Sustainability

Capital vs Lifecycle vs Whole-life Costs

In construction, 'cost' is frequently defined by duration, the most commonly used being capital cost (zero duration), where only the initial cost at construction is taken into account without consideration of subsequent maintenance or running costs. However, there are two other methods of assessing cost, both of which take into account maintenance or running costs which are occasionally considered when assessing alternative options:

Lifecycle – a composite of capital cost of an element of building plus maintenance (and occasionally, running) costs over a fixed cycle, normally 2-10 years, rarely longer.

Whole-life Costs – the total projected cost of a building (or element of a building) over its whole design life, often 25-60 years, including maintenance & elemental replacement costs.

The phrase 'payback period' is often used in context with these alternative methodologies. This is the length of time that the initially more expensive item takes to achieve cumulative cost parity with the cheaper alternative as lower running or maintenance costs keep the total cost of the more expensive item down whilst reflecting the higher real costs associated with the cheaper alternative. Shorter payback periods are obviously more attractive than longer ones.

Running costs are normally only taken into account by owner-occupiers, but these are rarely considered beyond around 5 years. Speculative developers rarely have an interest in anything other than capital cost as they are not responsible for future costs – potential owners are.

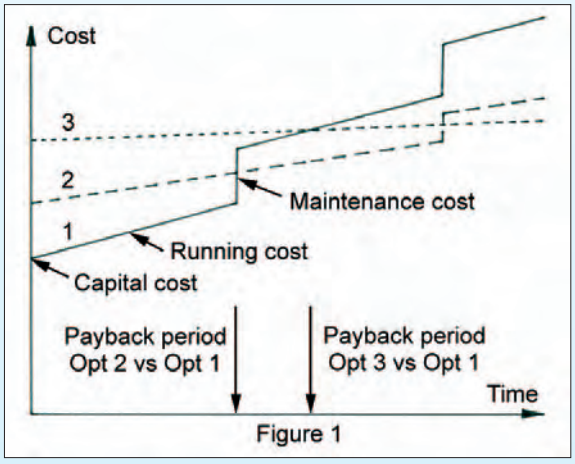

Figure 1

Why use cost comparisons other than Capital?

Alternative cost comparisons can make the more 'expensive' option (in terms of capital cost) less costly in the longer term than the alternative with the 'cheaper' capital cost, as this permits future savings to be taken into account.

Why is this type of comparison becoming more important?

There are two areas where such comparisons can help to justify a decision to use a product with a higher capital cost:

- Better quality, better performing, or more durable products tend to be more expensive than basic alternative products that perform less well (although by definition, meet the specification), or will require earlier or more costly maintenance, or even replacement.
- New products or technologies tend to be more expensive than established alternatives until manufacturing volumes (i.e. sales) have reached suitable levels to compete on price.

The value of this approach in the first of these two areas is quite clear – alternative cost analyses allow purchasers to rationalise the more expensive alternative against future benefits – pay a little more now, but save overall in the longer term, often just a few years.

It is in the second area however that cost comparisons other than capital are of particular value. Clearly, a new product could have great value to a customer, such as being exceptionally durable, or offering real savings in running costs, and although in the longer term manufacturing costs will reduce, today the product is more expensive than alternatives. With the right customer, such as one who wants a cutting-edge building, alternative cost comparisons can make new technologies 'affordable' (or even unmissable), and make them trend-setters in their sector.

To date, 'cost' has automatically been taken to mean 'money', but the analysis methods are equally applicable to 'carbon' as a unit of comparison.

- Capital cost would be a comparison of the construction-phase carbon (energy) expended to create the building.
- Life-cycle would be its construction, running & maintenance carbon over an analysis period.
- Whole-life would be construction, running and maintenance, plus the recycling-carbon cost (or recovered-carbon credit) at the end of its working life.

Perhaps in today's progression to a carbon-lean economy, this is the real potential benefit of alternatives to capital cost as the measure of value – tools to help design teams to make truly sustainable decisions? In this way, when considering, for example, an energy-saving installation, the carbon payback period could be established and taken into account together with financial considerations.

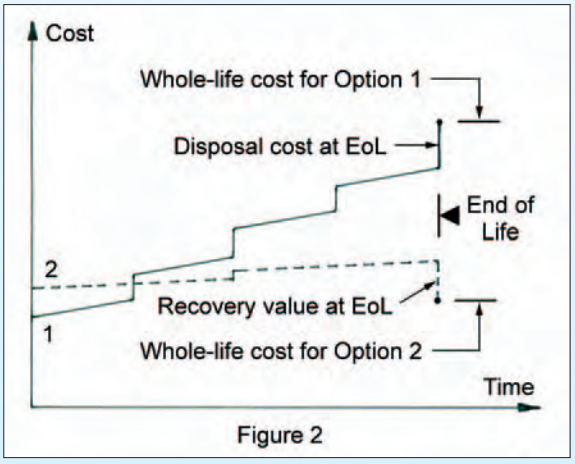

Figure 2

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Further Information

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