# Brick industry background

## Introduction

1. In this appendix we set out further information on the brick industry, covering:

   *(a)* brick production methods;

   *(b)* further information on brick demand including the choice of cladding material;

   *(c)* further information on the brick procurement process, covering the methods of buying bricks used by the different customers of the main brick manufacturers; and

   *(d)* the regulatory environment of the brick manufacturing process.

## Brick production methods

2. All the major brick manufacturers are involved in all stages of the brick manufacturing process from the clay quarry to the delivered brick.

3. Clay brick production consists of extracting the clay from the ground, grinding it to particles of an appropriate size (sometimes adding water at this stage), shaping the bricks, drying them and then firing them. We set out these stages of brick manufacture in more detail below:

   *(a)* Nearly all plants are built on or adjacent to clay reserves due to the high cost of transporting clay in comparison with its value. Clay winning (the extraction of the clay from quarries) occurs during good weather in the summer, for a period of only a few weeks in the year.

   *(b)* Some plants transport some of their requirements for clay from nearby quarries to mix with their own to produce a specific brick type. Clay may also be brought in from a nearby quarry where the plant's existing clay reserves have been exhausted.

   *(c)* The clay is extracted in bulk and then mixed to even out any variations.

   *(d)* The clay is then ground to reduce the particle size. In addition, water (and other additives) may be added or water may be removed to achieve the desired consistency.

   *(e)* The wet clay is formed either by extrusion or by soft mud moulding to produce the brick shape. Flettons are formed from a drier material and pressed into shape.

   *(f)* The clay is then slowly dried using ambient heating: if the clay is dried too quickly, the outside may form a hard crust and water trapped within the brick can cause damage during the firing process. The drying process can take up to five days and will often use heat recycled from the kiln.

*(g)* The bricks are then fired. There are three types of firing method generally in use: tunnel/flow kilns, intermittent/batch kilns, and clamp firing.

(i) Tunnel kilns are used in most modern large-scale production plants. In tunnel kilns, the bricks move along a production line through the kilns. Tunnel kilns are more efficient than intermittent kilns and of higher capacity, but cannot easily be turned off and allowed to cool without damage to the kiln (the refractory ceramic tiles shrink as they cool and can become detached).

(ii) Intermittent or batch kilns are ovens in which batches of bricks are stacked, fired and cooled in cycles which typically last several days. They have a lower capacity and lower efficiency than tunnel kilns.

(iii) A third, traditional, method of firing bricks is clamp firing. This represents a small part of the market. In this process, the bricks are piled up and burnt for up to eight weeks. The process is laborious and has a high level of waste but produces bricks with a distinctive appearance. Ibstock currently has two such plants and Baggeridge has one.

*(h)* Firing occurs at around 1,000$^{o}$C, although this will depend on the clay and the desired end product: engineering bricks require a higher temperature, flettons a lower temperature. In general, the higher the temperature, the lower the eventual water absorption of the brick.

4. The clay used for fletton production has a higher carbon content (reducing the energy requirements in firing them) and higher sulphur content. However, these increase the environmental impact of firing them and additives and additional emission control equipment are required to reduce the environmental impact.

### *Brick technical standards*

5. In the UK there is a single standard for all clay bricks including engineering bricks, namely BS EN 771-1 (engineering bricks have further properties defined in a separate annex). This specifies what technical qualities the manufacturer has to satisfy (eg frost resistance, compressive strength). It also sets out the methods of testing and the allowed deviation from the stated quality.

6. Engineering bricks are characterized by specific technical properties, defined in the UK National Annex to BS EN 771-1. These properties primarily relate to requirements for a greater load-bearing capacity and lower water retention. Engineering bricks can be subdivided into Class B bricks which retain less than 7 per cent water, and Class A bricks which retain less than 4.5 per cent.

## Brick demand

### *Historical brick demand*

7. The main parties have told us that there has been a slow decline in demand for bricks over the last 50 years. Set out in Figure 1 is a chart of brick demand since 1980.

FIGURE 1

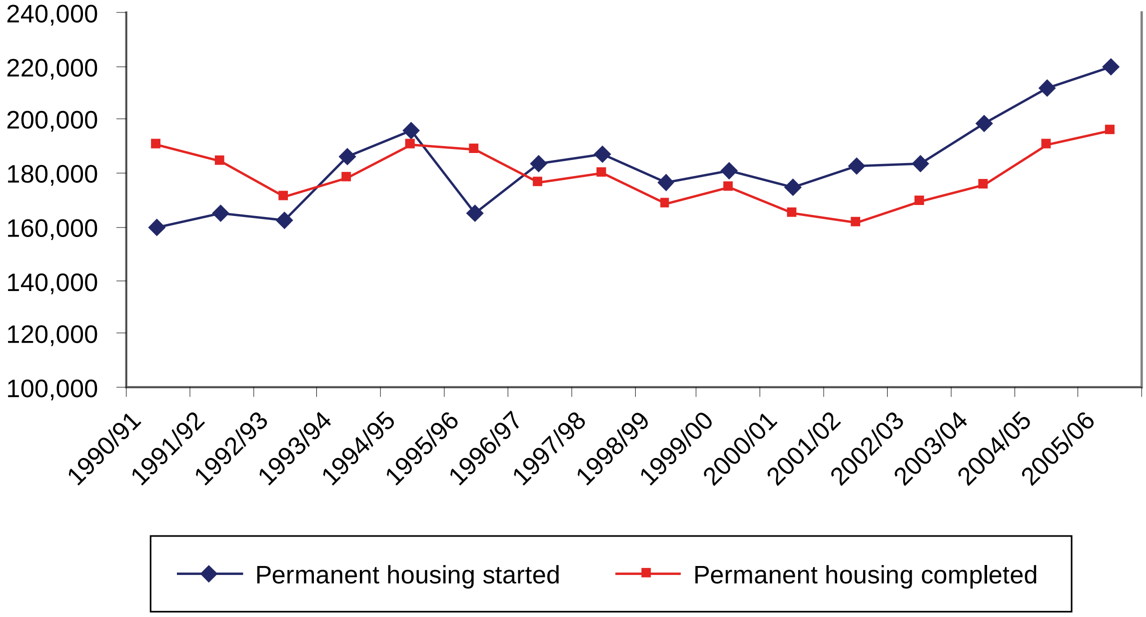
**UK brick demand (millions of bricks)**


*Source:* DTI.

8. Set out in Figure 2 is a chart showing housing starts/completions in Great Britain since 1990: it is not clear from this chart that the reduction in brick demand has been caused by any reduction in the number of housing units being built. In addition Baggeridge told us that the divergence between starts and completions was getting 'worse and worse'. It should be noted that the chart does not include the peak in demand in the late 1980s.

FIGURE 2

**Great Britain housing starts/completions**




*Source:* Communities and local government data (www.communities.gov.uk).

9. The second reason proposed for the decline in demand for bricks has been the change in housing mix from detached and semi-detached houses towards apartments. Ibstock told us that they believed that the number of dwellings might potentially increase but the number of apartments was likely to continue at a similar level.

10. Overall government planning policy plays a role in the decisions taken by local planning authorities. The ‘Planning Policy Guidelines 3’ (PPG3), now replaced by the ‘Planning Policy Statement 3’ (PPS3), were originally issued by the Office of the Deputy Prime Minister and are now under the jurisdiction of the Department for Communities and Local Government. PPG3 encouraged higher density housing, and created the requirement that at least 60 per cent of development must take place on ‘brownfield’ sites. Although PPS3 places more emphasis on family houses, it was only introduced in November 2006 and it is not yet possible to forecast with certainty whether it will have any impact on brick demand.

11. Alternative cladding materials have to some extent displaced bricks, particularly, but not exclusively, for apartments and commercial buildings. There has been support from the Government for off-site fabrication and other modern methods of construction which also require fewer skilled tradesmen and this may be a contributory factor to this trend.

### *Choice of cladding*

12. Brick is now used mainly as a method of cladding the outside of a building: concrete blocks, steel and, to a lesser extent, timber are now more usually used to provide the inner structure of a building. Residential houses are now typically built with a block inner wall and brick or render cladding. Alternatives for cladding the outside of the building include brick look-alike cladding materials (such as Baggeridge’s Corium), render, timber, natural or reconstituted stone, steel, and glass (these last two are

more common in commercial buildings). Brick may sometimes be used in domestic buildings in conjunction with other forms of cladding. In addition, the shift of house building towards apartment blocks has contributed to the declining use of brick as these buildings are more apt to be constructed with cladding materials other than brick.

13. The choice of cladding is made by the developer or architect (or occasionally by the end user) at an early stage of the design process. However, they will have regard to the planners' requirements or preferences. Whilst planners may stipulate brick or stone cladding in sensitive or conservation areas, it has been suggested to us that in some areas planners are actively encouraging timber and other forms of cladding to provide a more varied 'street scene'.

14. Baggeridge told us that the planners' views on the choice of cladding were 'absolutely key', and the importance of aesthetic appearance over price in the initial choice of cladding material was confirmed by Wienerberger.

15. A survey of Baggeridge's key customers reported that the switch to other wall construction materials was mainly driven by changes in taste and the building mix sought by architects and planning officers rather than by price factors.

16. Ibstock provided us with the data in Table 1 which shows how the choice of brick as a cladding material has reduced between 2000 and 2005.

TABLE 1 **Types of cladding**

| | *% of external wall cladding* | |
|---|---|---|
| | *2000* | *2005* |
| Brick | 61.2 | 51.7 |
| Profiled steel | 14.6 | 16.7 |
| Rendered block | 6.6 | 10.3 |
| Curtain walling (glass, laminates etc) | 3.5 | 6.4 |
| Reconstituted stone | 4.8 | 4.1 |
| Other | 9.3 | 10.8 |
| | **100** | **100** |

*Source:* 'Construction Markets Limited'—wall and roofing survey January 2006.

17. The actual choice of brick will depend on the type of building being constructed, the area and the local planning requirements. Wienerberger told us that 'if you are in a particularly sensitive area, the criteria are much more stringent'.

18. Although developers' decisions are largely driven by price, some developers have noted that the choice of facing brick can be largely determined by planning requirements, and that they would not usually switch between different facing bricks during the course of a particular project, for which planning permission has already been received.

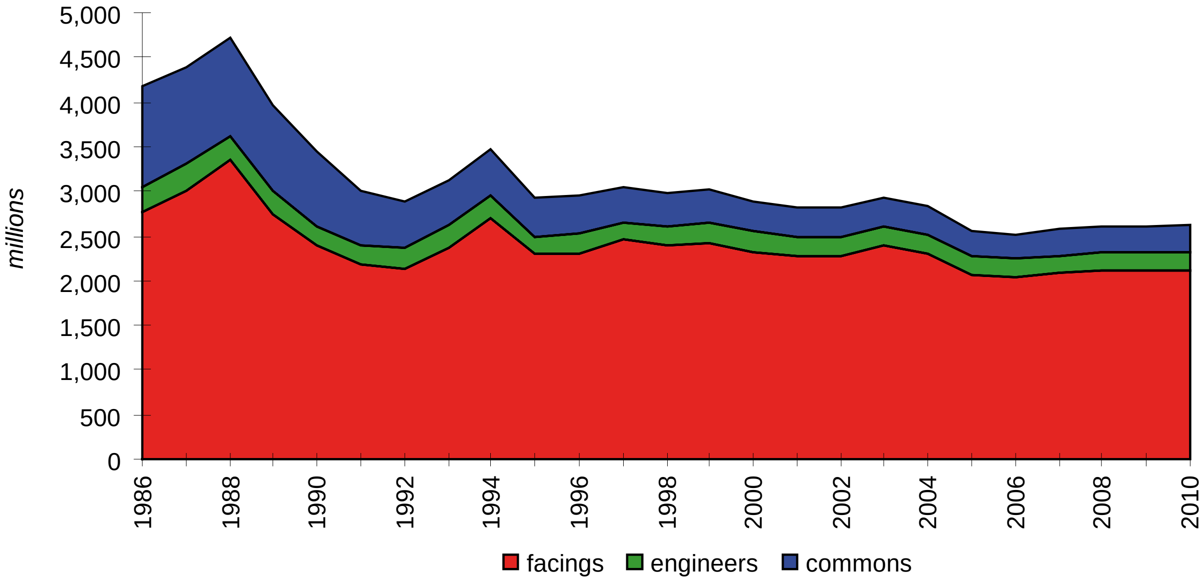
19. We have also been told that soft mud bricks are considered more acceptable in some parts of the country, particularly in the South-East, and one third party told us that the 'planning premium' that arose when a planning authority gave approval to a soft mud brick was such that it would not be likely to switch on the basis of alterations of relative prices. On the other hand, we were also told that Local Authorities usually specify a certain brick appearance, rather than a particular brick production method, which would in many cases allow developers to switch between soft mud and extruded facing bricks, at least between projects.

### *Demand outlook*

20. Set out in Figure 3 is a chart showing historical and forecast brick demand, split between facing and engineers and commons.

FIGURE 3

**Historical and forecast brick demand**




*Source:* Leading Edge management consultancy (provided by the parties).

### Procurement process

21. There are two principal ways of buying bricks, and different customers of the brick manufacturers will buy bricks in differing ways. These are *(a)* purchase through a framework agreement at pre-determined prices, and *(b)* purchase with prices determined at the time (ad hoc or spot purchases).

22. Prices are quoted either ex-works, or as a delivered price. The cost of delivery will be dependant on the distance from the plant to the delivery site.

### *Framework agreements*

23. Framework agreements are a feature of the brick buying process. A framework agreement may set out a detailed matrix of prices for the bricks required, setting out agreed prices for bricks of many different specifications and incorporating a matrix of different transport costs to different locations or agreed ex-works prices. Customers negotiate the terms (and price) on which they will purchase brick from a manufacturer, based on their anticipated volumes (often using prior years as a benchmark). However, there is generally no firm commitment to purchase these or any volumes. The customers will then ‘call off’ the supplies as they need them. The agreements will also set out any rebate arrangements.

24. Wienerberger told us that it also uses less detailed framework agreements [✂].

25. National framework agreements which set out a precise matrix of prices are routinely used by the national developers when buying from the four large manufacturers. Wienerberger told us that [✂].

26. Merchants also use framework agreements but, given the uncertainty in their demand, may have less prescriptive terms or matrices of prices: Wienerberger told us that its framework agreements with builders' merchants [✂].

27. Baggeridge told us that [✂]; Wienerberger that [✂].

### *Ad hoc pricing*

28. Rather than agreeing prices in advance through a framework agreement, some customers buy some or all of their requirements for bricks on an ad hoc basis. Many factors routinely buy bricks in this way.

29. Ad hoc agreements do not operate to the exclusion of volume rebates agreed between the manufacturer and the customer. In addition, those customers who are already covered by a national framework agreement may also buy ad hoc:

    *(a)* Some framework agreements are focused primarily on the rebate structure and do not set out detailed pricing plans. These customers will therefore buy ad hoc. Wienerberger told us that [✂].

    *(b)* In addition, some unusual bricks may not be covered by the framework agreement, and so a separate negotiation will be necessary.

    *(c)* Also, special deals may be agreed on an ad hoc basis for instance when a manufacturer which is carrying too much stock of some bricks offers to sell them at a reduced price.

### *Role of price lists*

30. While many companies have a price list, these do not generally determine the prices paid for the substantial majority of bricks. [✂], Baggeridge introduced a price list in 2006 and has told us that [a very small proportion] of its purchases occur at list price. Ibstock and Hanson sell similar proportions at list price. Ibstock told us that average realized selling prices were about [✂] per cent of list prices. Similarly Hanson's average realized price was around [✂] per cent of its list price.

31. In general, the merchants will be interested in rebates based on aggregate values of all bricks purchased by them. National developers will tend to know more precisely what bricks they intend to buy and will therefore be more interested in fixing the lowest price, although they may also be offered volume-related rebates in order to encourage them to achieve a certain volume.

### *Annual price negotiations*

32. In order to arrive at the annual framework agreements, the brick manufacturers will send out letters to the national developers and builders' merchants, generally in the last quarter of the year, to indicate any proposed price changes in the following calendar year. This will start the process of price negotiations in which the prior year pricing is normally the starting point. Some large customers, particularly developers but also large merchants and buying groups, will then hold meetings, described by Baggeridge as 'beauty parades', to allow the sellers to propose a set of prices and

the rationale for them. The beauty parades are followed by a period of intensive negotiations before the framework agreement terms are agreed.

33. Manufacturers will be alerted to having pitched their prices too high in two ways. First, it is possible that at the end of the negotiations the buyer may reject the manufacturer's best price. However, this is unlikely since the framework agreement does not involve any commitment to volume. In general, the manufacturer will only discover the problem during the course of the year as the volume called off by the buyer falls below the level notionally agreed upon.

34. Some customers and suppliers have recently sought to negotiate a wider variety of types of purchasing agreement, such as longer contract terms, varying levels of rebate/volume discount, and in some cases a move to greater certainty on volumes in exchange for lower prices.

## Regulatory environment

35. The regulatory framework within which the UK clay brick industry operates is as follows:

*(a)* clay extraction sites require mineral planning permissions from the relevant Mineral Planning Authority;

*(b)* brick manufacturing sites require:

(i) Pollution Prevention and Control (PPC) permits (either Part A1 or Part A2);

(ii) a Climate Change Agreement with the UK Government; and

(iii) a permit from the Environment Agency in accordance with the EU Emissions Trading Scheme;

*(c)* most clay brick manufacturers operate quality management systems that satisfy the requirements of ISO 9001;

*(d)* an increasing number of clay brick manufacturers operate environmental management systems that satisfy the requirements of EMAS or ISO 14001; and

*(e)* all clay brick manufacturers operate a health and safety management system in accordance with the requirements of the British Ceramic Confederation Health and Safety Pledge.

36. We were told by the parties and their competitors that obtaining planning permission for a clay quarry was a significant barrier to entry. York Handmade Bricks has told us that obtaining mineral extraction planning permissions was a long and detailed process and it might take up to five years to obtain permission. Wienerberger has also told us that planning permissions have become more onerous as there are more environmental regulations such as Environmental Impact Assessments, increased local area sensitivity and public awareness of the implications of mineral exploitation. We have been told that mineral extraction planning permissions were usually limited to existing sites and that planning permission for a new clay quarry was 'rare'. The only recent greenfield planning permission to have been granted is for Baggeridge's site at Warstone in 1995.

37. The main regulatory developments over the last five to ten years have been in relation to the environmental control requirements of the Pollution Prevention and

Control Act 1999. Workplace requirements have also been proposed with respect to noise, airborne dust and manual handling.

38. The new EU carbon trading regime will affect industry costs from 2008 onwards. Costs are likely to increase as the allowances issued to each company to emit carbon dioxide decrease over time. Thus it will be necessary for brick manufacturers to purchase additional allowances from the EU carbon market to surrender in discharge of their obligations under the regime, or reduce the level of carbon dioxide they emit.