Energy Security and Global Climate - Labyrinths Identified by Policy Makers

Possible Energy & Climate Change Policy Pathways

- Energy efficiency
  - Improve energy efficiency
  - Improve efficiency of buildings
  - Improve efficiency standards for products, vehicles, power plants, industry on - off, new equipment
  - introduce better feedback for consumers, smart meters, smart infrastructure, smart grids
  - Improve efficiency (sustainable design)
  - Public information
- Fiscal policy
  - Limit / encourage consumption with taxes and / or subsidies
  - Foster exploration of new energy sources
  - Regulate the market for electricity and other energy sources
  - Manage capacity, supply, demand
  - Regulate the market, or liberalise
  - Policy on carbon price - post-beyond 2012
  - Extend emissions trading schemes
  - Affordable fuel for the poor
  - Support research/development
  - Post Kyoto commitments
  - Agreed product standards
  - Improve/ new power infrastructure
  - Build liberalised open markets
  - Support research
- Security of supply
  - Increase storage of gas up to 90 days
  - Set up a market for gas storage - Plan for more distributed generation - Encourage/ rely on renewable energy - Foster good governance in resource rich countries
- Build new non-CO2 emitting sources
  - Nuclear power
  - Nuclear power with waste disposal
  - Policy on nuclear waste disposal
  - Improve quality of wind generation
- Technological fixes
- Transport
  - Radically increase vehicle emission standards
  - Phase out old stock
  - Improve public transport (change behavior with property)
  - Drop "roads first" policy
  - Build cycle routes rather than cars
  - Reduce parking spaces 5% a year (a la Copenhagen)
  - Promote hyperlans
  - More closely connect geographically resources with users.

Identified Constraints on Policy Development and Implementation

Technical constraints

"Decarbonisation of natural gas on a commercial scale is key - the constraint is economics"

"Considerable price instability in liberalised markets generate political damage"

"I am not sure a technology breakthrough is needed, we just need to make it work - we achieve hydrogen storage at scale. Fusion has been 50 years away for the last 50 years. We have had huge successes, including military, but commercial technology for the past hundred years but we haven't."

"Technical constraints include hydrogen, whose technologies are not ready for competition for a long time."

"Nuclear may be an intermittent supply source not a baseload"

"We cannot rely on the market to secure security of supply. Regulatory framework set by government is based on fantasy and timetable. We need to do some fundamental work and get it right first time, not just hope for a fair wind."

"Gives from renewables may be best through inefficiencies in the baseload"

"If renewable energy sources (i.e. wind) are more than 10 percent of the energy supply, the continuity of supply will be a challenge for the baseload."

"There may be new technologies on the horizon to rescue us - but we can't rely on that. Without them, we can't meet security of supply and climate change objectives at the same time without making some difficult decisions."

"I believe that there has been much hype on renewables and that this is a total fantasy. I hope they are not the saving grace but may be a contributor."

"Differences between EU and EU emission trading schemes may create double burden on UK business."

"The gas market takes a short term view. Only when the molecules actually start to flow through the pipe will they believe it."

"We have done quantitative analysis on how much we can reasonably expect from (above market rate) for security of supply. The amount always turns out to be a small number."

"There is no demand for clean coal technology. It is China and India are just downsizing coal power stations, they are not interested. Nor is the US."

"Apart from petroleum (and hydro) there is no other primary energy source in the UK that doesn't need a government subsidy in order to compete (true for nuclear, solar, wind, biofuels, coal, etc)."

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Market constraints

"Because North America is powerful and has access to fossil fuel resources it is difficult to get a collective global strategy. The EU is not in the same position and so has to generate an inclusive strategy."

"Liberalisation of energy market does not favour the LT view."

"UK market could counterpoint liberalised EU market to which it is connected"

"Nuclear power / coal with sequestration is a tradeoff slows down domestic decisions"

"It is not clear what is the EU security of supply at a global level. It probably means diversity."

"Difficult to develop a Russia policy that reconciles gas supply and human rights"

"There are major political constraints - coaching international carbon agreements, Kyoto, WTO, concerns about developing countries and developing economic development."

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"Product manufacturers won't design energy efficient products without government prodding"

International constraints

"China won't do anything, India won't, that it is our problem anyway."

"We seem willing to pay very high prices for oil, too - to emit carbon. We still have a property to buy data."

"Domestic climate change policy actions require public acceptance, hence are resisted"

"Individualism and selfishness are constraints."

"World has low overall capacity to cope with disasters could lead to a Hobbesian outcome from global chaos."

"UK climate decisions too small to make a difference"

"There are people-rooted factors about nuclear power: public concerns, Chernobyl, and a NIMBY attitude about new builds."

"There are major political constraints - coaching international carbon agreements, Kyoto, WTO, concerns about developing countries and developing economic development."

"The public is unwilling to listen to and trust scientific and technological arguments on the issue of energy problem. A society that ignores science is a constraint."

"If it really is the biggest threat to mankind, why aren't we generating money now? Because the electorate don't care."

UK citizens constraints

"Is the UK willing to bite the bullet and sacrifice standard of living in order to reduce energy use?"

"It is now harder to find hydrocarbons in large quantities - the easy ones have been discoveries is much reduced."

"Before 2050 we will run out of oil. The gap between demand and supply is going to become incredibly big incredibly quickly. That's a very big uncertainty about what the UK should do."

"Potential supplies and suppliers are being secured by China and India leading to real resource constraints"

"Big crops? Can't see it. It beggars belief we could produce enough of the stuff. Hydro? Not enough left. Solar? Been around forever and never seems to have broken through the economic barriers."

"The UK can only drive technical change through market mechanisms. Government can't make enormous sums of public money to spend."

"How will we pay for renewables? Where will the money come from?"

"There is a limit to the planet's carrying capacity - the planet is finite. Climate change may put pressure on some of these other resources, as well as energy. This could lead to severe reductions in global population."

"Supply crisis in energy is possible"

Resource constraints

"Human beings' ability to make long-term decisions under conditions of uncertainty is very limited. Pol / markets (financial and commodity) make short term decisions."

"No policy framework-rather knee-jerk reactions to events and policy reviews"

"Scientific and technical expertise is becoming a lone voice in government and has been given time it will have disappeared."

"No way to compare investment in local solar with new nuclear plant economically"

"No method for independent evidence gathering and presentation of facts that leads to shared understanding, risks and costs."

"The rise of the internet has strengthened lobby groups. Decisions that are in the global interest can be attacked by well mobilised campaigns."

"There is a tension between the advantages of certainty, compared with being locked into an unfavourable policy that needs changing. Business has to accommodate this."

Policy process constraints

"Failure to use technical civil service expertise"

"There is a tendency in government not to admit that things are not working."

"A big government constraint is the inability of UK government ministers to take decisions."

"Politicians are always optimistic. They don't want to tell people bad news. But news is generally difficult or costly they say 'let's not fix it it will be better'. So it has to be very obviously broken."

"Parliamentary processes and the electoral cycle mean that big decisions have to be harvested in advance. Otherwise the next parliament could change them."

"The DEFRA/DTI current split on climate change doesn't make any sense. DTI and DEFRA now share a PSA for target on climate change. DOPM should share it too."

"The government's new sustainable development strategy should mainstream thinking across government. The PM is the only person that we should listen to on the issue of environmental action limits."

"The debating culture in government is adversarial and unhelpful. You always have to be right. People get defensive of policy A and support policy B."

"There is a conflict between the certainty that stakeholders and ministers and people want from an energy policy and what is a sensible energy policy should be in a time of uncertainty."

"Government is succumbing to fashion. Because it does not know what it wants to do it does not organise around the issue and does not policy to deliver them. Instead it is organised around departments."

Significant Uncertainties - Identified by Policy Makers

Are UK public willing to sacrifice standard of living to reduce energy use ?

Climate change - Really happening? How fast? How safe?

World economy - grow how fast?

US and developing countries - growth and CO2 limits possible? level playing field for business?

Uncertainty about demand ?

Oil - stable supply, Peaks when?

Technical advances - Which? How Soon ?

Buildings

Renewables - ready? when? at what cost?

Clean coal - when? who pays for R&D?

Reliability of Supply ?

Reliability of Russia as gas supplier ?

Reliability of Middle East oil suppliers ?

Energy - infrastructure? partners? storage? price?

Effective policy mechanisms - can it be done?

Energy efficiency - enough improvement

Gas - strength, more, less?

Vehicles

Nuclear power - more, less, same?

Carbon markets - how? who benefits?

Hydrocarbons will increasingly become a scarce resource

Emissions trading - how expensive? when?

Enabling Conditions

"We are much interested in our use of energy"

"In 2050 we will be using less energy either because we have changed our habits or because technology will give us new means to provide for our energy needs."

"a threefold increase in transportation efficiency, all new buildings self-sufficient in energy, and more efficient transportation systems that reduce the necessary movement of goods and people (e.g. feeder flights)."

"Maybe we had to go through the pain of learning how to use energy more efficiently. The 2003 review of energy policy represents a change together in the first time. Now we have a better framework in place for joined-up policy-making."

"What might catalyse people to do something is a crisis where, or a feeling that it is worthwhile."

"It big heroes is that we need to lower our fuel bills and the security of political system. This would be a powerful motivator. Other motivators are e.g. tax raising to pay for research and investment."

"We need to be smarter about how we use the renewables available to us. UK. But as consumers we need to be encouraged to be more interested in using renewable supplies."

"We need clarity on gas. Whether we want it, we are going to have to import 10 to 20 per cent. The market is less structured than the market for OPEC). We can move to a situation where we are supply on the spot market."

"If we had been bolder in 2003, for example on renewable energy, we would be in a better position. As the EU, we would have more leverage with Russia and Middle East."

"The UK can not only reduce its own emissions but importantly also use its influence to help deliver international action towards, e.g. in the clean development mechanism."

"We need a sense of being in the same boat. Lots of people collaborating at this stage, but for me it is the way forward."

"Setting minimum standards for products delivered over time is a powerful tool for replacement, particularly very effective. It has to be technical, it has to be mandated and it allows people to make their own choices. It should be simple. It must transcend. And it must be what people want - as far as possible - at household scale."

Good Outcomes

A favourable outcome is one in which in 2050...

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"a threefold increase in transportation efficiency, all new buildings self-sufficient in energy, and more efficient transportation systems that reduce the necessary movement of goods and people (e.g. feeder flights)."

International markets are open and seen as fair

"A good scenario is where the 'Doors' so long as imperfections in the market are not abused by social policy rather than by market failures that distort the energy market."

"A good outcome would be that we have moved to a situation in which everyone has access to energy services have access to the benefits of owning energy services, and we developed wisely so that we do not place those through targets for developed countries."

"A favourable situation is that everyone is taking energy security and basic carbon issues the same by government, business and people. A global ETS would be transformative."

"A favourable outcome is that we have continued changes would be made to make efficient use of energy from someone else who is using energy inefficiently."

"I hope we can have a policy framework that allows us to understand how we expect the market to provide a reliable supply from a diversity of sources."

"A favourable outcome is that the UK's contribution to global energy moves in a market based way, so people are making decisions market based decisions"

Clean technologies have reduced the carbon impact of the fossil fuels in the mix

"A good outcome is that we have found a way to drive investment flows so that the market is cost effective, especially for carbon emissions, supporting economic flow from rich countries to poor countries to achieve this."

"A good outcome is a proliferation of low-cost, low-carbon technology and flexibility in the system to allow them to be introduced quickly as the new technologies emerge."

"A good outcome is that carbon catchment and storage work such that there are no climate change disruptions of fossil fuels."

There is global agreement on a declining path for carbon emissions, with the costs shared fairly and an effective global ETS.

"A good outcome is that there is a global emissions trading scheme."

"A good outcome is that we have some sort of global agreement on carbon emissions, supporting economic flow from rich countries to achieve this."

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"A clear policy for the UK government to encourage the development of other sources so that there would be no dependence on one sector."

"Imported gas for hydrocarbons - Kyoto mechanisms - real policy on energy efficiency (eg buildings) - serious decision on future of nuclear, tackling the issue of waste"

"The favourable scenario is an energy system that produces the energy we need, which could be quite substantial, but which produces it in a sustainable, renewable way."

There is plenty of energy available from diverse sources at affordable prices

"Renewable energy is a good outcome, rather than relying on finite resources. Many countries have access to sun, wind or wave."

"The mix of energy supplies will work internationally, including China and India, and will incorporate viable low technology."

"A good outcome would be that policy decisions would be made to create alternative energy sources, whatever they are."

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"A good outcome would be that all nations globally take climate change seriously and are willing to add costs and change behaviour. It would be good if the developed countries have to pay for the damage caused by the developed nations? Maybe countries which have benefited should have to help the developing countries to adapt to it and should you stay behind."

And individuals are committed to playing their part, and can see the benefits of doing so.

"In the positive scenario people get through to the consumer. We understand the risk of climate change, we support government policy and we change our habits as individuals."

"We should interfere in the way people want to live the lifestyles as little possible. There are some big problems if we fail to meet people's aspirations. Sustainability is not a lifestyle that people are wearing hair shirts and living in caves. For example, I enjoy guilt-free flying so am quite pro technical fixes."

"A positive scenario will allow our children and grandchildren in 2050 to have at least as good a standard of living as we do, if not better."

What this information means: The information above represents visually a number of interviews with senior UK civil servants and outside experts about the challenges of dealing effectively with energy security and climate change policy. The information is presented in a way that attempts to show the complexity of the issues and the interrelationships between the various factors. It is not a "cause and effect" diagram - though which policies must proceed in order to result in the possible good outcomes is important. It is not a "decision tree" - though it does show the "fork in the road" choices that need to be made. It is not a "Bayesian Network" - though it does show the interrelationships between the issues and the view of the policy process offered by those operating within it.

Warning: Beware of the map not being the reality. It does not show literal paths that a specific policy or group of politics must take in order to navigate the labyrinth. Indeed, it may well be that the map is wrong, that there are more paths than are shown, that some of the paths shown do not exist, that there are more "dead ends" than are shown, that there are more "traps" than are shown, that there are more "helpers" than are shown, that there are more thoughtful people with ropes & wood still raise moods difficult otherwise.

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