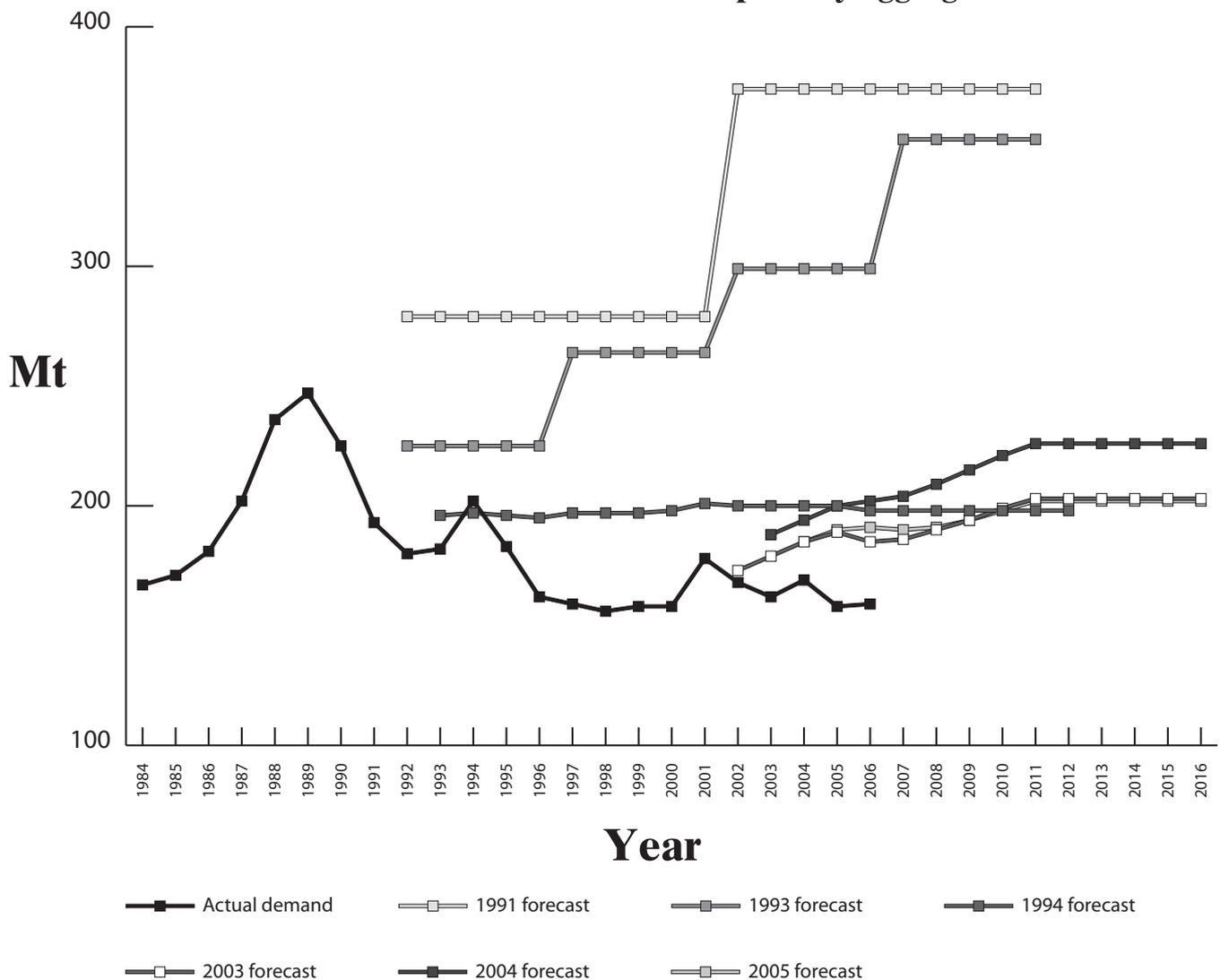


MINERAL *planning*

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Actual and forecast demand for primary aggregates



Aggregates demand forecasting failures

Is inaccurate aggregates demand forecasting warping national policy and limiting the Mineral industry?

Richard Bate explains: page 10

Fixing the forecasting folly

Demand forecasts for aggregates are now commissioned annually by the Government to inform the national aggregates Guidelines. Richard Bate argues that they will continue to be unreliable and to warp national policy

To estimate the annual demand for primary aggregates in England over the next ten years, which would be more reliable:

- the forecasts commissioned by the Government based on an econometric model;
- continuing the average of the last five years' demand; or
- carrying forward the most recent annual demand figure available?

The answer based on the experience of every forecast since 1991 is that the official forecasts would have been least accurate and honours split equally between the other two methods based on recent consumption.

How accurate are the official forecasts?

Every official demand forecast since 1991 has over-estimated aggregates demand for every single year. The scale of the discrepancy is substantial, with the forecasts usually being 20% or more too high*. The forecasts are shown in Figure 1 (also see front cover). The most excessive forecasts were published in 1991 and 1993: these predicted that demand for primary aggregates would rise to over 350 million tonnes per annum. In reality, demand had already peaked at 247Mt in 1989 and slumped in the recession to just 180Mt in 1992. Since then there has been a gradual progressive decline to 159Mt in 2006 (with brief mini-revivals in between). The 1991 forecast for 2006 was 374Mt.

The forecasts are expected to show broad trends and scales of demand rather than to offer accurate predictions for outputs in individual years. It is a matter of judgement as to how wrong the forecasts are allowed to be before they cease to serve any useful purpose, but the history of forecasting suggests that their performance is, to say the least, unreliable.

The Verney Report (in its Figure K2, illustrated) showed that early demand forecasts for sand and gravel hugely under-estimated demand (the Waters Committee in 1946 and the Ministry of Works in 1959). No doubt embarrassed, subsequent Ministry of

Works forecasts in 1964 and again in 1970 wildly over-estimated demand.

After the 1974 recession the forecasts were still too high for some years, but then failed to anticipate the major demand spike in the late-1980s economic boom: the August 1981

estimate for 1989 was 166Mt – two thirds of actual demand. More bizarre was that the 1989 forecast for 1989 was just 164Mt. After this, the forecasting error flipped once again from being spectacularly low to spectacularly high, as outlined above.

Year	Actual demand	1991 forecast	1993 forecast	1994 forecast	2003 forecast	2004 forecast	2005 forecast
1984	167	-	-	-	-	-	-
1985	171	-	-	-	-	-	-
1986	181	-	-	-	-	-	-
1987	202	-	-	-	-	-	-
1988	236	-	-	-	-	-	-
1989	247	-	-	-	-	-	-
1990	225	-	-	-	-	-	-
1991	193	-	-	-	-	-	-
1992	180	279	225	-	-	-	-
1993	182	279	225	196	-	-	-
1994	202	279	225	197	-	-	-
1995	183	279	225	196	-	-	-
1996	162	279	225	195	-	-	-
1997	159	279	264	197	-	-	-
1998	156	279	264	197	-	-	-
1999	158	279	264	197	-	-	-
2000	158	279	264	198	-	-	-
2001	178	279	264	201	-	-	-
2002	168	374	299	200	173	-	-
2003	162	374	299	200	179	188	-
2004	169	374	299	200	185	194	185
2005	158	374	299	200	189	200	190
2006	159	374	299	198	185	202	191
2007	-	374	353	198	186	204	190
2008	-	374	353	198	190	209	191
2009	-	374	353	198	194	215	194
2010	-	374	353	198	199	221	198
2011	-	374	353	198	203	226	202
2012	-	-	-	198	203	226	202
2013	-	-	-	-	203	226	202
2014	-	-	-	-	203	226	202
2015	-	-	-	-	203	226	202
2016	-	-	-	-	203	226	202

Figure 1: Official forecasts for 1984 to 2016

Why are the official forecasts so weak?

For over 30 years the official demand forecasts have been based on assessments of future construction activity and the contribution of aggregates to this. The most recent explanation of the forecasting methodology is given in CLG's consultation on the Draft Revised National and Regional Guidelines for Aggregates Provision in England, 2005-2020, supplemented by an earlier ODPM document Forecasting Aggregates Demand: A Technical Summary. (Both are on the CLG website.)

The forecasting model is complex, technical, obscure and difficult to

understand. It requires assumptions in respect of matters such as the intensity of aggregates use per unit of financial investment in construction, and the extent to which aggregates are tied to projections for the wider economy and the construction sector within it. Small variations in these important assumptions can have significant effects on the predicted aggregates requirement.

Furthermore, the forecasts rely on estimates of construction activity provided by Cambridge Econometrics: this may be the source of the touching but fallacious belief that demand will always increase. Every demand forecast since 1991 has assumed that demand

will rise or remain about constant (with that constancy usually being assumed at a point well into the future, to avoid the foolish spectacle of it increasing for ever).

Hasn't the problem been tackled before?

The aggregates demand forecasting methodology was subject to extensive review in 1990-92, revised ten years later and tweaked since then (e.g. to accommodate the effects of the Aggregates Levy). ECOTEC prepared the 1991 forecasts for the Department of the Environment. ECOTEC were also asked to review the methodology for DoE. Their report in July 1992 concluded that the methodology was robust. They also concluded that aggregates demand would average 341Mt annually 1991-2011. The Department continued to ask ECOTEC to provide demand forecasts.

A Review of the Overall Approach to Planning for the Supply of Aggregates, by ECOTEC, was published by DETR in May 1998. This included an assessment of the role and performance of demand forecasts. It considered that much of the criticism of the approach used could be addressed by clarifying the objectives, improving the consultation process, and thereby improving the level of understanding and 'ownership' of the approach.

DETR consulted in October 2000 on Planning for the Supply of Aggregates in England, floating the idea of developing demand forecasts for shorter periods than 20 years, plus various technical improvements. Then, when the final Guidelines were published in 2003, the Department responded to disquiet about the demand forecasts by committing to a monitoring programme which has in practice involved commissioning revised forecasts annually.

Do the forecasts matter?

The severe shortcomings in the aggregates demand forecasts amount to much more than a lament for the craft of economists. The forecasts are central to the operation of the managed aggregates supply system expressed through the Guidelines and the work of the Regional Aggregates Working Parties. The quantum of overall national demand for which the Guidelines make provision is fixed by the forecasts. Mineral Planning Authorities are collectively required to grant enough planning permissions for the forecast demand to be supplied (with appropriate landbanks). The unduly high forecasts since 1991

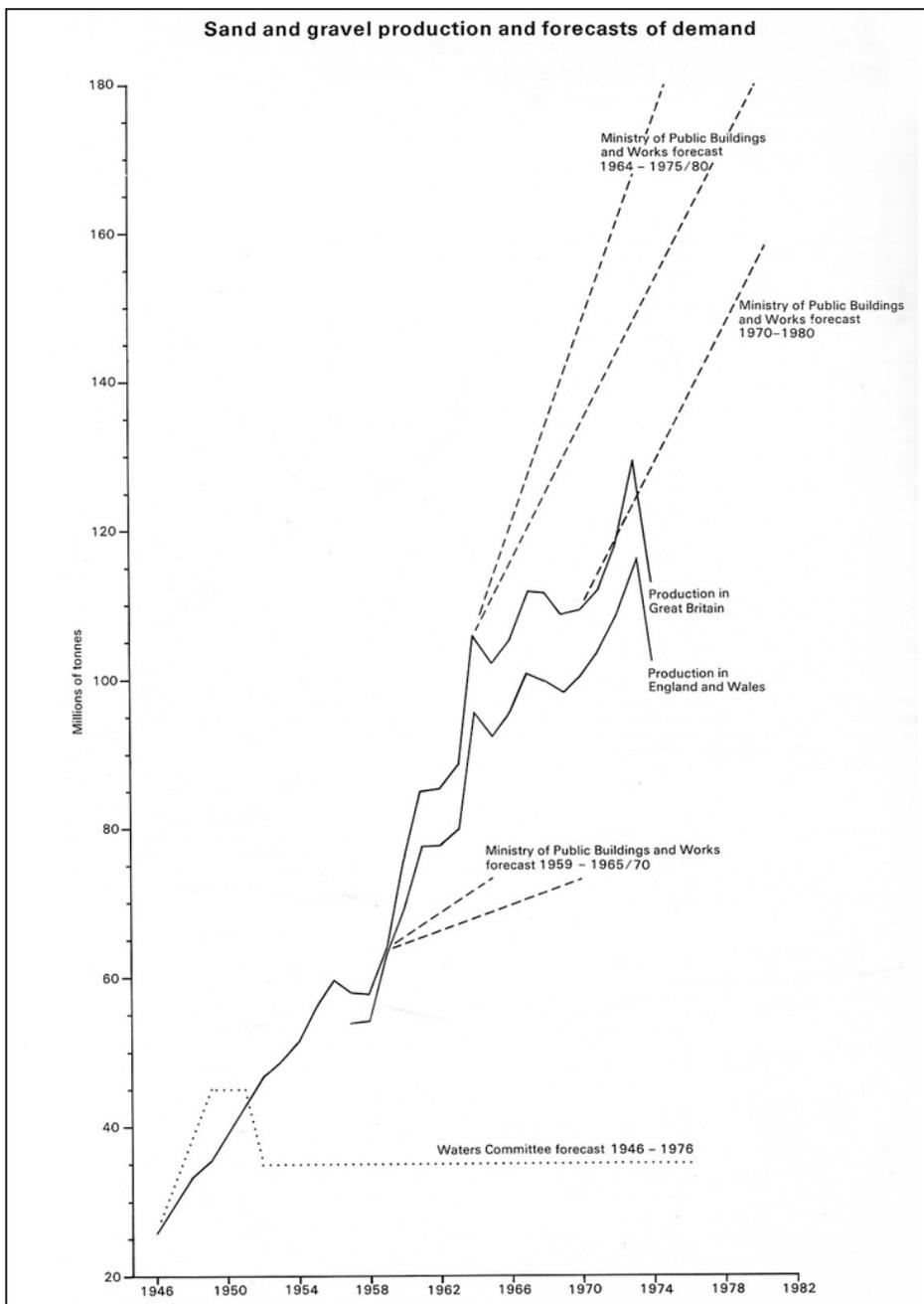


Figure K2: The Verney Report

Demand forecasting

have therefore obliged MPAs to provide for more supply than the Government's method intended, warping outcomes.

The method has also encouraged Pavlovian responses from the various vested interests: those wanting more planning permissions for aggregates working urge higher forecasts, and those wanting fewer urge lower forecasts. This has impaired debate on forecasting methods because all participants have their own preferred results in mind.

This is a classic example of 'predict and provide': there is no meaningful separate policy input in deciding the level of supply for which the planning system should provide. The inaccuracy of the forecasts merely compounds the concern in principle.

The Government has long recognised this. Its Rural White Paper (2000) stated "We will issue new planning policy guidance on aggregates supply in 2001, with the aim of getting away from the present mechanistic 'predict and provide' approach by making more realistic estimates of future requirements, and providing a greater opportunity for these estimates to be tested at a local and regional level. We also want to find better ways of ensuring that environmental issues are built into the decision making". The current revision of the Guidelines provides CLG with an opportunity at last to deliver on that promise.

Do we need forecasts anyway?

Just because the current demand forecasting arrangements are defective does not deny that some form of quantitative assessment of future requirements will continue to be essential for forward planning, and, if they believe the forecasts, for mineral companies' investment strategies. However, this does not necessarily mean that there is a requirement for fixed and seemingly definitive figures for each year or period. Rather, the influences on demand are, in part, matters of judgement, involving choices and policies.

There are also choices to be made about the returns to be gained from the effort of each alternative approach to the problem. The time, cost and effort involved in preparing the current econometric forecasts, for outputs which no-one closely familiar with them is likely to believe, calls into question the value of continuing with them. Years of attempted refinements have failed to improve their performance significantly. Their unreliability should not merit annual review but cessation.

So what are the alternatives?

Estimating future demand on the basis of past demand is projection rather than forecasting, but the evidence since 1991 is that projection is more accurate than the econometric forecasts. Table 1 compares cumulative annual estimates of demand for primary aggregates in England for each of the last six forecasts (up to a maximum of ten years ahead where the data allow). The actual demand is compared with the demand predicted by three methods:

- the official demand forecasts;
- continuing the most recent annual demand for which figures were available at the time of the forecast; and
- carrying forward the average of the five most recently available years' demands.

This shows that assuming that future demand will be 'pretty much what it has been recently' is consistently more accurate than relying on the highly technical econometric forecasts, (though only modest weight should be afforded the as-yet short lifespans of the three most recent forecasts). A rule of thumb – perhaps just a common sense approach – is shown to perform better. For planning purposes this may be sufficient for the short term. Scotland believes so as this is the method used there.

Better estimates of future demand, based on policy and its implementation as the Rural White Paper indicated, demand a completely fresh approach.

The kinds of topic which need to be taken into account include the following:

- the implications of the sustainable construction agenda;
- the implications of development in different locations, according to ground quality, flood risk, new infrastructure requirements, the scope for public transport to supplant private transport, etc;
- the impact of the timing of major construction projects on overall aggregates demand;
- the capacity of the construction industry as a whole to supply and the diversion or addition of labour and materials for the completion of major projects;
- the demand for aggregates of different types (sand and gravel, and crushed rock) and qualities;
- testing of the extent to which each of these factors influences overall demand.

Conclusion

Pursuing sustainable construction is likely to be a major requirement in the years ahead, but the jury is still out on what this means for aggregates. For example, will there be:

- building of flood defences or avoidance of construction in flood-prone areas?
- lightweighting or greater thermal mass in new buildings?
- new transport infrastructure built or demand managed to existing infrastructure?

What is needed is a debate about this. Taking aggregates demand forecasting in this direction will make aggregates planning a more robust process, clear about the direction of policy and sensitive to progress towards meeting policy objectives. Aggregates planning would be tied more efficiently to meeting real demand.

Notes

* There are various detailed means of comparing the official forecasts with alternative projections and with consumption, each producing slightly different results. A statement on the methods used for this article can be obtained on application from the author, by e-mail to batemp@greenbalance.co.uk

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This article draws in part on the author's research with BGS and others for CLG on Managed Aggregates Supply in England: a review of the current system and future options (in press).

Year of demand forecast (and period assessed)	Demand estimate by econometric forecasting	Previous year's demand carried forward	5 year average demand	Actual demand	Excess of demand forecast over consumption (%)
1991 (1992-2001)	2,790	2,250	2,180	1,718	62
1993 (1994-2003)	2,593	1,930	2,200	1,686	54
1994 (1995-2004)	1,981	1,820	2,050	1,653	20
2003 (2004-2006)	559	504	489	486	15
2004 (2005-2006)	402	324	330	317	27
2005 (2006)	191	169	167	159	20

Table 1: Comparison of demand estimates

NB. The estimate closest to actual demand over the forecasting period is shown in bold.