BANNG

Blackwater Against New Nuclear Group

House of Commons Energy and Climate Change Committee

Inquiry into Energy National Policy Statements

Evidence on Behalf of the Blackwater Against New Nuclear Group

(BANNG PAPER NO. 5)

The Blackwater Against New Nuclear Group (BANNG) is a Citizens' Based Organisation formed in early 2008 to oppose the proposed development of a new nuclear power station at Bradwell. Its Aims and Purpose together with more information about the Group can be found on the website www.banng.org.uk.

Executive Summary

The government's process of consultation on the Draft Nuclear NPS cannot by any standard have been deemed to be open and effective. It has failed to clearly inform people around the Blackwater estuary of the main differences between the operation of new nuclear power stations at Bradwell and the operation of the old power station. We believe effective communication would have resulted in residents understanding the following differences:-

- High level radioactive waste could be stored on site for 160 years or more. DECC hopes that by then a national repository will have been built elsewhere to accommodate this. This can not be guaranteed.
- A new more powerful nuclear power station would require far more cooling water from the relatively narrow, shallow estuary. This would result in far more serious damage to fishing and oyster industries, ecology and marine life.
- There is a proposal to build 2 additional nuclear power stations at Bradwell which would require cooling towers due to a lack of sufficient cooling water in the estuary.
- The location for this very large nuclear complex, next to the old partly decommissioned power station, is a vulnerable low lying site which must be securely protected for 160 years against increasing threats which include rising sea levels, flooding, storm surges and tsunami.
- Mersea Island is only 2 miles downwind of this proposed Bradwell complex and now has a population of some 7,500 people, rising to 15,000 in the holiday season. In 1962 there were only 3,000. It is claimed there is no need for an emergency evacuation plan even though the only access road regularly floods at high tide, preventing departure.
- Claims that increased employment would benefit all local communities are questionable since Bradwell is not particularly accessible to communities on the north side of the estuary. On the contrary the presence of a prominent nuclear complex is just as likely to cause a decline in major employment in the valuable tourism, holiday, sailing, fishing and oyster cultivation industries around the Blackwater estuary.

We maintain that the Draft NPS and associated reports for nuclear power justifying the Bradwell site are very superficial and biased. They omit relevant facts which would have been known to competent authors and even make claims of reasoned judgement when none is evident. This leads us to the view that there is a bias intended to guide the IPC to accept a site which should not have been justified for inclusion as suitable .

BANNG urges that the Bradwell site should be classified as unsuitable.

1. Waste Storage

1. a The Statement admits that high level waste will remain on site for around 160 years (D1). It also states that radioactive wastes, including spent fuel and intermediate-level waste, can be safely and securely stored 'on the site……until it can be sent for disposal in a geological disposal facility'.
The Government has adopted a process of "volunteering" by communities for selecting a deep geological disposal site to host stores for radioactive waste……to secure public confidence (3.8.11).
Contrary to this there is no such process of "volunteering" for the storage of low, intermediate and high level radioactive waste from new nuclear power stations which would have to be stored at the proposed Bradwell site.
There is as yet no guarantee of this geological disposal route or its timescale for the long term storage of high level waste, and the Bradwell site becomes by default both that of a nuclear power station and a high level radioactive waste store, upon which no evaluation of risks or local consultation or acceptance has taken place, and wastes therefore, may well have to be stored indefinitely on a coastal site increasingly liable to inundation.

1. b BANNG maintains the voluntarism principle which applies to legacy waste storage should also apply to so called 'interim' high level waste storage for new build, which could remain on site for 160 years or longer.

2. Flooding Storm Surge and Tsunami

2. a The majority of the Bradwell site is in flood zone 3, high probability. (5.6.24)
The Environment Agency needs to explain what it means when it says that '*it is **potentially reasonable to conclude** that a nuclear power station (and waste storage facility?)……..could potentially be protected against flood risks throughout its lifetime*'. (5.6.28)
Potentially reasonable is not yet reasonable. It is therefore unreasonable to make this claim.
BANNG totally rejects the subsequent amended version of this view expressed in 5.6.31 that makes the unsubstantiated jump to '*a nuclear power station **could potentially be protected** against flood risks through its lifetime, including the potential effects of climate change, storm surge and tsunami*'. Given that it is clearly impossible to predict with any confidence the effects of coastal change over such a long timescale, or the ability of agencies to reliably protect the site over such long timescales.
BANNG demands that any site approved for nuclear power or a nuclear waste operation can be guaranteed safe for life prior to site approval.

2. b At the West Mersea DECC presentation on Dec 10 2009, Peter McDonald advised that climate change projections up to 2100 have been used and that assessments beyond this would be dependent on a regular cycle of reassessments, probably every 10 years, throughout the life of the station. Given current uncertainty on climate change effects and the consequent lack of 160 year projections, it is therefore possible that the Bradwell site may become unsustainable earlier than planned.

2. c BANNG considers it unethical to proceed with the Bradwell site under these circumstances.

3. Health Risks of Nuclear Reactors at Bradwell

3. a Much of the opposition to any new nuclear reactor at Bradwell, Essex, rests upon continuing anxiety about the past and future health risks to local populations, as attempts to establish the truth about such risks remains very difficult for ordinary members of the public. There is also mistrust in the nuclear industry's openness regarding problems and accidents.

3. b Many people believe that investigations in the Blackwater area have suggested excess levels of cancer and higher levels of breast cancer mortality arising from the Bradwell power station (Busby and Bramhall, 2002). More recently, a reworking of the data on childhood leukaemia in the Blackwater area, following the German KiKK study, indicates a possibility of higher levels than in the population at large.
In February 2009 Magnox Electric were found guilty of allowing a radioactive leak at Bradwell to continue for 14 years and were fined a total of £400,000. The leak only came to light during decommissioning work and not as a result of any routine safety inspection. Mike Weightman, chief inspector of the Nuclear Installations Inspectorate, said it was not possible for them to 'check every feature of a complex plant'. Cases like this do nothing to give peace of mind to those living near nuclear installations.

3. c Please see Annex A for a detailed report on research into health risks.

3. d The Government's view that a nuclear power station would 'pose very small risks to safety, security, health and proliferation' is clearly open to challenge, and therefore BANNG believes the Precautionary Principle should apply and that any risk should be avoided by not constructing a new nuclear power station and high level waste store.

4. Demographics / Evacuation Plans

4. a The demographics assessment (C1) suggests the site meets semi-urban criteria but fails to take account of the transient holiday populations, such as the large numbers in the caravan and camping sites on Mersea Island and around the estuary during the summer. There is also no consideration of the potential risks posed to substantial urban populations within 20 miles, including Southend, Chelmsford, Colchester and Clacton.

4. b In the event of an accident, evacuating the 7,500 residents of Mersea Island only 2 miles downwind could be impossible, since the only access road to the Island is regularly blocked for several hours by tidal flooding.

4. c In addition the transient summer population of day visitors and longer term tourists in caravans and tents totaling some 7,500 would need immediate evacuation under nuclear emergency planning, as in the Sizewell off-site emergency plan. This applies to people without the shelter of permanent buildings in the event of an incident .

4. d It is difficult to understand how a planned evacuation of the Island could be arranged safely. If the public was advised to remain on the Island during an emergency it is probable many would attempt to leave in anticipation of an incident worsening or of being cut off by the tide.
Other communities around the estuary such as Tollesbury also have restricted access roads which could make evacuation very difficult.

4.e Another concern, as outlined following exercises by the Government Nuclear Emergency Planning & Liaison Group, which simulated the crash of an aircraft on the old Bradwell site, is that site emergency plans refer only to credible accidents, and not to outcomes of deliberate acts such as that of terrorism.

4.f BANNG considers that under these circumstances local populations have a right to expect plans for their safe evacuation to be a prerequisite for site acceptability, not merely a subject for later consideration by an applicant (5.6.9).

5. Impact of cooling water intake, outfall and biocides on fishing and oyster industry and ecosystem

5. a Many fish, larvae, eggs, spawn and other forms of marine life are killed by the intake of power station cooling water. Larger fish are trapped and killed on filter screens which are designed to prevent them passing through the cooling system, while larvae, eggs, spawn and smaller fish pass on through the system and the sudden heating of the water during this process kills them also (Dr P. Henderson Pisces Conservation). There is no reference to this in AoS table 6:2 Summary of Potential Significant Adverse Effects.

5. b The Blackwater is a relatively shallow and narrow estuary and this limits the availability of the huge amounts of cooling water required by a nuclear power station.
The old Bradwell power station of 242 MW required an average of 1.88 million tons of cooling water per day (British Energy). At frequent intervals the cooling system also had to be treated with chlorine to prevent a build up of marine growth, thus keeping it clear of obstructions.

5. c These actions are known to have had an adverse effect on the fish and oyster numbers in the estuary. For example, West Mersea oystermen know that the foreshore and sea bed on the Bradwell side of the estuary became completely sterile and barren, with the ground very bleached, for one and a half miles either side of the cooling water inlets and outlets. At the time British Energy denied responsibility for this. Native Oysters also disappeared from the northern shore of the Bradwell coastline. Six months after the closure of the power station in 2002 this coastline began to regenerate, with new growth appearing along with new oysters.

5. d During the operating life of the old power station the cultivation of native oysters could only be maintained by importing all seed oysters from elsewhere around the UK coast. Today by contrast, the oyster industry is healthy and sales are increasing, with none normally imported because stocks have been rising along with employment. Total weight of oyster sales from West Mersea are now approximately 250 tons per annum and increasing. 15 years ago, sales were approximately 100 tons per annum. This example appears to confirm that marine life suffered during the lifetime of the old power station.

5. e A new EPR power station of 1.65GW will require 6.22 million tons of cooling water per day, over three times the volume required by the old reactor. This volume represents ten percent of the total estuary volume of exchange water each tide. Temperature rises of up to 10C are forecast on the south shore in the vicinity of the power station, with a 1C to 2C increase elsewhere. This rise in temperature in the River Blackwater is likely to have a much greater impact on its ecosystem than previously. The larger cooling system will also have to be treated with more biocides to prevent fouling of pipe-work. These biocides, such as chlorine, sub-react in water to form more complex and potent biocides with increased half-life. Such biocides are likely to further affect the eco-system on a larger scale than

before. The increased volumes and velocity of water will also cause greater scouring of the sea-bed, resulting in much larger dead areas.

5. f It takes 10 days to totally refresh the water in the estuary, a very low refresh rate when compared to the open sea. This low refresh rate, together with one tenth of the estuary daily tidal volume passing through the reactor, means that the incidence of damage from cooling water circulation would be far greater than in the open sea, and far more significant than previously experienced.

5. g The commercial inshore fishing industry and the oyster industry are directly and indirectly important to the local economy. The eco-system of the estuary will be more seriously affected by this development which will in turn affect the local industries dependent upon it.

5. h **T**he oystermen and fishermen fear that if a new power station is built, then the larger temperature increase in the estuary might cause a significant increase in the breeding rate of the Pacific Oyster which would not only seriously endanger the relatively fragile Native Oyster, but also threaten other marine species and marine birds in the estuary by causing a fundamental change of the fertile mudflats around the estuary into rocky shores. These mudflats support life forms at the base of the existing food chain.

5. i West Mersea is the only remaining oyster fishery area in the UK which *cultivates* the Native Oyster. In other locations they are only dredged.

Mersea Native Oysters are also known as Colchester Native Oysters, and are a heritage industry with an international reputation.

The Native Oyster has been identified as a species in the UK which needs further protection. (Institute of Estuarine and Coastal Studies 14 May 2001, English Nature)

5. j The Blackwater also supports a unique endangered species called the Blackwater Herring which would be vulnerable to greater changes in the ecology of its habitat.

The consequences of the above serious issues do not feature prominently in the NPS, Habitats Regulations Assessment or Appraisal of Sustainability Report and it is implied that that risks can be mitigated (Table 6.2 AoS Report Bradwell).

5. k **Threats to the marine ecology and therefore the fishing and oyster cultivation industries in the Blackwater Estuary rule it out as a suitable site for new nuclear power stations.**

6. Environmental effect on wetlands and adjoining RAMSAR, SSSI and other designated areas

6. a The whole of the Blackwater estuary neighbouring the site, except for the pleasure beaches of Mersea Island, is designated SAC, and the all the intertidal mudflats, with the above exception, are designated SPA, RAMSAR and SSSI sites. A large proportion of the intertidal mudflats are also designated NNR. The proposed complex immediately adjoins these sites. Cooling water would be obtained from and returned to these areas.

6. b The industrialisation of this area of importance with reactors, radioactive waste stores, cooling towers and pylons will prejudice those designations. RAMSAR sites in England are protected as European sites, as set out in the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). The proposed site and adjoining RAMSAR wetlands are important habitats for birdlife which may be affected. These sites are an important example of natural or near-natural wetland type found within the bio-geographic region.

6. c BANNG notes that the Statement says is not possible 'to rule out adverse impacts on sites of European Nature Conservation Importance'.

BANNG does not believe that:-

'there is an imperative reason of overriding public interest that favours the inclusion of this site…..despite the inability to rule out adverse effects on European sites at this stage'.

6. d **On the contrary, BANNG considers this issue alone is enough to warrant the site being excluded from further consideration.**

7. Earthquake Risk with reference to the major earthquake of 1884

7. a A major earthquake occurred in the area in 1884, the "Colchester Earthquake" or "Great British Earthquake". The most severe reported in this country for over 400 years. Although this was centred south of Colchester near Mersea Island it also caused much structural damage in the Bradwell area. While assurances have been provided that the reactors themselves would be resistant to an earthquake, no assurance has been received about cooling systems, such as pipe-work on the sea-bed or cooling towers on which they are dependent, or facilities for storage of radioactive waste,

7. b It is unlikely the emergency services could successfully deal with the wide ranging consequences of an earthquake and a nuclear incident, especially if tidal problems were to coincide.

7. c **We maintain that the earthquake risk affects the site sufficiently for it to be classified as 'unsuitable' in the SSA (5.6.120)**

8. Effects on Communities

8. a The Statement says that 'a nuclear power station may also bring alternative economic benefits to a region which could have the potential to offset some disbenefits'(5.6.112).
BANNG utterly rejects the argument that 'the likely enhancement in employment, community wealth, housing stock and other associated neighbourhood infrastructure should improve community well-being and health generally'. These benefits may apply near Bradwell, but it is extremely unlikely they will apply elsewhere.

8. b The AoS Report (P59 Adverse effects on communities: Population, Employment and Viability) makes no mention of the potential adverse effects on communities relating to loss of employment in holidays, tourism, leisure, fishing, oyster cultivation and sailing related industries. The potential decline in property values and the possible difficulty attracting new industries to the area is also omitted.

8. c On the contrary, we consider the detriments to the tourist, fishing and leisure economy and the negative image created by a massive nuclear complex will far outweigh any increases in employment associated with a new plant.

9. The Consultation Process

9. a It is unfortunate that by responding to the various stages of the government consultation process, participants appear to legitimise it. The only hope for any redress is to describe the actual experience on the ground at each stage to show the inadequacy of the process on which the National Policy Statements are based.

9. b The process has been flawed at every stage. Most importantly, there has been no emphasis on the proposal to store highly radioactive spent fuel and intermediate wastes on site at Bradwell for around 160 years. This is a glaring omission that should render the consultation process invalid. When this issue was discussed at meetings, it was members of the public who raised it, not the representatives of British Energy or the Department for Energy and Climate Change.

The process at grassroots level has occurred in six stages as follows:

9. c British Energy (BE) Roadshow

During November, 2008, British Energy took a Roadshow to communities around the Blackwater estuary. The aim was to inform people about proposals for a new nuclear power station at Bradwell and to consult them on the proposals.
Attendance at these was low due to lack of awareness, inconvenient timing and the apparent requirement for pre-registration.

9. d The large towns of Colchester, Chelmsford and Clacton were not included although they have a legitimate interest in what happens at Bradwell.
Audiences at Tollesbury and West Mersea expressed a great deal both of hostility to the idea of a new power station and of scepticism at British Energy's claim that the chances of an accident were 'vanishingly small'. Other concerns included the storage of spent fuel well into the next century on such a vulnerable site; evacuating Mersea Island in the event of an accident; the deleterious effects on the Colchester Native Oyster industry and the marine ecology; health issues.
Those attending clearly did not trust the nuclear industry. Local communities had been promised that the old nuclear power station would be decommissioned and the site returned to greenfield within 25 years and now this has been revised to 100 years.

9. e Draft Strategic Siting Assessment (SSA) Criteria

The Blackwater Against New Nuclear Group (BANNG) made a substantial and well informed response to the SSA consultation. The response drew attention to many problems with the criteria, particularly demographics, flooding and coastal processes. Unfortunately, it seems that scant attention has been paid to this by the Government.

9. f Justification

The Blackwater Against New Nuclear Group (BANNG) made a substantial and well informed response to the Justification consultation and, along with several other groups, called for a Public Inquiry into whether new nuclear practices in the form of new power stations could be justified. Unfortunately, it seems that scant attention has been paid to this by the Government.

9. g 'Have Your Say'

The 'Have Your Say' consultation on the nominated sites lasted only one month.
BANNG made a substantial and well informed response to this, reminding government of its responses to the SSA and Justification consultations. Scant attention was paid to this.
The restrictive structure of the template, depth of knowledge required and the lack of time available is known to have been a major deterrent for many people.

9. h Department of Energy and Climate Change (DECC) – Exhibition and Public Meetings

'The Government wants to hear your views' was the claim for these events, but few members of the population knew about them, resulting in low attendances. There were 52 members of the public at the meeting in West Mersea and only 28 at Maldon. Residents at Bradwell have complained in the press that they were denied a consultation meeting even though they would be most affected.
A show of hands at the West Mersea meeting showed that only 3 people out of the 52 attending had received a DECC leaflet. DECC claim 11,000 of these were distributed door to door. The Mersea Island *Courier* 4 December, 2009 included an article by BANNG informing readers of the exhibition and public meetings and the Editor took it upon himself to publish a DECC leaflet. While petititioning outside the exhibition in Maldon on 11 December, the Secretary of BANNG discovered almost everyone she spoke to knew nothing about the event or the public meeting. She directed members of the public to the exhibition, otherwise there would have been very few attending.

9. i *Public Meeting at West Mersea 12.30 on Thursday10 December, 2009:*

Despite the inconvenient timing, there was a good turnout of Mersea Islanders keen to press home their objections to the proposed new power station.
Among the points made by those attending, were that a massive nuclear power station, and possibly up to three, would create a major industrial complex that would totally transform the landscape, ecology, economy and amenity of the Blackwater estuary. More than that, such a project imposed high risks and potential dangers threatening the security and safety of many thousands of people within a short distance of the power station. In the event of a major incident, it was doubted that emergency planning procedures would be able to cope with evacuation of the population.
The shallow Blackwater estuary could hardly cope with providing cooling water for one of these giants, let alone two or three, for which cooling towers would be necessary. The threat to fishing, oysters, the tourist trade and, indeed, the well-being of the Blackwater community would persist over many generations. Bradwell was among the most vulnerable sites and the idea of highly radioactive waste being safely managed 160 years hence was frankly incredible.
Questioners were not generally given an opportunity to query the response given to them with the result that few of their questions were satisfactorily answered.

9. j *Public Meeting at Maldon on 10.00 Saturday 12 December, 2009:*

Similar questions were raised and again virtually none were answered.
Several pointed out that without the approach from BANNG outside the previous day's exhibition they would not have known about the meeting. Once again this could hardly be described as a satisfactory consultation.

9. k Draft National Policy Statement EN-6

The statement presents a limited, superficial, biased and misleading view of evidence particularly in relation to the Bradwell site.
The brief period allowed for consultation on this National Policy Statement, the quantity of material needing to be read and understood, and the difficulty in obtaining the material, has made it once again extremely difficult for many people to participate. We are also concerned that most people will not have realised the importance of this NPS becoming accepted until it is too late to influence the decision.

9. l We urge the government to reject the Bradwell site in this NPS. However if it is decided to list the site we request the reasons for its acceptance are set out along with the reasons why the objections from us and others were rejected.

9. m The assertion that the ten listed sites are the only suitable locations in the whole country, and that they are all essential, and should therefore all be accepted, due to 'Imperative Reasons of Overriding Public Interest' appears to almost consign the whole consultation process to the waste bin.

9. n We hope that our submissions will help to prove this is untrue.

Annex A

10. Research into Health Risks from Bradwell and other Nuclear Installations

10.a There are two sides to the debate about nuclear installation health effects. The 'orthodox' approach rests, primarily, upon criteria of risk drawn from short term exposure to high levels of radioactive material: Hiroshima and Nagasaki atom bomb survivors, plus some experiments involving the sub-cutaneous placement of radioactive material and irradiation of non-human subjects. Statistical procedures are also applied, *post hoc*, to aggregate health data which often have the effect, intentionally or unintentionally, of smoothing out many apparent cancer clusters. [See: C. Busby, *Wolves of Water*., Green Audit, 2006, pp. 322-27] Moreover, where cancer clusters have been detected around nuclear installations, their significance has been discounted through the deployment of atom bomb based criteria of risk. [see, for instance, the discussion in pp. 24-6 of the 9th COMARE report, of 2004]

10.b Relatively low levels of radioactive material can have a cumulative effect that could be damaging to some of its recipients, particularly during their developmental years. With an emphasis upon water borne contaminants, particularly in muddy estuaries, the unorthodox side focuses upon clusters of cancers amongst populations of settlements immediately bordering the waters adjoining nuclear installations.

10.c The emergence of the debate between orthodox and unorthodox positions led, in 2001 to the formation of an internally adversarial body – the Committee Examining Radiation Risks of Internal Emitters (**CERRIE**) to supplement the work of the existing Committee on Medical Aspects of Radiation in the Environment (**COMARE).** CERRIE'S functioning between 2001 and 2004 proved to be highly acrimonious [Busby., pp. 406-28: and *Radioactive Times,* vol. 6, no. 1, May 2005] but did result in a final report that highlighted many areas of continuing uncertainty. CERRIE had also planned further research into nuclear health issues **around Bradwell**, but this was cancelled when the committee's work was suddenly subjected to an arbitrary deadline in summer of 2004. Whatever the intrinsic merits of this action, it remains a tactical and presentational miscalculation of major proportions for a government that was eventually to commit itself to a programme of new nuclear reactors.

10.d The consequences of CERRIE's premature termination were dramatic. A vitriolic exchange of articles and letters appeared in ***The Guardian*** newspaper in the autumn of 2004. [See: C. Busby, *Wolves of Water*., Green Audit, 2006, pp. 322-27]

10.e COMARE's 9th report in October 2004 was devoted to a detailed and well-balanced response to the CERRIE final report and identified numerous areas of continuing concern and need for further research. COMARE's subsequent 10th and 11th reports continued to highlight uncertainties and further research needs. However, they also continued to emphasise both disputed statistical techniques and criteria for radiation risk drawn from exposure to atomic bomb blasts, and to focus overwhelmingly on childhood cancers, rather than cancers subsequently contracted by adults living near nuclear installations.

10.f COMARE's approach to the identification of health risks from nuclear installations is highly cautious. This is quite understandable in the light of the irresponsible alarmism over the MMR inoculation. However, the anxieties of many who live close to nuclear installations have not been quelled by its work and general faith in orthodox scientific positions has not been encouraged by the example of the determined resistance to early suggestions of a link (by Richard Lacey, in particular) between BSE and its human equivalent. This general unease, moreover, comes against a background of growing distrust for government statements and official statistics as reported by the *Financial Times* [report of 30 December 2009– 'High Levels of scepticism over data revealed'] and widespread concern at the kinds of statistical operations – 'tricks' - of which staff at the climate change unit at the University of East Anglia have recently been accused.

10.g The controversy about the health effects of nuclear installations is likely to fester indefinitely unless new approaches to research are adopted. One avenue would be to undertake detailed, longitudinal studies of relatively discrete populations, such as Tollesbury in Essex, where cohorts can be identified and their development tracked with relative ease. The second, and even more powerful, possibility has just arisen with the announcement by **454 Life Sciences** of the successful **sequencing of cancerous tumors** [See the report by EmaxHealth: 'Breakthrough in DNA Sequencing for Cancer Research', http://www.emaxhealth.com/51/6413.html]. Such DNA sequencing could, eventually, provide concrete evidence about the genesis of individual tumor, thus highlighting the cause(s) of specific cancers and providing powerful ammunition for those victims who might wish to seek redress from past and future operators of nuclear installations, where low-level radioactive contamination can be proven to have been in any way culpable.

10.h The Energy and Climate Change Committee is uniquely placed to investigate further many of the continuing controversies over the health effects of the operation of UK nuclear reactors and their implications for new nuclear construction. **Key questions include**:

- Are the orthodox statistical techniques appropriate, particularly: the radial analysis of areas of potential effect, that otherwise ignore topographical features; and the adoption of 'Bayesian smoothing' to reduce the apparent incidence of cancer clusters. Moreover, are the criticisms directed against advocates of the unorthodox position fair, particularly the claim of 'Texan sharpshooter targeting' in the identification of cancer clusters? [see: Busby, pp. 322-27]
- Is the orthodox focus upon the effects of exposure to high level radioactive material valid, or should more attention be paid to longer-term exposure to lower level radioactive materials, particularly those that are water-borne?
- Is there not now a case for initiating longitudinal studies of relatively discrete communities to establish whether there have, or have not, been cancer clusters amongst their long-term residents? Earlier work by J.F. Bithell (whose work is relied upon by COMARE to counter the implications of the KiKK report) and colleagues, suggested the possible desirability of something along just such lines [J.F. Bithell, S.J. Dutton, G.J Draper, N.M. Neary 'Distribution of childhood leukaemias and non-Hodgkin's lymphomas near nuclear installations in England and Wales', **BMJ**, 20 August, 1994]. Also, might it now be timely to encourage the application of DNA sequencing to cancers developed in the vicinities of nuclear installations.?
- Why has the existence and work of CERRIE, and attendant controversies, been excluded from the 'health' sections of the NPS EN-6 and the accompanying sustainability assessment [Draft National Policy Statement for Nuclear Power Generation (EN-6), **London, Stationery Office**, November, 2009, e.g., pp. 77-9; and Appraisal of Sustainability: Site Report for Bradwell, Department for Energy and Climate Change, November 2009, pp. 23-6] and the German KiKK report only been paid scant attention in the Appraisal of Sustainability. [Bradwell Appraisal Report, p. 25 and for the details of the KiKK report See the summary in: http://teknorg.wordpress.com/2007/12/17/german-kikk-study-higher-cancer-risk-nex...]
- Why, moreover, has COMARE turned the focus of its major reports away from nuclear power stations' health effects since its last report on the issue – the 11th report of July 2006, save for *ad hoc* responses to external stimuli like the publication of the German KiKK report? Is the government's revival of the nuclear energy option significant in this respect?

10.i In exploring these questions, the **ECC committee might consider**:

- Interviewing members of CERRIE to investigate its functioning and findings, particularly its chairman Professor Dudley Goodhead, a key secretary, Dr. Ian Fairlie, , Dr. Chris Busby of Green Audit and Richard Bramhall of the Low Level Radiation Campaign.
- Interviewing one or more experts in statistical techniques to establish the appropriateness of the specific statistical techniques that have been employed in identifying levels of cancers (particularly childhood) in the work of COMARE and its contributors.
- Interviewing one or more of the authors of the German KiKK study to determine their view of the reworking of UK nuclear cancer clustering by Bithell, *et. al.*, [J.F. Bithell, T.J. Keegan, M.E. Kroll, M.F.G. Murphy and T.J. Vincent, Childhood leukaemia near British nuclear installations: methodological issues and recent results, *Radiation Protection Dosimetry,* 2008, 132(2)]
- Interviewing the head of the Health Protection Agency to establish his/her view of the current state of research on the health effects of radioactive materials and exposure.
- Recommending longitudinal studies of rates of cancer in discrete communities near nuclear reactors, like Tollesbury in Essex.
- Interviewing the head of the Welcome Trust to review the prospective contribution of DNA sequencing to the identification of specific causes of cancers commonly found in communities adjoining nuclear reactors.

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