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**Submission to the DTI consultation on
“Our Energy Challenge: Securing Clean, Affordable Energy for the Long Term”**

The Construction Industry Council (CIC) is the representative forum for the professional bodies, research organisations and specialist business associations in the construction industry. It provides a single voice for professionals in all sectors of the built environment through its collective membership of 500,000 individual professionals and 25,000 firms of construction consultants.

Existing buildings account some 50% of all energy use, the construction industry a further 10% and built environment is a major influence on the use of energy by transportation. The industry represented by CIC is, therefore, consideration for future Energy Policy.

CIC is committed to the efficient use of energy and resources to counter the threat of climate change and to help sustainable living.

CIC believes that progress on the Government’s energy goals needs to be made more urgent. In order to achieve this, the Government will need to commit explicitly to an “Energy Hierarchy” which places greater emphasis on energy conservation and efficiency while aiming to phase out the more unsustainable technologies and energy sources.

CIC is of the firm opinion that enormous technological potential exists to improve energy management and reduce emissions on both the supply and the demand side, but that policy intervention will be required to create a sustainable market for it.

A clear vision from Government, expressed as stable and consistent policies will be key to establishing more responsive market mechanisms.

To underpin that vision, there needs to be improved support for innovation, to ensure that national research efforts lead to commercially viable industries and that older technologies do not distract investment from innovation and new technologies.

CIC acknowledges the international dimensions to the questions in the review, and recognises the responsibility the UK has in exporting solutions overseas to enable others to achieve carbon reduction and security of supply. Also the UK research effort needs to be adapted to the new global realities, making the most of the potential for international collaboration.

CONSULTATION QUESTIONS

Q1. What more could the Government do on the demand or supply side for energy to ensure that the UK's long-term goal of reducing carbon emissions is met?

1. CIC considers that a sustainable energy policy requires a clear set of priorities which awards due importance to the management of energy transformation and use. We propose the adoption of an "Energy Hierarchy" as follows:

SUSTAINABLE



- Energy Conservation (reducing total energy demand) – good design can reduce demand, via better fabric performance, use of natural energy, etc and through compact urban form, supporting lower transport fuel use
- Energy Efficiency – minimising the carbon footprint of the energy used within a property - this includes the utilisation of combined heat and power which vastly increases the efficiency of generation from fossil fuels and similarly reduces CO2 emissions e.g. Woking project 60% reduction in CO2
- Exploitation of Renewable, Sustainable Resources - clean energy from wind, wave and sun etc
- Exploitation of Non-Sustainable Resources using Low/No-Carbon Technologies – including nuclear generation and the sequestration of CO2 from fossil fuel, as they both do vast collateral environmental damage.
- Exploitation of Non Sustainable Resources using Traditional Technologies – as we do now

UNSUSTAINABLE

The Energy Hierarchy offers a consistent approach to the management of energy demand and supply, which recognises the need for effective use of energy as a valuable resource to combat climate change.

Energy conservation is the most fundamental element in this hierarchy. In order to guarantee continuity and to meet our short-to-medium term energy needs we will

have to continue utilising measures and technologies from the base of the hierarchy. However, CIC urges Government to make a determined commitment to shift the country up the hierarchy from the more wasteful and polluting modes of energy use to the most sustainable. In the remainder of this response we make our recommendations in relation to the Energy Hierarchy.

Demand Side

The technology exists today to deliver significant reductions in energy demand and the associated emissions.

Energy efficiency technologies have the capacity to contribute to principal considerations of the review in that they reduce demand, reduce fuel poverty, reduce harmful emissions and reduce the need for centralised generation. This point cannot be stressed too hard: the reductions in demand that could be achieved through conservation and efficiency could obviate the requirement to build major new energy generators.

Successful energy conservation is dependent on the effective engagement by Government of consumers and other market participants in order to gain their support for reducing energy demand and carbon emissions. Engagement must address willingness and ability to affect significant lifestyle and attitude changes.

Unfortunately, as energy is relatively cheap, there is little or no price mechanism in the market to make people or businesses “go green”. Therefore, energy conservation and efficiency must be encouraged by incentives or regulation.

Commentators are frequently pessimistic about the ability to make a major impact upon energy conservation and efficiency within homes and businesses using grants or incentives, pointing to the poor uptake in the past. As there are now new national imperatives underpinning action on energy efficiency, it does not follow that future Government led campaigns would fail. These should provide the impetus that was lacking when the UK was comfortably self sufficient in oil and gas.

It will be essential to create enduring public engagement through sophisticated and committed communication and education programmes, and to equip the public with the means to participate actively in energy management.

Options for policy include:

- There should be a general legal duty on all users of energy to act reasonably in its use and not to waste energy, similar to the duty not to waste water. In particular, it should not be legal to implement changes to energy use which directly counter provisions of the Building Regulations. Examples of such use include patio heaters and the heating of spaces designed to be unheated e.g. conservatories
- Mandatory efficiency standards should be agreed and enforced for new buildings and new electrical equipment at the level of current best practice.
- Whenever a building is extended, Building Regulations should require the existing property to be brought up to current efficiency standards as part of the project
- A major project to retrofit existing homes and businesses so that say 80% percentage of the building stock achieves a clearly defined very low carbon footprint by 2026.
- Energy efficiency obligations on energy suppliers should be strengthened and extended.
- More innovative fiscal measures should be devised to incentivise consumers to adopt less carbon-intensive consumption patterns.
- Micro generation technology is developing rapidly and take-up is growing, but for the majority of people it remains prohibitively expensive. Government must consider what tools exist at its disposal – whether through incentives or mandatory standards - in order to encourage greater take-up of available and developing technology. This in turn would create sufficient economies of scale to make such equipment more affordable for greater householder take-up.

Supply Side

On the supply side, there is a real challenge for Government to devise comprehensive and effective mechanisms to drive commercial decisions towards

achieving its long-term environmental goals. Clear Government vision and commitment will be essential to securing the confidence of market players.

Encouraging diversity of supply would require using a variety of energy sources and technologies. If that were combined with prioritising renewable energy, it would be possible to provide significant improvements in the security of supply.

In the electricity generation sector, measures should be focused on enabling renewable technologies and newer low-carbon technologies to become more affordable. These technologies, with such good long-term prospects, need adequate support to ensure that they become commercially viable and part of the mainstream energy industry

More attention should be devoted to measures targeted at the heating sector, including simpler regulation and better incentives for cogeneration and renewable heating.

Q2. With the UK becoming a net energy importer and with big investments to be made over the next twenty years in generating capacity and networks, what further steps, if any, should the Government take to develop our market framework for delivering reliable energy supplies? In particular, we invite views on the implications of increased dependence on gas imports.

CIC believes appropriate market mechanisms need to be in place to deliver reliable energy supply. The market has delivered security of supply to date and it must be given the legislative framework and policy stability to continue to deliver security of supply in the future.

Decentralised generation, such as combined heat and power, and other less capital infrastructures must be given priority. These forms of generation require less investment in infrastructure and achieve a faster return on investments.

The Government should avoid indiscriminate public funding and continue to maintain liberalised energy markets. In particular Government should avoid giving public guarantees, unit energy price guarantees or other forms of hidden subsidy that skew the energy supply industry. By maintaining a diversity of supply the market will have

a large choice with which to decide which technology is most appropriate to meet consumer demand.

Security of supply must be an essential element of Government energy policy, but it must recognise all imported fuels are vulnerable and have an increasing scarcity value. This applies not least to nuclear where only a few countries have known reserves.

To improve security of supply CIC supports the following measures:

- the introduction of a market mechanism to foster investment in renewables with a requirement for all suppliers to demonstrate that they were reinvesting a defined percentage of company profits in renewable technologies
- the introduction of a more sophisticated and competitive market platform for grid balancing services, to reward investment in storage technologies and efficient network management solutions.

Q3. The Energy White Paper left open the option of new nuclear build. Are there particular considerations that should apply to nuclear as the Government re-examines the issues bearing on new build, including long-term liabilities and waste management? If so, what are these, and how should the Government address them?

The extent to which the UK will be reliant on nuclear generation will depend upon the success of conservation and energy efficiency strategies, as well as the development of renewables, and these should be accorded the highest priority.

The Government should ensure it does not compromise investment in energy efficiency and renewables technologies through the pursuit of nuclear energy. Human and other resources applied to the development of new nuclear facilities will inevitably deplete the resources applied to renewables.

By common consent, taking the most optimistic scenario, a new nuclear station could not be built and operational in Britain before 2015. (The construction period alone for Sizewell B took 7 years.) It would, therefore, not contribute significantly to the 2020 emissions targets and would not cover the critical shortfalls in generation capacity

projected to arise before 2020. As stated above, greater reliance on nuclear fuel would not improve security of supply.

Without public guarantees or hidden subsidies of any kind, it would be difficult to finance the large investments required for nuclear generation.

Government should act swiftly on the report of the Committee on Radioactive Waste Management (CoRWM) published summer 2006 and decide on a solution for nuclear waste disposal. The view in the science and technology community is that acceptable solutions do exist, and it is now imperative that a decision be made on the basis of the CoRWM recommendations. Existing waste must be addressed before new developments are undertaken.

The pursuit of nuclear power would be a major detractor from the development of renewables and energy efficiency industries. For them opportunity costs are very high. Currently there is a political will and the financial resources available to develop these technologies so as to increase security of supply and reduce emissions. However, greater investment in nuclear would create greater demand for these finite resources, leading to increased costs of fuel and reduced capacity to produce energy through the use of nuclear technology. Similar investment in renewables technology would reduce costs and increase capacity.

Nuclear facilities are now in danger of targeting by terrorists, which presents a major risk to energy supply and human life.

The costs of decommissioning and the long-term containment of nuclear waste remain major barriers, which have proved intractable thus far.

Q4. Are there particular considerations that should apply to carbon abatement and other low-carbon technologies?

CIC supports the Engineering for Energy Forum in calling for:

- The delivery of low-carbon technologies, including energy efficiency technology and renewables, is dependent on substantial innovation and engineering development. This implies a more extensive requirement for Research, Development Demonstration and Deployment (R, D, D & D). The

technological potential exists to deliver innovation, but public policy should focus on defining the priorities, and offering encouragement, which may have to be substantial.

- Public spending on R, D & D, as well as incentives for spending in the private sector must be adapted to the new global realities, and be targeted to enhance co-operation and avoid duplication of effort (see also issue iii). Where a global research effort is already underway (e.g. clean coal) the Government should focus on resolving local issues (such as detailed application studies of safe geological storage of CO₂).
- Technologies must be assessed in terms of their lifecycle carbon emissions and cost. It is expected that rigorous lifecycle analysis will demonstrate that the Energy Hierarchy as laid out in this document provides the most efficient and cost-effective route to achieving the goals of emissions reduction and security of supply. Definitive lifecycle analysis on generation from waste, nuclear, renewables, combined heat and power, and clean coal, including the primary fuel production, processing and transportation, and the building, running and de-commissioning of energy using or generation equipment, will provide comprehensive evidence of each technology's ability to contribute to reducing emissions and securing supply. Carbon emissions associated with transportation of operating staff and fuels over the life of a technology will also vary markedly and should also be included in such an analysis.

Q5. What further steps should be taken towards meeting the Government's goals for ensuring that every home is adequately and affordably heated?

Upgrading the thermal performance of the housing stock and improving the efficiency of energy-using devices will contribute directly and substantially to the alleviation of fuel poverty, and this should be the first priority of Government policy towards this goal. More over well-insulated homes offer other social benefits:

- reduced costs associated with ill-health
- greater opportunities to treat sick or disabled people at home
- reductions in other care costs

A system akin to the German one could be adopted whereby the stock is progressively upgraded by first bringing the worst, say 5%, of the stock up to the

current benchmark, and then tackling the next worst tranche. Households would be protected during the transition period by grants or refund of disbursements.

CONSULTATION ISSUES

i. The long term potential of energy efficiency measures in the transport, residential, business and public sectors, and how best to achieve that potential.

CIC supports the Engineering for Energy Forum in calling for:

- The potential for energy saving is very considerable, but crucially dependent on public engagement for its delivery. There is a great deal of uncertainty surrounding the rate at which savings can be delivered, and a commensurate need for explicit Government commitment to achieving it. Energy conservation and energy efficiency are the most sustainable elements in the Energy Hierarchy, but like waste reduction and reuse in the corresponding waste hierarchy, they could prove the easiest to overlook.
- Government should demonstrate leadership by using public sector projects to illustrate best practice. The financial parameters for project assessment need to be changed to reflect the Government's energy priorities. Current procurement based on lowest capital expenditure discourages innovative thinking in most instances, and does not deliver energy performance that meets current commercially available best practice.

ii. Implications in the medium and long term for the transmission and distribution networks of significant new build in gas and electricity generation infrastructure.

Long-term strategic vision is needed to ensure that today's incremental investment promotes flexibility in the future electricity networks, which can be expected to include more distributed generation and demand-side participation. Encouraging decentralised generation effectively within a liberalised market framework will require the full engagement of the power industry, the regulators, central Government and planning authorities.

- The technological solutions for managing the increasing volume of distributed generation are well known and their implementation needs to be encouraged aggressively.
- There is a need for greater co-ordination between the consenting process for network expansion and the development of new generation capacity, to avoid inhibiting investment.

iii. Opportunities for more joint working with other countries on our energy policy goals.

Given the global nature of the problems of climate change and energy security, there is a great deal of scope for co-ordinating solutions and sharing the costs on their development.

The future markets for energy technology will be strongly influenced by the requirements of emerging markets like China and India, and it is therefore important to gain an understanding of their current and future needs and to establish productive working relations with them in this field. These arrangements will inevitably be reciprocal – current advances in energy efficient and renewable technologies in these countries could place them at the leading edge in many sectors. A good example of this is that various companies in India were licensed by European companies in the 1950s/60s to manufacture steam turbines and boilers for their indigenous cane sugar industry. In the intervening period, the Indian companies have manufactured many more turbines and boilers than the original licensors and now represent the state-of-the-art in CHP and power generation from biomass.

The Government should work with other EU member states to ensure that the Energy Performance of Buildings Directive, the EU Emissions Trading Scheme and future joint initiatives are developed dynamically in the future, so that they consistently provide an impetus to improve the energy efficiency of industry, housing and transport across the EU, and provide relevant and adequate assistance to new member states joining the EU.

Emissions reduction is an international issue, and we need to ensure that UK incentives do not merely 'export' the problem elsewhere. For example, low sulphur coal is currently imported from Russia to meet emission standards, but global carbon emissions are increased through its transportation.

Security of supply is an international issue. Renewable technology should be pursued to enable countries from all income levels to adopt and develop appropriate technologies to reduce the global supply for non-renewable sources.

iv. Potential measures to help bring forward technologies to replace fossil fuels in transport and heat generation in the medium and long term.

CIC supports the Engineering for Energy Forum in calling for:

- The transport and heat generation sectors represent growing demand and emissions, and therefore merit significantly greater effort than they are presently receiving. There already exists significant technological potential in these areas, and Government needs to focus on policy measures to bring it forward, including maintaining support for research, addressing the barriers that counter the adoption of promising technologies, and rationalising the fiscal regime to make them more attractive (e.g. by reforming the current tax regime for bio diesel).
- Developing alternative fuels for aircraft represents a significant challenge, and one to which more research focus should be devoted. The aviation sector will continue to represent a major challenge. The efficiency achievements in aircraft (both frames and engines) over the last thirty years surpass those in any other sector and yet the overall emissions of GHGs from aviation has significantly increased during that period because of the massive increase in the number of flights for both passenger and freight transport.

If you have any queries regarding our response to this consultation please contact Kate Dunne on kdunne@cic.org.uk or on 0207 3997412. We would also be grateful if you could feedback any outputs and next steps from the consultation exercise to Kate.

We look forward to hearing from you.