

Dear David,

Thanks for inviting Transition Network to take part in this call for evidence. In summary we believe that the evidence points to a future in which it will be impossible to address climate change while maintaining the energy intensive growth which has characterised the past ~200 years, and which informs current political thinking.

There is a huge challenge in balancing short-term policy with the imminent energy constraints which remain unimaginable to many. The requirements of sound energy policy are typically reduced in the press to the hackneyed phrase 'keeping the lights on', which is still largely taken to mean supplying as much energy as there is demand for. Yet there is no source of energy supply ready to step up, so we must instead adjust our energy demand to this reality. It is our view that this now-inevitable energy descent will require responses across all areas of policy as it is a change of huge social and political significance.

Of course Transition Network is not primarily a research body, so in terms of the hard numbers on oil availability, price etc, we refer you to the sources listed in the appendix. Our unique contribution may be to give evidence on the innovative ways we have developed for communicating the problem, the challenges inherent in getting people to take action, and giving examples of what it looks like when communities voluntarily reduce their energy use. We can also suggest policies that would assist in preparing for a lower-energy future which is perhaps more prone to outages or overloads.

Such policies might include:

- Tradable Energy Quotas (TEQs) to engender a sense of national common purpose in the energy descent and empower community responses. *We attach a pre-release copy of an All Party Parliamentary Report on Peak Oil policy report on TEQs (embargoed).*
- Incentives for personal and particularly community energy schemes (such as the Totnes Renewable Energy Society, recently launched in Devon by Transition Town Totnes).
- A transport policy strongly weighted towards alternatives to individual use of private cars.
- Policy measures to encourage greater fuel efficiency in freight movements.
- Promoting the value of pollution reduction as a result of fewer cars/fossil fuel power stations.
- Planning policies which encourage walkable accessibility to key services.
- Different models for buying/selling energy which encourage efficiency.
- Further increasing efficiency standards on appliances.
- Decreasing the maximum load requirements to the national grid by limiting the number of appliances which can run at one time and agreeing variable rates with businesses to reduce load during peak hours.
- Expanding the 'Big Society' agenda's focus on *localism* to also focus on *localisation*, an increasing meeting of local needs from local production, and an enabling of greater community ownership of their own key assets.

Work ongoing at Transition Network focuses on resilience, and on the need to expand our understanding of resilience beyond the way in which it is understood by government at present to also include peak oil, and the inclusion of the idea that resilience can be a desired state in itself and that building resilience to peak oil and climate change at the local level could be of significant economic benefit to communities.

Communication of the problem, and prompting action

A key problem in mobilising action on climate change and energy descent is the way in which it is usually communicated. The usual approach of “if we don’t change we’re in big trouble” has failed to engage and motivate the vast majority of people.

More successful has been the Transition approach of stating the facts clearly, but then focusing on the improvements we can make to our communities and our collective future if we act on our understanding promptly and positively. The development of desirable, realistic visions of the future to set alongside the bleaker stories is key to this. We are naturally drawn to work towards making these our reality. Shaun Chamberlin, author of *The Transition Timeline*, has written more on this here:

<http://www.darkoptimism.org/2009/04/15/the-transition-timeline-in-detail/>

As we have seen with climate change, however, this approach can be undermined when the facts are disputed. Well-placed media appearances can create the illusion that the jury is still out on the challenges that we face, and this is as true for our energy challenges as it is for climate science.

If the public perceive that there is uncertainty about the realities of our time, or that perhaps ‘science’ will produce some magical technology to fix our problems, the drive to individual and community action is seriously undermined. This in turn makes the technical challenges facing our engineers impossible, as no technology could keep up with ever-increasing energy demand.

Government is perceived as having a unique position of authority on such matters, and sets the frame for any debate, so it is important that the facts are clearly and consistently stated. An honest picture of a future that looks difficult generates a motivation to change it, as long as there is also a vision of what we can do about it. This is where Transition comes in.

What it looks like when communities voluntarily reduce their energy use

The above noted challenges in mobilising people notwithstanding, Transition has met with some success in exploring what community action on peak oil and climate change might look like. There are now 321 official Transition initiatives (169 in the UK) and another 219 who have been in touch to say that they are working towards that status.

The monthly roundups on Rob Hopkins’ Transition Culture site provide a good flavour of the actions taking place around the world:

<http://transitionculture.org/search/round-up>

A few selected highlights might include:

The Totnes Energy Descent Action Plan – a collaborative community-produced document laying out Totnes' 20 year plan:

<http://totnesdap.org.uk/>

A ten-minute film exploring the various projects in Transition Town Kingston:

http://www.youtube.com/watch?v=O3gFd6iiYJw&feature=player_embedded

An Italian local authority passing a radical strategic partnership with their local Transition initiative:

<http://transitionculture.org/2009/12/04/what-it-looks-like-when-a-local-authority-really-gets-transition-the-monteveglio-story/>

The Lewes pound – a successful local currency scheme:

<http://transitionculture.org/2009/07/29/the-lewes-pound-expands-with-the-most-beautiful-notes-youve-ever-seen/>

[Transition Network holds an annual conference, has published a number of 'how-to' guides for Transition initiatives, produced a film, and works to network the many Transition initiatives in such a way as to enable them to share their experiences.](#)

Appendix - selected evidence with regard to coming energy limits

Oil

In 2009 the IEA warned that "The projected increase in global oil output hinges on adequate and timely investment. Some 64 mb/d of additional gross capacity — the equivalent of almost six times that of Saudi Arabia today — needs to be brought on stream between 2007 and 2030". Fatih Birol, Chief Economist of the International Energy Agency, reiterated the warning on [German TV](#) on August 10th.

The tone of the IEA's June 2010 mid-term report by contrast claimed that supply side concerns were now "less intense" for the "next few years", although it does contain caveats around the "head winds" facing Iraqi production increases, economic impacts, geopolitical impacts, and the possible impact of greater regulation around off-shore drilling – about which it added in its August monthly report "Macondo places the ability of the industry to access important new reserves on a knife edge,". They also note that "some 30 per cent of existing global oil, and nearly 50 per cent of new supplies by 2015, needs to be sourced from offshore, much of it from deep water."

The premise that the world needs to bring vast amounts of new oil resources into production simply to keep producing at present levels is relatively uncontroversial. That there is a limit to how long production can increase is also fairly well accepted – for example, the evidence case made by Jeremy Bentham of Shell in the [UK Industry Taskforce on Peak Oil & Energy Security 2008 report](#) says that a plateau in 'easily accessible oil' could come this decade and that maintaining that plateau for oil and gas 'will become a serious challenge in the 2020s'. There remain however considerable differences in assumptions on how long current rates of production can be maintained as more oil comes from the difficult to access reserves.

The IEA remains a relatively optimistic commentator producing a forecast in which supply keeps up with rising global demand out to 2030.

Other recent reports to refer to, by way of comparison, would be the [UKERC Global Oil Depletion - An assessment of the evidence for a near-term peak in global oil production report](#) which concludes that there is a significant risk of a peak in conventional production before 2020.

An examination of the IEA 2008 World Energy Outlook by the [Uppsalla Hydrocarbons Study Group](#) - which questions many of the assumptions made about future production.

[The Oil Crunch: A wake-up call for the UK economy](#) - UK Industry Taskforce on Peak Oil & Energy Security (ITPOES) - 10 February 2010

It is also of note that with 10 million bpd of production coming from Saudi Arabia, the lack of transparency around the kingdom's reserves and depletion rates remains a significant supply side risk. In theory Saudi Arabia has the spare capacity to raise production in the case of a demand spike to 12.5 million bpd. During the 2008 oil price spike Saudi Arabia increased production by only .5 million bpd leaving global production almost flat.

David Strahan has a chapter on Saudi Arabia's oil reserves in his book *The Last Oil Shock*
A couple of articles which sum up the opaque nature of the Saudi energy picture are:
<http://blogs.ft.com/energy-source/2010/07/05/saudi-arabias-real-energy-problem/#more-75296>
<http://www.arabianbusiness.com/583355-market-to-absorb-spare-saudi-capacity>

Oil Price

The oil price is already extremely high (compared to the previous two decades). Should global demand continue to rise as predicted, then unless supply can increase in tandem, the price will rise. We anticipate this will happen even if there is no global recovery since in China, India and other developing nations oil demand will still grow (if at a reduced rate) even if the developed nations remain in recession. Such a situation could hit the UK public particularly hard via food and fuel price increases, even though the impact on the economy as a whole might initially be offset by increased domestic oil revenues.

We assume that it is likely that energy prices have an inbuilt ceiling (except for short-term spikes) at which point economies can't afford the fuel and power down – thus going into recession, and that this cycle is likely to repeat with increasingly damaging effect.

Some reports about the economic impact of peak oil
[Causes and Consequences of the Oil Shock of 2007-08 - 638Kb](#) - James D. Hamilton, Department of Economics, UC San Diego
[Sustainable Energy Security Strategic risks and opportunities for business - 1418KB](#)
Chatham House-Lloyd's 360 Risk Insight - June 2010

Coal

It has already been determined that meeting UK carbon emissions goals will require the development and adoption of CCS if coal is to be retained as a fuel. This, even if proven commercially viable, will increase the cost of using coal, and will also reduce its energy efficiency, since current estimates are that around 25% of the energy produced by the power station would be used in sequestering 90% of the emissions.

The other problem is that a wide range of bodies have accepted that carbon capture and storage can't deliver on a big commercial scale until at least 2030. We cannot solve today's energy problems with tomorrow's new technologies

World Business Council for Sustainable Development, 2006. Facts and trends – Carbon Capture and Storage, 2006. <http://www.wbcsd.org/web/publications/facts&trends-ccs.pdf>
Shell is quoted in Fred Pearce (2008), "Can coal live up to its clean promise?", New Scientist, March. <http://www.newscientist.com/article/mg19726491.500>
United Nations Development Programme, 2007. Avoiding Dangerous Climate Change: Strategies for Mitigation, Human Development Report, 2007/2008, pp145-146
Massachusetts Institute of Technology, 2007. The Future of Coal, 2007.
<http://web.mit.edu/coal>
IPCC, Special Report on Carbon Dioxide Capture and Storage, 2005,
<http://www.ipcc.ch/ipccreports/srccs.htm>

While global coal resources are still vast we would also like to bring your attention to some reports & commentary which point to further risks around the economic viability of coal for the UK in the near future.

Energy Watch Group, Germany

http://energywatchgroup.org/fileadmin/global/pdf/EWG_Report_Coal_10-07-2007ms.pdf - estimates coal production peak by 2025-30.

Effects of growing demand in China/India - <http://www.postcarbon.org/article/96251-china-s-coal-bubble-and-how-it-will>

[Sustainable Energy Security Strategic risks and opportunities for business](#) - Chatham House-Lloyd's 360 Risk Insight - June 2010

Selection of reports on the future of coal:
<http://www.theoil Drum.com/node/2726>

Gas

According to the IEA 2010 mid-term report “Of course, depletion from existing fields is an issue in gas just as for oil. Decline rates, estimated at between 5% and 7.5% per year, mean that nearly half of the world's gas production needs to be replaced between now and 2030.”

Remaining conventional gas reserves are largely concentrated in Russia, Iran and Qatar. The UK government/European Union appears to be well aware of this in its current energy policy. LNG and unconventional gas hold out promise that gas resources can be expanded and more easily transported, thus allowing gas to be relied on as a ‘transition fuel’. However with gas demand rising globally, can production be safely ramped up to meet this new demand?

An analysis of the gas supply demand/assumptions in the IEA mid-term report with reference to Europe - <http://europe.theoil Drum.com/node/6803#more>

A report on gas demand in China – http://www.ukerc.ac.uk/support/tiki-download_file.php?fileId=283

News paper report on gas import/export strategy in the Middle East - <http://gulffnews.com/business/oil-gas/it-s-time-to-rebalance-gulf-gas-strategy-1.643434>

Chris Vernon, of The Oil Drum and the Centre for Sustainable Energy, has also highlighted that if 3% of the natural gas supplied leaks into the atmosphere, the global warming potential of a kilowatt-hour of electricity from gas is equivalent to that of coal-generated electricity.

<http://www.theoil Drum.com/node/6638>

It is hard to find good figures on UK leakage rates, but something around 1-2% seems plausible.

Nuclear

Building new nuclear will be a huge investment but is seen by many as key to meeting carbon reduction targets. Consideration of safety concerns, economic viability (no subsidies - presumably this time including decommissioning costs) notwithstanding, it only makes sense if sufficient fuel is available for the lifecycle of the plant.

With the decline of secondary sources of uranium (from weapons decommissioning etc), the nuclear industry is becoming more reliant on mined uranium. The 'Red Book of Uranium' claims that known reserves are sufficient to power the current fleet for at least 100 years – however demand is likely to be well above current global demand as the developing nations increase their nuclear capacity.

As a note of caution we would draw your attention to research by Dr. Michael Dittmar:
<http://europe.theoil Drum.com/node/5744>.

And by Dr. David Fleming:

<http://www.theleanconomyconnection.net/downloads.html#Nuclear>

Finally, with peak oil likely to put severe strain on the economy in coming decades, increased risk of shortcuts around safety and maintenance and decommission costs in a constrained economy should also be considered.

Biofuels

Biofuels are of course already making up a part of the UK energy mix. The [Zero Carbon Britain 2030](#) report presents a scenario in which this share is increased through significant shifts in land-use patterns.

However, there are obviously many factors to take into account here, such as competition with food production, GHG emissions, particulate pollution and sustainable sourcing (especially in an oil constrained future).

Renewables

Renewables have their own resource challenges which mean that replacing the current power load with renewables alone is not going to happen – your own book compares the amount of steel & concrete needed to produce 48kWh of power per day/person in the UK via off-shore wind versus nuclear and the inherent challenges with that. Rare earth metals are also required and will need to be either negotiated from China or sourced from elsewhere. Dealing with distributed rather than centralised power production is a huge paradigm shift presenting infrastructure challenges.

Yet the potential is large, and we note that you have endorsed, for example, the Public Interest Research Centre's Offshore Valuation report:

<http://www.offshorevaluation.org/>

New technologies – unconventional gas and coal

There is a general question that must always be asked with regard to energy sources that are proposed to contribute in a significant way to energy supply. Bearing in mind that it is flow rates, not ultimate reserves, that define the peak oil problem, what we need to know is how much net energy can be made available each year by a given source, starting when (and then, secondarily, at what price).

This information has not yet come to light with regard to the latest supposed superabundant energy sources, such as shale gas and underground coal gasification.

There are a few concerns about these sources that might usefully be noted, however:

UCG

UCG has its inherent problem of underground fires potentially burning out of control. These can release vast amounts of carbon and be essentially unstoppable. Despite assurances that these are easily dealt with, the famous Centralia fire in the US has been burning since 1962, and underground fires in China are reckoned to have already reduced their mineable coal resource by almost a fifth. As with coal, the usefulness of UCG is also entirely predicated on energy efficient, reliable CCS technology.

Shale gas

There are of course increasing concerns about ground water pollution caused by 'fracking', but there are also questions being asked about the real size of the recoverable resource:
http://www.declineoftheempire.com/2010/04/natural_gas_boom_gets_put_on_hold.html
<http://www.declineoftheempire.com/2010/04/a-miracle-in-the-marcellus-shale.html>
http://energyandourfuture.org/tag/shale_gas