

**To:** City Executive Board

**Date:** 20 May 2009 **Item No:**

**Report of:** Head of Oxford City Homes

**Title of Report:** Review of Replacement Windows

### Summary and Recommendations

**Purpose of report:** To advise on the recent review of replacement windows with a particular focus on price and sustainability.

**Key decision?** Yes

**Executive lead member:** Councillor Ed Turner

**Report approved by:**

**Finance:** David Higgins  
**Legal:** Jeremy King

**Policy Framework:** More housing, better housing for all.

**Recommendation(s):** To instruct the Executive Director, City Services, to adopt PVCu windows and doors as the standard for replacement windows and doors for the next five years.

### **Background –**

1. When approving the acceptance of the last tender for replacement windows to the Council's housing stock in December 2005, Members requested that before the next round of tendering a review should be undertaken and that review should focus on cost and sustainability issues.

2. This report presents that review which, to a great extent, relies on a recent assessment of different window types by the Building Research Establishment (BRE) an independent testing body, in their latest Green Guide to Specification (2008 ratings). Comparison costings (see the Financial implications section) were obtained from the Institute of Quantity Surveyors and the Councils own historical information. Further information on best value was obtained from a paper in Construction Information Quarterly, Volume 10, issue 1.
3. The BRE assessment was based on a 1.48m high x 1.23m wide double glazed window, with a central mullion and one opening light, and covered a range of window materials including:-
  - Hardwood – painted (water & solvent based) and stained
  - Aluminum/softwood composite
  - Aluminium
  - Galvanised steel
  - Softwood – painted (water & solvent based) and stained
  - PVCu with steel reinforcement
4. Each window type was assessed under thirteen different “green” elements and rated from E (lowest) to A+ (highest). The elements were:-
  - Climate change
  - Water extraction
  - Mineral resource extraction
  - Stratospheric ozone depletion
  - Human toxicity
  - Ecotoxicity to freshwater
  - Nuclear waste (higher level)
  - Ecotoxicity to land
  - Waste disposal
  - Fossil fuel depletion
  - Eutrophication
  - Photochemical ozone creation
  - Acidification

A summary rating, again from E to A+ was given for each window type.

5. It should be noted that the main environmental impact of windows is from the heat loss through them. The embodied impact of windows should only be taken into account as a small part of the decision, with the main emphasis being to choose a window which will reduce operation energy usage.

6. Windows are one of the elements with a less important role in the overall embodied impact of buildings due to their low impacts and relatively low area within buildings.

### Window Summary –

7. The summary ratings from the Green Guide to Domestic Windows are as follows, please see the financial section for details of costings:-

- Softwood window, solvent gloss paint (non TWAS) - A
- Softwood window, water based stain (non TWAS) - A
- Softwood window, water based stain (TWAS) - A+
- Softwood window, solvent gloss paint (WAS) - A
- PVCu window with steel reinforcement - A
- Durable hardwood window (all types) - A+
- Aluminium/softwood composite window - D
- Aluminium window – various weights – rating from B to D
- Galvanised steel window (powder coated) - B

TWAS is the Timber Window Accreditation Scheme and windows manufactured under this scheme are of better quality with a corresponding increase in price.

8. From the summary above, it would appear that either a pre-treated softwood window (TWAS) with water based stain or a durable hardwood type is preferable from the “green” perspective. However that is only one part of the equation, the other main elements being whole life costs and best value, which are highlighted in the Financial Implications section below.

### Financial Implications-

9. A detailed whole life (50 year) costing, using current prices, has been carried out on the window types based upon a house with 8 windows (16m<sup>2</sup>) and 1 door. In the 50 year time-span, there will be at least one replacement and in some cases two. The summary is shown below:-

Acrylic Aluminium (30 year life)	£16,261:62
Softwood timber (22 year life)	£21,199:46
Hardwood timber (30 year life)	£34,055:75
PVCu (22 year life)	£15,162:44

10. A best value analysis in the CIQ Construction Paper 227 was produced to assist an RSL to use the principles of best value in choosing between either repairing, or renewing, their existing metal windows. The metal windows have been removed from the equation for our purposes and only timber, PVCu and aluminium compared. Full details of the weightings and utility values used will

not be given in this report owing to their complexity but the completed overall values for the windows, which took into account guarantees, thermal efficiency, sustainability, sound insulation, aesthetics and security are as follows:-

Timber	5.90
PVCu	9.06
Aluminium	8.54

11. The budget for replacing windows in the current financial year is £341,000 including fees.

### **Summary**

12. The Green Guide shows that PVCu windows come a close second to high specification, water based stained softwood and hardwood windows (all types) but when the best value analysis and whole life costings are taken into account, PVCu is a clear winner.

### **Legal Implications -**

13. There are no specific legal implications to this report. If the recommendation is adopted, PVCu windows and doors will be specified for a period of five years with a further assessment being made after this period.
14. Leaseholders will be given the option to replace their windows at the same time. As it is optional, the full leaseholder consultation process will not be necessary but if they decide to have windows fitted they will be required to sign a contract agreeing to pay the costs.

### **Climate Change/Environmental Impact -**

15. The window comparisons have been addressed in the main body of the report.
16. Based on the predicted number of double glazed units being installed this financial year, a saving of 140 tonnes of CO<sup>2</sup> will be achieved.

### **Equalities Impact –**

17. There are no equalities issues within this report.
18. The Housing Advisory Panel discussed this report at their meeting on 22 April 2009 and agreed with the recommendation.
19. At their meeting on 28 April 2009, the Tenants' Repairs and Improvements Panel discussed this report and agreed with the

recommendation to use PVCu replacement windows but also made the following comments:-

- More thought to be given to the design/aesthetics of the windows in order to break up the mass plastic look and consider the operation of the ventilators/opening lights by consulting with tenants on what is best in their homes.
- More supervision of the installation and more opportunities for the tenants' to feedback their thoughts to the contractor during the contract.
- Choice to be given in certain circumstances, e.g. the replacement of brown stained timber windows, a choice between brown and white PVCu should be given but a majority decision would prevail. This would avoid a "messy" appearance in a block of flats, street or close.

#### **Level of Risk –**

18. High cost would be a higher risk to future window replacement projects due to financial constraints and would reduce the number of units installed in any year and reduce the amount of CO<sup>2</sup> saved.
19. Health and safety risks would be similar for all window types during installation. Although those requiring less maintenance would show less risk over it's lifetime.
20. The Risk Register is attached, see appendix 1.

#### **Appendices -**

21. Appendix 1. Risk Register.

#### **Recommendation –**

22. To instruct the Executive Director, City Services, to adopt PVCu windows and doors as the standard for replacement windows and doors for the next five years.

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**List of background papers:** BRE Green Guide to Specification 2008  
CIQ Construction Paper 227  
Whole Life Costing calculations

**Version number:** 2.0 27 April 2009

### CEB Report Risk Register – Windows Appraisal

Risk Score **Impact Score:** 1 =Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic    **Probability Score:** 1 = Rare; 2 = Unlikely; 3 = Possible; 4 = Likely; 5 = Almost Certain

No.	Risk Description Link to Corporate Obj	Gross Risk		Cause of Risk	Mitigation	Net Risk		Further Management of Risk: Transfer/Accept/Reduce/Avoid		Monitoring Effectiveness				Current Risk	
		I	P			I	P	Action:	Outcome required:	Q	Q	Q	Q	I	P
1	Value for money not achieved	2	2	Recommendations not adopted and a less vfm window type chosen.	Mitigating Control: None Level of Effectiveness: (HML)	2	2	Action: Action Owner:  Mitigating Control: Control Owner:	Outcome required: Milestone Date:	Q 1 ☹	Q 2 ☹	Q 3 ☹	Q 4 ☹	I	P
2	Fewer homes have replacement windows (More housing, better housing for all) and less CO2 saved (tackle climate change).	2	2	Recommendations not adopted and a less vfm/more expensive window type chosen.	Mitigating Control: None Level of Effectiveness: (HML)	2	2	Action: Action Owner:  Mitigating Control: Control Owner:	Outcome required: Milestone Date:						
3					Mitigating Control: Level of Effectiveness: (HML)			Action: Action Owner:  Mitigating Control: Control Owner:	Outcome required: Milestone Date:						
4					Mitigating Control: Level of Effectiveness: (HML)			Action: Action Owner:  Mitigating Control: Control Owner:	Outcome required: Milestone Date:						