Energy efficiency standards for existing dwellings

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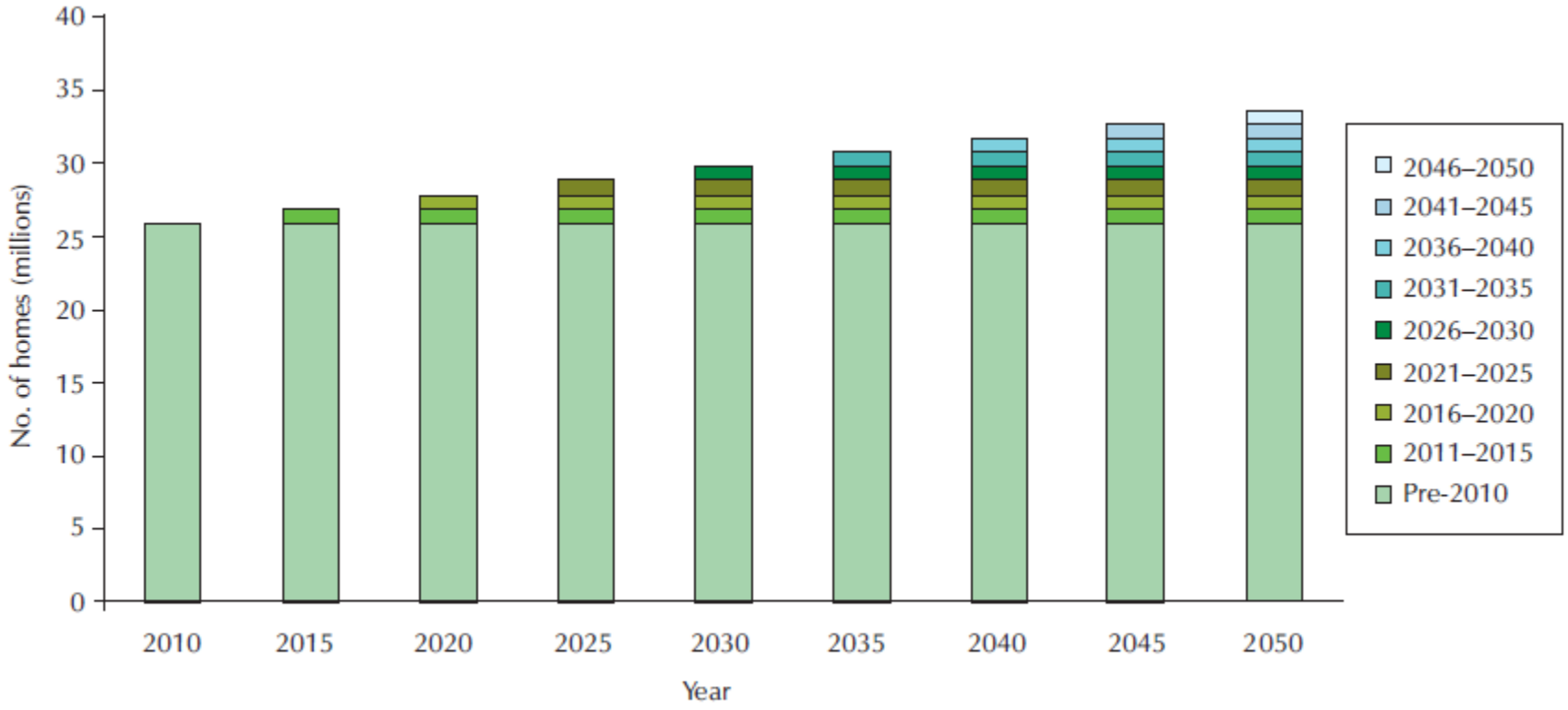
Introduction

- Most attention is usually given to the energy performance standards of new buildings.
- The real opportunity for reducing national CO_2 emissions from the built environment is to improve the existing stock.
- To put it into context:
  - there are around 1.3 million existing homes in Wales
  - the new build rate has historically been 5,000 - 10,000 per annum.

Introduction



Source: "energy efficiency in new and existing buildings: comparative costs and CO_2 savings“, BRE Trust

Introduction – Part L for existing dwellings

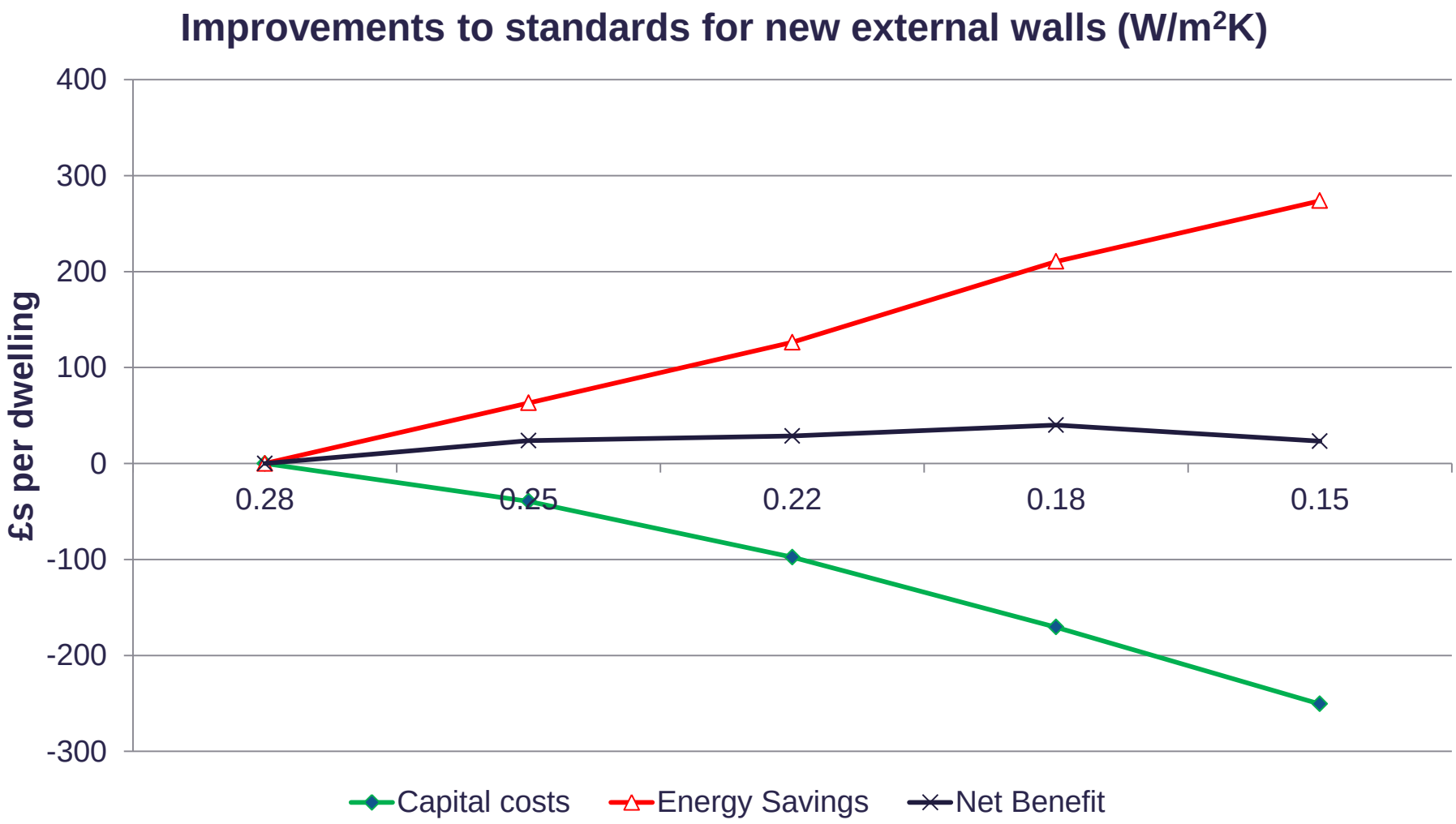
- At the strategic level, there are three main but related questions to achieving greater energy efficiency via Part L.
  - Can we improve the standards of energy efficiency required by Part L?
  - Can we improve levels of compliance?
  - Can we bring more building work into scope?
- In particular the first two issues can be interlinked
  - If the standards are set too high, building owners might seek to evade the regulations in order to avoid the “perceived” costs of compliance.

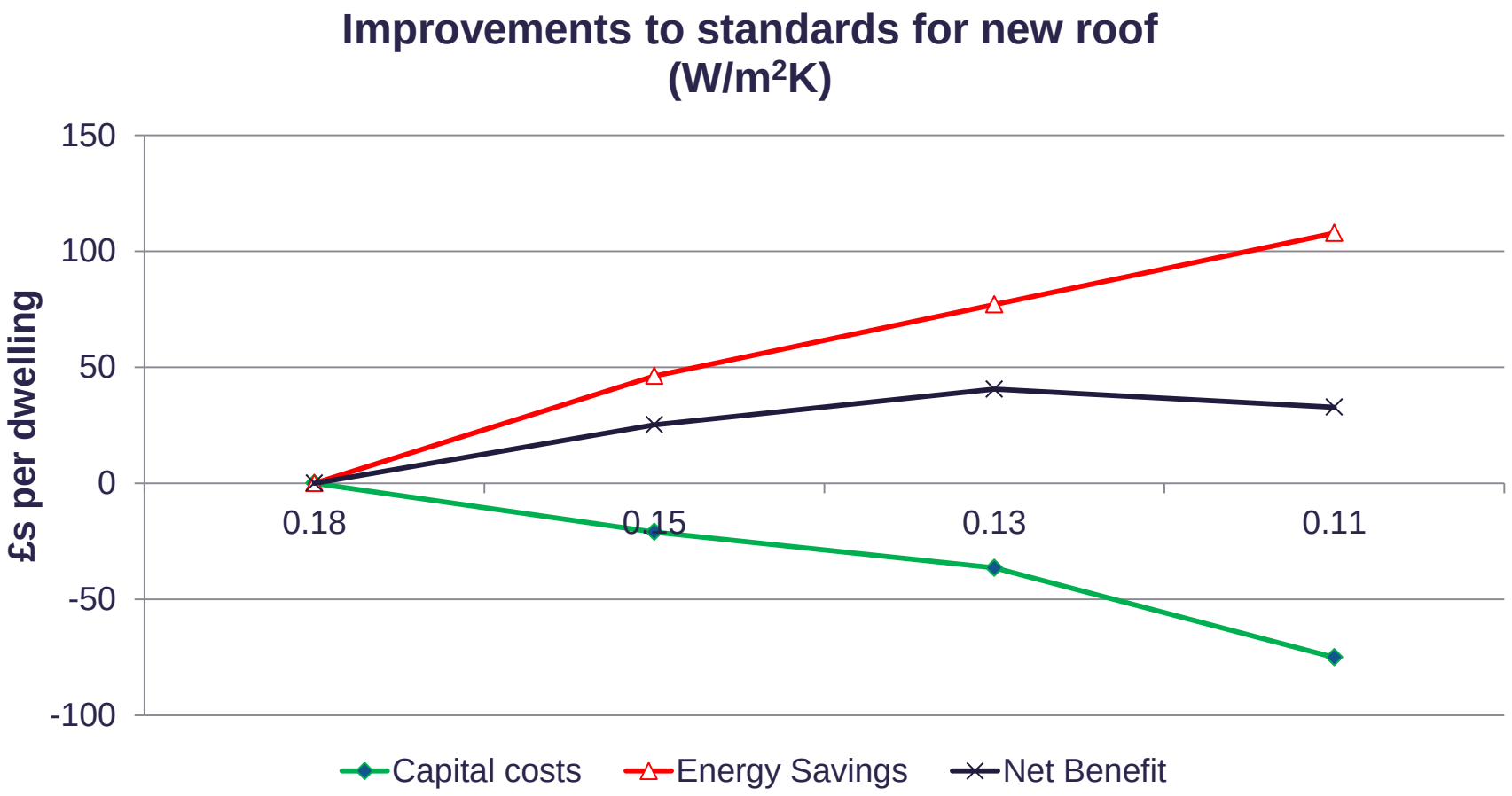
Improvements to current energy efficiency standards

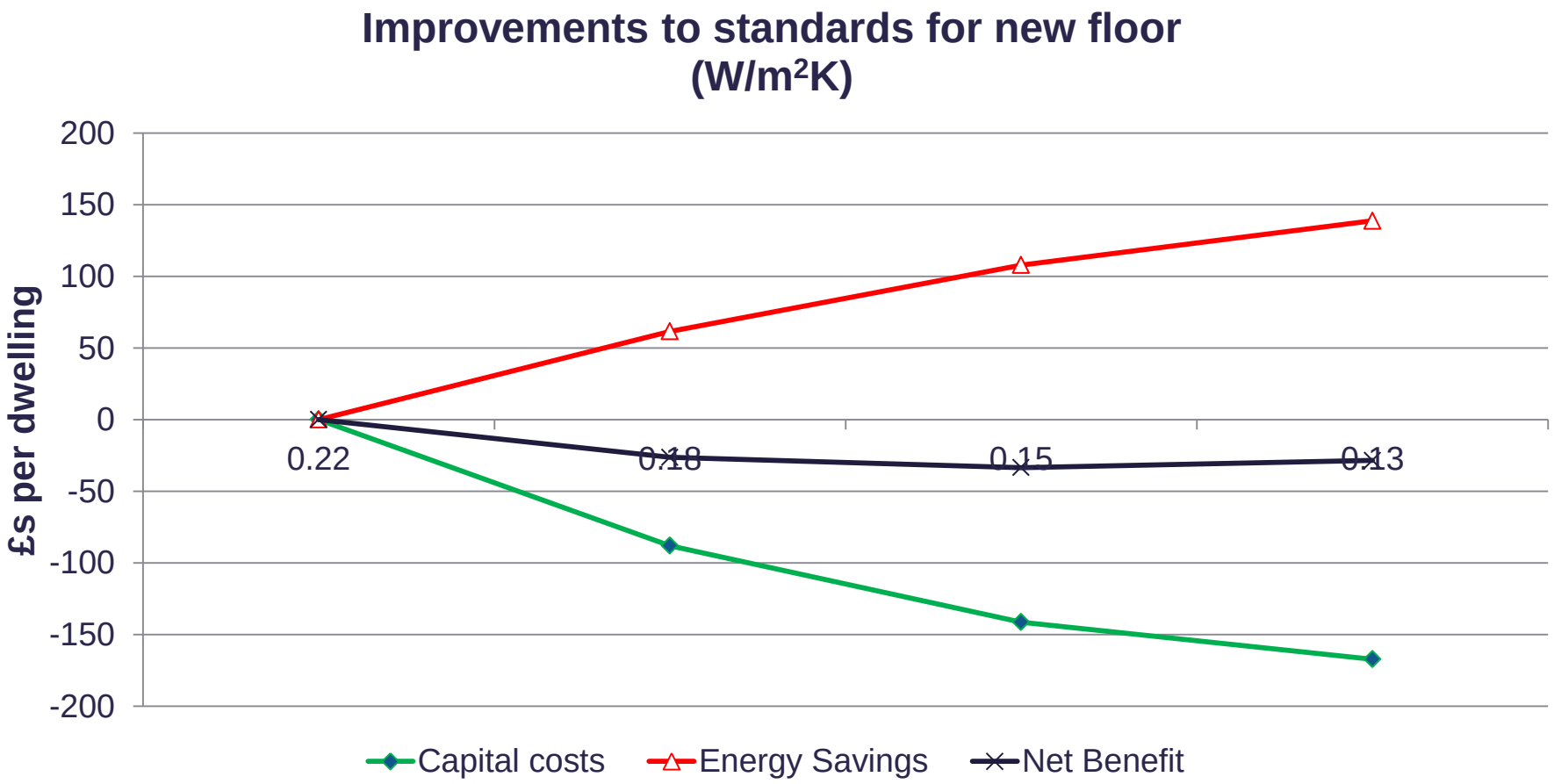
- **Replacement of controlled fittings and services**
  - For dwellings this typically comprises window and boiler replacement
  - ADL1B recommends minimum energy efficiency for replacements
  - In particular, improved standards may be possible in replacement windows
  - May be sensible to achieve similar to new-build standards
    - Efficiency gain is locked into the product
    - No/little additional hassle for installer
    - Will undertake cost-benefit analysis of potential improvements

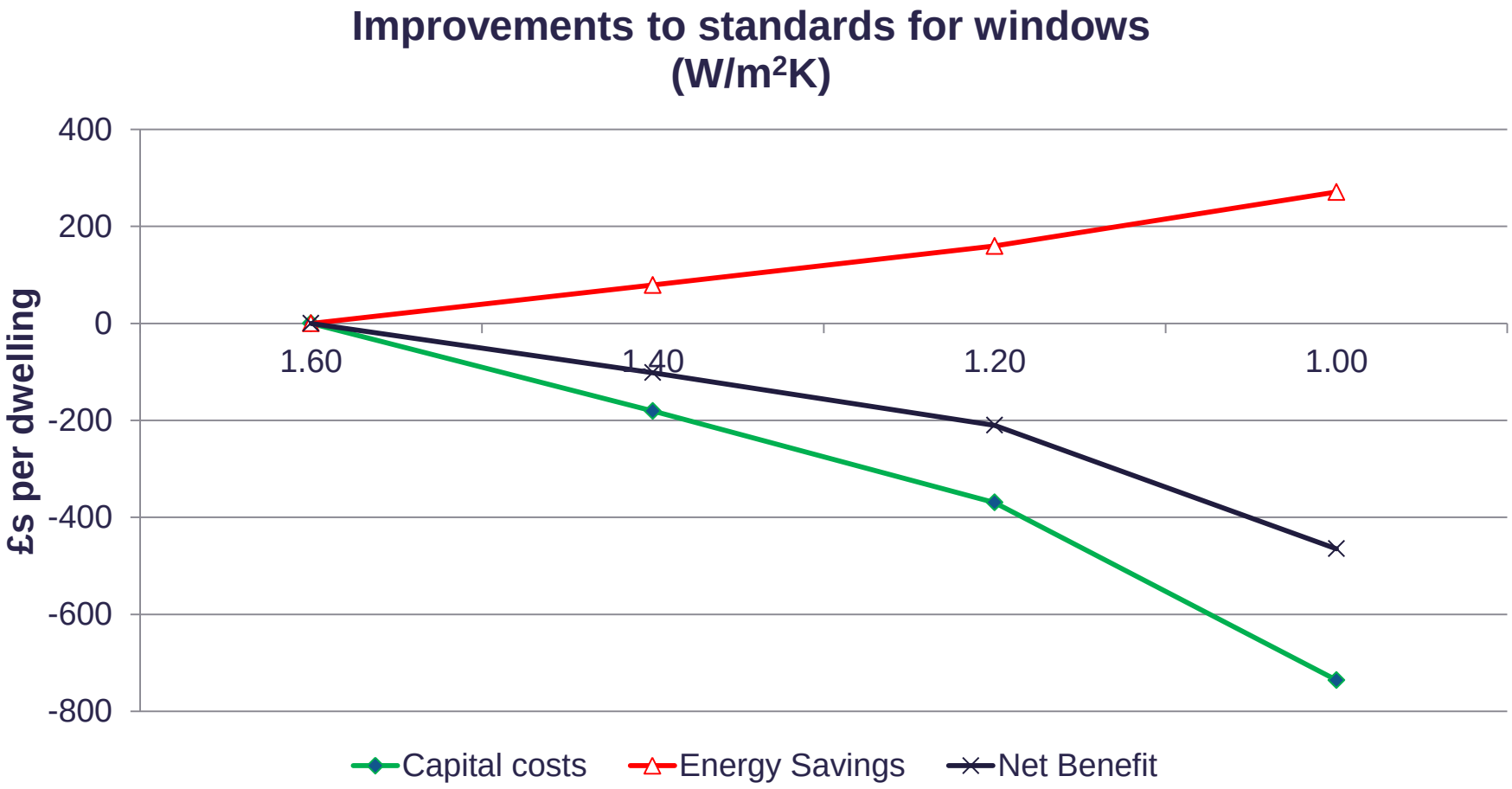
Improvements to current energy efficiency standards

- **Construction of extension**
  - ADL1B recommends minimum energy efficiencies for thermal elements, glazing and additional fixed building services
  - Again, it may be reasonable to achieve close to new-build standards
    - Constructing an extension involves few constraints on design or specification of the thermal envelope
    - To undertake cost-benefit analysis of incrementally improving standards

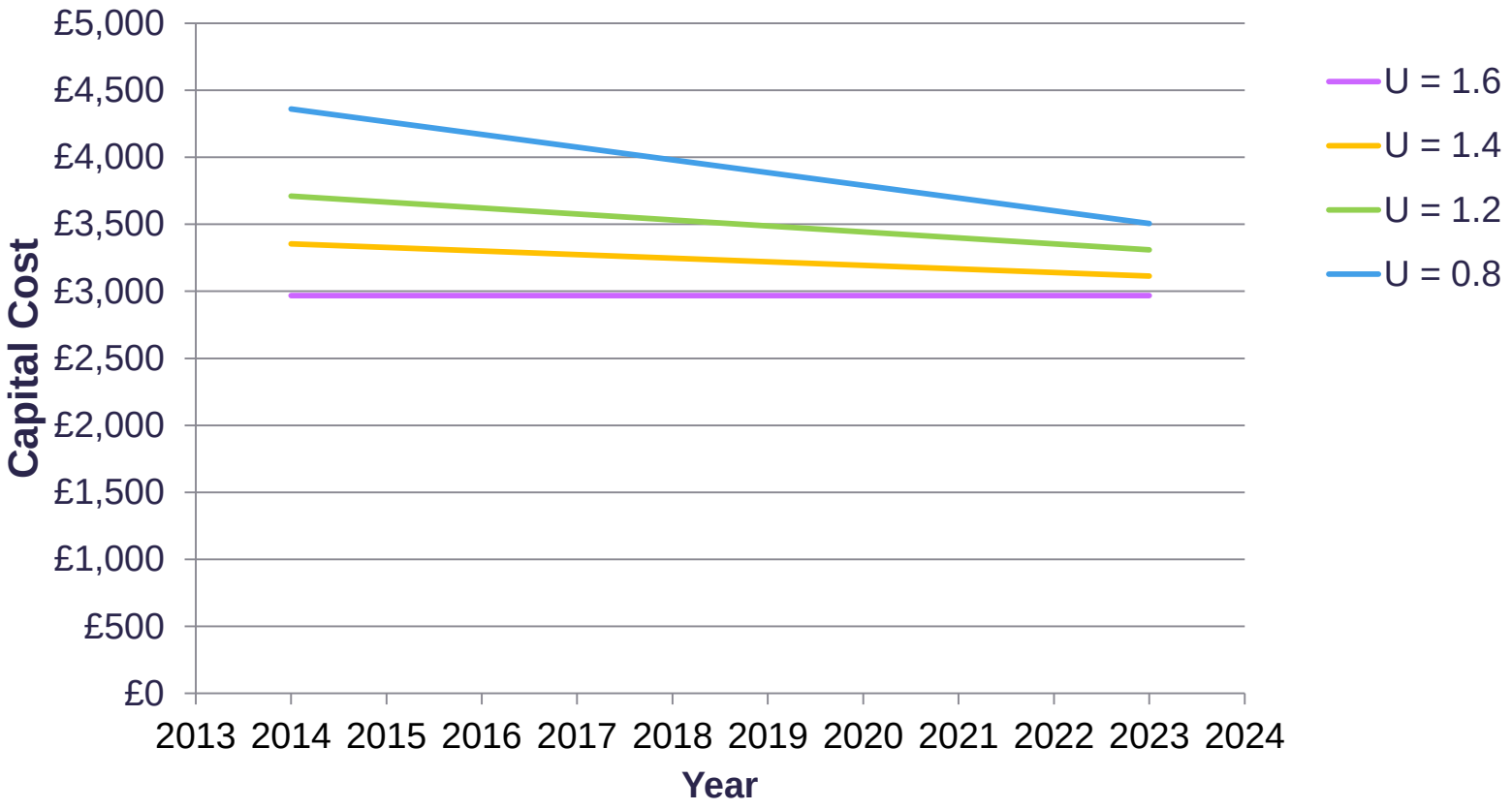

Improvements to standards for new external walls (W/m²K)
£s per dwelling
400
300
200
100
0
-100
-200
-300
0.28
0.25
0.22
0.18
0.15
Capital costs
Energy Savings
Net Benefit


Improvements to standards for new roof (W/m²K)
£s per dwelling
150
100
50
0
-50
-100
0.18
0.15
0.13
0.11
Capital costs
Energy Savings
Net Benefit


Improvements to standards for new floor (W/m²K)
£s per dwelling
200
150
100
50
0
-50
-100
-150
-200
0.22
0.18
0.15
0.13
Capital costs
Energy Savings
Net Benefit


Improvements to standards for windows (W/m²K)
£s per dwelling
400
200
0
-200
-400
-600
-800
1.60
1.40
1.20
1.00
Capital costs
Energy Savings
Net Benefit

Predicted Cost of Windows for End-Terrace Dwelling



Improvements to current energy efficiency standards

- **Renovation of a thermal element**
  - ADL1B recommends minimum energy efficiencies where there is a significant renovation of a thermal element
    - 50% surface of element (or 25% of building envelope)
    - e.g. cladding/rendering external surface or dry-lining existing surface
  - In these cases, greater argument for not setting the bar too high
    - Anecdotally, this is an area of poorer compliance
    - Greater expertise needed on part of the installer
    - Practical guidance may achieve greater carbon savings
    - However, usually only one opportunity to install additional insulation
    - Next step is to consider the costs and benefits of different approaches

Consequential Improvements and the Green Deal

- For buildings > 1000m^2, increasing the carbon footprint of the building requires consequential energy efficiency improvements
- Triggers are
  - An extension
  - Initial provision of a fixed building service
  - An increase in the installed capacity of any fixed building service
- Consequential measures are
  - Extensions: Select from measures in a table, to be capped at 10% of principal works. Measures selected to achieve payback in 15 years.
  - Services: Improve fabric in serviced areas and included additional measures as per extensions.

Consequential Improvements and the Green Deal

- Green Deal is to be introduced in October 2012
- Private firms to offer consumers energy efficiency improvements to their homes (and community space and businesses) at no upfront cost.
- Payments recouped through a charge in installments via energy bills

Consequential Improvements and the Green Deal

- Given the introduction of Green Deal, we are investigating the extension of Consequential Improvements to dwellings
- In all cases, the Consequential Improvements would need to be 'Green Dealable' i.e. Green Deal finance available to off-set the upfront cost.
- What would be the trigger(s) for improvement?
  - Increasing the carbon footprint of the dwelling?
  - Extending to include other building works?
- What measures should be included?
  - Should they be capped at 10% of principal works?
  - In at least some cases, would it be better to simply require a Green Deal assessment?
  - Should they be linked to the same tradesman as carries out the principal works?