Synergies in abatement and costs

J Webb, Dan Forster, AEA

Eric Audsley, Cranfield University

Mike Holland, ERMC

Brigitte Eurich-Menden, KTBL

1 - Modelled impact of reducing GHG emissions on NH$_3$

**Preliminary results for the UK pig sector**

Defra project AC0208
The Limits to a Sustainable Livestock Sector in the UK

the overall objective is to report the effect of potential changes in the size and configuration of the livestock sector on emissions to air and how the industry can be re-configured to best meet current targets to reduce emissions of GHGs and NH$_3$, while maximising productivity

using a Linear Program model which selects the livestock production systems which maximise sector output within emission targets, using emissions estimated by the Cranfield LCA model

Impact of GHG reduction on ammonia emissions - pigs
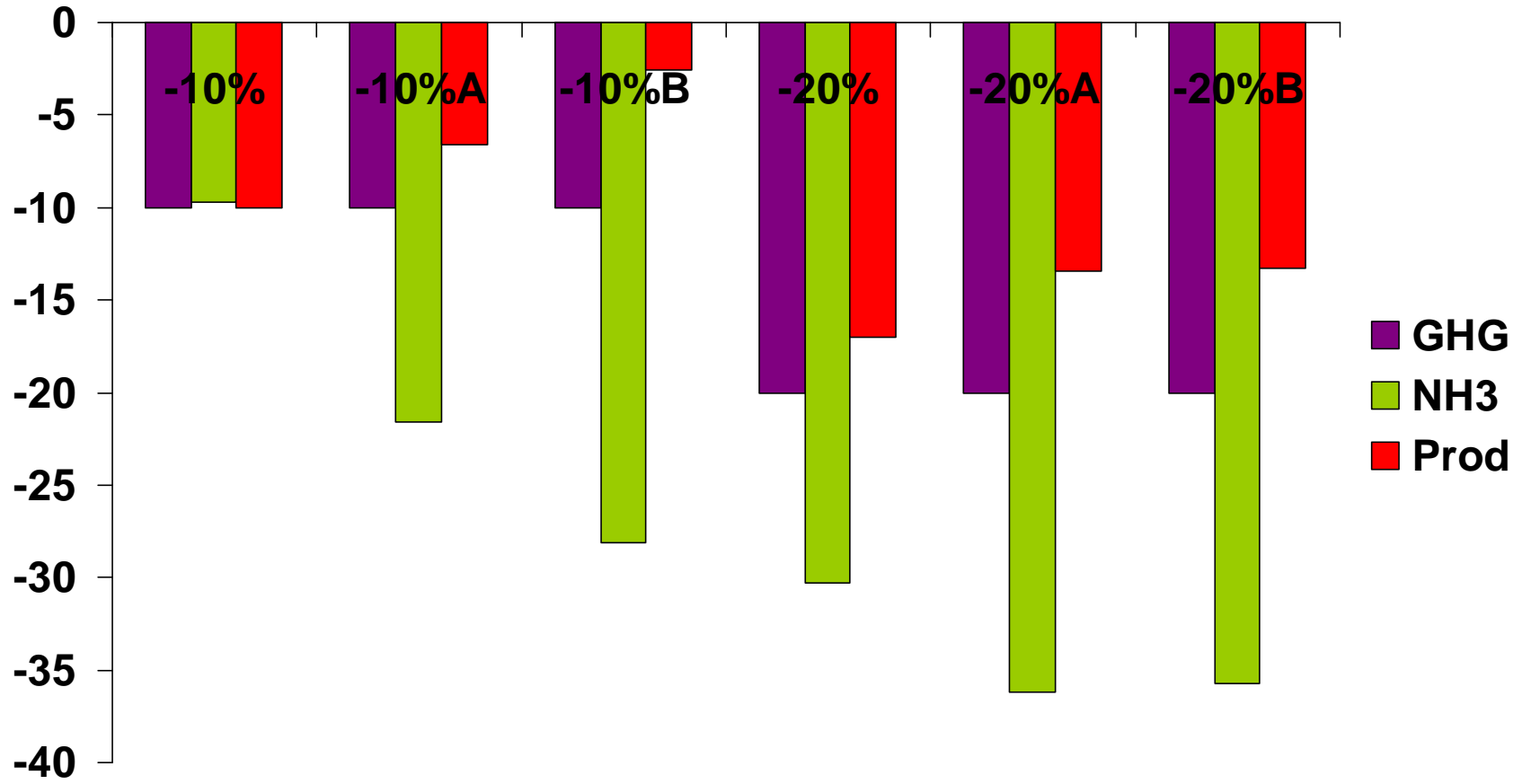
Impact of GHG reduction on ammonia emissions - pigs

The LP begins by maintaining the same structure to obtain a 10% reduction in GHG emissions

then optimizes each aspect in turn to maintain 10% reduction but enabling increases in production

taking account of inherent differences in emissions between systems

manure management

indoor/outdoor

finishing systems

in all cases the limiting factor is the GWP

ammonia is always reduced by least a 10% reduction and in the all cases is actually better than a 20% reduction

Impact of ammonia reduction on GHG emissions - pigs

Prioritising ammonia emission reductions tended to increase emissions of GHGs

but by only a little

Cost estimates -
from EU project 2006/452044/MAR/G1, ex-ante/ex-post

The revised European Commission Impact Assessment guidelines stress the importance of the analysis of costs and benefits for assessing the impacts of new policy measures

ex-ante cost benefit analysis is now an established step for policy development

comparison of ex-ante and ex-post cost benefit analyses tend to differ

hence we need a better understanding of why the estimates of costs before the introduction of legislation might be different to actual costs incurred after implementation

the findings of these preliminary studies are that overestimation of ex-ante costs is common, though does not happen in every case

ex-ante/ex-post cost

Classic example: US industry analysis of the Montreal Protocol

predicted that a 30% cut in CFC use would have far reaching consequences for the US economy and lead to a significant rise in unemployment

the consequent agreement of a near 100% cut, however, has had no noticeable effect on either

Cost estimates - from EU project

A wide range of factors were identified that may result in differences between ex-ante and ex-post estimates of costs

- failure to account for technological advances, which may of course be stimulated by new legislation;

- existence of alternative methods for (e.g.) emissions control that are more cost-effective than those originally envisaged;

- differences between proposed policy and subsequent legislation

- variation in costs between countries (e.g. where a country that has taken the lead in development of a technique for pollution control has higher labour costs than a second country that wishes to use the technique in question

- misrepresentation of data, for example presenting likely worst cases as typical

Failure to account for technological advances

N emissions more likely to be controlled by management than by end-of-pipe technology

Existence of alternative methods

**There are always alternatives, but
will they meet all requirements?**

Variation in costs between countries

The former Ammonia Expert Group did establish a sub-group to collate estimates of costs in different countries.

Misrepresentation of data, for example presenting likely worst cases as typical

The importance of activity data

what is typical?

balance between preparing an accurate inventory which acknowledges prevalence of poor practice and need to recognise adoption of better practice

also a desire by policy makers not to be over-optimistic in their assumptions about the likely costs of abatement

in no-ones interest to bankrupt the industry

production will move elsewhere and the emissions with it

Example: Qualitative appraisal of biases in modelled cost data

Bias factor	Accounted for?	If yes, how accounted for? If no, why not accounted for?	Bias on outcome
Maturation of existing technologies			
Availability of alternative existing control techniques			
Development of new control techniques			
Variation in requirements of final legislation			
Variation in interpretation of the legislation between Member States			
Variation in costs between countries			
Variation in baseline conditions			
Possible additional cost elements			
Data reflecting best or worst cases			
Influence of secondary market factors, such as fuel price			

And finally

‘We do not know what the future will bring,

accept that it will be different to any future we could predict.’

J M Keynes