The key to affordable performance

LEAN PASSIVHAUS

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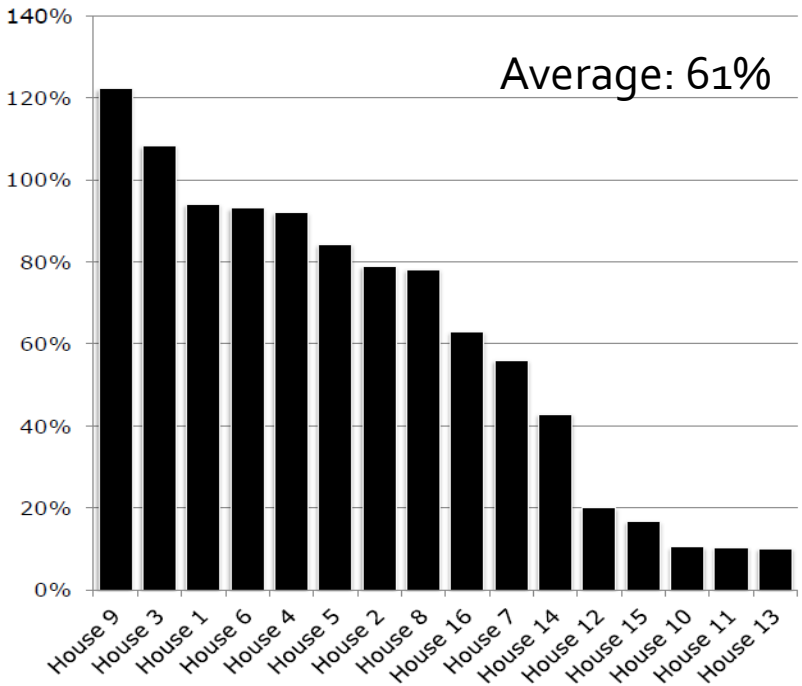
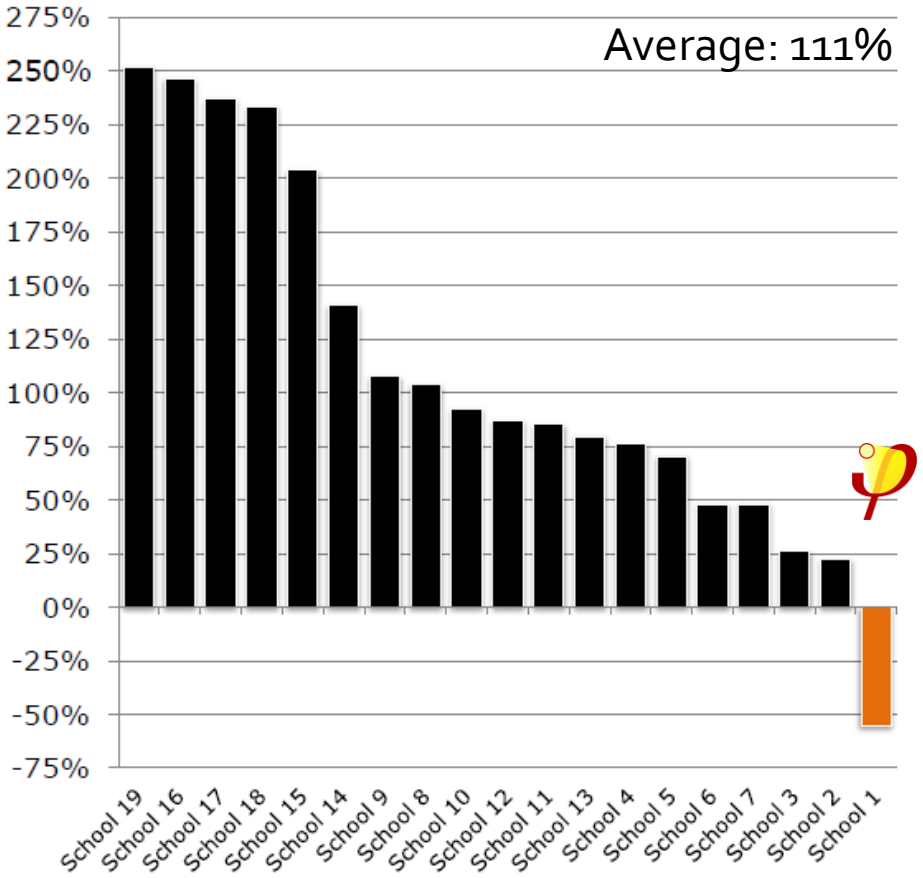
Performance Gap

- Domestic



Adapted from Zero Carbon Hub (2010)

- Non-domestic

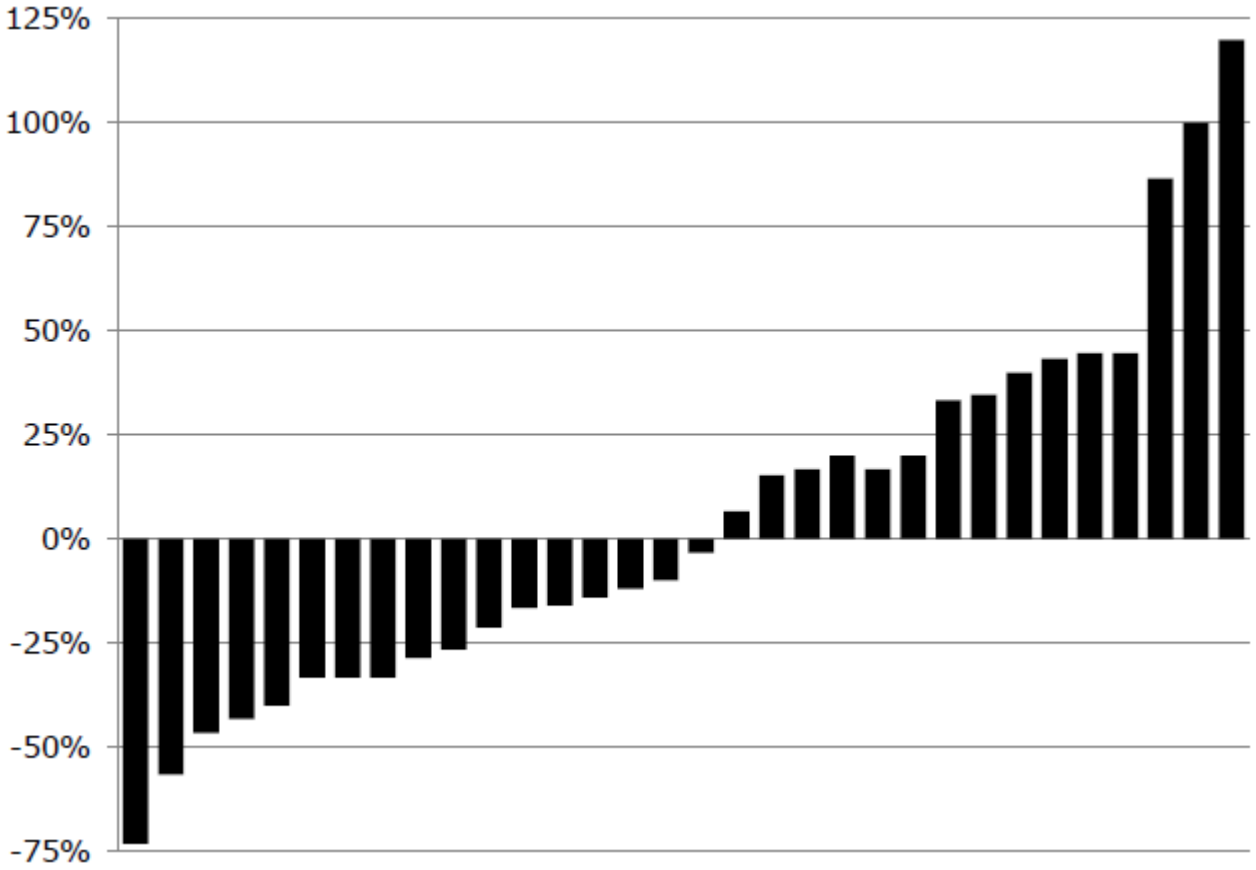


Adapted from Bordass (2009)

Passivhaus = Energy Performance

- Passivhaus

Average: 4%



Adapted from Feist (2005)

Performance, at what cost?

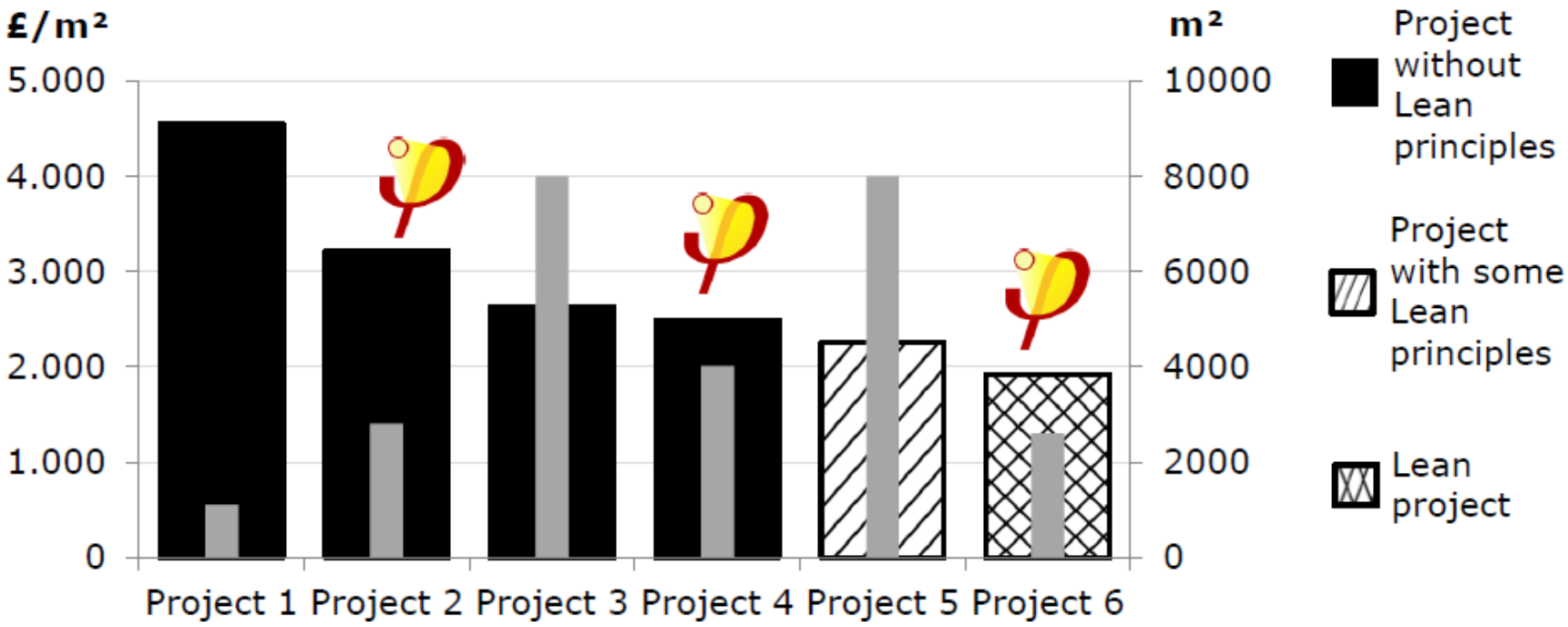
- Passivhaus = Building Regs + 10-15% capital cost [Newman and Whidborne 2011]
- Lean = reducing cost by eliminating waste whilst preserving value

based upon I Six Sigma (2012), Resource Engineering Inc. (2012), Winser et al. (2009) and Ohno (1988)

Case Studies

- 6 Educational buildings in the UK
- New-Built
- All BREEAM very good
- 3 out of 6 Passivhaus certified
- Qualitative interviews with indirect questions to evaluate the use of Lean principles
  - 1 used a few Lean principles
  - 1 had fully integrated the Lean principles
- Recording of cost & m^2, comparing the £/m^2

Case Studies - Results



Conclusion

- Passivhaus delivers energy performance
- No necessary correlation between Passivhaus and increased cost
- Passivhaus can be LESS expensive then Business-As-Usual though good management
- Projects using Lean principles show considerable capital cost reduction
- Lean and Passivhaus compatible
  => Affordable Performance

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