PEER REVIEW COMMENTS ON DECC'S PRICE PROJECTION PROFESSOR PAUL STEVENS CHATHAM HOUSE 31st July 2015

The revised draft of the price projection is much improved and you have managed to address most of my initial concerns. The range of future crude oil price projections reflects plausible variability in underlying long-term price drivers and the inherent uncertainty in the market, both over the medium and long terms. A few concerns remain, although in general these would be difficult to accommodate given the nature of the exercise. I list them below under the relevant headings:-

<u>Transparency/clarity</u> – this version now makes much clearer the basis of the analysis and the underlying assumptions. It is clear that this is not and was not intended to be a dynamic supply and demand model but a much simpler approach focused on long term crude oil prices by intersecting the demand assumptions taken from the IEA with the supply curve taken from the Rystad data. This approach has the virtue of simplicity and it would be hard to argue that a more sophisticated modelling approach would produce results that might carry greater credibility.

<u>Feedback loops</u> – This is a key issue in the approach. However, it is reasonable that the paper is not trying to incorporate short and medium term volatility and so it is difficult to incorporate feedback loops except in terms of very general trends. Thus the paper is not trying to model price cycles since it is based upon a long run fundamentals approach based on estimates of the cost structure of production. However, it is good that you at least point out in paragraph 15 some of the volatility issues. All such projections based upon straight lines on graphs are flawed because the reality will be very different and this is well known and understood. There can be no other way of creating long-term projections without using very heroic assumptions. The best that can be hoped for is that the straight lines reflect elements of trends. Discontinuities cannot effectively be incorporated into the projections.

<u>Use of LRMC equilibrium</u> –. This is now much better addressed in this draft and you now make explicit the levels of production assumed from OPEC.

<u>Use of futures prices</u> – I pointed out that all the empirical evidence suggests that 'futures prices' are unbiased but very imprecise indicators of future price. This point has been reinforced in the new text and the reality is that the IEA and other organisations use this approach imparting legitimacy of a sort.

<u>Scenarios vs projections</u> – I had serious problems with your use of the term 'scenarios' in the first draft. This has now been addressed satisfactorily and you now make clear that the paper is based upon alternative price assumptions derived from plausible alternative long-run fundamentals.

There have also been a number of other improvements addressing my original concerns. Thus you have added some comparisons of others' demand projections and prices to provide a broader context. You have also given a clearer exposition of how the Rystad methodology translates exploration into production.