



2050 Pathways Call for Evidence Coordinator
Department of Energy and Climate Change
3 Whitehall Place
London
SW1A 2AW

Dear Sir/ Madam,

2050 Pathways Analysis: A Call for Evidence

InterGen read the 2050 Pathways Analysis document ("the Analysis") with great interest and this letter sets out our response on the issues and conclusions reached. InterGen has focused particularly on the following question from the consultation:

Input Assumptions and Methodologies:

(g) Could the relative roles of coal and gas out to 2050 vary from the assumptions shown in this work, and if so, how?

In each of the six pathways presented in the Analysis, there is a requirement for very substantial fossil fuelled back-up capacity (approximately equal to installed renewable capacity) to meet the challenges of balancing the electricity grid. It is assumed that these assets will be dispatched at low load factors. InterGen would urge further detailed consideration of this assumption: to sustain these high levels of backup capacity, such capacity must be economic for its owners. The present energy-only market does not provide sufficient revenues and will need to be changed such that a value for capacity is realised by the plant owners in addition to the payments for energy. InterGen believes that the Energy Bill and Market Reform proposals from DECC this year must fully address this issue if necessary additional thermal generation is to be attracted into the market. Failure to address the issue now is likely to cause a boom-bust cycle of underbuild – high prices – high build which is far less economically desirable than steady price signals and the resulting progressive build programme.

InterGen believes that the Analysis should treat Carbon Capture and Storage (CCS) on coal and gas plant separately. There are three key input parameters in our thinking:

1. The difference in carbon emissions rate from the two fuel sources is large: a present generation coal plant emits 2.2 times the amount CO₂ for a unit of electricity compared with a new CCGT plant;
2. InterGen anticipates that there will be a step change in global gas reserves as shale gas is exploited in the coming decades and therefore there is no strategic need for coal-gas fuel diversity; and

3. All scenarios in the Analysis (other than the reference case) feature very large increases in electricity demand. A common factor across the scenarios is the need for very substantial new flexible thermal generation to be developed and constructed.

Clearly the first step with CCS must be commercial scale demonstration. InterGen supports the present proposed UK CCS demonstration programme but with the caveat that at least one of the four demonstration projects must be gas fired. This is crucial because of carbon emissions from flexible thermal generation plants prior to CCS being fully proven and widely installed. In a study by Shell (Shell World Energy model, July 2010) in which gas generation replaced coal over 2011-17 compared with a baseline of running existing coal until CCS is fitted in 2020 (gas CCS in 2025), the gas replacement scenario saved UK carbon emissions of 1 gigatonne. Ensuring that one CCS project is gas fired will support the existing economic preference for CCGT build and in so doing should substantially reduce UK carbon emissions prior to widespread CCS introduction.

In order to provide a level playing field and enable coal developments for those who believe the economics to be favourable, InterGen supports the application of an Emissions Performance Standard such that the emissions rate of a coal plant is limited to the same level as a present generation (F class) CCGT. InterGen believes that CCS would need to be fitted to half to 2/3 of the units of a new supercritical coal plant to achieve this.

InterGen would also urge DECC to consider further the intermittency assumptions in the Pathways document. In order for to plant to run intermittently as the Analysis suggests (fossil-fuelled plants with CCS balancing rapid wind generation changes and balancing unmanageable demand variations), very fast ramp rates will need to be achieved. The Analysis makes the assumption that CCS will not impede this flexibility but InterGen believes this is far from certain. Should CCS impede plant flexibility, it is possible that CCS will have to be switched off during ramps. Switching off of CCS during ramps would clearly have much lower carbon consequences with a gas fired CCS CCGT than with a CCS coal plant, given their relative carbon emission rates.

As with the introduction of any new technology, it should be anticipated that the technology and the sector will take a long time to mature. The Analysis presumes that large scale CCS will come on stream by 2025 (except in the pathway Beta analysis). However, InterGen considers it unlikely that CCS plant will be able to operate as the Analysis assumes until perhaps as late as 2040.

Wind energy and wind turbine design have been developing for 30 years and still require a direct subsidy to be constructed and operated. There has been no proposal to subsidise CCS beyond the initial four demonstration projects. InterGen believes that the Analysis should be extended to consider the economics of CCS coal and gas plants and the market changes which would be required to make such plants economic for their owners. To the extent a mechanism to value capacity is already necessary to bring forward new

back-up thermal projects when the forecast load factors are low, such a mechanism will be of even greater importance when the capital and running costs of CCS are taken into account.

It is evident that meeting the challenge of reducing greenhouse gas emissions by 80% by 2050 is significant. InterGen urges the Government to act swiftly on regulating for change in order that investment decisions can be made on a stable and enduring basis. Currently, the future of the energy sector is facing the biggest change since the introduction of NETA in 2001 as we anticipate market reform in the upcoming Energy Bill and measures to meet the greenhouse gas challenge. Until that future is made clear, electricity generation companies will find it increasingly difficult to attract backing from largely foreign boardrooms.

In conclusion, InterGen fully supports the Government's commitment towards 2020 and 2050 emission targets. In seeking the most effective way to achieve this, InterGen's key concern is that the present forward market energy prices do not on their own incentivise the necessary new build of lower load factor gas-fired generation. Hence a market reform is urgently needed and becomes even more critical when CCS economics are considered, to support the levels of investment required in flexible generation.

Yours Faithfully,



InterGen UK Ltd.