Wraxall & Failand Parish Council

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Hinkley C Connection Project
Consultation Response
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PO Box 5689
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11th August 2010

Dear Sirs

Re Hinkley Point C Connection Project …. Addendum to report of January 10

As agreed, with yourselves, this consultation reply has been delayed to today.

Following the further and better information provided by yourselves, for which we thank you, our own research, and our subsequent deliberations, we issue the attached addendum to assist with the overall process of moving from the constraints of overhead lines to a suggested better alternative.

We believe this represents National Grid's and our best understanding of the technical knowledge presently available and the best estimates of the likely financial implications at this early stage in the design process.

We look forward to continuing our relationship for the benefit of all parties.

Yours sincerely,

Chris Ambrose CEng

Chairman

Wraxall and Failand Parish Council

Cc: SoS for Energy Chris Hune MP, SoS Defence Dr. Liam Fox MP, IPC, OFGEM, CPRE, Save our Valley

Addendum to Report

Commissioned by Wraxall and Failand Parish Council

On

Hinkley point C connection project

The National Grid's proposals for the erection of 400KV Transmission lines and associated pylons

THE AMBROSE & PRATT REPORT

Report produced by :
Hugh Pratt
Chris Ambrose
July 2010

Overhead Pylon	
Build Cost	£394m
Total Life Cost	£1,124m

Undersea AC	
Build Cost	£400m
Total Life Cost	£720m

Underground GIL	
Build Cost	£288m
Total Life Cost	£519m

Addendum 1.1 Wraxall and Failand Parish Council have received no critique from National Grid to their response to the Hinkley point C connection project since it was submitted to six months ago.

Addendum 1.2 We understand that, since October 2009, the proposed power line has been upgraded 50% to a 6GW strategic powerline and not just a 4GW feed line from Hinckley.

1.2.2 This has a benefit for National Grid, who will now be paid for the work they are carrying out and the eventual installation of the new powerline.

1.2.3 This change does however skew the assumptions on which our report of 5th January 2010 was predicated.

Addendum 1.3 We understand that the original costing of £500 million is to be spent in reinforcing the grid system and not just the new line between Hinckley and Avonmouth. This change has skewed the assumptions on which our report of 5th January 2010 was predicated.

Addendum 1.4 We do acknowledge that very cordial discussions have taken place between the officers from National Grid and ourselves.

1.4.1 There is still considerable work to be done in the area of lifetime global warming power losses.

Addendum 1.5 National Grid's technical officers now agree, with us, that a subsea HVDC link can be used.

Addendum 1.6 The consultation period was extended with further and better information provided which clarified many issues. National Grid continue to disregard socio-economic and environmental costs when a route is determined.

Addendum 1.7 The undersea option continues to be excluded from the consultation as an alternative. This is because National Grid believes that they have only to consult on their preferred options.

Addendum 1.8 At the date of this revised summary, communities are being asked to join Community Forums to discuss the details of National Grid's decision on their preferred route. This may be valuable for some aspects of detail, but it appears to be demonstrating tacit approval for a solution that is contrary to the residents' wishes and resistance and challenges will continue against this approach.

Addendum 1.9 National Grid has acknowledged that their initial consultation was substandard and has made considerable efforts to improve their provision of information. Unfortunately, the constraints that they believe are imposed upon them by a variety of rules and regulations, means that they will continue to be viewed in a poor light by most communities.

Addendum 1.10 We continue to consider rules and regulations to be of great importance both locally and nationally and urge the new Coalition Government to establish a new policy for high voltage transmission that reflects the issues and needs of today, together with its interfaces with the range of associated power generation systems, in a European context.

Addendum 1.11 Decisions of today should not have a detrimental impact on the present generation or our children's future and must form part of any government policy.

Addendum 1.12 National Grid suggest that £1,000m of extra build costs add less than 1% to a domestic consumer's electricity bill but 3% to business and industry bills.

Addendum 1.13 We continue to maintain that, despite OFGEM regulating National Grid, domestic pressure plays a major part in their observable behaviour.

Addendum 1.14 National Grid has not optioneered Gas Insulated Lines, GIL, which National Grid use in the UK.

1.14.1 GIL is the most inexpensive option to build and maintain, and the lowest transmission losses.

1.14.2 GIL is a very efficient technology and can absorb great amounts of power.

1.14.3 GIL technology has been extensively used since the 1970s as Gas Insulated Switches, GIS.

1.14.4 GIL is essentially a 10 inch diameter metal tube, filled with inert gas, supporting a single conductor on an insulator, figure 1.

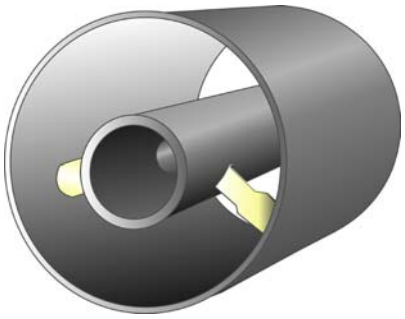

Figure 1 Gas Insulated Line

1.14.5 Six of these tubes could be buried in a trench 3 m wide and 3 m deep beside or down the centre of a motorway, figure 2.

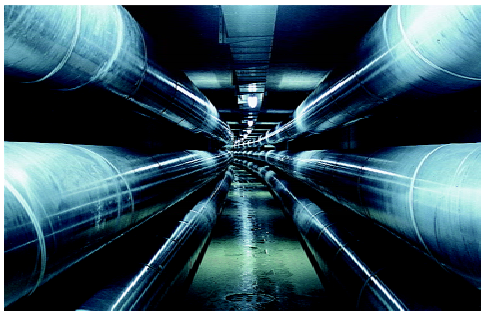

Figure 2 Multiple Gas Insulated Lines

1.14.6 There are various GIL suppliers in Europe and the Far East and we have been quoted for supply and installation in a variety of terrains at £9m per mile.

1.14.7 GIL has no moving or switching parts to be maintained.

1.14.8 GIL is self-contained and in the event of a failure does not burn, as underground cable, making access to its underground duct dangerous.

1.14.9 GIL produces no external electric field whereas there is a continuing question mark about health issues with overhead power lines.

1.14.10 GIL is not affected by lightning, climatic change or pollution whereas overhead power lines and insulators incur costs and suffer outage.

1.14.11 GIL has only a 10th of the spatial foot print of an overhead power line, and no carbon foot print.

1.14.12 GIL has a very small capacitance 80nF/mile which means that a 37 mile length would need no reactive compensation.

1.14.13 The transmission, or joule, losses are typically between a half and a third of an overhead line.

1.14.14 There is no gas replenishment required during a fifty year life after which the metal components and 99.8% of the gas can be recycled.

1.14.15 There are other technical benefits to the transmission using GIL making it a reliable and robust link in the national grid.

Addendum 1.15 We have prepared a spreadsheet which presents all the options for consideration, table 1.

Conclusion 1.1 We conclude that GIL technology is demonstrably the most attractive, competitive on cost and provides the lifestyle which people recognise and need. More importantly GIL would allow a substantial benefit to meet the 2020 targets for global warming and recycling.

Recommendation 1.1 We recommend that GIL should be used for the transmission of power between Hinckley and Avonmouth.

1.1.2 We recommend that the UK Department of Energy should hold an International seminar to obtain independent values for transmission losses, lifetime maintenance costs to be used as a basis for future planning applications.

1.1.3 It is important that experts should not all be contracted to or working for National Grid.

	Overhead Pylon AC	Underground Cable AC	Underground GIL AC	Undersea Cable AC	Undersea Cable HVDC
Length Required	37 miles	37 miles	32 miles	35 miles	35 miles
Underground & beauty areas	10 miles	n/a	n/a	n/a	n/a
Cost overground	£2m/mile[2 & 6]	n/a	n/a	n/a	n/a
Cost underground	£25m/mile	£25m/mile	£9m/mile	£10m/mile	£8m/mile
Extra plant	£90m	£50m	£0m	£50m	£800m
Build cost	£394m	£975m	£288m	£400m	£1,080m
Life maintenance cost[4 & 5]	£2m	£4m	£0.5m	£5m	£5m
Life Global Warming[3 & 4 &5]	£701m	£315m	£231m	£315m	£350m[1]
Property blight[7]	£27m	n/a	n/a	n/a	n/a
LIFE COST	£1,124m	£1,294m	£519m	£720m	£1,435m

Note 1) Only non recoverable power listed as heat energy can be recovered
Note 2) In areas of outstanding beauty must be undergrounded
Note 3) Losses calculated for example = 365(days)x24(hrs)x40(years)x2E6(kW)x1(%)x10p/kWhr
Note 4) Costs are calculated at NPV, Net Present Value
Note 5) Life time costs are calculated for a 40 year life.
Note 6) Extra £90m required for route 1A
Note 7) Property blight figures from our report 5th Jan 2010

Additional references:

1) National Grid [2009] *Transmission networks offshore development information statement*

2) Bazannery.G [2000] *Underground links by gas insulated transmission lines* The 5th International conference on advances in power systems controls, operation and management APSCOM 2000

3) Davies. M et al [2008] *HVDC plus- basics and principle of operation* Siemens

4) Noack F. [2008] *The ASKON report on undergrounding* North East pylon pressure

5) EirGrid [2008] *EirGrid position on NEPP Askon study* EirGrid

6) Xyngi. I et al [2009] *Protection, transient stability and for what through issues in distribution networks with dispersed generation* IEEE