



SUMMARY

In common with other Trade Associations, the British Cement Association has experienced considerable difficulties in working with Defra/Dti consultants Entec as a result of their shortcomings in a number of areas:

- the lack of technical understanding of the sector;
- poor management of their brief;
- frequent changes in their requirements;

BCA is anxious to provide government with the data it requires for Phase II EU ETS and has endeavoured to work with Entec. However, it has reached a point where Entec's unstructured demands and inexperience necessitates the intervention of Defra/Dti in order that the work is completed for government.

In conjunction with its Member Companies, BCA has produced the attached document which:

- summarizes the criteria upon which the Phase I spreadsheet was drawn up;
- makes proposals as to how these can be applied to the Phase II spreadsheet.

BCA and its Member Companies have the requisite information with which to proceed with these proposals. If these proposals are not acceptable, the BCA believes that the only way forward would be a tri-partite meeting between BCA, Entec and Dti/Defra. In view of Entec's inexperience, we feel that Dti/Defra might benefit from the presence of FES.

1. Background

In 2004 BCA worked with Defra consultants FES to create an EU ETS Phase I new entrant spreadsheet. The procedure was simple because the FES consultants had a great deal of experience of the cement sector due to their involvement in the climate change agreements.

For Phase II, Dti commissioned Entec environmental consultants to *confirm* the appropriateness of the Phase I FES spreadsheet. It is clear to BCA from communications and conversations that Entec do not have sufficient knowledge and experience of the UK cement industry to carry out this task in full.

We are disappointed by the approach of Entec and their management of this issue. Entec have made a number of conflicting requests for information and do not appear to know what information is needed. The timescales have not been made clear and the agenda from Entec appears to have changed from updating the Phase I spreadsheet to attempting to set incumbent allocations using benchmarking.

The BCA believes that the architecture of the Phase I FES spreadsheet is entirely appropriate for Phase II new entrants, subject to the updating of some parameters. BCA has therefore summarized the parameters included in the Phase I spreadsheet and those required for a Phase II new entrant spreadsheet. BCA emphasises that the information relates to Phase II only and that any further developments for *post* 2012 should be discussed with BCA.



BCA is open to the development of the new entrant benchmark spreadsheet for Phase II and will continue to co-operate fully with Defra and Dti. If benchmarking is to be considered for the post 2012 period BCA would welcome further dialogue with Government. At this early stage in Phase I we do not see why the Entec agenda appears directed toward Phase II and III incumbent benchmarking.

2. Criteria in the Phase I spreadsheet

a. Design Capacity

The FES spreadsheet includes an assumed capacity factor of 109% of the design capacity. It is not uncommon for cement kilns to reach 120% of their design capacity, as BCA explained to FES in 2004. The design capacity has commercial significance since it is generally incorporated in the kiln manufacturer's guarantee. It is used as hand over point between installation/commissioning by the manufacturer and the commissioning and fine tuning carried out by the operator.

The capacity factor is used in conjunction with a typical number of operating days (in this case 330 to allow for annual shut down) and a utilisation factor of 95% (reducing the allocation to allow for short term stoppages) to derive an estimated annual production of clinker.

The capacity factor, operating days and utilisation were taken from a confidential specialist database on *worldwide* cement kilns held by Whitehopleman consultants following 'appropriateness' checking by FES. The Whitehopleman data are *independently* generated and represent the most comprehensive data of this type for any sector.

BCA is at a loss to understand how a complete novice in this area such as Entec has such difficulty in accepting information from a world authority, Whitehopleman, or indeed from FES.

b. Total Energy CO₂

The FES spreadsheet uses an energy benchmark of 3169 MJ/te clinker from the Whitehopleman database to derive a dry process CO₂/te clinker benchmark of 0.291tCO₂/t clinker, by using a BCA average fuel mix. A moisture variable is added because not all new entrant kilns will have the possibility of using dry raw materials due to geology and alternative raw material use (the maximum moisture content allowed is 28% based on the reality of existing raw feeds in the UK). Because the drying of the raw material requires additional energy input, there is additional CO₂ generated. [There is a direct correlation between the amount of moisture and the energy use].

A variable is included in the FES spreadsheet for the degree of 'by pass' used for the kiln. The kiln by pass is *variable* depending on the *fuel* and *raw material impurities* and the by pass dust cannot be returned to the process due to its high alkali and chloride content, as such there is a heat loss and additional CO₂ is generated according to the amount of by pass removal.

The maximum bypass allowed in the spreadsheet is 20% based on actual UK operation. In addition to removing alkalis and chlorides a by pass can be used to maintain conditions in the fuel preparation areas that prevent opportunity for



explosion consistent with health and safety legislation such as DSEAR. There are examples of this on new kilns in the UK.

As alternative fuels are hopefully used more in the UK cement industry there will be an increasing requirement for by passes to be fitted to kilns and an increasing use of by pass currently installed.

The combination of fuel energy, moisture and by-pass are used to derive the energy CO₂ for the new entrant

c. Process CO₂

The spreadsheet calculates the amount of process CO₂ by using a site specific process CO₂/te clinker factor which is dependent upon geology and raw material mix which is therefore site specific, and consistent with the monitoring and reporting guidelines.

The spreadsheet also includes a variable for the inclusion of information of non-carbonate carbon in raw materials on a dry basis. This geology dependant variable will vary according to raw feed mix and supply and is therefore site specific.

The process CO₂ factor, non-carbonate carbonate carbon dioxide from raw materials and the addition of by-pass dependant CO₂ are used to derive the annual process CO₂ element of the allocation.

The overall allocation is then reduced using a 50 day ramp-up factor for the new entrant kiln.

3. Criteria in the Phase II spreadsheet

a. Design capacity

A new entrant kiln only has a designed capacity by definition as it has not produced at full capacity. This design capacity can be verified in the design documentation and contracts between manufacturer and operator.

BCA Proposal:

Retain design capacity as an input variable which can be verified or checked by the regulator.

b. Assumed capacity factor

It is widely accepted that a new entrant kiln will exceed its design capacity and evidence of this can be provided confidentially. However, during the first year of production and due to the additional commissioning stoppages the kiln may only exceed its design capacity in short bursts.

BCA Proposal:

Retain 109% assumed capacity factor for allocation years beyond year 1 of operation. In year 1 of operation assume 100% of design capacity.



c. Moisture Content

The moisture content of the kiln feed is dependent upon site specific conditions particularly the geology and therefore site location

BCA Proposal:

Retain a variable input into the spreadsheet for moisture based on design moisture for a new entrant or existing analysis data for replacement new entrant which is verifiable.

d. Assumed operating days and utilisation factor

The number of operating days during the first few years will vary according to the new entrant. However, experience tells us that 330 out of 365 is typical. This and the 95% utilisation factor can be confirmed/adjusted using the Whitehopeleman database.

BCA Proposal:

Update the operating days and utilisation factors based on the latest information from the Whitehopeleman database

e. Energy benchmark

The current benchmark of 3169 MJ/te clinker is based on the upper quartile performance of worldwide kilns entered into the Whitehopeleman database and represents modern dry process technology. Supporting information to demonstrate this was supplied to FES which has subsequently been sent to Entec but may be updated if needed.

BCA Proposal:

Update the energy benchmark based on the latest information from the Whitehopeleman database excluding 2005 which has been influenced by the first Phase EU ETS

f. Fuel Mix

The fuel mix in the FES Phase I spreadsheet represents a BCA average for all installations in 2002. BCA has supplied updated fuel mix information to Entec for the period 2002 to 2004. This fuel mix is not typical for new entrants because significant barriers exist concerning the permitting, supply and public perception of alternative fuels. Although, in the interests of simplicity and transparency BCA propose to use an average UK fuel mix. However, it should be noted that in the long term we believe that benchmarks should be based on a standard fuel such as coal in order to incentive the use of biomass fuels.

BCA Proposal:



Use the BCA average fuel mix

g. Bypass

The purpose of a bypass is to remove from the kiln system excess requirements of certain chemical elements. Typically the elements removed are sodium, potassium, chlorine and sulphur; of these chlorine and potassium are the two most commonly found in excess. In sufficient quantity these are deleterious to kiln operation or to customer quality requirements. International cement standards limit the amount of chloride in cement. The term bypass is only applicable to preheater and precalciner kilns i.e. those that are the most energy efficient and thus likely to be included in new entrant design.

The amount of by pass utilised by the new entrant will be dependent upon the design fuel mix and other design criteria such as the recovery of a low oxygen gas stream for explosion/fire protection in ancillary plant.

BCA Proposal:

Retain the bypass variable in the spreadsheet to a maximum value of 20%. This can then be verified according to the specific plant requirements. Further supporting information can be provided concerning Phase I new entrant bypass design if needed

h. Process CO₂

The process CO₂ is again dependent upon the raw materials (as the EU ETS M&R guidelines confirm). It should either be a variable input on a site specific basis or a default value could be used such as the one used for the World Business Council for Sustainable Development (WBCSD) cement CO₂ reporting protocol. The WBCSD default is 525 kg CO₂/te clinker

BCA Proposal:

Retain the process CO₂ variable in the existing spreadsheet. The variable can be verified using raw material information where available.

i. Non-carbonate carbon in raw feed

Non-carbonate carbon in the raw feed is process CO₂ but accounted for separately as this varies according to the raw mix.

" process emissions means greenhouse gas emissions other than combustion emissions occurring as a result of intentional or unintentional reactions between substances or their transformation, including the chemical reduction of metal ores, the thermal decomposition of substances, and the formation of substances for use as product or feedstock" M&R Guidelines

By accounting for the non-carbonate carbon separately make the spreadsheet more transparent. If this variable is removed the non-carbonate carbon would have to be added to the process CO₂ factor in another way.



BCA Proposal:

Retain the non-carbonate carbon as a variable in the spreadsheet. The variable can be verified using raw material information from the specific site.

j. Ramp up factor

In the FES spreadsheet a 50 day ramp-up factor is included for new entrants to achieve the assumed capacity factor as it is believed that the assumed capacity factor and run factors will not be achieved from day 1 of operation. Evidence from Phase I new entrants suggests that ramp up to the assumed capacity factor can occur within this period however other interruptions to production resulting from the commissioning process are likely to affect the kiln production rate during the early commissioning periods. It is suggested that the ramp up factor could be increased to 100 days.

BCA Proposal:

Retain a ramp up factor in the spreadsheet but perhaps consider increasing it from 50 days.