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Summary of responses to the consultation entitled ‘Improving the energy performance of motor driven systems’

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1 Introduction

1. On 5 December 2007, following the publication of the Energy White Paper, the Government launched a motor driven systems consultation paper[1]. Interested parties were invited to provide comments by the end of February 2008. AEA Energy and Environment managed this consultation, as lead contractor of the Government's Market Transformation Programme (MTP).

2. The paper (chapter 7 of the consultation paper) set out the Government's current evidence, analysis, indicative targets and eco-design standards for motor driven systems that are sold and brought into use in the UK. The consultation paper was directly circulated to over 350 organisations and individuals. In addition, it was published on the MTP website and open to all interested parties for comment. This consultation is part of a wider annual review and policy development process, supporting delivery of the Government's objectives for energy and for sustainable consumption and production.

3. The responses have been reviewed and are reported in the following sections:

- Section 2 summarises the quantity and nature of responses received.
- Section 3 gives a summary of the responses by consultation question and the Government's response.
- Section 4 details the next steps in the process.

4. Appendix 1 lists the stakeholders who provided a response.

2 Overview of responses

5. Six responses were received, all of which represented industry (see Appendix 1). Four of the responses were from trade associations representing fan, pump, variable speed drive and air compressors manufacturers & suppliers. Four stakeholders provided detailed comments and suggestions in relation to most of the nine questions posed in the consultation document; two participants chose to submit general comments.

6. A range of factors were discussed in relation to market and technological trends from the observed trend towards use of smaller pumps and circulators in the building services market to the common misapplication of pumping systems.

7. A common concern expressed by most of the stakeholders, in relation to a range of issues, was that the focus of policy was on the performance of components

[1] The original motor driven systems consultation document (Sustainable Products Policy Brief, Energy in use: Motor Driven Systems. Evidence, analysis, targets and indicative standards) can be downloaded at www.mtprog.com/cms/whitepaper.

and products, rather than total (motor driven) systems. It was commented by more than one stakeholder that system-based energy savings were more significant than those which could be achieved by measures directed towards components. In this context, it was felt that the EuP Directive in particular was too focused on component rather than system performance.

8. Concerns were also expressed in relation to the Enhanced Capital Allowance (ECA) scheme and Carbon Trust Energy Technology List (ETL). The current effectiveness of the scheme was questioned by several participants and it was suggested that it should be expanded to include alternative motors, alternative motors with drives, and fans.

9. Stakeholders stressed the need for more education and awareness raising aimed at users of motor driven systems as well as the importance of international harmonisation of design and test standards.

3 Summary of topics raised and the Government's response

Question 1: Are there any other market or technological trends or factors that should be taken into account in this market overview?

Summary table for Question 1

Key topics raised	Number of comments
Trend towards smaller pumps and circulators in the building services market	1
Process of ETL application and resultant studies is lengthy and stifles enthusiasm for new product applications	1
Scope of consultation does not include motors/fans <0.75kW	1
Increase in VSD usage with products that do not have an integrated frequency drive incorporated into the motor	1
Current lack of system awareness leading to misapplication of pumping systems	1
Problems noted with ECA scheme	1
Common format/methodology needed to compare manufacturers' products on a life-cycle cost basis	1
Other comments	2

10. Four participants responded to this question. A wide range of market trends and factors were identified.

11. One participant noted the trend towards smaller pumps and circulators in the building services market. It was further noted that in the UK market, pumps that use conventional induction motors are generally available with 'EFF2' efficiency rated motors with the higher rated 'EFF1' as an option, and that circulators up to 2500W P1 are now available incorporating a permanent magnet design along with additional variable speed benefits. This stakeholder commented that the process of introducing

new products to the Enhanced Capital Allowance Scheme (ECA) and resultant studies is a lengthy one, which stifles enthusiasm for new product applications for known technologies and further that the 2005 circulator labelling scheme had received a lack of UK recognition due to a negative approach by both other manufacturers and industry (it was also suggested that the Energy Savings Trust did not fully embrace the scheme).

12. One participant noted that the consultation did not appear to consider motors of sizes under 0.75kW, and suggested there is a significant market for motors and fans in the size range under 0.75kW where large percentage energy savings may be achieved.

13. It was observed by one participant that there has been a definite increase in the uptake of variable speed drives (VSD) used with products that do not have an integrated frequency drive incorporated into the motor or where BMS control systems dictate it. In this context, it was commented that building service consultants have largely driven the VSD usage on pumps and that engagement with CIBSE and HEVAC Association bodies for an integrated systems approach would be recommended.

14. Comments relating to the misuse of pumps were received by two stakeholders. One participant commented that whilst some manufacturers have pump selection tools to facilitate good pump selection, the UK market is generally influenced by consultants, installers and third party pump suppliers (who often select inappropriate pumps). It was suggested that there was a need for education and accreditation of those organisations who demonstrate good selection and system application knowledge.

15. A second respondent also highlighted the current lack of system awareness and that a majority of pumping systems are being misapplied. It was noted that energy savings are possible according to two groupings of measures:

- *Component-based measures* (improvement to the pump design; use of high efficiency motors) which can achieve between 4-10% energy savings; and
- *System-based measures* (design; appropriate pump selection; use of controls) which can achieve up to 37% savings.

16. Several comments relating directly to the market for fans were received by two stakeholders who noted that many fan manufacturers have significantly increased the energy efficiency of fans over the past ten years. It was commented that the Enhanced Capital Allowance (ECA) scheme for induction motors had caused confusion and complications in the fan market and that there has been an inability or lack of will to change the scope of the category to assist fan manufacturers. It was further commented that the ECA for variable speed drives is biased towards a small number of manufacturers, does not consider the full technological market for alternative variable speed drives, causes problems to fan manufacturers with respect to the use of inverters, and creates early life failures of electric motors.

17. One stakeholder expressed their agreement with the comments made in the consultation document relating to price factors but noted that to fairly compare manufacturers on the basis of life cycle costing, there was a need for a common format/methodology, and that this should incorporate all the standard elements of the analysis together with the agreed running hours over which payback is calculated.

Government response

18. The Government supports the introduction of minimum energy efficiency performance requirements on ac induction motors, pumps, fans and circulators through the EuP Directive in line with our published indicative standards. This will positively affect the performance specifications of motors supplied with pumps and other products.

19. Whilst the majority of motor driven products placed on the market are in the size range >0.75kW and reference is made to these, the scope of the consultation does not exclude motors or other products in the size range <0.75kW. Products are considered according to their overall energy consumption and savings potential.

20. Industry associations, expert bodies and other stakeholders have been regularly engaged throughout the process of developing the indicative performance standards, and we would also welcome their participation in, for instance, the development of standards for pumping systems in buildings.

21. The mis-application of fan, pump and other systems is noted. Increasing the competence of suppliers is addressed to an extent in the consultation paper. Demand for training may also increase as a result of demand from end users responding to the introduction of performance standards. The Government is also pleased to note the work the industry are carrying out to raise awareness of correctly specifying pumping systems.

22. The difference in energy savings between component based measures and system based measures is noted. Measures proposed in the Consultation document address both of these, for example measures resulting from the EuP Directive will target products whereas the development and implementation of performance metrics are intended to target ‘systems’.

23. The Carbon Trust has indicated that it intends to progress examination of alternative motor technologies.

24. The comment about comparisons based on life cycle costing is noted. Some work in this area has started within the pump industry and is likely to progress.

Question 2: Do these graphs accurately illustrate how key existing policy instruments could support delivery of more efficient new products?

Summary table for Question 2

Key topics raised	Number of comments
Graphs do not consider alternative motors	1
Need for separate category and energy performance target for integrated motor and drive	1
Component-based measures, whilst important, offer small returns on savings compared with system-based measures	1
Future step changes agreed in the consultation forum should contribute to the data used in the graphs	1

25. This question refers to the graphs describing the average efficiency of induction motors and water pumps (see pages 12 to 14 in the original consultation document). Two stakeholders responded.

26. The first participant expressed the view that the graphs did not accurately illustrate how existing policy could support delivery of more efficient new products as they did not consider alternative motors, which are significantly more energy efficient. It was suggested in this context that there should be a separate category for integrated motor and drive with an associated energy performance target. It was stressed that there is confusion and misuse of data when comparing motor-only and motor-plus-drive with respect to energy efficiency losses.

27. The second respondent repeated the point made in relation to Question 1 that in respect of pumps, component-based measures offer small returns on savings when compared with system-based measures (it was noted that this was confirmed in the European Commission's 2000 Pump SAVE study and also the Lot 11 study, carried out as part of the proposed EuP Directive). It was however accepted that improvements in component efficiency should be part of an overall energy performance strategy.

28. This stakeholder also noted that the Joint Working Group on pumps within the lot 11 EuP study has formulated a methodology that considers the bigger picture "House of Efficiency", cost to industry versus energy savings made, mandatory CE marking, EN standards and timescale. It was further commented that the future step changes which will be agreed in the consultation forum should contribute to the data used in the graphs.

Government response

29. The Government is aware of the concern about comparing a motor only with a motor plus drive with respect to energy efficiency losses. A similar point is also mentioned in the 'Critical Issues' chapter in the MTP Briefing Note BNM01 'Revising EU motor labelling schemes and actions to increase UK adoption of higher efficiency motors'.

30. MTP modelling does take account of alternative motors however their impact is not currently significant. We do not yet have enough data on the performance of alternative motors types to present separate graphs; these will be developed as more data become available. Alternative motor technologies are discussed further in the response to question 3 below.

31. The graphs will be amended at regular intervals to take into account, inter alia, the outputs from the EuP discussions.

Question 3: Do the performance values shown in the tables in the Appendix cover the right products and are they set at the right levels?

Summary table for Question 3

Key topics raised	Number of comments
Performance values should include alternative and new technologies in addition to induction motors	1
Values in Tables A1 to A3 are indicative of the levels achievable by design improvements	1
Value in Tables A4 and A5 are less than those attained today by many manufacturers	1
The combined efficiencies of both pump and motor should be considered	1
Other	1

32. This question refers to the tables describing the indicative performance targets in the Appendix (see pages 32 to 35 in the original consultation document). Three stakeholders responded.

33. One respondent repeated the concern that the performance values were restricted to induction motors (rather than including alternative and new technologies) and that as such, they were uncompetitive and would not encourage innovation.

34. A second stakeholder commented that whilst they were not in a position to comment about the motor efficiencies indicated in Tables A1 to A3 they were indicative of the levels achievable by design improvements. It was suggested that the hydraulic efficiencies for pumps indicated in Tables A4 and A5 were less than those attained today by many manufacturers, noting however that different pump styles (e.g. vertical multistage) can attain better efficiencies than those achieved by the end suction pumps indicated. It was recommended that the *combined* efficiencies of both pump and motor should be considered, noting that an efficient pump, combined with the best possible motor is what should be offered before system and application benefits are considered.

35. A third response noted that pumps are the single largest motor-driven users of electricity in industrial and commercial applications in the UK and that they consume around 47.6 TWh of electricity, representing approximately one third of all electric motor consumption in industry and commerce. It was highlighted that the number and types of pump applications are large and diverse, ranging from water utility supplies through industrial and chemical processes, and agriculture, to heating and cooling applications in buildings. Attention was drawn to a study commissioned in

2006 by the Market Transformation Programme (MTP) to identify energy consumption by pumps and pumping systems in the UK; this study found the greatest energy consumption by pumps is in building applications (41%) followed by the water and sewerage utilities (14%) and the chemicals and pharmaceutical industries (9%).

Government response

36. Whilst the potential is significant, currently numbers of alternative motor technologies placed on the market are still relatively low, as the market increases and further performance data become available, separate tables for these technologies will be presented. Actions to ensure equal comparisons of alternative motor technologies are being considered.

37. The performance values and graphs presented for motors and pumps represent market averages and therefore include products with higher efficiencies. Data on many product sub types are still being collected and will be presented when they become available. These may include combined motor-pump efficiency where appropriate.

38. The outputs of the Pump Market Study conducted on behalf of the Market Transformation Programme are being taken into account.

Question 4: In the areas of market analysis, projections and targets, should consideration be given to any additional measures, risks or strengthening initiatives?

Summary table for Question 4

Key topics raised	Number of comments
Component- based measures offer smaller energy savings than system-based measures	1
Measures should be European wide and tied into mandatory CE marking	1
Restrictions within the ECA scheme will limit innovation and the possibilities of further energy savings.	1
Other	1

39. Three participants provided comments in response to this question.

40. One stakeholder reiterated that, in respect of pumps, component-based measures will offer small energy savings compared to system-based measures. The view was expressed that measures should be European wide and tied into mandatory CE marking. It was also commented that there was a possible risk arising from the fact that final criteria emerging the EuP consultation forum meetings could seriously harm the pump industry (for example, if the European Commission push for a 80% "cut off" criteria it will cost the pump industry €1.3 billion and could put some manufacturers out of business whilst only saving a small amount of energy).

41. Two responses perceived that there were restrictions within the ECA scheme, and specifically mentioned the induction motors and frequency drives categories, which could limit innovation and the possibilities of further energy savings.

42. One respondent proposed additional grants and tax advantages for programmes that replace less efficient products currently in service.

Government response

43. The Government understands the point made about system based measures, and that product based measures offer lower overall potential energy savings. However, it should be pointed out that product based measures under EuP are more likely to be delivered, as there is already a process in place for these, and that reducing energy use from motors even by a small amount will afford potentially large energy savings. Nevertheless, Government is keen to also focus on the system as a whole where this is possible, and is discussing with industry how this might be taken forward in the context of EuP and the other measures described in the consultation document.

44. The Carbon Trust is expected to examine emerging motor, drive and control technologies for future ECA scheme consideration.

Question 5: In the area of engaging the supply chain, should consideration be given to any additional measures, risks or strengthening initiatives?

Summary table for Question 5

Key topics raised	Number of comments
Diverse nature of the fan industry presents a challenge to the success of supply chain initiatives	1
Important role of education in ensuring energy efficiency is considered in pump replacement purchases	1
All standards and procedures and guidelines should achieve widespread recognition	1
Stakeholders should enjoy easy access to participate in and implement these measures	1
Mechanisms to monitor and maintain the integrity of the measures set out will be necessary	1
Measures could be transposed into formally recognised international standards and used in procurement specifications	1
Other comments	3

45. Four respondents provided comments relating to this question.

46. Two participants expressed the view that there was no need for additional measures or strengthening initiatives and identified a key risk that supply chain initiatives for fans could fail due to the diverse nature of the fan industry. It was also commented that, contrary to the statement made in the consultation document, the minimum performance standards set in the Building Regulations (i.e. specific fan power for a system) did in fact provide a method to assess the performance of a complete fan and system installation.

47. The effect of the supply chain on the selection and supply of pumps was stressed by one participant. It was noted that the pump replacement sector is huge and that the wholesaler/distributor has a major role to play in what products are supplied and used. Given that pumps are often replaced on a "like for like" basis, it was highlighted that inefficient fixed speed pumps are often used in preference to those that could consume less power. In this context, the important role of education was stressed, particularly as pumps are often seen as commodity items which have little energy saving value. The potential benefits from setting performance standards for energy efficient systems (e.g. via the Building Regulations) was noted. Although it was felt that these could be difficult to enforce in the total pump supply market, it was felt that it would be possible to implement these for defined closed circuit systems if the MTP were to work with the building industry as a whole.

48. It was commented by one stakeholder that in order to strengthen any supply chain measure/engagement, Government needed to support customer (i.e. demand side) initiatives to obtain the maximum reduction in motor driven system electrical consumption. The need to introduce a systems approach scheme which addresses the pump installed base was stressed, noting that this is estimated to be ten times the pumps sold in one year and could potentially deliver the highest savings in pumping systems. In order to implement best practice throughout the whole supply chain, it was stressed that delivery of knowledge (education) to both the purchaser and the end user (unlikely to be the same person) will be required and that an informed purchase of a system based on life-cycle cost considerations will be both energy efficient and cost-effective over the life of the system.

49. In order to ensure adequate adoption of the proposed measures, the same respondent stated that both industry and policymakers should give consideration to the following (in respect of pumps):

- All standards and procedures and guidelines should achieve widespread recognition;
- Stakeholders should enjoy easy access to participate in and implement these measures;
- Mechanisms to monitor and maintain the integrity of the measures set out will be necessary.

50. It was suggested that an alternative approach to delivering these measures would be to transpose them into formally recognised international standards; purchasers, including Government could then specify compliance with these standards in their purchasing requirements. Finally, it was noted that part of the overall strategy should be to carry out on-site energy audits on pumping systems, and that it will be necessary for the auditor to be suitably educated (independently certified) on pumping systems and energy reduction and able to use suitable independent software such as PSAT (pump system assessment tool) to assist with audit verification and potential energy reductions.

Government response

51. Supply chain initiatives may be appropriate in certain product areas or markets such as pump supply; these will be progressed accordingly.

52. Performance metrics targeting 'systems' are likely to influence customer demand thereby strengthening any supply chain measure/engagement.

53. The point made about addressing the installed base of pumping systems is noted. Performance metrics such as the one proposed for Building Regulations will go some way to addressing this.

Question 6: In the area of EU and international policy actions, programmes and initiatives, should consideration be given to any additional measures, risks or strengthening initiatives?

Summary table for Question 6

Key topics raised	Number of comments
International harmonisation of design and test standards for motors will assist in the capture of the best economic technologies available	2
Current climate of "lowest cost" discourages customers and contractors voluntarily using standards that will increase price	1
EUP proposals are too focused on components rather than whole installations/systems	2

54. This question was answered by three respondents who commented on the role of international standards and the Energy Using Products (EuP) Directive.

55. One stakeholder noted that international harmonisation of design and test standards for motors will assist in the capture of the best economic technologies available and that with a global market and fewer manufacturers, these new "best in class" motors would come to market competitively. Similarly, a second response noted that a large majority of UK pump companies now have international owners either in Europe, USA or the Far East and that whilst developing global measures/ standards required significant time and effort, this would be the most effective way to reduce energy consumption from motor driven systems. In view of this, it was commented that appropriate measures should be put in place wherever possible.

56. A key challenge was identified in that both EN (European) and ISO (International) standards are voluntary unless mandated by legislation and that the current climate of "lowest cost" usually discourages customers and contractors voluntarily using any standard that will unnecessarily increase the price.

57. Stakeholders also commented on the EuP Directive. Two stakeholders highlighted that the proposals are too focused on components whereas previous studies have acknowledged that greater energy savings are achieved when the complete installation is considered. It was therefore suggested that the UK should engage with the European Commission to encourage the EuP to focus on higher-

level assemblies (e.g. pumping systems) rather than components within those assemblies.

Government response

58. The UK is engaging internationally to develop agreed performance standards for motors as described in section 3.3.1 of the consultation document.

59. Measures such as building regulations, Government procurement standards and industry voluntary commitments will discourage purchasing on lowest cost.

60. Measures such as building regulations, supply chain commitments and industry voluntary commitments are designed to achieve energy savings in 'systems'; the UK will engage internationally to promote these where appropriate.

Question 7: In the area of UK policy actions, programmes and initiatives, should consideration be given to any additional measures, risks or strengthening initiatives?

Summary table for Question 7

Key topics raised	Number of comments
Use of Building Regulations to increase pump system and motor energy performance	2
Greater need for public sector procurement of high performance pump systems	1
ECA scheme not sufficient incentive for pump/motor purchasers	1
ECA scheme should extend existing categories	1
Use of supply-side and demand-side measures/tools (see above)	1

61. Comments were received from three stakeholders covering a range of issues including use of the Building Regulations and the ECA scheme.

62. One response noted that, in respect of pumps, whilst the ETL/ECA list gives preference to those organisations which have tax incentive potential to purchase energy efficient equipment, there has been no evidence of procurement policies in the public sector. Although the problems associated with refurbishment in public sector buildings were acknowledged, it was stressed that (excluding domestic central heating) the majority of pump stock is in this sector and that that if performance standards and metrics could be established here, the Building Regulations could potentially be used to increase system performance (focusing on new buildings in the first instance).

63. The potential for the Building Regulations to drive greater use of Variable Speed Drives in "closed loop" pumping systems in the public and commercial sector was also noted. Another participant commented that the use of the term 'specific fan power' (SFP) in the Building Regulations should be changed to another term that focuses on the system efficiency, for example Specific System Power (SSP).

64. It was commented that the ECA scheme is not seen as a sufficient incentive for pump/motor purchasers in their procurement process, and that whilst the ETL has

some merit there was a need for an alternative vehicle to persuade the market to adopt new energy efficient equipment. It was noted here that no pump is currently listed on the ETL and that there is scope for inclusion.

65. A second response suggested that the ECA scheme needs to be extended to include any product that can achieve the efficiency criteria set out within the particular category. It was commented that the current practice of allowing only induction motors into the scheme is restricting opportunities for greater carbon savings. In this context it was recommended that greater effort be given by the Carbon Trust to extend existing categories to prevent uncompetitive practices.

66. One participant outlined the following potential measures and tools in relation to existing pumping systems:

Supply side (manufacturers):

- Standards setting out efficiency related information to be supplied with pump products and systems in the course their specification, tender, and supply.
- System design and component selection procedures / standards.
- Tools (software) to assist pump and associated components selection, and estimate system efficiency.
- Training materials and guides for each of the different stakeholder groups.
- Standards to assess the installed performance of pumps and pumping systems.

Demand side (users /purchasers):

- Mandating minimum performance standards for pumping systems according to various sector and application types.
- Agree scope of pumping application types under consideration.
- Develop on site performance measurement methodologies according to pumping application type.
- Collate performance data across a wide sample of pumping systems according to application type.

Government response

67. The Government is considering developing appropriate standards that could be deployed through Government procurement (see section 3.4.1 of the consultation document)

68. The development of performance standards for pumping systems in buildings has been proposed that could be applied through building regulations and Government procurement.

69. The point about changing the term Specific Fan Power (SFP) to Specific System Power (SSP) is noted

70. An outcome of the EuP study is a proposed method to classify the performance of pumps. Once agreed there should be no reason why businesses should not apply to the Carbon Trust to develop a new product category for pumps on the Energy Technology List (ECA scheme).

71. Use of demand side and supply side tools and measures is noted, some work in this area has already commenced.

Question 8: Are there any other policies likely to impact on motor driven systems that should be taken into account?

Summary table for Question 8

Key topics raised	Number of comments
Issue of the supply chain passing on reduced VAT levels should be investigated	1
Government should consider the use of grants to meet additional costs of equipment replacement	1
Technical and economic challenges/barriers must be overcome in the market transformation of pumps and pumping systems	1
Need to ensure competency of product suppliers	1
Measures should target both the supply side and the demand side of the market	1

72. Three stakeholders responded to this question.

73. One participant commented that in the event of selected products being approved for lower levels of VAT, the issue of the supply chain passing on the lower VAT levels should be investigated. Commenting on the replacement of existing fan installations with more energy efficient equipment, it was noted by a second respondent that there are examples where such projects have not gone ahead due to the additional cost of equipment replacement. It was suggested that Government should consider the use of grants to meet these additional costs.

74. One participant commented that there were significant challenges to be overcome in the market transformation of pumps and pumping systems, both technical and economic. It was suggested that when developing policy options the following barriers must be considered:

- Cost effectiveness: tenders for large, high value pumping systems will more easily warrant energy efficiency and life-cycle cost considerations, whereas for low cost products it is often difficult to justify time performing efficiency calculations.
- Diversity and performance classification: the large range of pumping applications and types suggests that it may not be very practical to develop a set of generic measures appropriate to a range of pumping applications (for example measures appropriate to a pumping system delivering clean water will be different to measures applied to a pumping system where solids have to be handled).
- Wide range of stakeholders: stakeholders in the pumping systems market include pump and associated equipment manufacturers, designers and

specifiers, installers, purchasers and end users, each with their own set of priorities.
- Competitive market: suppliers compete with one another, whilst purchasers are seeking low initial capital costs.
- Lack of awareness: many pump system purchasers or users are not aware of the costs associated with running pumping systems (for example, within buildings services pumping systems are often viewed as a commodity over which there is no scope to influence efficiency)

75. It was stressed that whilst suppliers may be willing to supply energy efficiency products and solutions, it is important to ensure that they are competent to deliver these. The point was also made that as users hold considerable influence over the market it is vital that incentives are created such that they will demand energy efficient products and solutions. It was commented that consequently a mixed set of measures are required in order to tackle the pumps and pumping systems market and the installed base of pumping systems. It was felt that such measures should target the market from both the supply side and the demand side as this will have the combined effect of both pushing and pulling the market forward.

Government response

76. The UK Government is making the case to our European partners for European VAT rules to be changed, to allow a more widespread application of reduced VAT rates to the most energy-saving materials and energy efficient products. Dexcisions on the scope of any new reduced rate would be a matter for unanimous agreement of all EU Member States. However, it is reasonable to assume that a well-targeted VAT reduction would usually be passed through to consumer prices, consistent with the findings of the 2007 Copenhagen Economics study on reduced VAT rates, prepared for the European Commission

77. With regard to the technical and economic challenges/barriers the mixed set of measures proposed in the consultation document are aimed at addressing these. Measures such as EuP performance standards, Building Regulations, Government procurement, the ECA scheme and industry voluntary commitments will influence the demand side. Measures such as supply chain commitments will target the supply side.

Question 9: What additional measures would you suggest developing to drive forward sustainability in motor driven systems?

Summary table for Question 9

Key topics raised	Number of comments
Expansion of ECA scheme to cover alternative motors and fans	1
Creation of a scheme to encourage a retrofit programme	1
Use of measures requesting annual/bi-annual checking of existing motor driven systems (over an agreed kW rating threshold)	1

78. Brief comments from two stakeholders were received in response to this question.

79. The first response stressed the need to expand the ECA scheme to:

- include alternative motor technologies;
- include alternative motor technologies with integrated drives; and
- add an ECA category for fans.

It was also stated that there was a need to create a scheme that encourages a retrofit programme.

80. The second stakeholder expressed their support for the comments made in the consultation document in relation to the role of training, education and awareness. It was noted that the BPMA through its "Better pumping practice initiative" is looking to move this issue forward. It was highlighted that the success of such initiatives would rely on engagement from UK authorities and the use of measures requesting annual/bi-annual checking of existing motor driven systems (over an agreed kW rating threshold) to ensure that pumping systems are operated at an acceptable efficiency level and also to confirm savings made from previous checks. In this context, the point was repeated that such checks/energy audits should only be carried out by technical experts accredited/certified to understand pumping systems.

Government response

81. The Carbon Trust has indicated that it intends to progress examination of alternative motor technologies under the ECA scheme. In addition the Government intends to encourage the development of performance standards that could be used to assess the performance of these products.

82. Once a suitable metric defining the performance of fans is agreed (it is understood initiatives are currently under way working on this) there should be no reason why businesses should not apply to the Carbon Trust to develop a new product category for fans on the Energy Technology List (ECA scheme).

83. The points concerning the need for a retrofit programme and for regular checks on the operation of systems are noted, The Government will investigate the opportunity to develop such measures.

Question 10: Are there any other potential impacts resulting from these proposals that should be taken into account?

84. Three Stakeholders responded to this question. Whilst not suggesting other potential impacts, one stakeholder expressed doubt that a majority of electric motors are imported into the EU (considered to be implied in the consultation document). A second participant simply responded that no additional potential impacts needed to be taken into account.

85. The third response noted the potential environmental impact(s) arising from increased copper usage in motors. It was noted that the market overview presented in the consultation document advises that 80% of systems are powered by motors of 7.5 kW rating or smaller, and that to improve the efficiency of these motors requires increasing the density of copper in each motor. In light of this fact, it was suggested that there would be a cut-off point where the copper concentration and associated efficiency effect are offset by the environment impact(s) associated with increased depletion of global copper resources.

General responses

86. Three stakeholders chose to submit general responses to the consultation document, two of which chose not respond to the consultation questions presented. A range of issues were discussed, although particular attention was given to the need to address the energy efficiency of whole systems.

Total system energy performance

87. All three responses stressed the need to adopt a total systems approach to measuring and improving energy efficiency in motor driven systems, in order to achieve design improvements and greater overall energy savings; the view was expressed that this approach is not supported by the EuP Directive and the ETL as they focus solely on product efficiency. The point was strongly made (in particular in respect to compressed air systems, which are not closed loop systems) that the most significant potential energy savings are made in the system, rather than the individual components (i.e. motors).

The Enhanced Capital Allowance (ECA) Scheme

88. Two participants commented on the ECA scheme and the Carbon Trust ETL. It was stated by one participant that whilst the incentives under the ECA and ETL had provided an initial interest in energy efficient technology, they had not led to significant results. It was suggested that efforts should rather focus on continued education of the user and the promotion of the benefits of system maintenance. The second response suggested that the ECA/ETL scheme could become a more effective tool for promoting energy efficient systems in the market if accompanied by the right level of incentive, organisation and publicity.

Other considerations

89. One stakeholder commented that because motor driven systems are supplied within an international market, whatever minimum energy levels are implemented, targets and timescales adopted by the UK need to be harmonised with Europe and also internationally.

90. Another participant expressed the concern that the Market Transformation Programme (MTP) may not have gathered sufficient detailed evidence on certain products to make accurate calculations on market trends. Specifically, it was

commented that high efficiency motor usage, variable speed pump sales and variable speed drives may have been underestimated.

91. Several general comments/observations were made by one participant:

- System installation, commissioning and maintenance are as important in reaching optimum efficiency levels as the product design.
- There is an issue of how to test and control rewound motors on the market to maintain same/similar efficiency levels within the total stock.
- Government should promote Motor Management Policy within industry, especially for SMEs, comparing existing vs. refurbished vs. new, and the total lifecycle costs.
- Energy Efficient Product needs to be specified by end users if the market is to be transformed.
- Motor comparisons should be carried out across a range of loads, not just full load, as efficiency varies across the range.
- The opportunity for energy saving with VSDs is far greater than with High efficiency motors, with a greater potential for savings and market penetration.
- Over-voltage on distribution networks contributes to widespread inefficiency across all product categories (not only motor driven systems)

Government response

92. Measures described in the consultation document are designed to cover the performance of motor driven products and the systems within which they are used. For products we have EuP, ECA and in future Government procurement standards. For systems we have Building Regulations, industry voluntary commitments and supply chain initiatives.

93. MTP does gather data on high efficiency motor usage, variable speed pump sales and variable speed drives but admits that in some areas it is limited. MTP welcomes any data in these areas that industry could supply.

4 Next steps

94. The Government will be considering the details of all responses provided as part of this consultation procedure. This will help inform various policy areas.

95. The Market Transformation Programme has carefully reviewed the existing evidence and taken into account these stakeholder responses and any new information or data. The original projections for the future performance of motor driven systems are being reviewed along with options for their ongoing improvement. MTP will be updating its library/literature in the light of these useful responses and any other consultations, in particular the development of performance standards and metrics for motor driven products and systems where these do not yet exist.

96. The outcome of this process is published in the separate document entitled ‘Policy Brief for Motor Driven Systems’ which provides an update of the baseline information provided in the original Consultation Document. While the formal consultation process has closed, engagement on the standards will continue as part of an annual reviewing and updating process.

Appendix 1 - List of respondents

Grundfos Pumps Ltd
Gambica
BCAS Ltd
Fan Manufacturers Association
Ebm-papst UK Ltd
British Pump Manufacturers Association (BPMA)