Department for Communities and Local Government

Simplifying the provisions of Part B2 of the building regulations

Impact assessment

December, 2012
Department for Communities and Local Government

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Title: Simplifying the provisions of Part B2 of the Building Regulations **IA No:** DCLG 0083 **Lead department or agency:** Department of Communities and Local Government **Other departments or agencies:**	Impact Assessment (IA) **Date:** 17/12/2012 **Stage:** Final **Source of intervention:** Domestic **Type of measure:** Secondary legislation **Contact for enquiries:** Brian Martin
Summary: Intervention and Options	**RPC Opinion:** Validated by RPC

Cost of Preferred (or more likely) Option				
Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANCB on 2009 prices)	**In scope of One-In, One-Out?**	**Measure qualifies as**
£399m	£452m	-£24.4m	Yes	OUT

What is the problem under consideration? Why is government intervention necessary?

Requirement B2 of the Building Regulations restricts the spread of flame and heat release rate of the materials used in lining any partition, wall, ceiling or other internal structure. The guidance in Approved Document B sets reasonable standards but as a result of changes in technology this guidance may be imposing additional cost beyond that necessary to achieve appropriate levels of fire safety. Wall coverings products currently available on the UK market and certified according to British Standards will soon have to bear a European Standard marking, but will not achieve European Class B standard as currently required. Allowing European Class C in specific circumstances will deliver adequate safety levels at lower cost.

What are the policy objectives and the intended effects?

The policy objective is to reduce the cost of delivering appropriate standards of fire safety in buildings. The amendments to Approved Document B will allow greater use of acrylic materials to be used in lighting installations; evidence suggests that appropriate safety standards will be maintained and a significant cost saving to industry will result. Allowing European Class C products for wall coverings in specific circumstances is intended to deliver equivalent fire safety standards to those in place currently and to avoid unintended consequences of cost increases for the industry.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Option 0 - 'Do Nothing'

A do nothing option would continue to see unnecessary cost incurred in new lighting installations and would have unintended consequences for wall coverings manufacturers

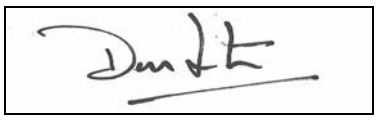
Option 1 – Make amendments to requirement B2

The preferred policy option is to make amendments to Requirement B2 and this is considered in this impact assessment against a counterfactual 'Do Nothing' option. The proposed amendments were widely supported by respondents to the consultation.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 11/2016

Does implementation go beyond minimum EU requirements?			Yes / No / N/A		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro** Yes/No	**< 20** Yes/No	**Small** Yes/No	**Medium** Yes/No	**Large** Yes/No
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:** **0.**6 $MtCO_2$	**Non-traded:**	

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.

Signed by the responsible Minister:  Date: 17 December 12

Building Regulations Minister

Rt Hon Don Foster MP

Summary: Analysis & Evidence

Policy Option 1

Description: Simplify the Guidance Supporting Requirement B2

Full economic assessment

Price Base Year 2012	PV Base Year 2013	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: 167.4	**High: 661.9**	**Best Estimate:** 399.3

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0.9	Optional	**0.9**
High	6.1	Optional	**6.1**
Best Estimate	2.9	0	**2.9**

Description and scale of key monetised costs by 'main affected groups'

One off transition costs for 4500 building control officers and 60,000 electrical engineers to familiarise themselves with the new arrangements taking approximately one hour per professional (£4.1m in the central case).

Other key non-monetised costs by 'main affected groups'

None

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	10.2	**173.5**
High	Optional	38.9	**662.8**
Best Estimate	0	23.6	**402.2**

Description and scale of key monetised benefits by 'main affected groups'

Capital cost savings for lighting installations in new build commercial and education projects (£86m) and refurbishment commercial projects (£153m). Energy savings amounting to £127m and carbon savings amounting to £18m as a result of using fewer light fittings. Benefit to wall covering manufacturers of £19 m from avoiding the increase in production costs that would arise if European standards continued to be referenced when product marking becomes mandatory.

Other key non-monetised benefits by 'main affected groups'

None

Key assumptions/sensitivities/risks (%)	Discount rate	3.5

The proposals are designed to deliver appropriate standards of fire safety as backed by external research. The estimated benefits are particularly sensitive to the cost of individual light fittings (which have been provided by experts and are considered robust) and to future build and refurbishment rates for commercial projects, both of which are uncertain and are explored further in the evidence base.

Business assessment (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OIOO?	Measure qualifies as
Costs: -0.16	**Benefits: +26.48**	**Net: +26.32**	Yes	OUT

Evidence Base (for summary sheets)

Problem under consideration

Background on the Building Regulations

1. The Building Regulations control certain building work - principally to protect the health, safety and welfare of people in or around buildings. Part B of Schedule 1 of the regulations relates to fire safety aspects of building design and construction and Approved Document B contains statutory guidance that demonstrates how the provisions can be complied with.
2. The regulations themselves are expressed in “functional” terms and do not dictate how the desired level of safety *must* be achieved. However, for the benefit of both industry and building control bodies, advice on how the requirements of the Building Regulations *may* be met are contained in guidance approved by the Secretary of State. This covers some of the more common building situations, but there may well be alternative ways of achieving compliance with the provisions. However, if followed, the guidance may be relied upon in any proceedings as tending to indicate compliance with the Building Regulations.
3. Requirement B2 of the Building Regulations restricts the spread of flame and heat release rate of the materials used in lining any partition, wall, ceiling or other internal structure. The guidance in Approved Document B sets reasonable standards by reference to both the European (EN) and British (BS) test and classification systems. The appropriate classification varies in the guidance depending on the location of the wall lining and either system of classification can be used. These design standards provide a baseline set of technical performance requirements for fire safety, but are not exclusive of other options being used to show compliance.

Thermoplastic lighting diffusers

4. The existing guidance in Approved Document B covering the application of requirement B2 to lighting diffusers was developed some time ago. Since then lighting technology has changed considerably and requirements for energy efficiency have become more stringent. Having looked again at this guidance, a solution was proposed at consultation stage which would allow more efficient lighting layouts by relaxing the restrictions on use of acrylic lighting diffusers.

Decorative wall coverings

5. The existing guidance in Approved Document B covering the application of requirement B2 to wall linings does not clearly differentiate between decorative wall coverings and wall linings that form part of the construction. As a result there is uncertainty as to how decorative coverings should be addressed. This is particularly pertinent at this time as a mandatory requirement to use the European classification system for fire performance which takes effect in 2013 has the potential to introduce unintended consequences and increased costs for certain types of wall coverings.

Rationale for intervention;

6. Building Regulations apply to "building work" (typically the erection or extension of a building) and seek to ensure buildings meet certain minimum health, safety, welfare and sustainability standards. Part B seeks to ensure that a building is safe in the event of a fire. This addresses an important information failure in that assessing fire safety performance after construction is complex and costly to rectify. By specifying fire safety performance standards at the point of build these costs are minimised. Designers, builders and even owners might take too short term a perspective in respect of fire safety and be too optimistic in assessing risk. There are also agency issues in that they also might not face the full costs of fire damage if the building is occupied by tenants who face the health and safety risk, cost of fire service provision are borne by the public sector or they are able to obtain insurance against such an incident. Minimum fire safety standards are therefore important for a well-functioning market.
7. This deregulatory policy aims to continue to deliver these benefits of Part B of the Building Regulations but to do so without industry incurring unnecessary costs.
8. As the legislative provision is "functional", statutory guidance contained in the Approved Documents sets some of the ways, for the more common buildings, of ensuring basic minimum health, safety and welfare standards are achieved when constructing buildings. This provides certainty for building control bodies and industry alike as it sets out what is sufficient (whilst providing flexibility to provide alternative building approaches where beneficial). Importantly, it also ensures that a proper cost/benefit assessment and consultation with industry has been undertaken by Government to assess what reasonable minimum standards are appropriate (and avoids the risk of unnecessarily onerous and costly standards being imposed on business).
9. DCLG undertook an exercise in the latter half of 2010 to determine what changes were necessary to the Building Regulations to ensure they remained fit-for-purpose, with a particular emphasis on identifying measures to reduce the cost of regulation to business and any other "must do" regulatory changes.
10. There were 248 responses from our external partners to this exercise. In addition, DCLG drew upon ideas and suggestions submitted to the Cabinet Office's *Your Freedom* and DCLG's own website. A summary and analysis of responses and details of the work being considered in advance of the consultation this proposal forms a part of is contained in *Future changes to the Building regulation – next steps*[1]. As set out in this document:
11. "Few responses questioned the principle of regulations setting national standards that ensure buildings are built to baseline standards, although there was some comment that they were on firmest grounds in relation to health and safety (rather than wider sustainability objectives). Many specifically recognised the positive role Building Regulations played and welcomed the fact that there was a nationally applied set of minimum requirements."
12. There were 54 responses relating to the fire safety provisions in Part B. A significant proportion of these included calls for greater regulation and the wider use of fire suppression systems. However, this exercise did not produce any significant new evidence on the health and safety benefits of greater sprinkler provision that would alter the cost/benefit analysis and the basis of the current approach.

Thermoplastic lighting diffusers

13. The Lighting Industry Federation submitted a request seeking clarification of the provisions in Approved Document B that affect the specification of thermoplastic lighting diffusers.

[1] Future changes to the Building regulation – next steps. Published by DCLG in December 2010. Available at www.communities.gov.uk/publications/planningandbuilding/buildingregsnextsteps

Supporting evidence in the form of a research report by BRE global supported the technical case for allowing greater use of acrylic materials, which indicated that a layout allowing acrylic material would deliver fire safety 'equivalent to or better than' the current approach[2].

Decorative wall coverings

14. In addition to the comments made to the Department in response to specific calls for evidence, we have also identified a need to clarify how the provisions in relation to Requirement B2 relate to decorative wall coverings. As it stands the guidance does not clearly differentiate between decorative wall coverings and wall linings. As a result there is uncertainty as to how decorative wall coverings should be addressed.

15. The guidance in Approved Document B sets reasonable standards by reference to both the European (EN) and British (BS) test and classification systems. The appropriate classification varies in the guidance depending on the location of the wall lining and either system of classification can be used.

16. However the main provisions of the EU Construction Products Regulation (305/2011) will take effect from 1 July 2013 in the UK. From this date, manufacturers of wall coverings will have to test and label their products in accordance with harmonised European standards and classification systems before they place them on the market. The primary objective of this is to establish a "common language" for specifying the essential characteristics of construction products rather than to restrict the use of any particular products.

17. The Guidance in Approved Document B currently calls for wall linings in the corridors and other circulation spaces of non domestic buildings to be rated as either "Class O" under the British Standard classification system or "Class B" under the European system.

18. At present most decorative wall coverings for use in non domestic applications are rated as "Class O" under the British Standard classification system and would be acceptable for use in corridors and other circulation spaces. However, evidence suggests that the same product would tend to be rated as "Class C" or even "Class D" under the European classification system and, under the current guidance in Approved Document B, would not be permitted in those locations. This is a problem peculiar to thin wall coverings such as wall papers and does not manifest itself for other lining products subject to the same guidance.

19. This has not been a problem to date, as use of the European standards and CE marking labelling system has been voluntary in the UK. CE marking of these products becomes mandatory in 2013 at which point the issues highlighted will become more of a significant issue. A building control officer *could* choose to accept a product achieving "Class 0" under the British System despite a European classification of "Class C" rather than "Class B", but this would be a matter of discretion. Furthermore, industry has expressed significant and valid concerns that professionals responsible for specifying materials required would tend towards products classified as "Class B" under the European system in order to ensure compliance.

20. It should be noted that the proposed amendments are not intended to reduce standards of safety and would not change the need to CE mark products in accordance with the Construction Products Regulation. However it is possible to mitigate some of the unintended consequences of imposing the European classification system by amending our own national provisions.

[2] http://www.planningportal.gov.uk/uploads/br/BREG_Report_127687.pdf, page 31

Response to the public consultation

21. The policy proposals received support in the consultation. 88% of respondents to the consultation agreed that proposals around wall coverings would indeed maintain the necessary standards of fire safety. 82% of respondents to the consultation agreed that the proposals around lighting diffusers would maintain the necessary standards of fire safety.

22. The majority of respondents could not provide additional evidence to support assessment of the impact of the policy, although some useful information regarding the costs of producing more fire resistant wall covering products was provided and has helped to develop the evidence base.

23. A number of respondents indicated their support for using a diagram in the approved document to illustrate the restrictions on spacing of lighting diffuser with the caveat that the diagram required a clear key to aid interpretation. This feedback has been taken on board for the final Approved Document.

Additional research informing the final impact assessment

24. As well as the results of the consultation this final stage impact assessment also benefits from the publication of a technical research report published by the Department alongside the consultation and two further pieces of research, one carried out by Exova Warrington Fire on fire performance of wall coverings, and a second commissioned by the Department looking specifically at the cost-benefit case on lighting diffusers.

25. During the consultation the Department published a research report commissioned from BRE[3], which analysed the fire safety performance of six wall coverings according to the British and European testing systems. Unfortunately the report was inconclusive; in the first set of testing on standard plasterboard substrate all six products selected actually failed to achieve British "Class 0", (which would be a requirement of the Building Regulations for their use in circulation spaces) although they performed better when tested on a backing of calcium silicate board. In the latter scenario for the one product which recorded a "Class 0" according to the British system a European "Class C" was recorded.

26. The second piece of research was commissioned by the British Coatings Federation, the Association of Interior Specialists and the British Contractor Furnishers Association and conducted by Exova Warrington Fire. The project examined the performance of eight commercial grade decorative wall covering systems. Of the eight products analysed six were classified "Class 0" and two "Class 2" according to the British test system. The two graded "Class 2" and four of the others were classified as European Class C whilst two products classified as "Class 0" under the British System were classified as "Class D" according to the European testing methodology. These results suggest overall that a European "Class C" is the closest equivalent to a British "Class 0".

27. Requiring a European "Class C" would therefore allow most products currently in common use to continue to be marketed as they are, and would, according to this research, deliver a marginal improvement in fire safety overall. Maintaining the current reference to European Class B would effectively increase provision for fire safety for which a cost-benefit case has not been made.

28. Most other European countries would allow European "Class C" for use in corridors and circulation spaces, so the policy approach provides for greater consistency in terms of use and application of products in the single market, alongside a common system of testing and labelling.

[3] The impact of European fire and test classification standards on wallpaper and similar decorative coverings, BRE, 2012, available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/2107408.pdf

Policy objective

29. To simplify and update the guidance supporting Requirement B2 to ensure that unnecessary burdens associated with compliance are avoided whilst maintaining adequate standards of safety

Description of options considered

Option 0 – Do nothing

A 'do nothing' option would lead to continued use of polycarbonate lighting diffusers despite evidence that significant savings could be delivered by allowing acrylic lighting diffusers whilst maintaining an appropriate degree of fire safety. There could be unintended consequences, in terms of increased costs to industry, if current requirements on wall coverings are not amended in advance of construction product marking becoming mandatory in 2013.

Option 1 - Amend the guidance supporting requirement B2

The policy option being taken forward is simplification of the guidance in Approved Document B for Lighting Diffusers and Wall Coverings. The costs and benefits of policy are considered in this impact assessment against a counterfactual 'do-nothing' scenario. The policy will reduce costs for business whilst maintaining an appropriate standard of fire safety.

Monetised and non-monetised costs and benefits of the chosen policy

Costs

30. As with any change to Building Regulations Guidance there will be some transitional costs associated with users of the guidance familiarising themselves with the changes. Given the very limited nature of these proposals we do not consider that any additional training would be required and it is most likely that professionals will familiarise themselves with the changes when they come to use it for the first time.

Lighting diffusers

31. Transition costs have been estimated as approximately £3m. This assumes that around 30% of 197,400 electrical engineers will have to spend one hour familiarising themselves with the new guidance, equivalent to around one engineer per electrical firm[4], and 4500 building control professionals will similarly have to spend one hour. In reality some firms will specialise in commercial installations and every staff member will need to become familiar with the new guidance and some firms will avoid such work and might only need to familiarise themselves with the guidance at the point of doing a commercial job.

[4] Number of professionals based on EC Harris estimates. Number of electrical contracting firms based on data used for Part P impact assessment (39,000 firms registered with competent persons plus an estimated 20,000 not registered), see http://www.communities.gov.uk/documents/planningandbuilding/pdf/157248.pdf.

32. Estimates of hourly costs are based on two sources, the EC Harris database of professional fees and from the Annual Survey of Hours and Earnings[5]. Hourly rates have been calculated for the central case by attaching a 50% weighting to wage rates from the EC Harris professional fees database and a 50% weight to wage rates derived from the Annual Survey of Hours and Earnings[6]. This leads to estimated hourly rates of £46.5 for electrical engineers and £42 for building control professionals.

33. The EC Harris database has been used as a source of evidence on the cost for workers in the construction industry. This reflects the value by the market of a professional including wage, on costs and other business costs to the organisation. This approach is widely used in the construction industry. However, there is a risk that this may overstate the cost savings. For instance in some situations, the saving may result in the professional being employed for fewer hours and delivering less than the full business cost savings assumed in the charge out rates. We have therefore also used the Standard Cost Model to estimate costs based upon the Annual Survey of Hours and Earnings (ASHE) plus an additional estimate of 30% for additional overheads such as pension contributions and national insurance contributions . It is our assessment that this approach underestimates typical benefits of time for professionals in the construction industry.

34. So for our central estimate we have assumed an hourly rate half way between the EC Harris industry estimate and the ASHE plus 30% approach. We feel this estimate reasonably reflects that some time savings of key professionals have a high value reflected in the charge out rate for carrying out other priorities while in other situations the business cost saving might be more constrained.

35. To reflect the uncertainty over how long professionals will be required to spend familiarising themselves with the new arrangements we have assumed that only 30 mins is spent in the low cost scenario and 90 minutes in the high cost scenario.

36. The results of the consultation supported the view that the relaxation would still deliver an 'equivalent or better' level of fire safety[7] therefore there are no ongoing costs of the policy in terms of impact on fire safety.

Table 1 – Transitional Cost Assumptions

	Number	Proportion	Hourly Rate (low/central/high) £/hr	Number of Hours (low/central/ high)
Electrical Engineers	197,400	30%	29 / 47 / 64	0.5/1/1.5
Building Control Surveyors	4,500	100%	24 / 42 / 60	0.5/1/1.5

Source: Adroit Economics

Table 2 – Transition costs

	Low cost	Central	High cost
Electrical Engineers	£ 858,690	£ 2,753,730	£ 5,685,120
Building Control Surveyors	£ 54,000	£ 189,000	£ 405,000
Total	**£ 912,690**	**£ 2,942,730**	**£ 6,090,120**

[5] ONS, ASHE, 2012, http://www.ons.gov.uk/ons/rel/ashe/annual-survey-of-hours-and-earnings/ashe-results-2011/ashe-statistical-bulletin-2011.htm

[6] Estimates from the ASHE have been up-rated by 30% to allow for pensions, national insurance contributions and other variable costs of labour employment (see Standard Cost Model, BERR, 2005, http://www.berr.gov.uk/files/file44503.pdf)

[7] http://www.planningportal.gov.uk/uploads/br/BREG_Report_127687.pdf, page 31

Wall coverings

37. The proposed amendments to the guidance are designed to ensure that those products which are currently used will remain acceptable and therefore there are no transitional costs associated with this proposal.

38. In the counterfactual scenario over the longer term, greater use of European “Class B” products or reduced use of wall coverings altogether could result. However, the consultation has supported the view that any fire safety benefits resulting from increased use of European Class B products would be marginal.

39. The BRE report noted that ‘fire statistics do not contain sufficient detail to evaluate whether or not any wall coverings specifically contributed to fires’. The report also suggested that fires originating in circulation spaces were uncommon (<10%) and that the proportion of fires that spread from the room of origin was low (10-20%). The annual life-safety cost of all fires in relevant building types which started in circulation space (e.g. corridor) or were spread beyond the room of origin was estimated at £118m per annum. A DCLG review of the fire incident response database has identified that wall coverings are not separately identified from other fixtures and fittings in determining the spread of fire.

Benefits

Lighting diffusers

40. There are two classes of diffuser material; TPa and TPb. Current guidance on the spacing of TPb lighting diffusers tends to drive designers to use TPa materials which perform better in fire but worse than TPb in terms of lighting efficiency. As a result more light fittings are used to deliver the required degree of illumination.

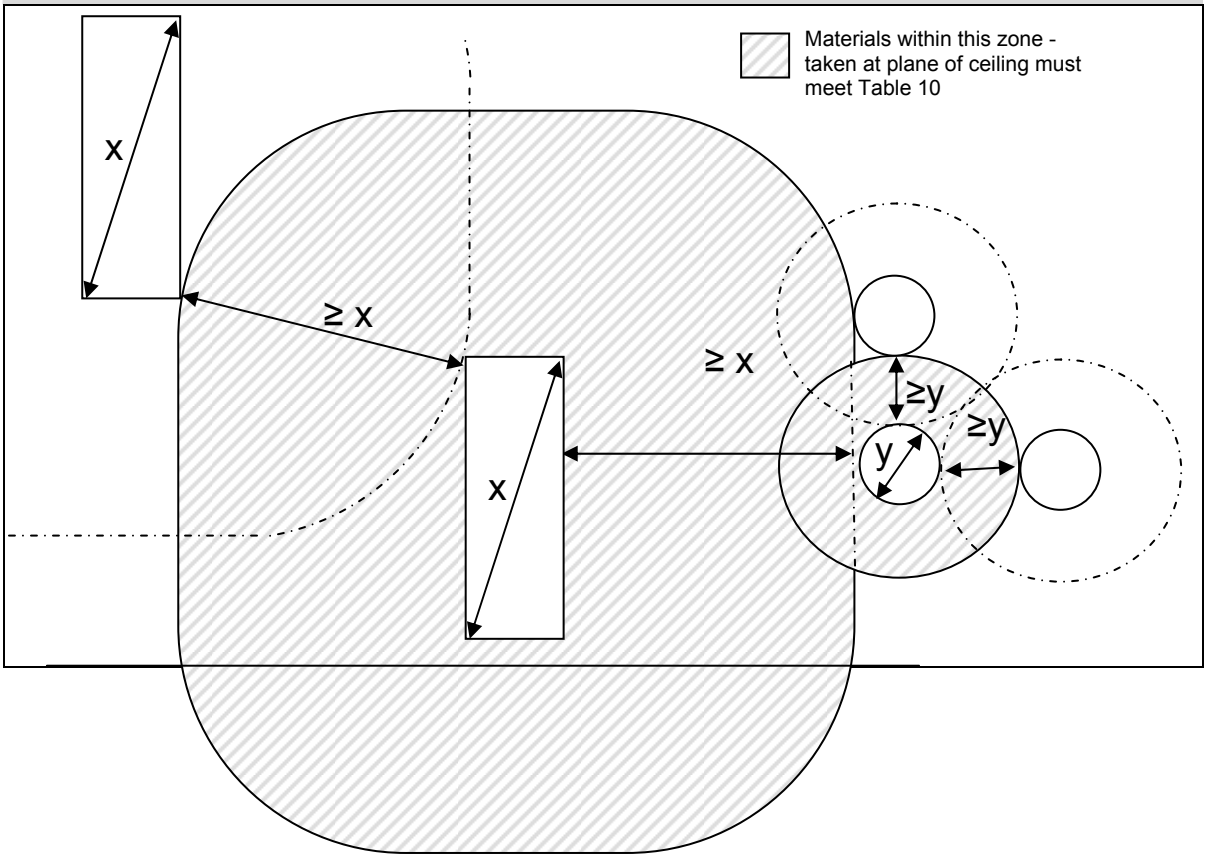
41. Current guidance provides for the unlimited use of TPa products but restricts TPb products to a maximum total area of 15% of ceiling area in circulation spaces and to 50% in rooms. In addition, individual panels or groups of panels are limited to a maximum size of 5m2 and must be located a minimum of 3m apart. The amended guidance retains the limits on total area but provides a reduced spacing requirement, shown in Diagram 28 of Approved Document B and reproduced below, for panels that are less than 1m2.

42. As shown in Diagram 28 the spacing requirement is reduced so that minimum distance between two rectangular diffusers must be no less than the length of the diagonal of the diffuser. Since a typical diffuser would have a diagonal length of less than one metre this allows the diffusers to be placed more closely together than the current three metre minimum. For circular diffusers the minimum separation between diffusers must be greater than the diameter of the diffusers.

43. The proposed changes to the guidance on spacing of TPb diffusers will allow designers to achieve the desired light level with slightly less units. The TPb diffusers would typically be further apart than the TPa diffusers which are currently widely used but closer together than is currently allowed for TPb diffusers. There is no significant cost difference between the two materials.

Fig 1 – Diagram 28 of Approved Document B

Diagram 28 of Approved Document B: **Layout restrictions on small Class 3 plastic roof lights, TP(b) roof lights and lighting diffusers**



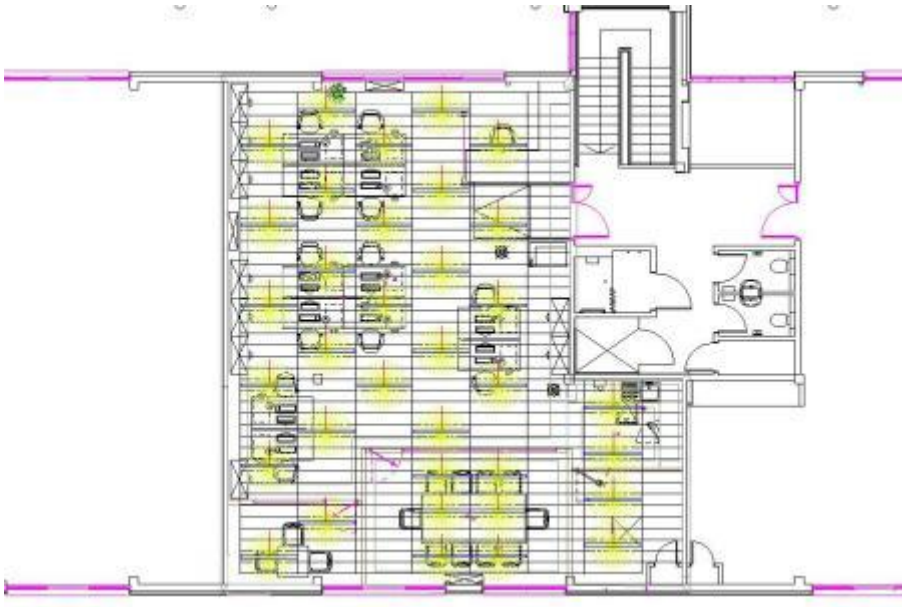
44. The potential savings are illustrated in figures 2 and 3 for a small commercial office. The top panel shows the optimal layout of luminaires to achieve the required level of illumination with the TP(a) polycarbonate diffusers. The bottom panel shows the optimal layout using the more efficient TP(b) acrylic diffusers. This layout could not be used currently due to restrictions in Approved Document B, but would be allowed under the new policy. As can be seen, the new optimal layout would deliver the required levels of illumination with fewer light fittings.

45. At consultation stage we estimated that around 15% less fittings would be necessary if the more efficient TPb materials could be more widely used.

46. At consultation stage estimates were presented on the basis of annual sales of the relevant light fitting (3m to 7m per annum) and the average installed cost (£45). Assuming that 80% of potential benefits were realised the year 1 benefit of the policy was estimated to be £27m and the present value benefit over ten years to be £232m.

Fig 2 – Illustrative optimal lighting layout with TP(a) polycarbonate diffuser

Fig 3 – Illustrative optimal lighting layout with TP(b) acrylic diffuser



47. To strengthen the evidence base DCLG commissioned EC Harris in conjunction with Hyder Consulting and Adroit Economics to further investigate how the proposals might be adopted in practice[8]. The key aspect of this research performed by Hyder Consulting considered lighting installations in seven notional building types and how the new guidance would change the optimal lighting installation in each case, looking at:

- small offices, shallow plan, less than 250m^2
- medium offices, shallow plan, 250m^2 to 1000m^2
- large offices, shallow plan, 1000m^2 +
- deep plan offices, 5098m^2 +
- retail premises
- educational premises
- health care centres.

48. The work considered whether the revised guidance would allow a reduced number of light fittings in the optimal design. EC Harris and Adroit Economics then estimated both the capital cost savings and the ongoing energy savings from the policy.

49. Hyder's report analysed the number of light fittings required to deliver the required degree of illumination in different parts of the notional building (desk areas, kitchen areas, corridors, reception areas and meeting rooms) according to relevant British Standards and guidance from the Chartered Institute of Building Service Engineers, using the both polycarbonate TP(a) and acrylic TP(b) diffusers and the spacing requirements outlined above. The calculation is performed using specialist software that uses an example layout of the notional building to calculate the optimum number of lighting diffusers (as used by designers in actual projects).

50. The software requires a variety of input assumptions to be made and values standard to this type of calculation have been assumed throughout.

- 2250 hours of daytime usage per year (250 working days with 9 hours of daytime usage per day)
- 250 hours of night-time usage per year
- occupancy dependency factor of 0.90 to reflect the fact that the building will not be fully occupied all the time
- 2.5m internal room height
- emergency lighting excluded from calculations
- windows not taken into account
- desks 0.75m high.[9]

51. For new installations, the potential reduction in the number of luminaires required is illustrated in table 3. The savings are greatest for deep plan offices, since these have the greatest desk area (where the brightest lighting is required by the guidance to aid reading and writing) and the additional performance of TP(b) materials is therefore most beneficial. The reduction in the number of luminaries in the optimal installation ranges from 13% to 25% dependent on the size of the office. This is consistent with the broad estimate made at consultation stage that the amendment would deliver a 15% reduction in the number of luminaires.

[8] EC Harris, Adroit Economics, Hyder Consulting, Lighting Diffusers Final Report

[9] Additional assumptions available in the report itself (e.g. regarding reflectance of different surfaces)

Table 3 – Lighting layouts in a new build project under the amended regulations

	No. Luminaires (polycarbonate)	No. Luminaires (acrylic)	Reduction due to amendment	Reduction due to amendment
Small Offices	40	35	5	-13%
Medium Offices	202	171	31	-15%
Large Offices	289	234	55	-19%
Deep Plan Offices	1,497	1,123	374	-25%
Schools				
1x35W linear fluorescent	120	130	10	8%
2x35W linear fluorescent	76	60	16	-21%

Source: EC Harris, Hyder Consulting

52. For refurbishment installations the potential reduction in the number of luminaires when the lighting layout is reconfigured is the same. No saving is anticipated for refurbishment of educational premises. Some refurbishment projects will reconfigure the ceiling layout and some will continue using the existing layout; where the existing layout is retained the amendment of Approved Document B will not deliver any savings. For the purposes of the report the consultants have assumed that 50% of refurbishment projects will include a new ceiling and lighting installation an assumption that is utilised in this impact assessment also.

53. One of the key findings of the research is the estimated cost of the lighting diffuser panels; in the consultation stage impact assessment we assumed £45 per fitting. The EC Harris report establishes a cost of £260 per lighting diffuser and is based on prices sourced from industry suppliers for the specific purpose of the lighting installations in question. For commercial projects, the designers have advised that £260 reflects the average cost of a diffuser suitable for use in typical office installations.

54. New installations have been costed on the basis that each fitting costs £20 to install covering both labour and the materials necessary for the installation. For refurbishment projects where the layout is maintained in the existing format the installed cost is £270 (covering materials and installation with no amendment to the wiring) and where the layout is modified the estimated cost is £285 as more modification of the wiring may be required. Capital cost savings for new installations have been calculated based on the reduction in the number of luminaires and the estimated installed cost of the light fittings as shown in table 4. The amended layout for refurbished schools was not found to be cost effective and so have not been included in Table 5.

Table 4 – Capital cost savings for new lighting installations

	Existing Regulation		Amended Regulation		
	Luminaires	**Rate**	**Luminaires**	**Rate**	**Cost Difference**
Small Offices	40	£280	35	£280	£1,400
Medium Offices	202	£280	171	£280	£8,680
Large Offices	289	£280	234	£280	£15,400
Deep Plan Offices	1,497	£280	1,123	£280	£104,720
Schools					
1x35W linear fluorescent	120	£128	130	£132	-£1,825
2x35W linear fluorescent	76	£136	60	£139	£1,987
Subtotal					£162

Source: EC Harris

Table 5 – Capital cost savings for refurbished lighting installations

	Existing Regulation		Amended Regulation		
	Luminaires	**Rate**	**Luminaires**	**Rate**	**Cost Difference**
Small Offices	40	£270	35	£285	-£825
Medium Offices	202	£270	171	£285	-£5,805
Large Offices	289	£270	234	£285	-£11,340
Deep Plan Offices	1,497	£270	1,123	£285	-£84,135

Source: EC Harris

55. The policy will also deliver a significant energy saving over the lifetime of the life fitting. The average life of a lighting diffuser is 10-15 years, so the energy savings from each building constructed under the amended guidance are valued over the lifetime of the light fitting and discounted to 2013.

56. The lighting installation software generates energy use statistics for each installation based on the assumptions set out in paragraph 45. The energy use of the installation is calculated from the wattage of the bulbs (49W) multiplied by the assumed annual usage (2500 hours). The optimal configuration of both types of lighting diffuser uses lamps of the same wattage and therefore the saving comes purely from the reduction in the number of luminaires required. The savings for the different notional building types are shown in table 6.

Table 6 – Energy Savings – per annum

New Installation Option 1 - 49W T5 Fluorescent Acrylic Diffuser			
	Existing Regulation (Polycarbonate 49W) (kWh/yr)	**New Regulation (Acrylic 49W) (kWh/yr)**	**Energy Consumption Saving (kWh/yr)**
Small offices	4,905.00	4,291.88	-613.12
Medium offices	24,770.25	20,968.88	-3,801.37
Large offices	35,438.63	28,694.25	-6,744.38
Deep Plan Offices	183,569.63	137,707.08	-45,862.55
Schools	23,355.00	22,059.00	-1,296.00

Source: EC Harris

57. The energy savings are valued using forecast electricity prices, in pence per kWh, as published by the Department for Energy and Climate Change (DECC)[1]. To reflect the uncertainty over future electricity prices the modelling in the IA uses the low/central/high electricity prices respectively for the relevant scenario of the IA. For the main social cost benefit analysis the variable element is used, as per DECC guidance. This takes the full retail energy price saving to the occupant and then nets off what are in effect 'transfer payments' - those fixed costs in the energy supply which will still need to be borne by other consumers and the loss of tax revenue to the government exchequer. The direct costs to business are considered in detail at paragraph 73 onwards using the retail energy price, since this is the fuel bill saving for business delivered by the policy. Forecast energy prices for the three scenarios are shown in Annex A. The annual energy savings for each build type for the first year are shown in table 7.

Table 7 – Value of Energy savings (£ per annum)

Energy Savings (£ per annum)	Low electricity price	Central electricity price	High electricity price
Small offices	-40	-57	-61
Medium offices	-247	-355	-379
Large offices	-438	-629	-672
Deep Plan Offices	-2,979	-4,280	-4,571
Schools	-84	-121	-129

58. The reduction in electricity demand will also deliver a carbon saving. This is calculated using marginal electricity emission factors taken from DECC guidance and valued in table 9 using low/central/high projected carbon prices as published by DECC. For 2013 the marginal electricity emission factor is 0.3735 kgCO_2/kWh.

Table 8 – Carbon Savings (tonnes per annum)

Carbon Savings (tonnes)	Carbon savings - tonnes
Small offices	0.23
Medium offices	1.42
Large offices	2.52
Deep Plan Offices	17.13
Schools	0.48

Table 9 - Value of Carbon Savings (£) per annum

Value of carbon savings (£)	Low carbon price	Central carbon price	High carbon price
Small offices	2	4	5
Medium offices	12	23	28
Large offices	22	40	50
Deep Plan Offices	151	272	342
Schools	4	8	10

[1] http://www.decc.gov.uk/en/content/cms/about/ec_social_res/iag_guidance/iag_guidance.aspx

59. To translate the savings set out into a national figure assumptions must be made about the rate of development of new commercial buildings and frequency of refurbishment of existing buildings.

60. There is uncertainty over future build rates and no official projections exist for non-domestic buildings, therefore three reasonable scenarios are modelled. The approach taken is to examine the stock of existing buildings by floor space and, based on assumed building lifetimes, to calculate how many new buildings would be expected. Consistent with the Part L Impact Assessment the central scenario uses a building lifetime of 60 years. In the low scenario 80 years is assumed and in the high scenario 40 years is assumed. The analysis assumes that buildings are refurbished every 10/15/20 years in the low/central/high scenario.

61. To validate these assumptions several further sources have been considered. Adroit Economics analysis of the ONS construction statistics suggests that in the order of 3600 new commercial units are developed per year[2]. The DCLG publication 'Baseline Key Performance Indicators' for the Sustainable and Secure Buildings Act presents data that 3,674,000 sq m of new commercial and retail floorspace was built in 2005-2006; if this is assumed to be built to the same proportions as the existing stock this would suggest around 4000 new commercial buildings per year. Furthermore, planning statistics collected by DCLG suggest 3,387 major and minor office developments in the year to March 2011[3]. These three sources help to confirm that the estimates presented below are a reasonable representation of construction rates for the different building typologies, particularly given the volatility of investment and construction over time. The stock estimate for commercial offices below excludes local government and the central government estate, which have not been monetised so the total is appropriate in assessing the impact on business. The central scenario is reasonably cautious, which is appropriate for quantifying the impact of a regulatory 'OUT'.

Table 10 – Build rate Assumptions

Building type	Stock of existing non-domestic buildings	Build rate - low	Build rate - central	Build rate - high
Small commercial office (<250 m^2)	201,113	1.25%	1.67%	2.50%
Med. commercial office (250-1000m^2)	40,613	1.25%	1.67%	2.50%
Large commercial office (1000m^{2+})	6,237	1.25%	1.67%	2.50%
Deep plan office (2500m^{2+})	3030	1.25%	1.67%	2.50%

Table 11 – Build rate assumptions

Build rate	Low	Central	High
Small commercial offices	1890	2363	3151
Medium commercial offices	477	636	954
Large commercial offices	73	98	147
Deep plan offices	36	47	71
Schools	200	200	200

[2] Adroit Economics: CBA of Proposed Changes to Lighting Diffusers, available at [WEBLINK]. ONS construction statistics are available at: http://www.ons.gov.uk/ons/taxonomy/search/index.html?newquery=*&nscl=Building+and+Construction&nscl-orig=Building+and+Construction&content-type=publicationContentTypes&sortDirection=DESCENDING&sortBy=pubdate

[3] http://www.communities.gov.uk/documents/statistics/xls/1929704.xls

62. These build rates, combined with the information from table 4 and 5 on the number of luminaires required in different circumstances suggest a total number of light fittings for these environments of around 1.3-2.6 million.

63. Table 12 shows an illustration of all the savings in the central build rate scenario for new buildings only. The energy and carbon savings accumulate as more buildings are built to the more efficient design. For example, in year 2, the energy and carbon savings are counted for all buildings that were built to the new design in year 1 and those in year 2. In Annex B equivalent calculations are presented for refurbishment projects and for the low and high scenarios.

64. The analysis assumes that 65% of projects adopt the more efficient lighting design, rather than 80% as assumed in the consultation, on the basis of advice from Hyder Consulting. This takes into account the fact that some buildings are designed in such a way that the savings are not possible, or not possible to the same extent, and that some projects will choose alternative lighting solutions. This is believed to be a reasonable assumption based on current experience for at least the next five years, after which the picture becomes more uncertain as it is dependent on technological developments. After the first five years of the policy the proportion of projects for which savings are applicable is reduced by 5% each year to reflect the fact that other lighting technologies could potentially become more important over this time frame[4]. In the low scenario the analysis assumes that only 50% of projects benefit from the savings and this is reduced by 10% per annum after the first five years. In the high scenario we have assumed that 65% of projects continue to benefit from the savings over the entire ten year lifetime of the policy.

65. To reflect uncertainty in the low scenario the analysis assumes that only 50% of projects benefit from the savings and this is reduced by 10% per annum after the first five years. In the high scenario we have assumed that 65% of projects continue to benefit from the savings over the entire ten year lifetime of the policy.

66. Table 12 shows the capital energy and carbon savings generated by the policy. We have only included the benefits of capital or energy savings occurring within the ten year policy window but there are likely to be additional energy and carbon benefits occurring outside this window as a result of the policy action. This means the estimated NPV of the policy is conservative.

67. Table 12 shows the capital, energy and carbon savings estimated for new buildings in the central build scenario. Equivalent calculations have been performed for refurbishment properties and for the low and high build scenarios; detailed tables equivalent to table 12 are presented in Annex B. The summary results of this analysis are collected together in table 13.

68. The total carbon saving from the policy is estimated to be 0.6 $MtCO_2$ over the lifetime of the installations.

69.

Table 12 – Capital, energy and carbon savings for new buildings, central build rate

Savings for New Buildings - Central build rate				
Year	Capital cost saving (£)	Energy Saving (£)	Carbon Saving (£)	Total (£)
2013	9,981,654	430,260	27,377	10,439,292
2014	9,981,654	845,996	58,832	10,886,482
2015	9,981,654	1,269,114	97,553	11,348,321
2016	9,981,654	1,703,588	141,311	11,826,554
2017	9,981,654	2,132,902	188,562	12,303,119
2018	9,981,654	2,449,352	239,733	12,670,740
2019	9,981,654	2,815,489	299,648	13,096,791
2020	9,981,654	3,214,756	370,381	13,566,792
2021	9,981,654	3,684,408	469,145	14,135,208
2022	9,981,654	4,048,751	573,811	14,604,217
2023	-	4,081,575	643,401	4,724,976
2024	-	4,319,509	712,992	5,032,500
2025	-	4,202,842	738,349	4,941,190
2026	-	3,726,746	665,105	4,391,851
2027	-	3,328,166	581,712	3,909,878
2028	-	2,844,398	491,007	3,335,405
2029	-	2,338,153	395,830	2,733,983
2030	-	1,870,644	302,458	2,173,102
2031	-	1,381,726	223,148	1,604,874
2032	-	935,322	148,464	1,083,785
2033	-	531,433	81,510	612,942
2034	-	170,059	24,733	194,792
NPV	**85,918,952**	**37,216,824**	**5,139,054**	**128,274,831**

70. Table 12 shows the capital, energy and carbon savings estimated for new buildings in the low build scenario. Equivalent calculations have been performed for refurbishment properties and for the low and high build scenarios (detailed tables in Annex B) and the summary results are reported in table 13[5]. As explained above, the £37.2m energy saving is calculated using the variable energy price to give the net benefit to society from saving energy. The retail price benefit is estimated to be £58.7m. This includes the value of saved carbon ETS permits, estimated at £5.1m, which is already valued separately above. It also includes transfer payments such as fixed costs in the energy system, which will still need to be funded by consumers, plus reduced tax revenue to the government exchequer, together totalling an estimated £16.4m. These are subtracted from the retail energy price to give the variable energy price, used to estimate the overall impact on society.

71. Capital cost savings here are estimated to be £100-£300m. This is lower than the estimate made for the consultation stage impact assessment of £120-£430m, which is reasonable since the research highlighted that savings were only achievable for particular building types. The overall benefits of the policy are higher in this final stage impact assessment because the energy and carbon savings have also been considered.

[5] For further detail on the methodology see the Adroit Economics report.

Table 13 – Benefits of the amended regulations (£2012, annual equivalent values and present value over 10 year policy lifetime[6])

	Low	Central	High
annual equivalent benefit - new build	£ 3,645672	£ 7,519,760	£ 12,953,701
annual equivalent benefit - refurb	£ 6,083,606	£ 14,967,901	£ 23,992,202
Present value benefit – new build	£ 62,189,230	£ 128,274,831	£ 220,968,965
Present value benefit – refurb	£ 103,776,394	£ 255,327,960	£ 409,267,796
PV benefits	**£ 165,965,624**	**£ 383,602,792**	**£ 630,236,761**

72. There is a potential overlap between energy savings achieved from this policy and the requirements of Part L of the Building Regulations which deals specifically with energy efficiency. Buildings must achieve equivalent or better energy performance relative to the target emission rate derived from the notional building of the same size produced by the SBEM modelling software. At the margin, installing these more efficient lighting technologies will save energy with result that a builder might avoid having to install solar PV panels or some other form of abatement technology or renewable energy generation. In this case it might be more appropriate to value the avoided capital costs of the renewable installation as opposed to the energy savings. The capital cost savings would depend on the cost of the marginal technology required to achieve the notional building standard in any specific case (potentially Solar PV). However, this would all be dependent on whether the notional building would be modified to take into account the amendments to Part B of the Building Regulations which we have assumed will be the case in the future. In such a situation this change would not affect the other energy saving improvements required to meet the Part L standard. For this reason we have valued the energy savings as a result of this policy change directly in this IA.

Wall coverings

73. The amendments to Approved Document B will reduce costs to industry, since it avoids the additional cost associated with producing European “Class B” products.

74. The proposed amendments to the guidance are designed to ensure that those products which are currently acceptable for use will remain acceptable without modification. However, if the proposed changes are not taken forward then it may no longer be possible to use certain products and more expensive alternatives may need to be used instead. Information received from the British Coatings Federation prior to the consultation estimated the value of sales of commercial wall coverings to be between £25 to £28 million a year and estimated that manufacturing costs could increase by between 10% and 20% if these changes are not taken forward.

75. Further information received from Muraspec in response to the consultation indicated that European “Class B” would need to be sold at a price nearly 60% above that of products built to British “Class 0” and that the size of the UK wall coverings market was around £40 million (although only 35% of the total market, in volume terms, would be subject to the requirements of Part B of the Building Regulations for use in circulation spaces). The information provided indicated that with an additional primer coating Class B products could be produced, although at a cost around 29% higher than the current cost.

[6] Energy savings are considered over the lifetime of the lighting diffuser, 12.5 years.

76. For the purposes of estimating the costs for the impact assessment we focus on the additional production costs associated with producing Class B rather than Class C wall coverings; this is the burden avoided by amending Approved Document B. Implicitly this assumes that all manufacturers would switch to producing European Class B products. The effects of product switching are not taken account of here; the ultimate impact of keeping a European requirement of Class B would be felt through a reduction in demand for heavy duty wall coverings as potential buyers switch to alternative means of interior decoration but the cost increase provides a reasonable way of approximating the impact.

77. Case study evidence submitted to the department suggests that where UK firms have marketed Euroclass B products demand has been extremely low, although we have allowed for there being some demand for Euroclass B products currently by assuming 0%/5%/10% use of Euroclass B in the baseline.

Table 14: Benefits of amending Part B to reference European Class C for wall coverings

	Low	Central	High
Total market value of heavy duty wall coverings	£ 25,000,000	£ 32,500,000	£ 40,000,000
- of which 35% estimated to be Part B Relevant (in corridor spaces etc.)	£ 8,750,000	£ 11,375,000	£ 14,000,000
% of market choosing Euroclass B in baseline	0%	5%	10%
% cost increase (European class B vs European class C)	10.00%	20.00%	30.00%
Annual benefits of Part B amendments (cost increase averted)	£ 875,000	£ 2,161,250	£ 3,780,000
NPV (10 years)	£ 7,531,726	£ 18,603,362	£ 32,537,055

78. The estimated benefits of referencing European Class C for wall coverings rather than the currently mandated European Class B are therefore £0.9m to £3.8 million per year. The central estimate is £2.2m per annum giving a present value of **£18.6m**.

Summary of costs and benefits

79. The two elements of this impact assessment together deliver a net present benefit of **£399.3m** (with a ten year policy period and energy savings considered over the lifetime of the light fitting.)

Table 15 – Summary table of Costs and Benefits (2012 prices)

LIGHTING DIFFUSERS			
	Low	Central	High
New build - average annual benefit	£ 3,645672	£ 7,519,760	£ 12,953,701
Refurbishments – average annual benefit	£ 6,083,606	£ 14,967,901	£ 23,992,202
New build (present value)	£ 62,189,230	£ 128,274,831	£ 220,968,965
Refurbishments (present value)	£ 103,776,394	£ 255,327,960	£ 409,267,796
Present value benefit	**£ 165,965,624**	**£ 383,602,792**	**£ 630,236,761**
WALL COVERINGS			
Average annual	£ 875,000	£ 2,161,250	£ 3,780,000
PV (10 years)	£ 7,531,726	£ 18,603,362	£ 32,537,055

TOTAL			
PV Benefit	£ 173,497,349	£ 402,206,154	£ 662,773,816
PV Cost	-£ 6,090,120	-£ 2,942,730	-£ 912,690
Net present value	£ 167,407,229	£ 399,263,424	£ 661,861,126

Risks and assumptions

80. The estimated impact of the policy has been refined significantly since the consultation stage assessment on the basis of additional research conducted by EC Harris, Adroit Economics and Hyder Consulting. The final assessment of the deregulatory benefit of amending Part B is larger; we believe this is reasonable, both because it is underpinned by detailed work assessing the lighting installations required in different commercial buildings and because the work has been furthered by considering the energy and carbon savings resulting from the policy in addition to any capital savings.

81. However, there are still a number of important uncertainties. The number of new buildings per annum is unknown and has thus been reflected by the use of a broad range reflecting a plausible high and low scenario. The estimated number of new projects has also been compared to various other sources including ONS statistics, planning statistics and work performed for the Energy Performance of Building Directive Regulatory Impact Assessment strengthening the case for the build rates that have been assumed.

82. The proportion of buildings for which the savings estimates are valid is the other important unknown (some building designs might not lend themselves to the different layouts and some will choose alternative lighting technologies). 65% has been selected on the advice of the consultant team (see Adroit Economics report), representing a decrease from the 80% assumed at consultation. This is thought to be an accurate estimate based on current installations for at least the next five years. In the central scenario, after this time, we assume that 5% less projects are able to achieve the savings as other lighting technologies become more viable alternatives. The uncertainty associated with this is captured in the low and high scenarios' in the low scenario only 50% of projects achieve the savings and this falls at 10% per annum thereafter.

Sensitivity testing

83. The low and high scenarios considered in the impact assessment reflect the primary uncertainty over future new build rates and the additional uncertainties from the lifetime of the light fitting, the applicability of the savings and future energy and carbon prices. Thus most of the main uncertainties have been taken into account in the three scenarios presented.

84. The value of the individual lights fittings is an important variable. We have used £260 per fitting throughout the analysis as this is the cost sourced by Hyder Consulting as a representative unit suitable for use in commercial buildings. Were the light fitting to cost £45 as we estimated at consultation, instead of £260, the present value benefits from light fittings would be reduced from £393m to £158m. However, £45 was at the very low end of the possible cost of such fittings and not representative of a unit suitable for use in a commercial office building nor the range of potential options available for such use (with many options available at a cost much higher than £260).

Direct costs and benefits to business calculations (following OIOO methodology)

85. According to OIOO methodology the direct costs and benefits should be reported on an 'annual equivalent' basis in 2009 prices for standardised comparison across policies. There is a significant cost saving for industry generated by the policy. In order to value the saving specifically to business the previous analysis is adjusted to value energy savings at the retail energy price, as per DECC guidance. However, the retail price captures the cost of the Emissions Trading Scheme permits for carbon and so this has been excluded from the business calculation to avoid double counting. The energy savings to business are reproduced in Annex C. This gives a total benefit to business from lighting diffusers of £436.1m.

86. From a social perspective the fixed costs of the electricity supply network are not relevant as the costs will be incurred whether the units are consumed or not. The impact on business though is the full saving on the energy bill. The office savings above are for commercial buildings only so have been included as a benefit to business. We have excluded all schools from the benefit to business calculation.

87. For wall coverings the products in question are not used in domestic buildings but in commercial buildings such as hotels, therefore the full benefits accrue to business (£18.6m). The total benefit to business is therefore £454.7 m. Less the transition costs falling on business of £2.9m[7] the total net benefit to business is **£451.8m**.

88. Annual equivalent benefits have been over the lifetime of the savings, which has been estimated over 25 years based on 10 years of policy and the upper 15 year lifetime of savings estimate. This provides a cautious estimate of the size of the 'OUT'. The annual equivalent benefit in 2012 prices is estimated to be £26.5 million with an annual equivalent cost of £0.2 million and an overall annual equivalent net benefit to business of £26.3 million in 2012 prices (£24.3m in 2009 prices for OIOO).

Table 16 – Direct costs to business (according to 'One-In One-Out' methodology)

Direct costs to business	Central case
AE Cost (£2012)	-164,200
AE Benefit (£2012)	26,484,707
Annual Equivalent Net Benefit to Business (£2012)	26,320,507
Annual Equivalent Net Benefit to Business (£2009)	24,399,110

[7] Assumes that 25% of the transition costs to building control bodies fall on private sector building control bodies. See DCLG Survey of Building Control, 2008, http://www.communities.gov.uk/publications/planningandbuilding/surveybuildingcontrolrpt

Wider impacts

Equalities impact test

89. An initial equalities screening of the proposed policy was carried out and determined that a full equalities impact test was not required as the proposal does not adversely affect any minority groups.

Competition assessment

90. The proposed policy updates the standards that buildings should generally be constructed to. As such it does not make any significant change to how the UK market will operate.

91. On that basis, it is considered that the proposals to change the guidance apply in a proportional and equitable way.

Lighting diffusers

92. By allowing greater use of a product currently the subject of restrictions, the policy is expected to, if anything, have a small but positive impact on competition. Producers of TP(a) and TP(b) materials will be required to compete vigorously for business and on a more equal footing.

Wall coverings

93. On wall coverings the policy has a number of impacts on competition. Firms offering British Class 0 products will not be required to reformulate products in order to achieve the necessary European classification; this should foster competition by keeping a wider range of products in the market and reducing fixed costs.

94. Referencing European Class C rather than Class B in the Approved Document would bring England more in line with other EU Member States thus avoiding the need to develop different products for different markets and this will encourage Europe-wide competition in the market.

Small Firms impact test

95. The policy change on lighting diffusers should have a positive impact on both small and large firms. Both small and large firms will benefit from the installation cost and energy cost savings over time. Small firms are more likely to benefit indirectly, through reduced energy costs, rather than directly at the point of build.

96. Regarding wall coverings the policy will avoid British suppliers from having to reformulate products to obtain European Class B ratings or remove products from the market. This is likely to be of particular benefit for small firms in the wall coverings market that might have the least capacity to absorb additional fixed costs.

Environmental impact tests

97. It has been determined that this policy will result in a reduction in greenhouse gasses being emitted and have no impact on the wider environment. The changes to guidance on Lighting Diffusers will facilitate the wider use of more energy efficient lighting systems. We have estimated the total carbon saving to be 0.6 $MtCO_2$ tonnes of CO_2 over the lifetime of the light fittings.

Social impact tests

98. We do not expect the proposal to have any social implications.

Sustainable development

99. We do not expect the proposal to have any sustainable development implications.

Summary and implementation plan

100. The policy provides reductions in regulatory burdens and facilitates the use of more energy efficient lighting systems without having a detrimental effect on fire safety. This will deliver capital and energy savings to business over the lifetime of the policy.

101. The policy amends references for fire performance standards of heavy duty wall coverings assessed according to the European Classification system, maintaining current levels of fire safety to avoid the unintended consequences of the 'do nothing' scenario.

102. Amendments will be made to Approved Document B, coming into force from April 2013.

Annex A

Energy and Carbon Price Assumptions

Forecast variable element electricity price assumptions (as per DECC IAG guidance)

Electricity Prices	Variable element - low (p/kWh)	Variable element - central (p/kWh)	Variable element - high (p/kWh)	Retail - Low (p/kWh)	Retail - central (p/kWh)	Retail - high (p/kWh)
2013	6.50	9.33	9.97	11.13	13.96	14.56
2014	6.67	9.18	9.77	11.44	14.14	14.70
2015	6.58	9.18	9.56	11.14	14.08	14.44
2016	6.33	9.24	9.56	10.96	14.34	14.64
2017	6.49	9.25	10.03	11.19	14.50	15.24
2018	6.36	8.97	10.06	11.10	14.42	15.44
2019	6.67	9.02	10.51	11.46	14.72	16.11
2020	7.23	9.25	10.68	12.05	15.22	16.56
2021	7.56	9.71	11.02	12.32	15.83	17.06
2022	7.93	9.93	11.21	12.72	16.06	17.27
2023	7.70	10.01	11.37	12.52	16.15	17.44
2024	8.42	10.59	11.94	13.25	16.73	17.99
2025	8.83	10.92	12.23	13.69	17.10	18.33
2026	9.09	11.00	12.24	13.96	17.20	18.37
2027	9.18	11.38	12.52	14.06	17.56	18.64
2028	9.38	11.54	12.66	14.13	17.58	18.63
2029	9.43	11.67	12.80	14.08	17.61	18.67
2030	9.71	11.99	13.10	14.20	17.81	18.85
2031	9.71	11.99	13.10	14.20	17.81	18.85
2032	9.71	11.99	13.10	14.20	17.81	18.85
2033	9.71	11.99	13.10	14.20	17.81	18.85
2034	9.71	11.99	13.10	14.20	17.81	18.85
2035	9.71	11.99	13.10	14.20	17.81	18.85
2036	9.71	11.99	13.10	14.20	17.81	18.85
2037	9.71	11.99	13.10	14.20	17.81	18.85
2038	9.71	11.99	13.10	14.20	17.81	18.85

Source: DECC IAG guidance

http://www.decc.gov.uk/en/content/cms/about/ec_social_res/iag_guidance/iag_guidance.aspx

Marginal electricity emission factors (as per DECC IAG guidance)

Marginal Electricity Emission Factors	kgCO2/kWh
2013	0.3735
2014	0.3735
2015	0.3735
2016	0.3735
2017	0.3735
2018	0.3735
2019	0.3735
2020	0.3735
2021	0.3735
2022	0.3735
2023	0.3735
2024	0.3735
2025	0.3735
2026	0.3510
2027	0.3286
2028	0.3061
2029	0.2836
2030	0.2612
2031	0.2387
2032	0.2162
2033	0.1938
2034	0.1713
2035	0.1488
2036	0.1264
2037	0.1039
2038	0.0814

Source: DECC IAG guidance

http://www.decc.gov.uk/en/content/cms/about/ec_social_res/iag_guidance/iag_guidance.aspx

Forecast carbon prices (as per DECC IAG guidance)

Carbon prices	Low (£/tCO2e)	Central (£/tCO2e)	High (p/kWh)
2013	11.13	13.96	14.56
2014	11.44	14.14	14.70
2015	11.14	14.08	14.44
2016	10.96	14.34	14.64
2017	11.19	14.50	15.24
2018	11.10	14.42	15.44
2019	11.46	14.72	16.11
2020	12.05	15.22	16.56
2021	12.32	15.83	17.06
2022	12.72	16.06	17.27
2023	12.52	16.15	17.44
2024	13.25	16.73	17.99
2025	13.69	17.10	18.33
2026	13.96	17.20	18.37
2027	14.06	17.56	18.64
2028	14.13	17.58	18.63
2029	14.08	17.61	18.67
2030	14.20	17.81	18.85
2031	14.20	17.81	18.85
2032	14.20	17.81	18.85
2033	14.20	17.81	18.85
2034	14.20	17.81	18.85
2035	14.20	17.81	18.85
2036	14.20	17.81	18.85
2037	14.20	17.81	18.85
2038	14.20	17.81	18.85

Source: DECC IAG guidance

http://www.decc.gov.uk/en/content/cms/about/ec_social_res/iag_guidance/iag_guidance.aspx

Annex B

Further tables of Capital, Energy and Carbon Savings

Capital, Energy and Carbon Savings – Refurbishment Projects (central scenario)

Savings for Refurbishment Projects - Central refurbishment rate				
Year	Capital cost saving (£)	Energy Saving (£)	Carbon Saving (£)	Total (£)
2013	17,728,750	£1,043,497	£66,397	£18,838,644
2014	17,728,750	£2,051,769	£142,683	£19,923,202
2015	17,728,750	£3,077,944	£236,592	£21,043,285
2016	17,728,750	£4,131,662	£342,718	£22,203,129
2017	17,728,750	£5,172,864	£457,314	£23,358,928
2018	17,728,750	£5,940,341	£581,417	£24,250,508
2019	17,728,750	£6,828,320	£726,726	£25,283,796
2020	17,728,750	£7,796,651	£898,275	£26,423,676
2021	17,728,750	£8,935,685	£1,137,803	£27,802,238
2022	17,728,750	£9,819,314	£1,391,647	£28,939,711
2023	-	£9,898,921	£1,560,422	£11,459,343
2024	-	£10,475,974	£1,729,197	£12,205,171
2025	-	£10,193,025	£1,790,695	£11,983,720
2026	-	£9,038,365	£1,613,060	£10,651,425
2027	-	£8,071,702	£1,410,808	£9,482,509
2028	-	£6,898,434	£1,190,824	£8,089,258
2029	-	£5,670,653	£959,995	£6,630,648
2030	-	£4,536,816	£733,542	£5,270,358
2031	-	£3,351,058	£541,195	£3,892,252
2032	-	£2,268,408	£360,064	£2,628,472
2033	-	£1,288,868	£197,683	£1,486,551
2034	-	£412,438	£59,985	£472,423
NPV	**152,603,519**	**90,260,847**	**12,463,594**	**255,327,960**

Capital, Energy and Carbon Savings – New buildings (low scenario)

Savings for Refurbishment Projects - low build rate				
Year	Capital cost saving (£)	Energy Saving (£)	Carbon Saving (£)	Total (£)
2013	5,839,329	174,068	8,803	6,022,200
2014	5,839,329	357,579	19,976	6,216,885
2015	5,839,329	529,240	34,538	6,403,108
2016	5,839,329	678,041	55,232	6,572,602
2017	5,839,329	869,755	75,466	6,784,550
2018	5,839,329	988,290	92,026	6,919,646
2019	5,839,329	1,144,651	110,178	7,094,159
2020	5,839,329	1,317,738	130,319	7,287,386
2021	5,839,329	1,418,937	146,736	7,405,003
2022	5,839,329	1,509,020	161,597	7,509,947
2023	-	1,258,006	149,804	1,407,809
2024	-	1,150,525	134,414	1,284,939
2025	-	970,619	115,430	1,086,049
2026	-	755,288	87,264	842,552
2027	-	516,863	58,652	575,515
2028	-	326,911	35,741	362,652
2029	-	176,988	18,788	195,777
2030	-	78,062	7,792	85,854
2031	-	26,021	2,594	28,615
NPV	**50,263,116**	**10,846,050**	**1,080,063**	**62,189,230**

Capital, Energy and Carbon Savings – Refurbishment Projects (low scenario)

Savings for Refurbishment Projects - low refurbishment rate				
Year	Capital cost saving (£)	Energy Saving (£)	Carbon Saving (£)	Total (£)
2013	9,091,667	372,451	18,836	9,482,954
2014	9,091,667	765,108	42,743	9,899,518
2015	9,091,667	1,132,410	73,901	10,297,977
2016	9,091,667	1,450,797	118,179	10,660,642
2017	9,091,667	1,861,005	161,473	11,114,144
2018	9,091,667	2,114,634	196,908	11,403,208
2019	9,091,667	2,449,198	235,746	11,776,611
2020	9,091,667	2,819,550	278,841	12,190,058
2021	9,091,667	3,036,085	313,970	12,441,722
2022	9,091,667	3,228,835	345,767	12,666,268
2023	-	2,691,741	320,533	3,012,274
2024	-	2,461,765	287,605	2,749,370
2025	-	2,076,823	246,984	2,323,807
2026	-	1,616,081	186,719	1,802,800
2027	-	1,105,926	125,498	1,231,424
2028	-	699,488	76,475	775,963
2029	-	378,700	40,201	418,901
2030	-	167,028	16,671	183,700
2031	-	55,676	5,551	61,227
NPV	**78,258,215**	**23,207,179**	**2,311,000**	**103,776,394**

Capital, Energy and Carbon Savings – New buildings (high scenario)

Savings for New buildings - high build rate				
Year	Capital cost saving (£)	Energy Saving (£)	Carbon Saving (£)	Total (£)
2013	14,629,878	686,258	51,323	15,367,459
2014	14,629,878	1,345,137	109,604	16,084,619
2015	14,629,878	1,973,594	181,440	16,784,913
2016	14,629,878	2,631,554	272,882	17,534,314
2017	14,629,878	3,454,462	357,760	18,442,100
2018	14,629,878	4,156,103	475,110	19,261,091
2019	14,629,878	5,062,883	589,242	20,282,003
2020	14,629,878	5,882,383	729,861	21,242,122
2021	14,629,878	6,827,431	996,632	22,453,942
2022	14,629,878	7,719,894	1,302,413	23,652,185
2023	-	7,831,565	1,497,456	9,329,021
2024	-	8,217,805	1,692,500	9,910,305
2025	-	8,421,547	1,887,543	10,309,090
2026	-	8,429,114	1,957,315	10,386,429
2027	-	8,620,958	2,003,623	10,624,581
2028	-	7,844,034	1,823,820	9,667,854
2029	-	7,050,987	1,620,677	8,671,664
2030	-	6,313,856	1,401,232	7,715,089
2031	-	5,411,877	1,199,669	6,611,546
2032	-	4,509,897	982,578	5,492,476
2033	-	3,607,918	759,554	4,367,472
2034	-	2,705,938	540,190	3,246,128
2035	-	1,803,959	384,510	2,188,469
2036	-	901,979	204,447	1,106,426
NPV	**125,929,407**	**80,425,223**	**14,614,335**	**220,968,965**

Capital, Energy and Carbon Savings – Refurbishment Projects (high scenario)

Savings for Refurbishment Projects – high refurbishment rate				
Year	Capital cost saving (£)	Energy Saving (£)	Carbon Saving (£)	Total (£)
2013	23,638,333	1,486,008	111,133	£25,235,473
2014	23,638,333	2,912,727	237,334	£26,788,394
2015	23,638,333	4,273,575	392,887	£28,304,794
2016	23,638,333	5,698,305	590,893	£29,927,531
2017	23,638,333	7,480,211	774,685	£31,893,229
2018	23,638,333	8,999,527	1,028,792	£33,666,652
2019	23,638,333	10,963,048	1,275,930	£35,877,311
2020	23,638,333	12,737,574	1,580,423	£37,956,331
2021	23,638,333	14,783,961	2,158,085	£40,580,378
2022	23,638,333	16,716,478	2,820,214	£43,175,025
2023	-	16,958,288	3,242,557	£20,200,845
2024	-	17,794,642	3,664,899	£21,459,542
2025	-	18,235,820	4,087,242	£22,323,062
2026	-	18,252,206	4,238,325	£22,490,531
2027	-	18,667,620	4,338,599	£23,006,220
2028	-	16,985,288	3,949,258	£20,934,545
2029	-	15,268,042	3,509,376	£18,777,418
2030	-	13,671,877	3,034,196	£16,706,073
2031	-	11,718,752	2,597,735	£14,316,487
2032	-	9,765,626	2,127,652	£11,893,278
2033	-	7,812,501	1,644,720	£9,457,221
2034	-	5,859,376	1,169,714	£7,029,090
2035	-	3,906,251	832,609	£4,738,859
2036	-	1,953,125	442,704	£2,395,830
NPV	**203,471,359**	**174,150,898**	**31,645,539**	**409,267,796**

Annex C

Savings to Business

Capital and Energy Savings – New Build Projects

Central rate			
Year	Capital cost saving (£)	Energy Saving (£)	Total (£)
2013	9,950,061	608,466	10,558,527
2014	9,950,061	1,232,094	11,182,154
2015	9,950,061	1,841,007	11,791,067
2016	9,950,061	2,499,854	12,449,914
2017	9,950,061	3,159,769	13,109,830
2018	9,950,061	3,721,072	13,671,133
2019	9,950,061	4,340,621	14,290,682
2020	9,950,061	4,999,763	14,949,823
2021	9,950,061	5,677,885	15,627,946
2022	9,950,061	6,189,641	16,139,701
2023	-	6,225,581	6,225,581
2024	-	6,448,991	6,448,991
2025	-	6,220,622	6,220,622
2026	-	5,506,404	5,506,404
2027	-	4,857,067	4,857,067
2028	-	4,094,447	4,094,447
2029	-	3,334,581	3,334,581
2030	-	2,626,243	2,626,243
2031	-	1,939,838	1,939,838
2032	-	1,313,121	1,313,121
2033	-	746,092	746,092
2034	-	238,749	238,749
NPV	**85,647,002**	**£55,490,449**	**£141,137,451**

Capital and Energy Savings – Refurbishment Projects

Central Rate			
Year	Capital cost saving (£)	Energy Saving (£)	Total (£)
2013	17,728,750	1,561,278	-£17,197,966
2014	17,728,750	3,161,458	-£19,046,374
2015	17,728,750	4,723,883	-£20,872,586
2016	17,728,750	6,414,435	-£22,853,534
2017	17,728,750	8,107,727	-£24,846,844
2018	17,728,750	9,547,987	-£26,571,652
2019	17,728,750	11,137,703	-£28,484,625
2020	17,728,750	12,829,010	-£30,538,540
2021	17,728,750	14,569,020	-£32,721,105
2022	17,728,750	15,882,146	-£34,448,788
2023	-	15,974,366	-£19,333,198
2024	-	16,547,620	-£20,151,331
2025	-	15,961,642	-£19,573,059
2026	-	14,129,013	-£17,356,618
2027	-	12,462,863	-£15,296,587
2028	-	10,506,038	-£12,896,520
2029	-	8,556,281	-£10,492,289
2030	-	6,738,738	-£8,238,655
2031	-	4,977,477	-£6,084,680
2032	-	3,369,369	-£4,111,933
2033	-	1,914,414	-£2,328,719
2034	-	612,613	-£741,581
NPV	**152,603,519**	**£142,384,263**	**£294,987,828**