

## Sizewell C Stage 3 Consultation Submission on behalf of the Waveney Green Party 29/03/2019

### **1)What are your views on EDF Energy's proposals to build a new nuclear power station, Sizewell C, and associated development**

The Green Party oppose plans to build new nuclear power plants in the UK. Nuclear power is an outdated technology that is unsuitable and dangerous for a world facing the unpredictable consequences of climate change.

In the stage 3 pre application document, EDF sets out the government legislation that was developed a decade ago in order to justify the need for nuclear power. At that time the government was hoping that a new nuclear renaissance would fill the looming energy gap forecast to hit as old nuclear power stations were shut down and coal phased out in order to enable the UK to meet its legally binding targets in reducing CO2 emissions.

It is now abundantly clear that with long lead times, nuclear power plants are not going to be built in time to fulfil our obligations to reduce CO2 by deadlines set under the Climate Change Act. In fact, because of the huge capital costs and construction time, nuclear power is a hindrance to us reaching those targets rather than a solution. As Steve Holliday, a former CEO of National Grid, said in 2015:

*"This industry is going through a tremendous transformation. We used to have a pretty good idea of what future needs would be. We would build assets that would last decades and that would be sure to cover those needs. That world has ended."*

#### **The Site is Unsuitable**

When the government established the Infrastructure Planning Commission in 2008 they wanted to create a sense of urgency around providing new power sources and the public were misled into believing that this must happen quickly to "prevent the lights going out". The time frame outlined in EN-6 was for nuclear power stations to be deployed by 2025. So the choice of suitable sites was not based on geography or practicality, but on speed. The National Policy Statement for Nuclear Power Generation (EN-6) is quite open about this. The Strategic Siting Assessment focused primarily on sites which could come on stream by 2025 in order hit the Government's target for CO2 reduction. The main criteria was to choose sites that could be pushed through quickly rather than sites which were suitable.

The premise of an urgent need resulted in sites being chosen on the basis of the fact that nuclear power stations were already established at those sites. Therefore in reality, Sizewell was chosen as a potential site despite its geography, not because of it. It was chosen because it was deemed suitable in the 1950's when the knowledge of coastal erosion, climate change and hydrology was very different to that of today, and the importance of preserving areas of rich and rare environment was not so well understood or appreciated.

The site is proving to be far too small to accommodate the various pieces of infrastructure. The land take has increased since stage 2 and EDF is having to push the boundaries and steal more land from the AONB and from surrounding woodlands, though they have not been forthcoming about exactly how much land will be taken for Sizewell C and all the associated land for the construction phase. EDF's proposals will not be finalised until the DCO submission, though it is already painfully obvious that the site is not suitable for the two reactors. Problems with ease of access and the rural undeveloped wet land surroundings, flooding, drought and coastal erosion are all factors which should rule it out.

It may well be that there are many more sites around the UK that are geographically better suited to host a power station that will not have been considered solely because the government wanted to ensure a quick and easy process and they thought that it would be easier to impose it on a

community which had already lived with nuclear power for decades than it would a community without an existing nuclear power station. It is evident that the 2025 deadline for new build is impossible to achieve and so consequently the basic premise of the assessment that designated potential sites only on the basis of speed and ease should be revisited.

### **EDF's Unnecessary Haste**

A recurring refrain that runs throughout the EDF stage 3 consultation document is that nothing must be allowed to delay the project. Many of the options that were touted during the first 2 stages have been discounted in this 3<sup>rd</sup> stage because they take longer to implement, but it is puzzling that a dead line was decided upon prior to extensive work to determine how long different options might take. It is as if EDF have decided on an arbitrary end date and are cutting corners as much as possible to have a power station up and running by that date, and it is very obvious that the overriding aim of EDF is to push for the options that are the quickest and cheapest ones to deliver regardless of whatever negative impact they have, rather than to actually work out how long it takes to build with due consideration for the environment and locality.

It is understandable given the dire overruns at their other sites that EDF find it difficult to assess how long it takes to build something, but it is unjust to allow them to pursue the cheapest and most convenient option if that results in design of lesser quality. The urgency with which EDF are pushing forward to clinch the deal to build Sizewell C despite the fact that many of the details are as yet unresolved suggests that they are in haste to get the deal signed off before the nuclear renaissance fades away.

### **The Disintegrating Energy Strategy**

The government's nuclear energy strategy has failed abysmally and the new nuclear program is in complete disarray. Costs for renewable energy are rapidly falling and storage technology is improving, making nuclear power appear outdated and expensive in contrast. The demise of the Wylfa, Oldbury and Moorside nuclear power projects despite generous financial incentives offered by the government are proof of this as Greg Clark, Secretary of State for Business, Energy and Industrial Strategy acknowledged in January 2019:

*"In many ways, the challenge of financing new nuclear is one of falling costs and greater abundance of alternative technologies, which means that nuclear is being out-competed. Far from there being a difficulty with future supply, those are the reasons why the competitiveness of nuclear is more difficult."*<sup>2</sup>

In 2017 During an inquiry into Hinkley Point C conducted by the Public Accounts Committee Caroline Flint raised this point and asked why the strategy for nuclear was not being revisited, given that so much had changed:

*"We have covered quite substantially today how much things have changed. There are other players in the field now, there are small modular reactors, and you mentioned advances in storage and other matters, which may mean that some of the problems with the intermittency of renewables are not as bad as they were 10 years ago. Why can't we say, without fear of favour, that we now need to take stock of where we are and look at what is going to be provided under Hinkley and at what a new generation of technology, whether it is in nuclear or in other areas, can afford us? Why can't we have another discussion about that?"*<sup>3</sup>

Throughout the stage 3 consultation document there is a sense that everything must be done urgently and without delay in order to stick to the diktats of EN-1 and EN-6 and have new nuclear power to keep the lights on. However the Public Accounts Committee recognised that a delay at Hinkley could lead to a deficit in energy generation and so they brought in a recommendation for a 'Plan B' to cover any eventuality arising from a delay. Their report states:

*"The Department should ensure it publishes its 'Plan B' for achieving energy security, while at the same time delivering on its decarbonisation and affordability ambitions, before the end of this year and should review and revise it every year in light of the latest progress at Hinkley Point C."*<sup>4</sup>

The report describes how a delay would be managed :

*“In the event that there was a delay, we would be confident that we could take any necessary actions using what we call a capacity market auction, which enables us to buy electricity to ensure that we have the electricity we need both one year ahead and four years ahead.”*

In January 2019 Greg Clark confirmed that the growth in renewable energy has made the prospects of the lights going out for want of nuclear power highly unlikely:

*“Mr. Speaker, the economics of the energy market have changed significantly in recent years. The cost of renewable technologies such as offshore wind has fallen dramatically, to the point where they now require very little public subsidy and will soon require none. We have also seen a strengthening in the pipeline of projects coming forward, meaning that renewable energy may now not just be cheap, but also readily available.*

*As a result of these developments over the last eight years we have a well-supplied electricity market. Our electricity margin forecast is currently over 11% for this winter – having grown for each of the last five years.”<sup>5</sup>*

In 2015 the government set up The UK National Infrastructure Commission (NIC) with a remit of providing expert advice on the pressing infrastructure challenges facing the United Kingdom. One of its main tasks is to undertake a National Infrastructure Assessment during each Parliament, make recommendations to the government and then monitor the government's response. In July 2018 the NIC published The first National Infrastructure Assessment which set out the Commission's plan of action for the country's infrastructure over the next 10-30 years. The government has committed to respond to the Commission's recommendations within 1 year of the publication of the assessment, (so by July 2019), and to adopt agreed recommendations as government policy.

With regard to energy infrastructure, the Commission estimates that an electricity system powered mainly by renewable would cost no more than relying on new nuclear power plants

*“The Commission's modelling has shown that delivering a low carbon electricity system for 2050 powered mainly by renewables is a low cost option, cost comparable to building further nuclear power plants after Hinkley Point C.”<sup>6</sup>*

*“...the broad conclusion of the analysis implies that an electricity system with no further nuclear plants after Hinkley Point C is likely to be cost comparable with a system which accommodates a new fleet of nuclear reactors.”<sup>7</sup>*

It is uncertain at this point exactly how the direction of the energy policies laid out in EN-1 and EN-6 are going to be reconciled with the NIC's recommendations, because the 2 sets of policy guidelines are pulling in opposite directions.

### **Nuclear Power is Required for Nuclear Weapons**

The NIC does not rule out commissioning one more nuclear power station after Hinkley Point C, even though It suggests that renewables would be comparable in cost terms, because it recognises that a workforce with nuclear industry expertise would be advantageous for replenishing the UK nuclear weapons system. The fact that a major inducement to build Sizewell C is to develop a skilled workforce to maintain a UK nuclear deterrent has always been downplayed by the nuclear industry and government, but it was made explicitly clear in research carried out by Prof Andy Stirling and Dr Phil Johnstone at the University of Sussex Science Policy Research Unit. In evidence submitted to the 2017 Public Accounts Committee inquiry on Hinkley Point C, they identified that the need to maintain submarine nuclear capabilities in the military sector has played an influential role in the UK's decisions to champion nuclear power:

*“The issues arise in the problem that growing recognition of the seriously unfavourable costs of HPC [Hinkley Point C] when compared with other low carbon energy, appears to be having little effect on the intensity of UK Government commitments to nuclear power. We outline evidence that*

*the persistence of these nuclear attachments, despite adverse economics, is partly due to a perceived need to subsidise the costs of operating and renewing the UK nuclear-propelled submarine fleet.*

*This military nuclear infrastructure shares with civil nuclear power a necessity to maintain a large-scale national base of nuclear-specific skills, research, training, design, engineering, industrial and regulatory capabilities. Without large revenue flows to this highly-specialised joint industrial base from civil nuclear supply chains ultimately funded by electricity consumers, we document clear concern in defence policy debates, that the costs of UK nuclear submarine capabilities could be insupportable.”<sup>8</sup>*

This evidence was discussed by the committee who confirmed that it was true:

*“We have at some point to renew the warheads, so there is very definitely an opportunity here for the nation to grasp in terms of building up its nuclear skills. I do not think that that is going to happen by accident; it is going to require concerted Government action to make it happen.”<sup>9</sup>*

Renewing the UK nuclear deterrent runs counter to its commitments under the nuclear non proliferation treaty, which state that we have an obligation to get rid of our nuclear weapons. The building of Sizewell C will facilitate our continued flouting of international law and encourage other nuclear armed nations to do the same.

In light of the NIC assessment that a whole fleet of nuclear power stations are unnecessary and that only one might be considered, government should look again at the potential sites and reassess which one may be most suitable. Especially as EDF and CGN are planning to build at both Sizewell and Bradwell and this does not comply with the long term infrastructure plan.

### **EDF’s Precarious Finances**

One of the risks inherent in the Sizewell C project is the financial instability of EDF because nuclear costs have continued to rise even when they are building reactors of a similar design.

According to the Financial Times Journalist Neil Collins, the “grim truth is that these huge projects are a financial dead end.” He describes the Hinkley Point C project as promising “to be an epic financial disaster”<sup>10</sup>

And the Sunday Telegraph in January 2019 suggested that “Cash-strapped French utility EDF is weighing a range of options to distance itself from the British energy market.”<sup>11</sup>

Given that this is the case, the question should be addressed as to what would happen to the plans for Sizewell C if the project is begun but not finished. Who would be liable for the costs of restoring the landscape and dismantling whatever infrastructure had begun? It is important that this possibility is included in the DCO in some detail, because there are plenty of examples of partially constructed and even completed nuclear power stations that have been abandoned before generating any electricity. Indeed, when Theresa May put the Hinkley Point C project on hold to review the financial arrangements in 2016, there were some commentators who suggested this pause was to enable her to look for a loophole that would allow the government to back out of the project due to the growing chorus of voices that were critical of the very high price and very poor deal that the project offered for British consumers and tax payers.

### **The Local Population Will Not Benefit From a Cheaper Power Station**

The government is committed to paying a fixed strike price for the energy produced at Hinkley and a similar deal involving a fixed strike price will likely be made for Sizewell C. This means that if EDF can cut costs and build the station for a lower price, the extra savings go to EDF. If costs are lower than forecast, it will be of no benefit to the public who will be paying the same price regardless.

In the stage 2 consultation document, numerous references were made to the notion of ‘cost effectiveness’. For example, EDF would only use rail and sea transportation if they prove to be “cost effective”. If not, roads will be clogged up with more HGV’s. But for local people, there is no

benefit for anything to be determined on grounds that it is “cost effective”, particularly if by saving costs, an increase in traffic, pollution or or environmental degradation results. An explanation was asked for (but not given) as to which criteria were used to calculate whether something is cost effective. For example, How is cost effectiveness balanced against damage to the environment? What is the basis of that calculation done to prove or disprove cost effectiveness?

This has not been addressed in the stage 3 document either, and when the question was asked during one of the stage 3 exhibitions it was considered an interesting question, though still not one that could be provided any kind of answer. Examples of this from the consultation document are as follows:

*7.4.26 ..“an overhead connection is a significantly more reliable and cost effective proposal that would ultimately deliver better value to customers.”*

*15.1.2. ..“We have sought opportunities to limit the traffic and traffic-related effects of moving freight using non- road based transport where feasible and cost effective”*

The notion of “better value for customers” is impossible to assess- if EDF save money, there is no obligation to pass savings on to customers rather than take it as profit. However the overhead cables and extra traffic will be hard to miss.

A similar phrase that litters the consultation document is “reasonably practical” or “reasonably practicable”. Whilst the concept of "reasonably practicable" is an established practice in risk assessment, the criteria to determine what constituted reasonably practicable was asked for during stage 3 but was not forthcoming. So for example no information is available to judge how EDF determine the following;

*“1.1.4. EDF Energy will ensure that the power station is designed and delivered in such a way as to limit any adverse effects on the environment and on local communities as far as is reasonably practical.”*

or

*“Any significant adverse impacts of the construction, operation or decommissioning of the power station shall be mitigated where practical and appropriate”*

It is important to be able to hold EDF to established criteria in these instances so it needs to be made explicitly clear what these vague pledges actually mean on a practical level. How is it going to be ascertained whether or not mitigation is appropriate? Who decides? EDF have not proved themselves to be reliable or trust worthy, so we cannot be expected to accept their assurances that they will hold the interests of the local population and environment at the centre of their plans. It is already known, for example, that the UK nuclear regulator has raised concerns with EDF Energy over management failings that could affect safety at the Hinkley Point C power station. (Reported in March 2018)<sup>12</sup>

### **The Accommodation**

The strategy for the campus illustrates the folly of trying to squeeze an industrial complex into a remote rural setting. The accommodation campus is to be built on a green field site and then torn down once Sizewell C is completed. This is such a complete waste the materials and embodied carbon. This is being done because to house the workers elsewhere means more traffic on rural roads that cannot cope with the volume. The accommodation strategy will leave no legacy housing for the people of Leiston which is a shame. It would have been better if smaller permanent units that could have been utilised or sold of afterwards as social or low cost housing had been planned , or if the accommodation could have been nearer to Ipswich or Lowestoft with transport being laid on for workers at appropriate times. The original plan for the accommodation campus touted the idea that the campus would host social and recreational facilities and entertainment onsite in order to keep the workers on the campus to stop them dominating the pubs and social spaces in the nearby towns and villages, as happened during the Sizewell B build. There is no

mention of where the 400-600 caravan dwellers will find their entertainment, or whether similar facilities will be provided for them.

### **Fresh Water**

The construction and operation of Sizewell C requires 2000,000 litres (2 ml)/day) of fresh potable water. This would be necessary throughout the operational lifetime of the plant and beyond, as this water is also needed to maintain the cooling ponds.

During stages 1 and 2 of the consultation this was raised as an issue by several respondents including Leiston town council. However EDF omitted any mention of potable water in the consultation documents, and there is again no mention of it in the stage 3 documentation.

In order to accurately forecast what infrastructure will be needed in the future, the National Infrastructure Committee made careful assessments of our available natural resources and calculated the impact of factors like climate change and population on those resources. With regard to water, the NIC suggests that within the next few years we are going to run short of fresh potable water in the UK as a whole and in East Anglia, the most arid region of the UK, in particular. With regard to England and Wales, it states that maintaining the current levels of resilience to 2050:

*“would require additional capacity of about 2,700-3,000 million litres per day (Ml/day) An additional shortage of between 600 and 800 Ml/day would result from a severe drought (0.5% annual probability), and between 800 and 1,000 Ml/day in an extreme drought (0.2% annual probability).”<sup>13</sup>*

Given that the water supply is so crucial, a variety of other studies, plans and projections have been undertaken. The Water Resources Long Term Planning Framework Water UK 2015-2065 published in 2016 took an overarching view of the water resource management plans of the different water companies in the UK. With regard to East Anglia it recognises that there will not be enough water in this region within the next few decades and the solution that has commonly been put forward is the strategic transfer and storage of water from the River Trent. The framework cautions that:

*“There are a number of significant potential costs and constraints that would be involved in transferring, treating and storing water from the Trent that mean it is not currently possible to identify the most appropriate approach for doing this”<sup>14</sup>*

This concern over maintaining the water supply is echoed in the Climate Change Risk Assessment (CCRA) which the UK government is obliged to update every 5 years. CCRA2 was published in 2017 and it suggests that risk of shortages in the public water supply, and for agriculture, energy generation and industry is the 3rd highest risk we face. (Flooding is the first)

The following is from the CCRA2: Updated projections for water availability for the UK Final Report:

*“Summary Overview: The high level results indicate that in the present day, assuming that current EFl (Environmental Flow Indicators) thresholds according to existing regulatory approaches are met; levels of abstraction demand already exceed the available water resource in some catchments. This is particularly the case in the south and east of England”<sup>15</sup>*

*“Under the upper bound scenario (high population growth and a high climate change impact) for the 2050s, without any additional adaptation, there is a widespread pattern of large deficits in the provision of public water supplies. In particular, large deficits are projected in the south-east of England”*

This rather bleak scenario is echoed by the Environment agency. According to the East Suffolk abstraction licensing strategy 2017:

*“The confined chalk groundwater in the East Suffolk area is fully committed and no further consumptive abstraction can be considered.”<sup>16</sup>*

It is evident that maintaining an adequate water supply in East Anglia, even with moderate climate change and population growth factored in, is going to be a difficult task, and one that may be physically and practically impossible to do.

Like all water companies, Essex and Suffolk Water (ES Water) are obliged to draw up a periodic water Resource Management Plan outlining their resources and infrastructure plans. The Essex and Suffolk water Draft Water Resource Management Plan published in March 2018 acknowledges that there is little scope for more water abstraction from this area:

*“The Essex and Suffolk supply areas are located within some of the driest areas of the country and as such face particular challenges including growing demand, uncertainty from climate change and a general lack of new intrinsic water resources.”<sup>17</sup>*

ES Water also acknowledged that in order to maintain the environmental standards set out in legislation, they may be required to actually reduce the amount of water they were allowed to abstract

*“Operating in the driest part of the country, with increasing demands on current supplies of fresh water and the potential for sustainability reductions being applied to the Company’s abstraction licences, ESW recognises that “new” water for potable supplies will be difficult to come by.”<sup>18</sup>*

It is clear that if new water sources are necessary these will be expensive and create a large carbon footprint:

*“For some East Anglian region water companies, supply - demand deficits by 2060 will become more widespread, .. Since there are no resources available for year - round direct abstraction, options for developing these will be limited to winter storage reservoirs, water reuse schemes and aquifer storage and recovery. All of these have high CAPEX, OPEX and carbon requirements.”*

However, at that point ES Water were confident that they had no need to seek new water sources and that they had sufficient surplus to supply Sizewell C

*“Distribution Input forecast includes the potential demand of ~2Ml/d from the proposed development... Suffolk Blyth WRZ baseline supply demand balance with proposed development This shows that a supply surplus is still maintained across the full 40 year statutory planning period.”<sup>19</sup>*

In September 2018 ES Water published the Draft Water Resources Management Plan Statement of Response which contained feedback from consultees on the DWMP.

EDF was one of the consultees and their response clearly states how much water would be required by Sizewell C as well as the proposed new nuclear power station Bradwell B station in Essex that EDF /CGN also plan to build. They wished to have both projects specifically included in the WRMP in order to be able to include the water source in the stage 3 consultation:

*“EDF/CGN is proposing to construct and operate new nuclear power stations to be known as Bradwell B in the Essex WRZ and Sizewell C in the Suffolk Blyth WRZ within the 2020 – 2060 planning period. The developments will each require an estimated 2Ml/d supply of water. EDF/CGN request that the demand for Bradwell B and Sizewell C power stations be specifically identified within the WRMP. The inclusion will provide greater accuracy and assist at future stage when EDF/CGN undertakes further public consultation prior to submission of Development Consent Order applications to National Infrastructure Planning.”<sup>20</sup>*

So up until quite recently EDF believed that the water would be supplied from existing sources by ES water. Unfortunately for both companies, the Environment Agency (EA) disagreed with ES

Water because the abstraction needed for Sizewell C would breach environmental standards set by the Water Framework Directive. It is interesting to note that in their response ES Water acknowledge the recommendation by the NIC that only one new nuclear power station be built.

ES Water Response to EDF's feedback in the Draft WRMP:

*"EDF and ESW met on 14 May 2018 and again on 15 June 2018 with the Environment Agency to discuss Sizewell C water supply and demand. The EA has highlighted that including the 2 Ml/d of additional demand from Sizewell C in our final plan distribution input forecast would mean that there would be a sustained increase in overall abstraction. As the aquifers from which we abstract in the Blyth WRZ are not meeting the Water Framework Directive "good" status, we then would not be able to demonstrate compliance with the Water Framework Directive "No deterioration" test.*

*The EA has asked that we illustrate, through an additional supply demand balance scenario graph, the effect of the additional Sizewell C demand but with the supply line (known as Water Available for Use or WAFU) being based on recent actual abstraction (i.e. the maximum annual abstraction between 2005 and 2015). We have completed this work which shows (Section 11.3.2) that capping abstraction licence annual licensed quantities at recent actual levels causes a supply deficit and the need for a new supply scheme. Our view continues to be that there remains significant uncertainty regarding the start date and as such it would be wrong to include it in our final plan now. Our view is supported by the National Infrastructure Commission's (NIC) recommendation to Government that there should only be one more nuclear power station constructed in the country... As the EA has said that for the purposes of the WFD no deterioration test we would have to cap our abstraction licences at recent actual volumes, we would not comply with the no deterioration test. Consequently, we would have to develop a new supply and or demand scheme albeit that the cost of this will have to be funded by EDF. We have communicated our position to EDF."<sup>21</sup>*

EDF have an obligation to demonstrate where they will get the water supply from and an obligation to prove that it is sustainable and will not impact on the environment or water supply for other users. To date they have completely failed to do this and have instead attempted to brush the issue aside and fob people off who have asked about it instead of admitting this problem in an honest and open way during the consultation.

The 2000,000 litres per day for Sizewell C would be in addition to the 800,000 per day that is already taken for Sizewell B which is obviously a huge commitment of our precious water resources. There have been instances in the past in times of drought when Leiston residents have complained about the quality of their water because of course regardless of drought conditions or water shortages it is of primary importance to maintain the supply to Sizewell B in order to keep the fuel in the cooling ponds safe.

In Cumbria campaigners have claimed that the supply of good quality water from Ennerdale Water and Wastewater is taken by the Nuclear Decommissioning Authority for Sellafield's cooling and processing, whilst the water supply for 6000 local people is mixed with poor quality borehole water that is, according to the locals, making people ill.<sup>22</sup>

E S Water deny that if they were to supply the water to Sizewell C that there would be any impact on the water quality for the population. We can only hope that they are right, though trust in water companies is not high.

An article in the spectator in 2017 pointed out that privatised water companies "*promised to bring efficiency. Instead they have brought unsustainable levels of debt that, one way or another, the public will have to redeem. Researchers at Greenwich University say that in the past decade, the nine companies have made £18.8 billion of post-tax profits. Far from using the money to make the water system better, they have paid out £18.1 billion in dividends, and financed investment through loading £42 billion of debt on to consumers.*"<sup>23</sup>

It is essential that plans by ES Water and EDF are made available to the public and rigorously scrutinised before the DCO is considered.

### **Flooding and Systemic Risk**

According to the Climate Change Risk Assessment 2017 (CCRA2), Flooding is the most significant climate change risk to UK infrastructure, affecting all sectors. There is the potential for lengthy disruption and high costs of repair. Significant assets are already situated in locations that, without further protection, are exposed to river or coastal, groundwater and surface water flooding. These include power stations (41%, 6% and 18% of all power stations in England are at risk of river and coastal flooding, surface water, and groundwater flooding respectively), proportions of railway track (17, 9 and 17%) and railway stations (14, 3 and 16%), A-roads and motorways (9, 6 and 9%) and clean and waste water treatment sites (33, 12 and 24%). Flood risk from all sources is projected to increase across the UK, and even the most ambitious adaptation plans by national and local authorities will be unable to prevent flood risk rising in some parts of the country. Scenarios involving 4°C of global warming by the 2080s suggest large increases in expected flood damage in every UK nation and under all adaptation scenarios.

This 4°C of warming would lead, for example, to the 2,400 km of the UK rail network presently vulnerable to flooding rising by 120% by the 2080s. More intense rainfall under climate change will also increase sewer flooding and combined sewer overflow (CSO) events. Rising sea levels of 0.5–1m by the end of the century will increase the proportion of assets vulnerable to coastal flooding. The need to realign coastal defences in some areas in response to rising sea levels will have implications for infrastructure assets in the coastal zone, increasing their annual cost of maintenance by 150–400%.

It is a well known fact that the Sizewell site and surrounding area is at risk from flooding. It would appear that at each stage of the consultation EDF have increased the height of the flood defences to take account of this, but whilst the extent of possible flooding is being acknowledged in the plans, there seems very little consideration of systemic risk. If it becomes necessary to extend the flood defences beyond the currently proposed height, we will be in a situation where swathes of the UK elsewhere would also be either flooded or engaged in a huge operation to build flood defences. As noted above, not only power stations but rail, road and water systems would be compromised. The Sizewell engineers understand that climate change could bring sea level rises and surges that necessitate such adaptations however the planners appear oblivious that this level of flooding would impede reinforcing flood defences, if only because resources, materials, engineers and everything else necessary would be otherwise engaged elsewhere, probably attempting to prevent London being totally inundated with water.

With this in mind, and given the recent history of large infrastructure projects – Flamanville (8 years behind schedule and over budget) Hinkley (2 years behind schedule and over budget) HS2 (3 years behind schedule and over budget) it is fanciful to believe that reinforcing and raising flood defences at Sizewell in the event of major flooding, while simultaneously doing so for the miles of coastline elsewhere that would be affected would be a smooth running task.

There are several infrastructure projects currently being planned for the Suffolk coast as it is transformed into an energy hub; the East Anglia1(North) and East Anglia2 Scottish Power offshore wind farms, A National Grid substation and Sizewell C. It has been suggested that even now there is a lack of coordination between these projects and they are being taken forward with little consideration of the effects of the cumulative impact on the population and environment. Even the timing of the various public consultations has been set without regard to each other. For example the Scottish Power Renewables Phase 4 Consultation on the proposed East Anglia ONE North offshore wind farm project ran in parallel with this Sizewell C consultation which also clashed with a Sizewell B consultation. It is not surprising that the same members of the public were often keen to respond to all 3 consultations and it was a big a task to find enough spare time to respond to each of them fully, in addition to it being difficult to envisage how the collective effects of the construction for the different projects would impact the landscape and people. It would appear that even under circumstances where we are not dealing with the flooding and environmental breakdown that is

forecast to come, it is impossible to have an overarching coherent strategy for the development of the separate facets of infrastructure.

A report published in February 2019 by the the Institute for Public Policy Research entitled 'This Is A Crisis- Facing Up To The Age Of Environmental Breakdown' outlines just how little heed is being paid to the ferocious impact climate change will have on our ability to carry on as normal in the future:

*"Mainstream political and policy debates have failed to recognise that human impacts on the environment have reached a critical stage, potentially eroding the conditions upon which socio-economic stability is possible. Human-induced environmental change is occurring at an unprecedented scale and pace and the window of opportunity to avoid catastrophic outcomes in societies around the world is rapidly closing. These outcomes include economic instability, large-scale involuntary migration, conflict, famine and the potential collapse of social and economic systems. The historical disregard of environmental considerations in most areas of policy has been a catastrophic mistake.*

*Overall, environmental breakdown will act as a 'threat multiplier', increasing the risks and amplifying the impact of social and economic disruption . Key examples include increases in migration and conflict, with far- ranging consequences for social and political stability. The complex and dynamic interplay of local impacts, systemic consequences and interactions with wider socio-economic forces is creating a new 'domain of risk' unlike anything in recent history."<sup>24</sup>*

Under these circumstances it is foolish to pursue building a power station that includes crucial safety systems that rely on a guaranteed fresh water supply and uninterrupted electrical systems for the next 60 years or more.

### **Sizewell Nuclear Fuel Dump**

If Sizewell C is built, the site will hold over 100 times the amount of radioactivity released by Chernobyl. EDF have attempted to downplay the longevity of what will in effect be a massive nuclear fuel dump by describing the waste storage as 'interim', even though it is set to remain at Sizewell for at least the next 110 years. The current plan is that the waste is to be stored on site in dry storage casks until a Geological Disposal Facility (GDF) is built. Though there is no certainty that this will ever be constructed, as no host community or suitable geographical location can be found for it.

During one of the public exhibitions an EDF consultant told a member of the public that the problem of nuclear waste has been solved- because it is going to be put in the GDF. When CoRWM (Committee of Radioactive Waste Management ) settled on the GDF as the best solution for managing the legacy waste it was with the caveat that the approval of a GDF as a method of dealing with the legacy waste should not be seen as an indication that CoRWM approved of nuclear new build They were quite explicit about this:

*"It must be emphasised that CoRWM's recommendations are directed to existing and committed waste arisings. CoRWM believes that its recommendations should not be seen as either a red or green light for nuclear new build. The main concern in the present context is that the proposals might be seized upon as providing a green light for new build. That is far from the case. ... the political and ethical issues raised by the creation of more wastes are quite different from those relating to committed - and therefore, unavoidable - wastes."<sup>25</sup>*

*"On the question of new build, a clear ethical distinction can be made between dealing with existing and unavoidable wastes and the creation of new wastes. CoRWM members are unanimous in their view that the results of CoRWM's PSE programme cannot be taken to provide an endorsement that its recommendations should also apply to wastes from new builders"<sup>26</sup>*

The ethical considerations over whether it is morally right to create avoidable waste for future generations to deal with, particularly as we know that they will be facing a harsher climate with

more extreme weather events and fewer natural resources, is one that EDF has not concerned itself with.

The fuel that EDF propose to use in the reactor is high burn up fuel, so called because it has a burn up of over 45 GWd/MTU (gigawatt-days per metric ton of uranium). The burnup level affects the fuel's temperature, radioactivity and physical make up, and the dry storage of High burnup fuel is a recent procedure, having only begun in 2012 . Hinkley will be the first place where it is used in the UK. It is uncertain how the casks that are used to store it will fare with the different mechanical properties of high burnup fuel and they have only been licensed initially for 20 years . The reason why originally the proposed method for storing spent fuel at both Hinkley and Sizewell was to keep it in fuel ponds was precisely because the dry storage of this fuel is experimental.

The standard lower burnup waste from existing nuclear power stations in the USA has been accumulating for several decades. The casks that are used to store this waste in are theoretically designed to hold the waste safely for 100 years, but unfortunately there are signs that the metal casings in some are corroding after less than 30 years, so even with the lower burn up fuel, there is no guarantee that the storage casks are going to last for the design duration. If the casks fail or develop cracks a difficulty then arises in how to repackage them . Problems like this are as yet to be resolved.

There are several different designs of casks, and though there is little information about the casks used in the UK at Sizewell B, it seems that they are based on the HI-STORM MIC cask manufactured by USA company Holtec. It would appear that an extra layer of cladding has been added to the design at Sizewell which is just as well because Holtecs standard design for thin walled cannisters has been criticised in the USA:

*"None of the current U.S. thin-wall steel storage canisters are adequately designed for over 20 year storage and may start failing in as little as 17 to 20 years with through-wall cracks. Vendor claims of longer storage times are not supported by data. There is no ageing management designed into these thin canisters. They cannot be inspected for cracks or repaired once loaded with spent nuclear fuel waste. The NRC [Nuclear Regulatory Commission] lowers safety standards so the utilities can continue using them rather than requiring more robust containers."*<sup>27</sup>

It is claimed that The size of the dry fuel store will be sufficient to accommodate all of the waste from Sizewell C however it is usual for the licences of nuclear power plants to be extended beyond the initial planned time frame, often by up to 20 years. There is no indication that the fuel store would be capable of storing the fuel for any extension to the working life of the reactor.

### **Affects on The Environment**

The tourist industry in Leiston and Sizewell is going to be very badly effected over the many years of construction. People come to Suffolk for the peace, tranquillity and natural beauty of the countryside, and the construction of Sizewell C will have a massive impact on the coast and environs. This is acknowledged by the RSPB who run the world famous Minsmere nature reserve. The home page of the Minsmere website states that Sizewell C:

*"could be catastrophic for wildlife. The building work may increase erosion, upsetting the delicate balance of the reserve. It could affect the water levels in Minsmere's ditches, impacting its rare wetland wildlife, which includes bitterns, otters and ducks. Once the construction is in progress, it may increase levels of noise and light pollution. Rare marsh harriers, breeding ducks and geese and wading birds are very sensitive to this. The effects will be long-term."*<sup>28</sup>

The destruction of huge swathes of natural habitat rich in wildlife to make way for Sizewell C is being planned when it is simultaneously becoming clear that populations of all varieties of insects are in rapid decline. In February 2019 A study called The global review stated that the world was witnessing the "largest extinction event on Earth" for millions of years. Which threatens a "catastrophic collapse of nature's ecosystems",

More than 40% of insect species are declining and a third are endangered, the analysis found. The rate of extinction is eight times faster than that of mammals, birds and reptiles. The total mass of

insects is falling by a precipitous 2.5% a year, according to the best data available, suggesting they could vanish within a century.<sup>29</sup>

Head of conservation at the Suffolk Wildlife Trust, Ben McFarland acknowledged that the use of pesticides is one major factor for the crash, but he stated that *“This has been compounded by road building and development, which has caused a fragmentation of habitat.”*

It is becoming evermore clear that we need to pay attention to , and value the natural environment. The attitude that allows the devastation that will be brought by Sizewell C to continue is short sighted and ignorant because if we lose the insect population it will have huge ramifications for food production.

### **Jobs and Training**

EDF have made a great deal of noise about the training opportunities that Sizewell C will bring, however the language used around these training opportunities is vague, for example it is unclear how many apprentices EDF intend to employ and train directly. During one of the consultation meetings a Sizewell representative suggested it would be a ‘suitable proportion’. EDF have said that they intend to encourage the supply chain partners to take on apprentices, however they would have little direct control over the numbers. It appears that the apprenticeships that EDF intend to offer to students from East Anglia will require them to go to study at either the University of the West of England or the University of Exeter and gain work experience at Hinkley Point C. before returning to Sizewell as Hinkley Point C demobilises. It is unclear whether EDF intend to offer local apprenticeships on an ongoing basis throughout the construction of Sizewell C which would enable young people to study and work in this area without having to go to the west of England to train first.

It is consistently claimed that Sizewell C will provide 25,000 job opportunities. However the duration of many of these job opportunities may be only a few months. It is envisaged that once an employee is on site they may move from one role to another, because completing the safety checks required to enable an employee to operate at the site can be time consuming and expensive therefore once they have been carried out EDF will be keen to keep the certified employee on site .

Though it is often repeated that there will be 25000 job roles, there is no guarantee of how many of these jobs will go to local people. It was stated in the Committee of Public Accounts report on

Hinkley Point C in 2017 that:

*..”the Department does not know to what extent UK workers and companies will benefit from Hinkley Point C and the wider follow-on new nuclear programme, and has no plan in place to show how it will maximise the wider benefits of the project.”<sup>30</sup>*

*“Government credibility in this area will inevitably be questioned when – by its own admission – it doesn’t know what UK workers and business will gain from this project, and appears to have no coherent idea of what to do about it.”<sup>31</sup>*

Whilst there are aims and aspirations to employ local people, EDF will not employ many people directly so it will ultimately be up to the contractors to decide who to employ. It is extremely likely that experienced workers who have been on site at Hinkley and other EDF new build sites in France and Finland will be encouraged to come over to Sizewell.

This is exactly what happened in Finland during the construction of the Olkiluoto nuclear reactor. According to Kyösti Suokas, co-chairman of the Finnish Construction Union who said;

*“Olkiluoto has been a complete disappointment for us. There have been fewer than 100 Finnish builders there. It is the view of our experts that huge amounts of cheap labour have been brought here from abroad to work inefficiently”<sup>32</sup>*

Many of the severe delays at Olkiluoto and Flamanville arose because of the shortage of qualified experienced nuclear plant equipment manufacturers, so it is inconceivable that EDF would begin afresh with local suppliers rather than using people who have gained experience through supplying components for the new build currently under way.

in 2018 Colin Matthews, non-executive chairman of EDF, made it clear that EDF intends to transfer the Hinkley Point C supply chain to its next nuclear new build in order to reduce construction costs by 20%. He suggested that supply chains were “starved” by a lack of work after construction of the last new nuclear facility – Sizewell B, and said:

*“What if this time was different and, having built Hinkley Point C, we were to reuse and to develop that supply chain’s skills further? What if we were to transfer all of the experience from Hinkley Point C into the new construction?... We believe if we do that, we can reduce the cost of engineering and construction by 20%.”<sup>33</sup>*

This sentiment was reiterated in the EDF written evidence to the public Accounts Committee on Hinkley point C:

*“We are confident the cost of future nuclear projects at Sizewell and Bradwell will be significantly lower than Hinkley.... Suppliers have already invested to relearn nuclear supply standards and develop skills”<sup>34</sup>*

Though there will undoubtedly be some jobs created at Sizewell C for local people, this in itself may prove to be problematic. Short duration, capital intensive construction projects like that proposed at Sizewell C have been shown to seriously distort the local labour market because when an effort is made to hire local people, the construction project can have a detrimental effect by competing with local firms for a limited number of skilled workers. Evidence suggests that major construction projects in rural areas prevent the growth of employment in more stable industries such as tourism and renewable energy.

### **The Legacy**

Throughout the consultation document there are numerous references to the legacy benefits that will be left once Sizewell C is completed. Unfortunately a lot of this is in the form of roads and traffic scheme improvements, which it could be argued will be an unnecessary legacy. The road schemes are being built to accommodate the Sizewell construction traffic and so will have a higher capacity than is needed once the construction is complete. In 10 years time some of us are holding on to the faint hope that the AONB will return to the quieter more tranquil area that it is now. People come to Suffolk for its rural idyll they do not necessarily regard wide roads and bypasses as a positive. Sizewell is touted as a low carbon development, but tarmacking over the land is not a good way towards achieving a lower carbon footprint, and encouraging more road transport is diametrically opposite to the carbon reducing transport strategy we should be pursuing. The Suffolk coast is dotted with a myriad of historical buildings and it would appear that not all of these have been taken into account when drawing up plans for the various road improvements (for example Glevering Hall and stables, orangery and lodge (grade II) will be impacted by the alterations to “Easton Road” improvements but are not included in the study area.

The consultation document states that a causeway over a culvert best responds to environmental and programme considerations regarding crossing the SSSI. It is difficult to see how the causeway and culvert best responds to the environmental considerations. It is certainly the best option for EDF in terms of cost and time, however the convenience to EDF should not always be the primary determining factor in deciding which design to use.

### **The Causeway and Culvert**

The causeway would make a permanent barrier across the AONB, cutting it in two and impeding the movement of wildlife. Creating a barrier restricting the free flow of the intricate water paths in the AONB is liable to increase the flood risk rather than reduce it. It is clear from the stage 2 feedback that people who know this area well are in favour of the bridge option which requires less disruption to the AONB, requires less land take from the AONB and will not curtail the movement of

wildlife so severely. It seems that EDF pay little heed to the value of the AONB as they are so willing to sacrifice it. EDF suggest that one of the reasons that they chose the causeway and culvert option is because the land would not have to be disturbed a second time when the temporary bridge is removed. This claim rings hollow as it is evident that EDF consider savings in time and money to be of far greater concern than the AONB. They intend to dump huge quantities of excavated soil on the AONB in bunds and dig enormous borrow pits with little knowledge of how it will affect the surrounding flora and fauna, and with little regard to how the acidic nature of the peat might affect the land and the wildlife. In addition the noise and light pollution, dust and HGV movements will all wreak havoc in the AONB.

### **The Pylons**

EDF have decided to use overhead lines and pylons to transmit electricity to the substation. This redesign has been introduced since the stage 2 consultation when it was stated that they:

*“Aim to place power transmission routes underground within the Sizewell C operational site and avoid additional transmission pylons within the EDF Energy Estate.”*

The reason they give for this change is primarily and predictably that it is cheaper- and that consideration trumps all others. It is claimed that putting the cables underground will be difficult because the excavation would occupy a very congested area of the site where important construction activities are already planned and where key infrastructure would need to be installed. It is quite alarming to read that what appear to be quite major considerations regarding the planning of the site layout and operation are still underway. It is indicative of the rushed nature of this project which despite being at the 3<sup>rd</sup> and final stage of public consultation is obviously not ready to be approved.

EDF suggest that “Underground cables present different electrical characteristics, which would require major redesign of key parts of the power station plant if this solution was pursued.”, but this does not make sense because the stage 1 and 2 consultations proposed that the cables would go underground so the design of the power station must have been based with this in mind. It is difficult to see how the design could have got this far without it being realised that the underground cabling would not work. Again, EDF state that underground cabling would lead to delays, but if we have to have this monstrous folly hoisted upon us EDF should not be allowed to cut corners and scar the landscape even further just for the sake of their profit margins.

The claim that putting the cables underground will be too difficult, time consuming and expensive does not ring true when it is known that the East Anglia 1 and 2 offshore wind arrays will require 37km of onshore underground cabling to transfer electricity to a substation. If it can be done in the case of the wind farm, where presumably they have the similar extra expense of putting the cabling underground rather than the cheaper overhead cables, then the same should be required of Sizewell C.

### **Marine and Rail Options**

It is disappointing to see that the marine transport option with a temporary jetty has been discounted. One of the reasons EDF give for this is that the construction would have a detrimental effect on the marine ecology. It is difficult to credit that the construction of the jetty, which would allow for a subsequent reduction in road haulage is the primary concern. The beach landing facility and cooling water intake and outlet pipes in addition to the effect on fish stocks as fish and fry are sucked through the cooling system during the operation of the reactor, are surely going to have a much larger effect overall than the construction of the jetty. It would be useful to see the data used to reach this decision particularly because EDF have in the past emphasised the sturdy structure of the marine crag rock formations in response to questions about coastal erosion around Sizewell. It seems odd that the sea bed is deemed to be able to withstand the impact of storm surges and coastal erosion for the next hundred years or more, but is too fragile to support the construction of a jetty.

As a marine led strategy has been discounted, a rail strategy must be prioritised. It would be easy to assume that EDF had included the marine and rail options in the early stages of the public

consultations merely in order to deflect the focus away from the huge quantities of freight and extra traffic that will clog the roads, because it is quite clear that a road led strategy is the EDF preferred option. The rail led strategy is estimated to cost £80 million more than the road strategy. If a pricing mechanism similar to the one put in place at Hinkley is introduced at Sizewell wherein the consumer pays a fixed price per kWh regardless of the cost of construction, it will be of no benefit for the local population if EDF cuts the cost of construction at the expense of the environment. The extra cost must be weighed against the advantages to both the environment and population of a rail led strategy.

It is immensely frustrating to reach the third stage of the consultation and yet still be faced with so many vague and unfinished plans from EDF. There are no firm numbers given for LGV and HGV movements or tonnage of freight that might be expected to be on the roads, although at Hinkley, once the DCO had been granted EDF requested to be allowed to increase HGV movements up from 500 to 750 per day, so even if an agreement is reached it may be difficult to get EDF to stick to it. It is very difficult to consider the rail strategy when EDF admit that there is no certainty even at this late stage as to whether it is feasible or not. The suggestion is that it is partially dependant on whether network rail will be able to complete all of the necessary work in a suitable time frame is unconvincing. Network Rail is in effect a public body that the government has considerable control over. The government has brought in legislation that has smoothed the way for infrastructure that is in the national interest and hence circumvents many of the planning restrictions that it would otherwise be subject to. The notion that network rail could not be persuaded to focus its attention on completing the necessary work for a rail strategy to be feasible is not tenable, especially given the consideration that the government is willing to subsidise the nuclear new build with favourable financing options .

EDF state that the rail led strategy bears the risk of leading to delays in construction, but both the Hinkley and Sizewell projects are behind schedule in terms of the original plan to fill the energy gap by 2025 . Hinkley is already 2 years behind schedule, and given the pattern of delays at Flamanville and Olkiluoto, it would not be unlikely that the timescales for Sizewell slipped also. If there is a further delay in construction to allow for a more environmentally acceptable transport strategy this may be justifiable, especially if it leaves a rail legacy for the people of Leiston. It would be extremely inconsiderate to expect them to put up with 10 years or more of utter chaos and leave them without a decent passenger rail service.

### **15. The Consultation Process**

The consultation process was very unsatisfactory. Despite reams of documents to plough through, information that would have been helpful to respondents is missing. Many of the studies are still ongoing and the information will not be made available for the public to comment on or challenge prior to the submission of the DCO. There are several instances where the information in the consultation documents is wrong, for example Melton parish council noted that “the traffic statistics quoted in the consultation understated the number of traffic movements at the level crossing by a magnitude of 3000%. in other instances, existing dwellings have been omitted from the plan or are in the wrong place. The exact footprint of the site has not been finalised, we cannot really comment on the rail strategy because of the uncertainty surrounding it. The question of where the water is going to come from has again been ignored in the consultation. In this 3<sup>rd</sup> stage of the consultation there has been a 25% increase in the number of parking spaces on the park and ride sites, increases in the number of workers, and the introduction of overhead cabling. These are substantial changes and it is difficult to have faith that EDF will not continue to alter aspects of the project beyond the time when the public have an opportunity to provide feedback on the plans .

All in all the impression is that EDF are giving a show of a consultation and creating a high level of noise to information ratio to keep respondents busy whilst actually making the available information vague enough to give the company room to change parameters as they wish in the future. Very Similar criticisms were levelled at EDF throughout the Hinkley consultation and so it would appear to be a deliberate strategy as they have not learned lessons from that experience.

In many instances EDF have prioritised the cheapest and quickest solutions in spite of these proving to be the least popular with the consultation respondents. This leads to a perception that

EDF are overly concerned with their profit margins and are merely paying lip-service to the views of the people who will have to live with the impact of this building site. There is an overall impression that EDF are untrustworthy, evasive and care little about the environmental havoc that they are set upon wreaking.

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