected their concerns. One professional person who had recently joined a local campaign, told me she was very reluctantly deciding to give up. The amount of work involved could be a full time job and was consuming her personal and family life whilst her health had deteriorated with migraines and other health symptoms. The sheer volume of material which it is necessary to read in order to comment makes it impossible for ordinary members of the public to engage with the process. This whole exercise needs to be re-thought and started again from scratch.

Q.29 Do you have any comments on any aspect of the draft energy National Policy Statements or their associated documents not covered by the previous questions?

Stop Hinkley is seriously concerned about how the Planning Act represents an attack on democratic accountability. (60) In the case of applications to build nuclear power stations the removal of the right to cross examine witnesses is particularly disturbing. The new Act means that the IPC will normally make decisions without even a public hearing. The Government could go some way towards rectifying this situation by instructing the IPC to hold public hearings in the case of applications for nuclear power stations, and allow all who wish to make oral representations to be enabled to do so.

Stop Hinkley is also concerned that there may be a perception, amongst some community groups, of potential collusion between the applicant and the local authority when a Planning Performance Agreement is reached, with funding going from the applicant to the local authority. The “perception” of collusion could seriously strain relationships between the local authority and its citizens, because of the danger that any funding from the developer will compromise the local authority’s final recommendations. Stop Hinkley has drawn public attention to unethical local practices between the nuclear company EdF and Sedgemoor District Council (61, 62). We have also aired our views on the regrettable Planning Performance Agreement which simply makes collusion more easy and difficult to trace (63). The Government should seriously consider making alternative funding arrangements for the planning authority.

Stop Hinkley finally believes that there are large numbers of planned alternative renewable energy solutions – in addition to energy efficiency measures and micro-generation projects mentioned above – that may be hindered by the decision to build new nuclear power stations in the NPS. Offshore wind, tidal and solar energy all have greater potential to provide much more energy than the Government is suggesting. Stop Hinkley members would like to encourage such energy sources being tapped in preference to nuclear. There are some excellent examples around the UK and the positive moves towards supporting renewable energy is a key component of Stop Hinkley policy. Our response has concentrated on specific and detailed concerns around new nuclear build and a number of our members will also be responding.

Yours,

Jim Duffy
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www.stophinkley.org

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