

FAIRLIE COMMUNITY COUNCIL

RESPONSE to THE SCOTTISH GOVERNMENT

ERECTION OF MULTI-FUEL POWER STATION ON LAND AT HUNTERSTON TO SOUTH OF FAIRLIE

ADDENDUM REPORT



2011 Coal Burn Plume

PROPOSED MULTI-FUEL POWER STATION AT HUNTERSTON

1 Introduction

- 1 In August 2010 Fairlie Community Council (FCC) submitted to the Scottish Government a response to the planning application by Ayrshire Power Limited (APL) to construct a 1,852 Mw multi-fuel power station on land at Hunterston to the south of Fairlie. A similar response was submitted to North Ayrshire Council (NAC) following a Consultation Request from that authority.
- 2 FCC has now received and reviewed the July 2011 Addendum to the Environmental Statement (ES) and submits this response to that Addendum. To assist with its response FCC has had a sixth meeting with APL and asked questions of and received responses from APL by letter and e mail. FCC again acknowledges the assistance of APL in providing information to FCC about the proposed development.
- 3 Having considered the Addendum and the further information provided by APL, and taking account of the views of professional advisers and the Fairlie community, FCC would inform Scottish Ministers that FCC **MAINTAINS ITS OBJECTION** to the granting of planning consent.

2 Format of FCC Response to Addendum

- 1 The July 2011 Addendum has been prepared by APL in response to the consultation responses to the June 2010 ES, in particular the response by SEPA as contained in SEPA's letter to the Energy Consents Unit dated 15th October 2010 (Appendix N of the Addendum). FCC's response to the July 2011 Addendum takes account of the issues raised by SEPA and the extent APL has responded to these. In this regard it is noted that the response of SEPA to the Addendum is not in the public domain at the time of preparing the FCC response (29th September 2011). As much of the content of the Addendum is of a very technical and specialist nature FCC is at some disadvantage in not having the SEPA response. FCC therefore reserves the right to submit further comment to the Energy Consents Unit after the SEPA response to the Addendum has been reviewed.
- 2 This response should be regarded as supplementary to the August 2010 response. In this regard FCC notes that the October 2010 SEPA response and the July 2011 Addendum raise new issues relating to public health. FCC has therefore written to Health Protection Scotland and NHS Ayrshire and Arran seeking certain assurances that these issues are being fully investigated. At the time of preparing this response the response of the two health authorities to these new issues is not yet available. FCC would therefore again reserve the right to comment further when these responses are in the public domain.

3 Air Quality and Health

- 1 FCC is pleased to note that the concern expressed by FCC to APL at their first meeting about the potential difficulty of modelling by computer the dispersion of flue gas emissions from the proposed power station has now been recognised by both SEPA and APL. It is regrettable that these concerns were not acknowledged at an earlier stage in the assessment procedure. The presence of high ground downwind of the prevailing wind direction clearly presents problems in accurately predicting flue gas dispersion. As such FCC notes the discussion in Chapter 2 and Annex B about the merits of two different 'state of the art' dispersion models and the comment that terrain effects do increase the level of uncertainty in the modelling results. FCC is very concerned that there would still appear to be considerable uncertainty about the accuracy of air quality modelling at the Hunterston site.

- 2 FCC remains concerned about the inability of the dispersion modelling to accurately predict the concentrations and deposition patterns of flue gas emissions, particularly during periods of calm weather. It is noted from Annex E that no detailed studies have been undertaken of calm weather modelling and that conclusions relating to local impacts in calm conditions are based only on assumptions. This approach is not acceptable to FCC.
- 3 It is understood that when in full operation the proposed power station will produce between 40,000 and 67,000 tonnes of fly ash per month. It is stated in Section 9 of Volume 1 of the ES that a reliable high level removal of particulates of 'typically 99%' can be achieved in a modern power station although in Annex G of the Addendum it is claimed that 99.96% of fly ash generated will be removed from the flue gases. Assuming 40,000 tonnes per month of fly ash collected, and 99.9% capture, a minimum of 40 tonnes would release to air each month. It can reasonably be assumed that almost all of this quantity would comprise the micron size particles which can pose a known health risk if ingested. FCC is concerned that the modelling does not reliably indicate the impact of this release on Fairlie.
- 4 FCC notes from Table 3.9 of Chapter 3 of the Addendum the very considerable increase in the existing concentrations of substances that will result from the proposed power station emissions. The concentration of such substances as sulphur dioxide, ammonia, hydrogen fluoride, chromium and mercury will all be increased many times over existing background levels. While it is noted that the concentrations predicted for the operating power station will be below current PEC levels the increase from very low or negligible background levels means a significant reduction in existing air quality. This should be acknowledged and highlighted by APL and is a major concern of FCC.
- 5 The overall conclusion of FCC's review of the additional air quality modelling is that there remains considerable uncertainty about the accuracy of the emissions input to the dispersion modelling and the dispersion modelling, and the resulting impact on air quality and public health. FCC believes that for a major development in 2011 of the type proposed by APL the level of uncertainty is still too great as to give confidence that the potential adverse impacts have been adequately predicted.
- 6 FCC notes that the response of APL to the acknowledged uncertainty in the emission modelling is to increase the height of the flue gas stack to about 200 m, ie 50 m higher than originally proposed. It is noted that in Annex C it is stated that 'a stack height of 200 m will result in a process contribution less than the air quality standard, even taking into account the upper uncertainty limit of three times the modelled concentration'. FCC does not accept that simply increasing the stack height provides the required certainty about no significant adverse impacts on air quality and health.
- 7 FCC notes the conclusions of Annex G of the Addendum in relation to health risks from radionuclides associated with fly ash. However, FCC is concerned that the NRPB study is now 10 years old and therefore questions its applicability to a new thermal power station that will burn a range of imported coals. FCC would expect Scottish Ministers to be fully satisfied that the 2001 NRPB report remains relevant.
- 8 FCC is well aware that the emission and air quality issues are not only very important but also very complex. FCC therefore expects both SEPA and the health authorities to give the most professional and expert advice to Scottish Ministers on these issues. Thereafter FCC would expect Scottish Ministers to be able to give binding assurances to those living and working close to the proposed power station that there will be no adverse impact on air quality and human health.
- 9 FCC notes that the emissions will require to be consented by SEPA. It is aware that if the power station is constructed it will supply a high proportion of the base load power demand of Scotland. It is therefore very difficult to envisage a situation whereby the power station would be required to shut down if it was found to be in breach of its consents. **Scottish Ministers must be fully satisfied before granting any consent that the power station can be operated safely, and have the ultimate responsibility for that decision.**

4 Carbon Capture and the Amine Process

- 1 FCC notes from the Addendum and other scientific literature that the most likely method of carbon capture to be employed in the proposed power station is that involving the use of amine solvents. FCC recognises that this method is widely used, but not as yet on a large scale in a coal fired power station. FCC has attempted to research the latest scientific literature on this subject as well as considering very carefully Annex F of the Addendum.
- 2 It is FCC's understanding of this very complex and relatively new area of chemistry that the use of amine solvents in the carbon dioxide absorption process has been shown to result in amine degradation products, including nitrosamines and nitramines. FCC understands that both these products are carcinogenic and as stated in Annex F have caused concern about their potential environmental and health impact. It is thus of major importance to FCC that there is full and complete understanding of the potential for amine degradation and the effect on health if the amine process is to be used at the proposed power station for the required 300 Mw equivalent carbon capture.
- 3 FCC notes that APL states (para 2.1.4.3) that 'at the present time (2011) we have no quantitative data on the likely concentrations of amine and amine degradation products in the post-CCS flue gas'. In Annex F it is noted (section 6) that none of the technologies for measuring the concentration of degradation products is currently (June 2011) capable of measuring on a real time continuous basis the concentration that could impact on human health – the report stating that 'there is no method yet available for sampling/analysis of these species (nitramines and nitrosamines) in flue gas'. FCC also notes that there is currently no accepted maximum permissible concentration of these species in the United Kingdom in relation to human health. As stated at the end of section 7 of Annex F 'there is still a significant knowledge gap'.
- 4 FCC is aware that there is considerable research being undertaken both in the UK and elsewhere into the potential health impacts of the use of the amine process for carbon capture on large scale coal fired power plants. FCC agrees with APL that it is an issue on which sound knowledge and clear guidance must be produced. FCC is very far from convinced that the required knowledge and guidance, and the resulting regulatory controls and assurances, are currently available. A reasonable summary of the present situation would appear to be that (i) it is not known how much of these carcinogenic substances will be emitted by the proposed power station, (ii) it is not known what maximum concentration is acceptable, and (iii) it is not known how to measure the concentrations as to be able to control the processes.
- 5 It is noted that in both the main body of the Addendum and in Annex F it is stated that the potential health and environmental impacts of amine degradation 'are believed to be minimal'. FCC does not accept that a 'belief' is in any way adequate as a way of addressing a health issue that is critical for those both living and working close to the proposed power station. FCC thus **objects** to the application in relation to the proposed method of carbon capture until such time as internationally recognised standards and methods of measurement are available, and precise knowledge is provided about the potential release of these carcinogenic substances by APL. The health of Fairlie residents cannot form part of a carbon capture trial or demonstration!
- 6 Again FCC has requested SEPA, Health Protection Scotland and NHS Ayrshire and Arran to consider this issue. Until these agencies are fully satisfied that the carbon capture process presents no health risk to those living and working close to the proposed development then FCC believes that consideration of the APL application by Scottish Ministers is **premature**.

5 Landscape and Visual Impact

- 1 The increase in the stack height of the proposed power station to about 200 m significantly increases the number of locations within the FCC area from which the stack will be visible. FCC is aware that visual impact is a subjective consideration. FCC notes that APL considers that in relation to Fairlie the visual impact of the proposed structures will now be 'substantial' (Addendum, Chapter 6). FCC considers that the impact from all receptors within Fairlie will be substantial and adverse. FCC would again draw the attention of Scottish Ministers to the findings of the Reporter in relation to an earlier application to construct wind turbines of approximately half the height of the raised stack on the Hunterston site in relation to unacceptable visual impact.
- 2 It is noted that a visible plume will be emitted from the stack for approximately 29% of the year, ie for about 105 days each year. Unlike the stack the plume is dynamic and thus forms a significant addition to the visual impact. Neither the ES nor the Addendum include any representation of the plume. FCC has requested APL to undertake such a representation using well-established computer modelling (FCC has access to a program which has been used to simulate the rotational effect of wind turbine blades that can be readily adapted) but APL has declined to do so (see correspondence between FCC and APL dated 18th and 25th August 2011 as available on North Ayrshire Council planning website). FCC considers that without such visual representation of the plume the Addendum is **deficient** in that it does not provide a true visual representation of the proposed operational power station.
- 3 FCC notes that there is no way of mitigating the visual impact of the revised stack and therefore **maintains its objection** to the development in relation to visual impact.

6 Waste Material

- 1 In its response to the 2010 ES FCC expressed concern about the disposal of ash and gypsum waste arising from the combustion and carbon capture processes. FCC has subsequently discussed this aspect with APL and is pleased to note that should Scottish Ministers be minded to approve APL's application then APL will be prepared in principle to accept a planning condition that would require all ash and gypsum to be removed both from the application site and the wider Hunterston Industrial Area by rail. This assurance removes the previously expressed concerns of FCC about further loss of the intertidal area to ash lagoons, and the potential for the release of ash to air from local disposal.
- 2 FCC would ask Scottish Ministers to **note** this agreement and to agree its implementation should planning consent be granted.

7 Rail Noise

- 1 FCC considered that the 2010 ES was deficient in that it failed to include reference to possible noise from trains using the rail line running into the Hunterston site close to Fairlie. FCC is content to note that APL subsequently arranged for a full scale train noise test, the results of which have been reported to Scottish Ministers and North Ayrshire Council.
- 2 Analysis of the report on behalf of FCC by specialist noise consultants indicated that the measured noise levels, taken during day time and analysed on that basis, were likely to exceed acceptable night time noise limits if the train movements were to occur at night, and a report to this effect was also submitted to Scottish Ministers and North Ayrshire Council.

- 3 As it is at present not yet clear as to whether train movements into and out of the power station site will occur at night, FCC is pleased to note that APL has agreed that if such movements are probable then a further full scale test will be undertaken during night time (see APL/FCC correspondence of August 2011). Should measured noise levels exceed allowable limits then appropriate management measures would be implemented. APL has confirmed that should Scottish Ministers be minded to grant planning consent then APL would be prepared to accept a planning condition to this effect. FCC welcomes this commitment by APL and asks that it be **noted** by Scottish Ministers..

6 Waste Heat

- 1 FCC notes that the proposed power station will produce a very large quantity of heat that will be removed from the plant by sea water circulated through the steam condensers. In very broad terms approximately half the heat equivalent of all the coal combusted will be discharged to the Firth of Clyde as warmed water. No beneficial use is proposed for this heat. FCC expressed concern in its response to the ES that the ES contained no reference to the possibility of making some use of this heat within Fairlie. FCC also notes that in its October 2010 response to the ES SEPA advised that 'the development will not meet the expectations of the guidance applicable to thermal waste treatment systems' but advised that 'the applicant (APL) has undertaken to continue to explore the possibility of adopting combined heat and power configurations in the future'.
- 2 FCC is very disappointed to note that the Addendum again makes no reference to any continued exploration of the possibility of utilising some of the heat created by the power station beneficially within Fairlie and other nearby communities. This issue was therefore raised in meetings and correspondence with APL. The response of APL is contained within its August letter to FCC.
- 3 FCC acknowledges that there are cost and technical implications for utilising heat not required for electricity generation or carbon capture other than for warming the sea. However, this is 2011 and with approximately half the energy supplied to homes in Scotland being used for heating, and with the rapidly increasing cost of heating sources, it is difficult for FCC to accept that within a few kilometres of homes and businesses the equivalent of half the cargo of each coal ship discharging at Hunterston will in energy and financial terms be thrown away in the cooling water flowing to the Clyde.
- 4 FCC would request Scottish Ministers to require APL to undertake a fully costed study of how heat from the proposed Hunterston plant might be used beneficially, and to compare these costs with the benefits that would result both locally and to the wider Scottish economy. **No modern national energy policy can be credible with a situation where a new state of the art thermal generating plant offers no beneficial use for its otherwise wasted heat.**

7 PPC Regulations

- 1 The proposed power station site will require to be authorised by SEPA under the Pollution Prevention and Control (Scotland) Regulations. These Regulations will result in it being designated as a Part A site. However, the adjoining coal unloading jetty and stockyard are currently designated as a Part B site. This means, for example, that a coal stockpile within the power station site will require to conform to the requirements of Part A of the Regulations while coal stockpiled on an adjoining area just outwith the site, in the existing Clydeport Terminal, is subject to Part B requirements.
- 2 FCC considers that such a situation would result in considerable difficulties for the operators, regulators and public with regard to monitoring and enforcement. FCC would therefore **request** Scottish Ministers, should they be minded to approve the application, to redesignate the existing coal unloading and storage

facility at Hunterston as a Part A site. Such harmonisation should result in stricter controls of fugitive emissions from the existing coal handling and storage, which continue to be a source of concern to Fairlie residents.

8 Mitigation

- 1 Since the presentation of the 2010 ES FCC has continued to press APL to consider non-financial mitigation/compensation for the further loss of foreshore and other land currently used by local residents and visitors for informal recreation. FCC is well aware that APL is ultimately within the same ownership as the owner of a very large part of the Hunterston Industrial Area. While noting APL's reasons for not bringing forward any proposals as stated in the August correspondence, FCC is very disappointed that APL is still unwilling to include in its proposals physical works such as those undertaken by the former British Steel which have been advantageous to FCC residents and others, and which in a small way would provide recreational and environmental enhancement to offset the many adverse impacts of the proposed development.

9 Regulation

- 1 The proposed power station will be the largest industrial plant constructed in Scotland for many years and the first new coal-fired power station to be built in the UK in over 40 years. It will involve many new processes with the potential for harmful emissions to air and water, as well as the potential to create odours and noise. All of these potential impacts will require to be regulated and should the power station be built, monitored and controlled. The responsibility for such regulation will lie with SEPA.
- 2 It would be expected that many aspects of the development, should it be consented by Scottish Ministers, will be subject to planning conditions. It is expected that the responsibility for ensuring that these conditions are complied with will lie with North Ayrshire Council.
- 3 Regulation and compliance will continue throughout the operating life of the development. FCC is very concerned, given the unsatisfactory history of regulation and compliance in relation to all the existing energy related developments at Hunterston, that adequate resources, financial and technical, will be available to ensure that all planning conditions and emission constraints are effectively enforced. FCC, and Fairlie residents in general, have seen a long history of inadequate monitoring, control and enforcement relating to the nuclear power stations, marine construction yard, and coal terminal, and have little confidence that future experience with the proposed coal fired power station will be any different.
- 4 Should Scottish Ministers be minded to grant planning consent, therefore, FCC will seek very firm assurances that sufficient independent resources will be made available to ensure full compliance with all conditions and consents.
- 5 As previously mentioned, FCC has difficulty in envisaging a situation whereby regulators would shut down the proposed power station if conditions and consents were breached. Can Scottish Ministers give an assurance that the health and amenity of those living and working close to the proposed power station will at all times take priority over the generation of electricity?

10 Summary

- 1 Following the submission of the June 2010 ES FCC has engaged in further discussions with APL, SEPA and the health protection agencies, sought specialist technical advice, and considered the July 2011 Addendum. As a result FCC has gained increased understanding of the application and its implications

for the Fairlie community. FCC would acknowledge the assistance provided by APL.

- 2 The main concern of FCC in relation to the APL application (accepting that it is an NPF2 development) relates to air quality and health issues. Unfortunately FCC is not convinced that the additional studies undertaken by APL at the request of SEPA and as described in the Addendum demonstrate that the emissions from the power station stack, even with the increase in height, will not result in a significant reduction in the existing very high air quality in Fairlie. FCC notes in particular the difficulties of credible dispersion modelling resulting from the local terrain and the considerable uncertainty about the concentration and nature of the stack emissions both with and without carbon capture.
- 3 FCC notes the developing concerns relating to the health aspects of the potential degradation of the amine solvents likely to be used in the carbon capture process and the possible production of carcinogenic nitramines and nitrosamines. FCC notes that at present APL is unable to quantify the possible release of such substances, that there is no known method of real time measurement of concentration that could adversely impact on human health, and that as yet there is no regulatory agreement in Scotland as to an acceptable maximum concentration. FCC does not believe or accept that those who live and work close to the potential source of these substances should be part of any trial or demonstration until such time as firm assurances can be given that there is no health risk. Until such assurances can be given by Scottish Ministers then FCC considers that the APL application is premature.
- 4 Due to the technical complexities of emissions FCC relies on the advice provided to Scottish Ministers by SEPA, Health Protection Scotland and NHS Ayrshire and Arran. It is unfortunate that in relation to the Addendum this advice is not available to FCC prior to preparing this submission. As such FCC reserves the right to comment further when that advice is available.
- 5 FCC notes that because of modelling uncertainty APL now propose to increase the stack height to around 200 m. In the opinion of FCC this will result in substantial and adverse visual impact from many more locations within Fairlie. FCC is disappointed to note that APL has declined to include in the visual impact assessment the plume that is predicted will be emitted from the stack about 105 days each year. FCC has experience of both static and dynamic visualisations and would consider that the latter is much more important for the realistic representation of the stack's visual impact.
- 6 FCC acknowledges the acceptance by APL of possible planning conditions relating to disposal of ash and gypsum, and to night time rail noise.
- 7 FCC continues to be disappointed that in the 21st century a proposal for a new thermal power station will result in approximately half of the heat equivalent of the combusted coal being discharged to the Clyde as warmed water. With around 50% of household energy being used for heating, and with steadily rising energy costs, FCC fails to understand why some beneficial use cannot be made of the condenser coolant and other heat sources. FCC would ask that Scottish Ministers require APL to produce a detailed technical and financial study of the costs and benefits of providing heat to Fairlie and other nearby communities.
- 8 FCC would urge Scottish Ministers to ensure that both the proposed power station site and the existing coal handling and storage facility which will supply fuel to the proposed power station come within Part A of current pollution control regulation, or its future equivalent.
- 9 FCC continues to be disappointed that APL is unable at this time to propose any physical mitigation or compensation for the likely loss of foreshore and other land currently available for informal recreation.
- 10 FCC has poor experience of effective regulation and control of existing energy related developments within the Hunterston Industrial Area. FCC would therefore expect that Scottish Ministers are fully satisfied that sufficient technical and financial resources will be available over the operating life of the power station to ensure that all consents and conditions are fully complied with, and would expect an assurance to this effect should the development be consented.

- 11 In conclusion, FCC remains of the opinion that the design and operation of the proposed coal fired power station, including the carbon capture process, has still not been sufficiently developed as to provide confidence in relation to the effective management and control of potential health and environmental impacts as these would affect the Fairlie community. **FCC therefore maintains its objection to the proposed development.**

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