



Global Supply Chain & Localization, Issues and Opportunities: UK Programme Experience

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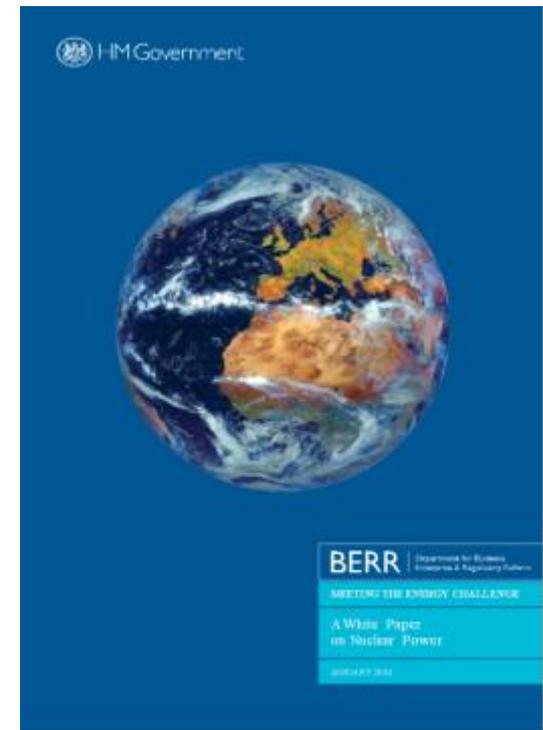
Policy Background



2008, a White Paper on nuclear energy set out Government's proposals for bringing new nuclear power stations.

- Focus on removing barriers to deployment
- To be funded by private sector
- Supply chain to be provided by market / private sector

2013 Nuclear Industrial Strategy produced identifying the priorities that government and industry will work on, together in a long-term partnership





Current UK New Nuclear Build



Plans for up to 16-18 GW of new nuclear capacity

- Sites currently generating
- NPS sites with development proposed
- NPS Sites, no proposals at present



EDF / CGN	Hinkley Point C	3,200 MW
EDF / CGN	Sizewell C	3,200 MW
CGN / EDF	Bradwell B	2,200 MW
Horizon (Hitachi)	Wylfa	2,700 MW
Horizon (Hitachi)	Oldbury	2,700 MW
NuGen (Toshiba)	Moorside	3,400MW



Hinkley Point C



2 EPRs being constructed at HPC
by EDF of France and CGN of
China.

This will give the UK 3,200MW of
low carbon electricity for the next 60
years.

First concrete poured for power
station galleries in March this year;
over 2000 workers on site.

Very visible safety culture
demonstrated on site.





Policy Framework



The policy framework for new nuclear sees no direct government funding. Government agreed a strike price of £92.50/MWh (in 2012 prices), acting as an enabler to Hinkley's construction.

Private sector and the market to provide the supply chains for new nuclear power stations.

No legal basis to mandate UK content or a percentage of UK content, although supply chain benefits recognised as important to the UK national economy, the local economy and for public support.

Government and industry bodies encouraged companies to engage in the UK nuclear programme, for example:

- Nuclear Advanced Research Centre's FIT 4 nuclear programme
- National Skills Academy for Nuclear – improving performance of companies through collaboration and action on skills.



UK Supply Chain Engagement



When the final project financing contracts were signed in September 2016, EDF stated their 'strong expectation that 64% of the content will come from the UK'

In a March 2017 press release in EDF confirmed that '*64% of the project spend is going to the UK*'.

Over many years, the UK supply chain was readied having discussions with EDF, AREVA and other FID7 Contractors.

EDF has worked very closely with the local community and local supply chain, in addition to supporting educational development and a range of community programmes.



UK Supply Chain Engagement



Nuclear AMRC has identified UK companies are market leaders, including:



- High quality forgings.
- Precision material components and assemblies, including valves and pumps.
- Plant instrumentation and control for reactor, generating plant and ancillary equipment.
- Specialised equipment and services including high integrity pipework; core component handling equipment; primary circuit auxiliary systems; craneage and fuel handling machines; specialist radiation retaining doors; radiation detection and monitoring products.
- Accumulators, tanks and heat removal systems.
- Fuel transfer tubes and key interlock systems.
- Validation of advanced NDT, inspection and materials.
- Waste measurement instrumentation.
- Radioactive waste management systems.
- HVAC systems

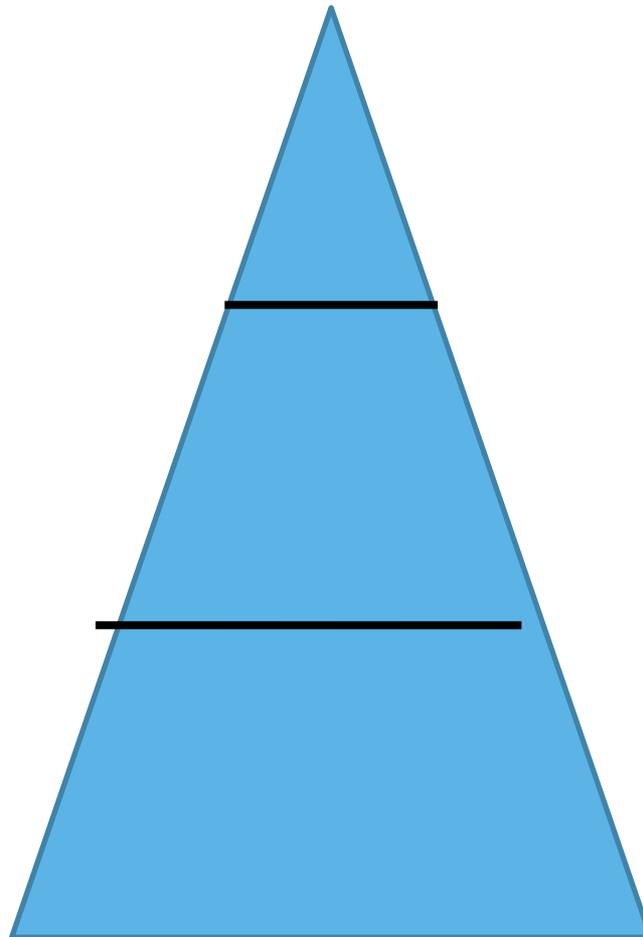
UK Content in New Build

Type of equipment

Very unlikely

Possible with,
upskilling, and
partnerships

Very likely



Specialised nuclear
island equipment
especially heavy
components

High technology
components and
safety critical
equipment

Construction, services,
non-safety critical
equipment and
ancillaries



ACTAN – UK Doosan Babcock; France Axima Concept and Tunzini Nucleaire - JV

Design, equipment qualification, procurement, installation and testing of all heating, ventilating and air conditioning equipment at Hinkley Point C.

Cavendish Boccard Nuclear - JV

Mechanical construction of the Balance of Nuclear Island. Detailed design, manufacturing, installation and testing of the complete piping systems and supports; installation of process equipment such as pumps, valves and tanks.



BYLOR - Bouygues TP/ Laing O'Rourke - JV

Main civil engineering works, delivering over 60 major structures across the Hinkley Point C over a seven year period



Darchem – Efinor - JV

Designing, manufacturing and installing spent fuel pool liners



International Collaboration Added Value



What is different from other potential suppliers?

Specific examples of benefits that one or other partner can bring

- Experience of similar projects
- Legislative and regulatory requirements
- Codes and Standards, e.g. RCC-M / RCC-E
- Expectations for Pre-Qualification Questionnaires (PQQs)
- Expectations for Invitation to Tender (ITT)
- Tender negotiation experience
- Sensitive to local pricing points / norms
- Developing SQEP resources
- Improved communication – local, available, responsive, clarify scope / issues
- Commercial contract management e.g. NEC (pain/gain share)
- Close to the Customer
- Network of approved supply partners
- Financial strength
- Cross pollination of best practice – Processes, Technology



Lessons Learned



- What is the UK content across the plant i.e. What high value scope is being supplied from the UK within say the nuclear island, e.g. fuel handling equipment, valves, pumps, actuators, heat exchangers, cranes and so on? How do we monitor?
- This is not only important for the current supply but through life support over the next 60 years.
- Diversity of supply can help bring process and manufacturing improvement and innovation – if the supply chain is balanced towards companies that have supplied say Olkiluoto and Flamanville, will this bring best practice and value to the industry?

Lessons Learned

On new build projects a shared supply chain plan or strategy would be beneficial. It would be helpful to set out what is important for local and national content and perhaps a crude 60% content needs to be more refined covering areas such as:

- Reactor Island Civil
- Reactor Island Mechanical
- Reactor Island Electrical
- Turbine Island
- Balance of Plant
- Equipment types & Equipment Qualification



This is why for future new nuclear projects will be requiring developers to come up with **Supply Chain Plans** to make clear expectations on both sides



Lessons Learned



Our need is to get the new nuclear builds constructed and online on time and to improved cost; in doing so we also need to consider the longer term benefits that address:

The community

The local supply chain

National supply chain

Technical/product capability

Development of transferrable skills

International partnerships bringing improved value





Final Thoughts for Newcomer Countries



Being clear about prioritisation of competing aims and the trade offs required – number of reactors, cost of reactors, how they're financed, role of supply chain, etc.

Shared supply chain vision / plan is clearly articulated and agreed between constructor and Government prior to project commencement. This will help maintain public support, set the supply chains expectations correctly, utilising their time and resources effectively, thereby reducing cost whilst managing risk. To last through the life of the project.