



9

Costing a project



Technique sheet

Problem-based learning resources

Introduction

Engineering is not free! The decision to go forward with a project often depends on the cost - it may be possible to build a bridge between Dover and Calais, but the cost could be too high. Committing to develop a new electric vehicle can involve a company investing billions before a single car rolls off the production line. Costing projects is critical - get it wrong and you could bankrupt your company or end up working for nothing!

What are direct costs?

If you want to design and install an electronic burglar alarm, a number of costs are directly linked to the alarm itself. These are called direct costs and could include the cost of the alarm, any wiring needed to connect it, scaffolding needed to install the alarm high up on the outside of the building, service fees needed for a company that monitors the alarm and even maintenance costs payable each year. These are related directly to the project. You will also need to include wages paid to workers while they are working on the alarm project. If you are not sure if a cost is a direct cost ask yourself 'If I did not pay for this would this particular project be impossible?'. If the answer is 'yes' then that cost is a direct cost.

- Make sure you think carefully about your direct costs because they are under your control. You should be able to justify every direct cost on the basis of the work the project involves.

What are indirect costs?

Indirect costs are costs that make it possible to do the work but might be shared with other projects. So, you may need some specialist tools to install an alarm system, but they could also be used for other projects. The van you use to get to the job might be an indirect cost. The costs of keeping essential components in a storeroom, paying your electricity bill at your workshop or paying non-engineering staff to provide and manage invoices and payments could be indirect costs.

- Make sure you do not forget indirect costs not tied directly to the project. They can be significant and can make it financially impossible!

Should you include 'just in case' or contingency costs?

The final cost includes the direct and indirect costs. You will then have to add a figure to provide a profit. This is usually a percentage of the total direct and indirect costs. Sometimes you might also want to add in contingency costs. These

contingency costs are in case of unexpected events or surprising new developments not covered in the original tender. If you feel you need to add significant contingency costs talk to your client to clarify the situation – can you make your predictions more reliable and so avoid unexpected extra expenses? Remember that a cost is a prediction of what you will spend – if you cannot predict with a degree of confidence you could end up losing money or the project running significantly over budget.

- Make sure your cost estimates are as reliable as possible. Give reasons for all your costs and try to avoid 'just in case' or contingency charges which would allow the budget to expand uncontrollably.

What about VAT and other taxes?

The tax rules vary for different jobs and can change often. Taxes are the responsibility of the engineering company or even the individual engineer not the client so ensure you pay the correct amount. Underpaying tax is a crime, and you can go to jail for repeated offences. Grants may also be available but claiming these are usually the responsibility of the customer. You may be able to advise the customer on grants that are available if you have experience of similar projects in this area (e.g. solar panels for domestic situations attracted a lower VAT rate in the UK for older clients.)

Make sure you are aware of your tax responsibilities. Get advice from an expert if you are uncertain. Many larger companies have departments that deal with this work to save the engineer from having to manage these responsibilities.

When should I get paid?

If the job is quite small the client will usually pay when it is completed. Larger jobs that last a long time often have interim payments so that the engineer can purchase essential kit or pay workers. These interim payments must be agreed in advance and tied to particular events (e.g. 25% on signing the contract, 50% when a particular stage is reached and the remainder at the end of the project when the work has been approved). The payment schedule should be part of the contract and include how these payments are triggered (e.g. automatically on a particular date or following an invoice from you). Late payment of bills can drive a successful company into bankruptcy so insist on prompt payment – and do the same for your suppliers!

- Make sure you know when and how you are going to get paid and ensure that these details

are included in the agreed contract. Do not delay paying your own bills and expect your clients to pay on time.



Check yourself

You should be able to answer these questions easily after reading this sheet.

1. What is the difference between direct and indirect costs for a project?
2. Who is responsible for the tax an engineer has to pay on a project?
3. When are interim payments useful?



Taking it further

These activities will deepen your understanding of this topic.

1. Think about a job you might do at college or work (e.g. installing solar panels, replacing the workshop lighting or power supply system). List all the direct costs (e.g. equipment, wages, transport to the site) and estimate what these would be. Be careful to justify all of these direct costs. Now review any indirect costs – what are these and estimate how much they would add to your project. These are more difficult to estimate than direct costs but do the best you can – again justify the figure you come up with. Now add a figure for profit. Finally consider what taxes might be payable. What figure do you come up with for the job? Prepare a tender for the job and compare it with tenders from others for the same job.
2. Explore the payment terms and conditions for a variety of different companies (these are often available on their websites). When do people typically expect to be paid? How are these payments initiated? If you were running your own business, how would you like to be paid?
3. Find the costs for a particular piece of equipment or service you might need in your professional life. Different suppliers will almost certainly have different costs. Choose the one that you think gives you the best value for money (it may not be the cheapest). Why did you choose them? Are there any you would definitely not use? Why not?