Onsite v Offsite Economics

A presentation by

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To

Buildoffsite Residential Hub

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Content of Presentation

- Why CombiCycle Comparator is cost neutral for off-site construction
- Traditional v off-site cost comparison
- Lessons from Europe re cost-efficiency
- Lessons from USA re cost-efficiency
- Construction costs in context – the development budget
- Who gets the benefit?
- Helps and hindrances to off-site cost- efficiency

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CombiCycle Comparator – Results Screen Comparing Traditional v Modular Solutions

GIA: 300 M² - **Location:** Wales

Cost Centre	**Default**	Select Survey **Default mod walls and roof16.12.15**
Viewing Result Totals		
Quality	Average	Average
Cost Analysis Period	30 Years	30 Years
Capital	£ 494,668	* £ 502,207
Life-cycle replacement	£ 176,052	£ 176,018
Maintenance	£ 277,564	£ 279,229
Cleaning	£ 28,299	£ 28,273
Energy (in occupation)	£ 569,483	£ 569,483
Waste Disposal		
Demolition		
Whole Life Total	**£ 1,546,066**	**£ 1,555,210**
Whole life sustainability factors (show/hide)		
Sustainability rating		
Initial sustainability	**5.7**	**5.7**
Sustainability Rating	B	B
Replacement sustainability		
Time on Site		
Time on Site (weeks)	23.9	19.7
* Includes saving in Preliminaries		4,062
**Includes waste materials adjustment - CO2 (embodied Initial) Tonnes		7

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CombiCycle Comparator – Results Screen Comparing Traditional v Volumetric Solutions

GIA: 300 M^2 - **Location:** Wales

Cost Centre	**Default**	Select Survey **Default volumetric_16.12.15**
Viewing Result Totals		
Quality	Average	Average
Cost Analysis Period	30 Years	30 Years
Capital	£ 494,668	* £ 487,558
Life-cycle replacement	£ 176,052	£ 177,785
Maintenance	£ 277,564	£ 279,584
Cleaning	£ 28,299	£ 29,615
Energy (in occupation)	£ 569,483	£ 569,509
Waste Disposal		
Demolition		
Whole Life Total	**£ 1,546,066**	**£ 1,544,051**
Whole life sustainability factors (show/hide)		
Sustainability rating		
Initial sustainability	**5.7**	**5.9**
Sustainability Rating	B	B
Replacement sustainability		
Time on Site		
Time on Site (weeks)	23.9	9.3
* Includes saving in Preliminaries		13,374

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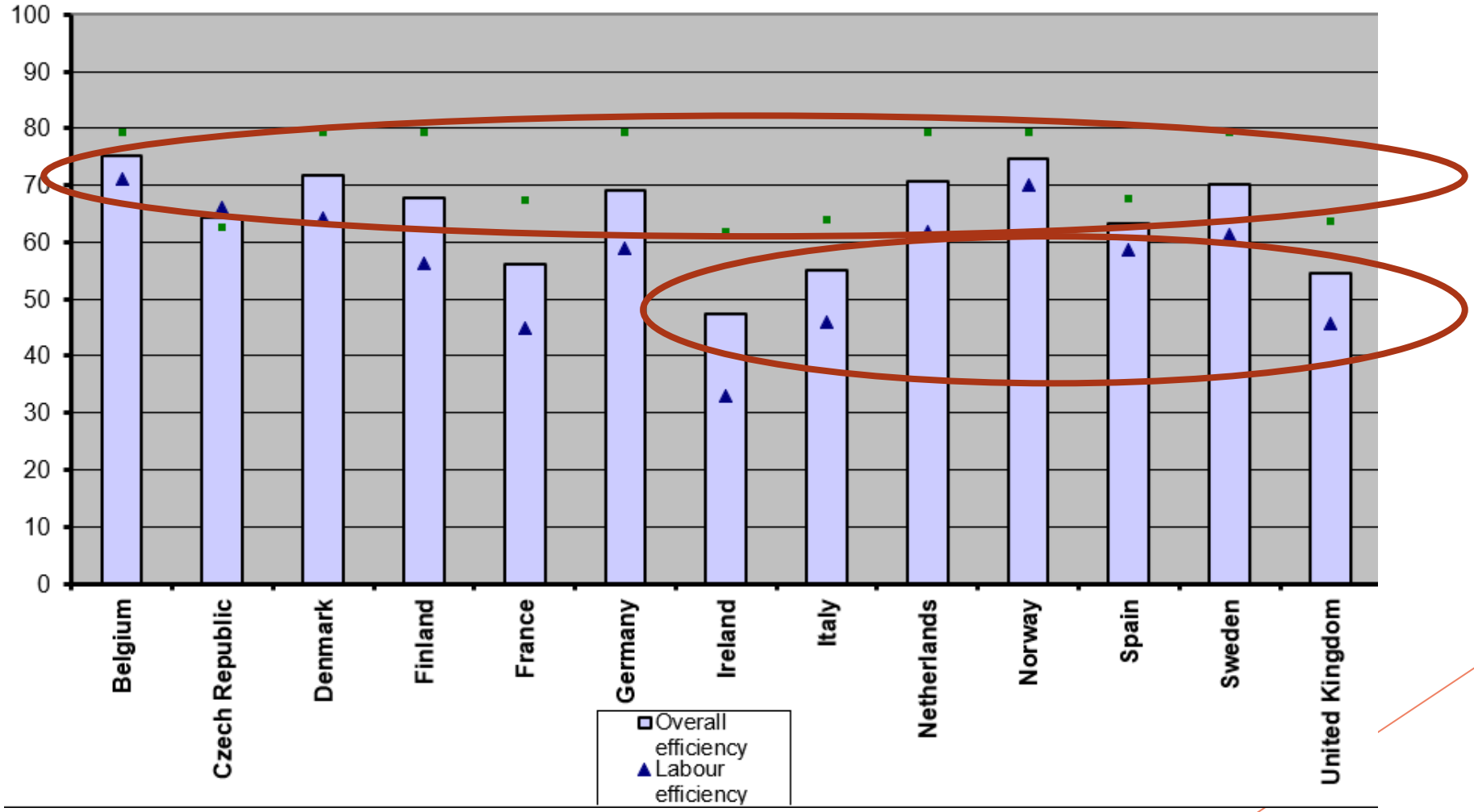
Benchmarking the Efficiency of the EU Construction Industries –ECDG/BWA 2006



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Reasons for Differences Between Countries in Terms of Resource Usage Efficiency

- Extensive industrialisation of the process
- Total or partial delegation of detailed design to the contractor
- A well-paid, well-trained, industrious workforce
- Limited scale of sub-contracting
- Well developed lean construction management
- Total project insurance facilitating integration of design and construction

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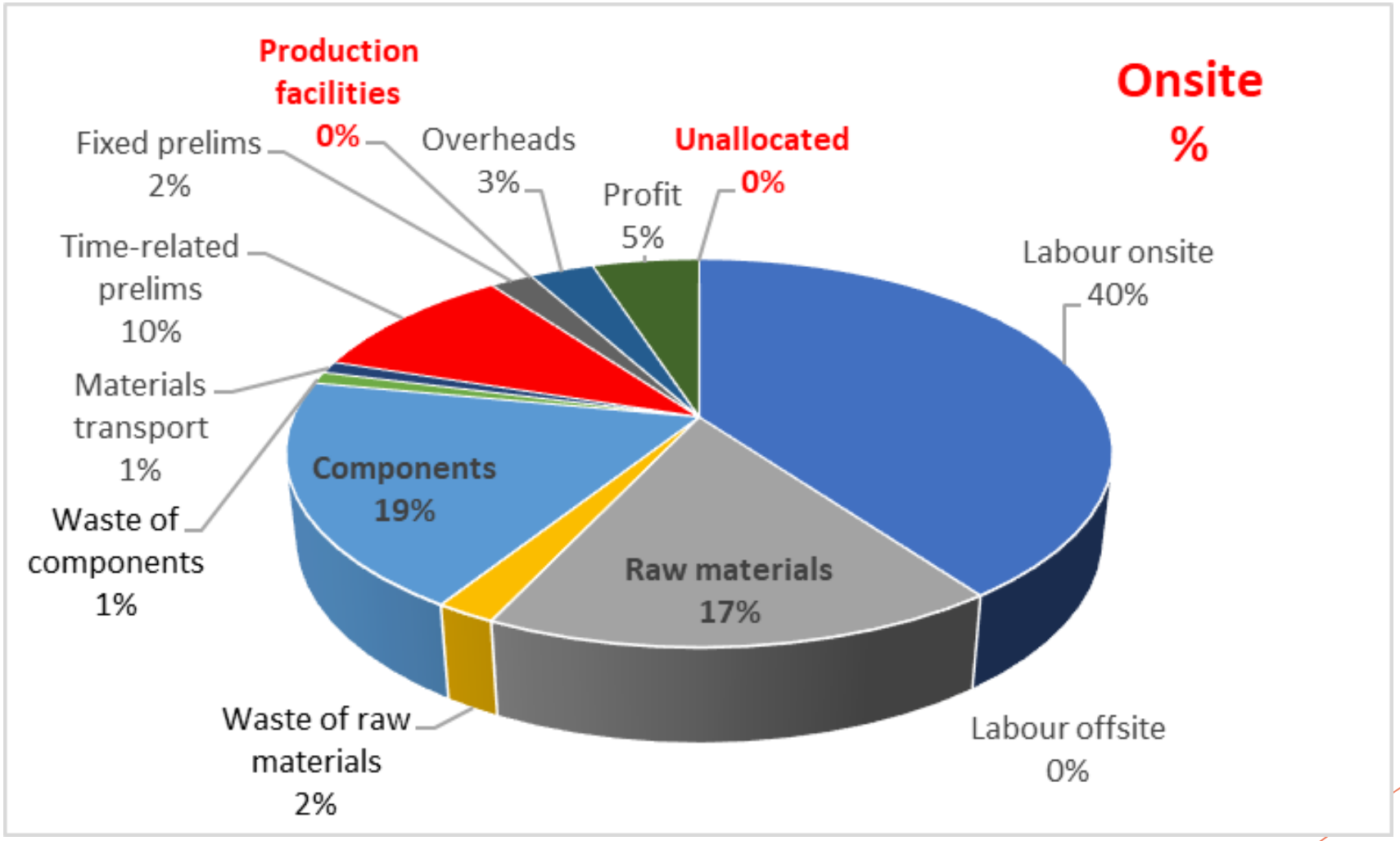
Typical cost breakdown:UK Traditional Residential Construction



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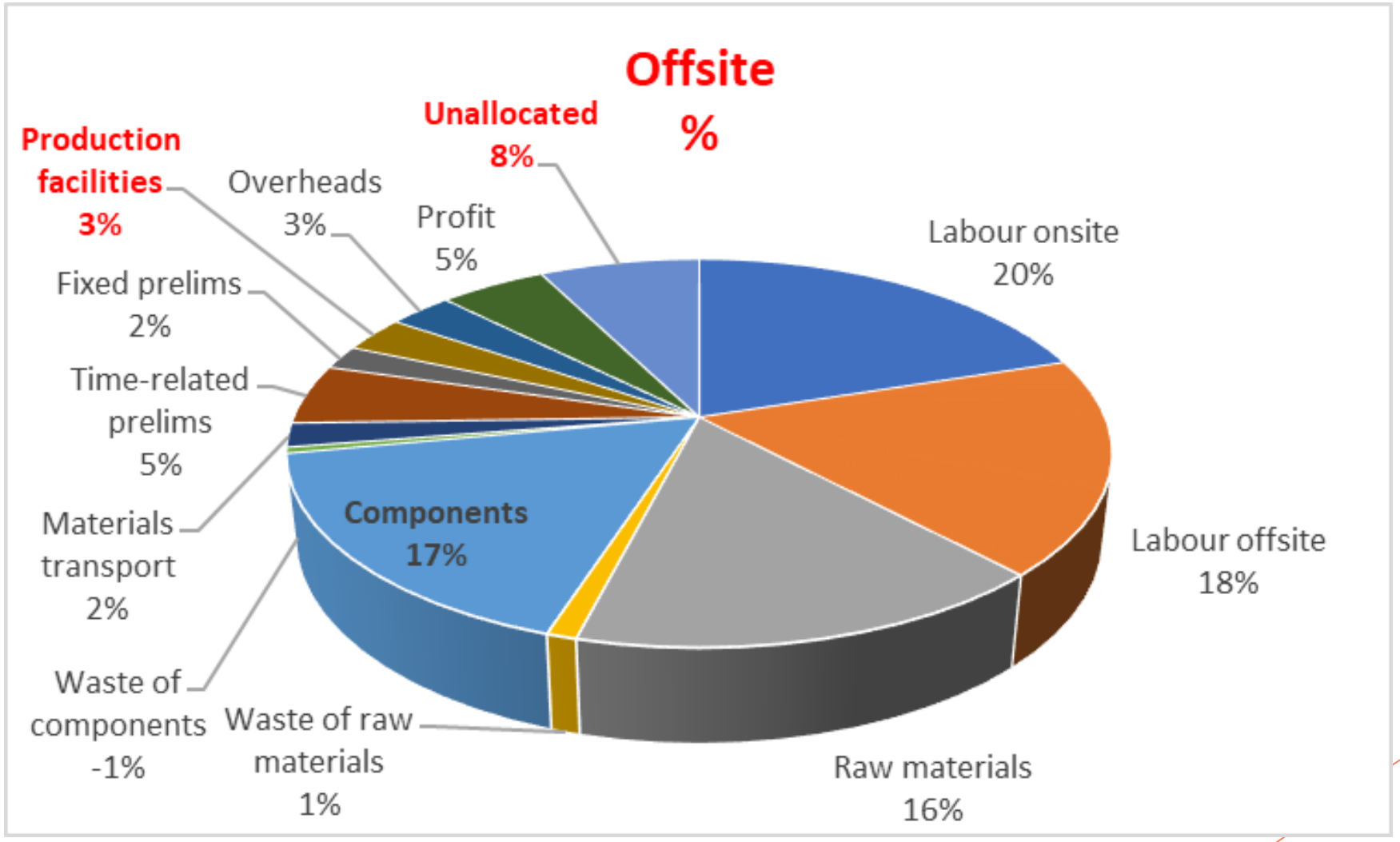
Typical cost breakdown:UK Cost-neutral Off-site Residential Construction



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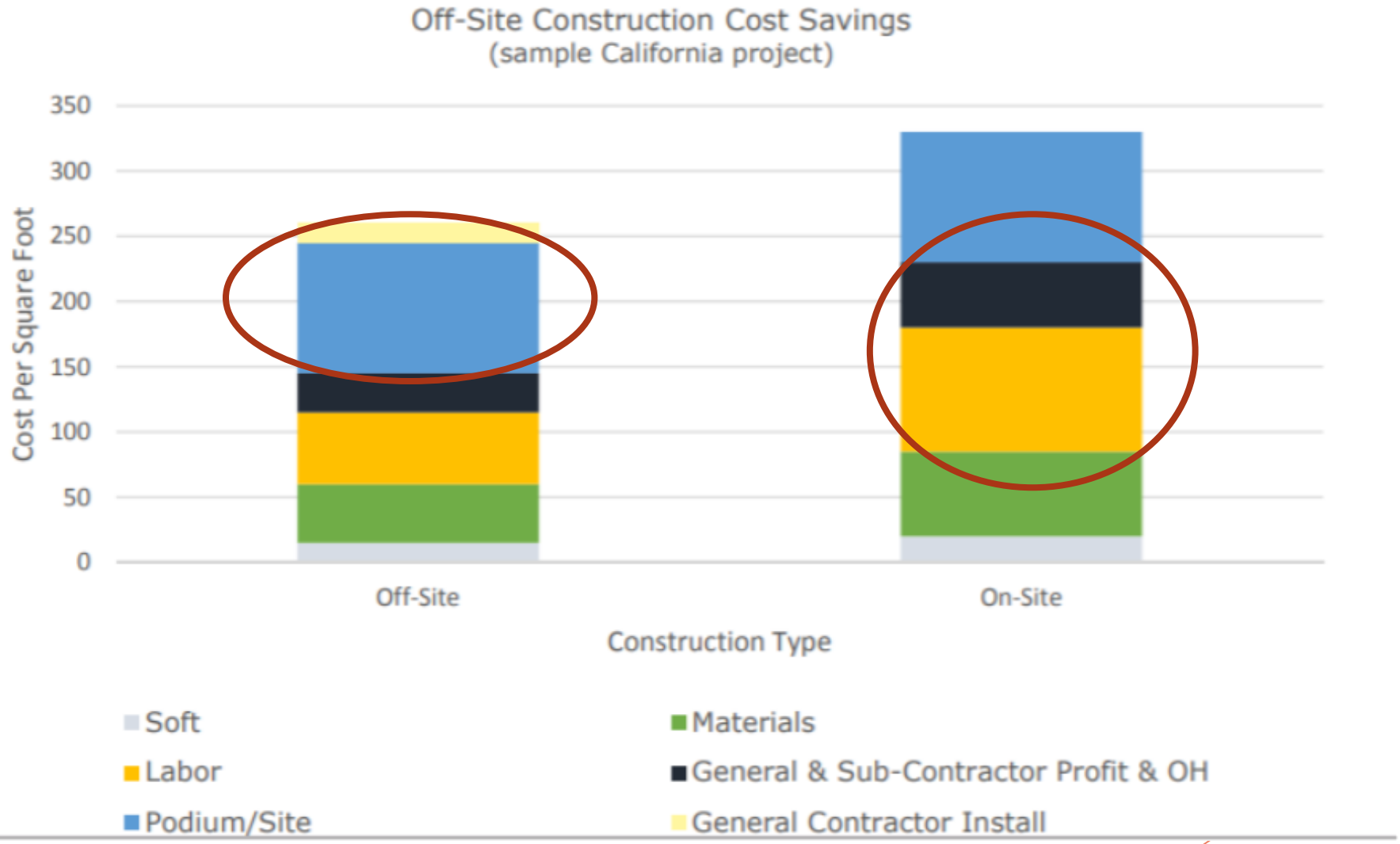
Quality comparison

- The quality control in the factory is superior to that prevailing on most construction sites.
- To make a fair comparison between the two processes the allowance in Preliminaries for Quality Control should be increased by upwards of 200% for the traditional solution.

UC Berkeley (USA) Research into Offsite Construction – Anecdotal Analysis



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UC Berkeley Results in a UK context
UK v USA Capital costs/m2 GIA

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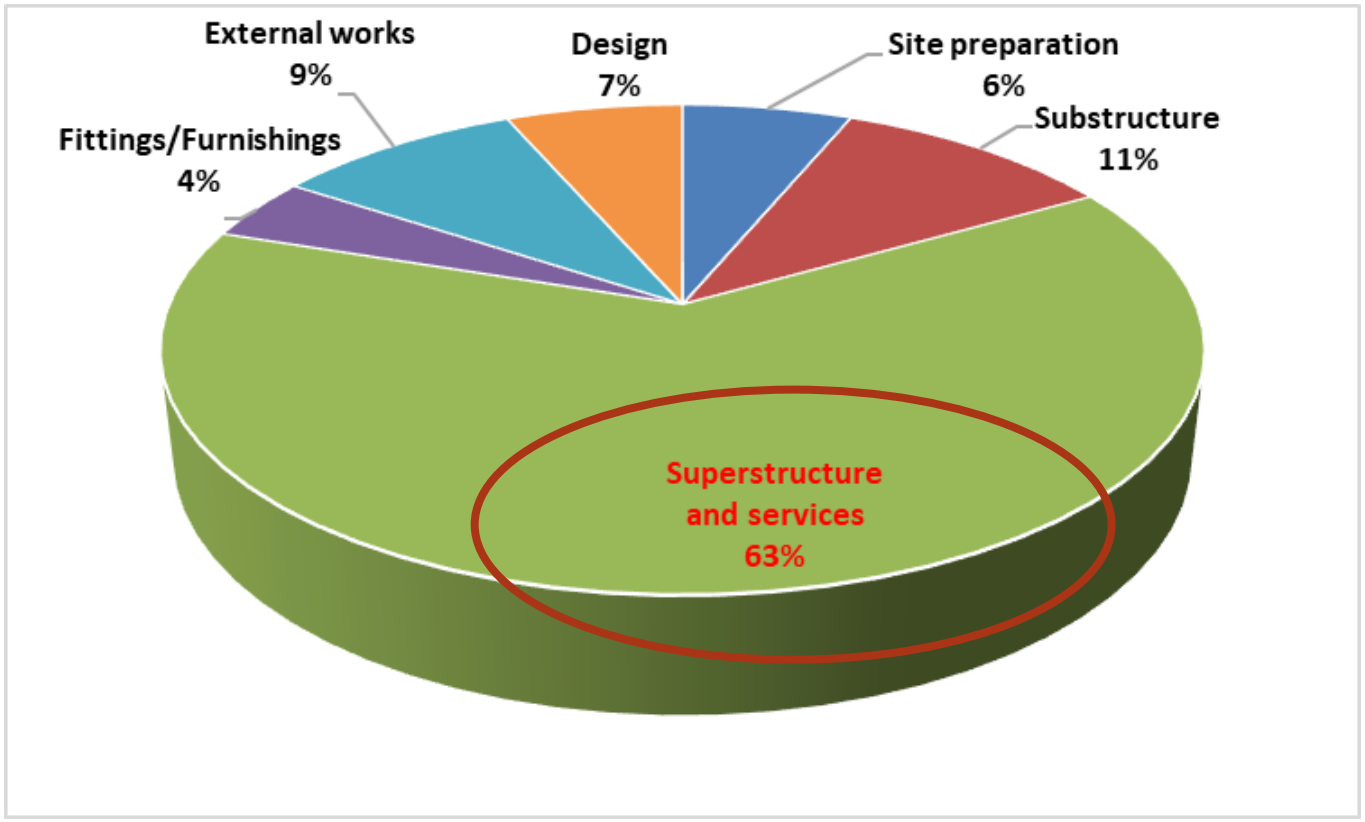
Low-rise Block of Flats

Low-rise Block of Flats – Construction Cost Analysis



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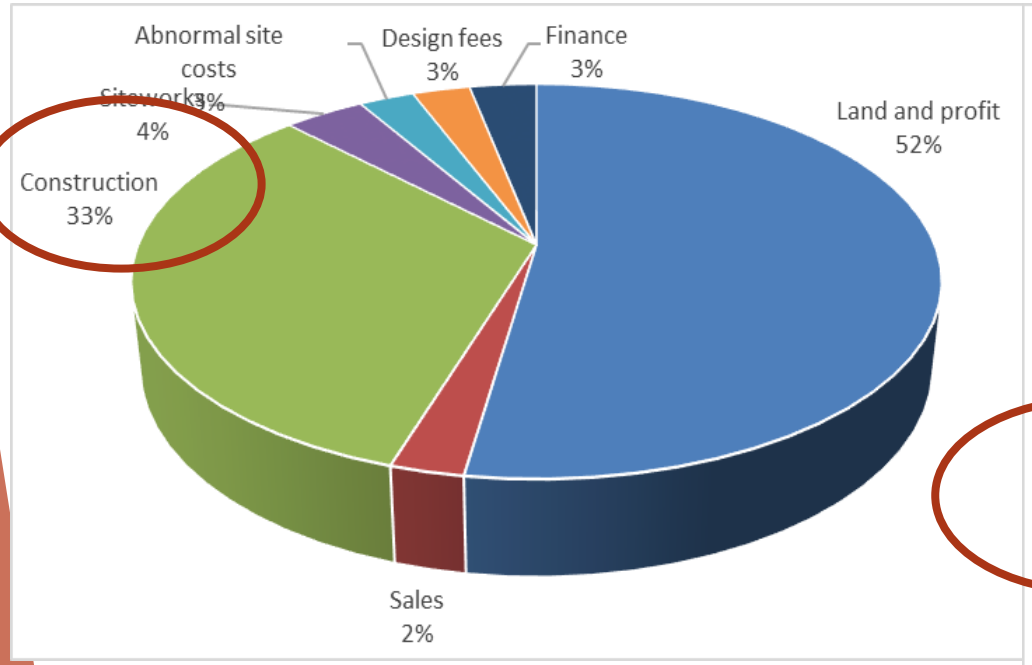
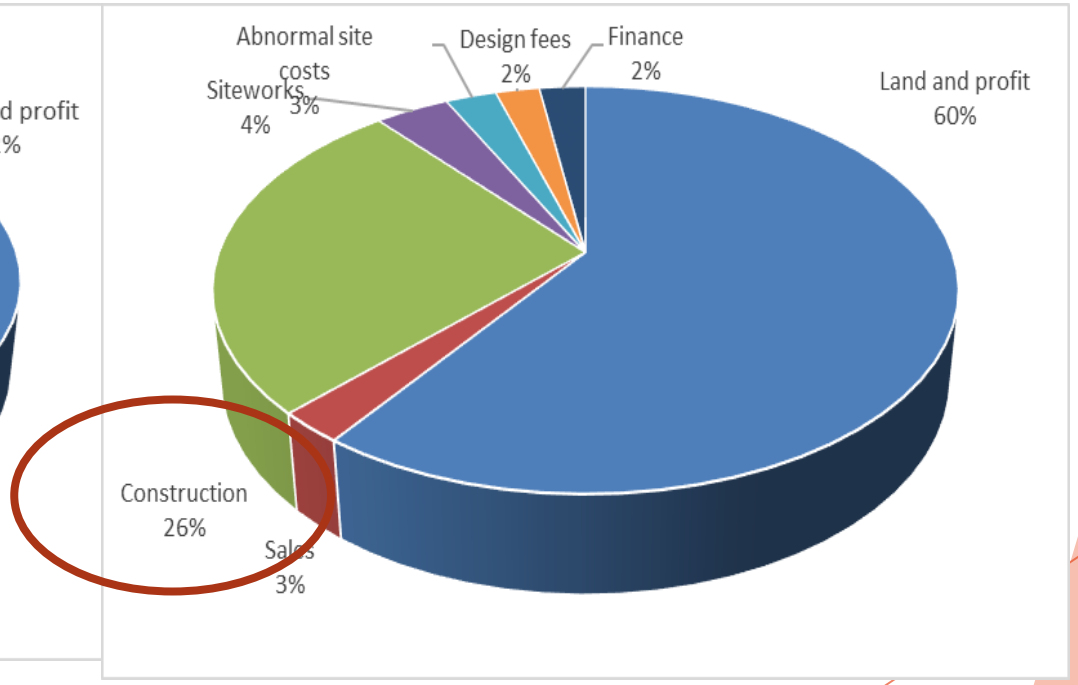
Effect of Saving on Residual Land Value/Profit

Traditional build



Offsite build - 20% saving



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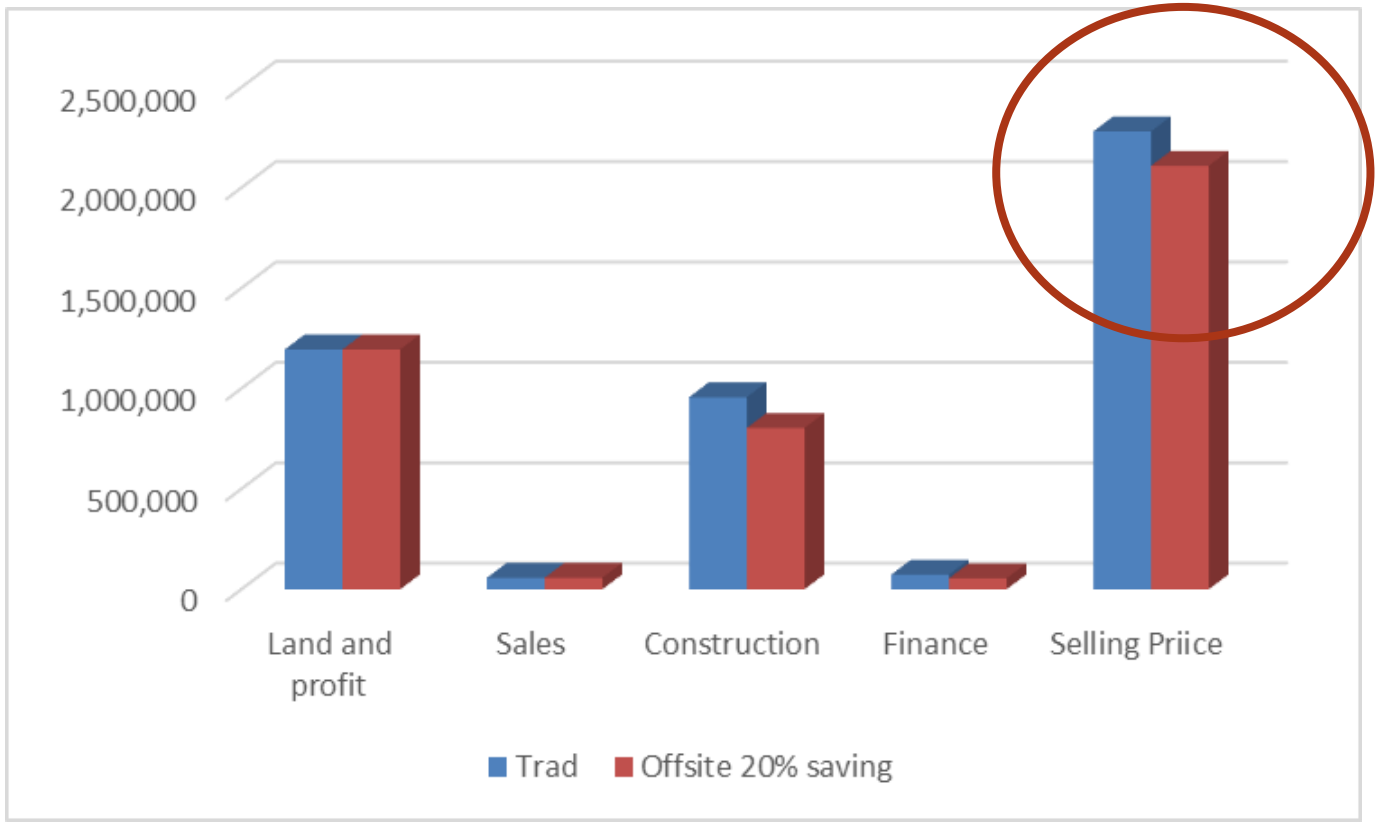
Effect of Saving Passed on to Purchaser



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Reasons for Cost Savings – Off-site v Trad

- **Materials**
  - Less waste
  - Bulk purchasing
- **Off-site labour**
  - Cheaper
  - Larger pool of labour (safety, comfort, local, women)
  - Greater efficiency – repetitive processes
- **On-site labour**
  - Less weather-dependent
  - More focused activities
  - Less sub-contracting
- **Time-related preliminaries**
  - Substantially reduced
- **Overheads and profit**
  - Tier One/Two contractors

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High-rise Volumetric – 40 Storeys by Vision Modular Systems

Supplier's View of Benefits of High-rise Volumetric

Vision Modular Systems delivers the following benefits:

- Major reduction in on site programme
- Guaranteed consistent high quality of finish
- Safer method of construction
- Certainty of programme and cost.

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Why Off-site Can Be More Expensive

- **Design and construction**
  - Fitting off-site to buildings designed for trad - i.e. late involvement
  - Lack of understanding of the process
  - Unwieldy and/or poorly designed off-site enabling works
  - Inappropriateness of solution – **redundant performance**

- **Site constraints**
  - Difficulty of access to site
  - Lack of space on site for unloading/ direct craneage

- **Commercial considerations**
  - Under-capacity
  - Early amortisation of initial investment
  - Tier One/Two contractor overheads
  - Construction industry recession

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Conclusions

- Off-site should be cheaper at low-rise – all other things being equal
- Jury is out on costs of volumetric high-rise
- Traditional construction costs are too expensive in UK
- Any type of boom will send traditional costs soaring
- The effects of reducing costs through off-site are limited to maybe 60-70%

  of total building costs….

  … and to less than 1/3 of the selling price
- The benefits of any savings do not always fall to the end user
- Speed of construction, quality and cost certainty would seem to be the main benefits of off-site construction.
- Off-site suppliers can improve the economics of their offering
- They can argue a good case for refusing to drop to the low margins of Traditional construction

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