



Sustainability through investment

Introduction

McCain Foods is the world's largest producer of frozen chips. It opened its first processing factory in New Brunswick, Canada in 1957 turning out cartons of frozen french fries. Owned and managed by the McCain family, the company grew rapidly and entered the UK market in the 1960s. Today, around 45% of all frozen potatoes sold in the UK are McCain frozen potato products. This makes McCain Foods the clear **market leader**. McCain Foods emphasises continuous innovation to enable the **brand** to deliver both variety and quality. This gives McCain real competitive advantage. By investing in new technologies, it can produce products on a huge scale. This enables the company to meet customer demand and keep down costs.

Business is about adding value. McCain transforms raw materials such as potatoes into products that customers value and are willing to buy. The resulting sales generate **revenue**. There is an outflow of costs at every stage of production. McCain Foods' Whittlesey plant in Cambridgeshire turns potatoes into bags of McCain's chips. The company must meet the costs of:

- materials, such as potatoes, cooking oil
- people to run and manage the plant
- equipment
- the building
- energy to run the equipment.

Some of these are **variable costs**. This means that the amount that McCain spends will depend on how much raw materials and other inputs are used. The volume of potatoes used each day and the wages of employees are examples of variable costs. Other cost items are fixed. For example, McCain's office and marketing costs do not change with the level of production. They must be paid regardless of output. **Fixed costs** are also known as **overheads**. All figures shown in this case study are for illustration only.

Example costs and revenues	Total costs £ million	Total revenue £ million
Variable		
Labour	4	
Raw Materials	28	
Energy	6	
Total	38	
Fixed		
Administration	8	
Marketing	2	
Total	10	
	48	60

These figures are for illustrative purposes only.

As a major user of energy for its production process, McCain is seeking to reduce how much gas and electricity it uses. It has invested in two major projects to set up renewable sources of energy for its Whittlesey production plant. These alternative energy sources are also more environmentally-friendly. The company has built a wind turbine system and a new wastewater treatment system. The wastewater system is a covered lagoon. This is a huge tank where the water from the production process is stored and treated to produce methane gas which is trapped beneath the covers. These systems will provide renewable energy to run the plant. This work also fits with McCain Foods' corporate social responsibility programme (CSR). This case study explores how McCain evaluated the benefits of its financial investment in these projects.

Reasons for investment

McCain Foods wants to find ways to maintain competitiveness by reducing costs. It also wants to establish a more sustainable source for the energy it must use.

The sales revenue left over after paying costs is **profit**. There are two common measures of profit. Gross profit is the difference between sales revenue and the direct costs of production. At McCain these include costs of labour, materials and energy.

CURRICULUM TOPICS

- Investment appraisal
- Discounted cash flow
- Payback
- Average rate of return



GLOSSARY

Market leader: the firm that has the largest share of the market, measured by sales (value or volume).

Brand: a name, symbol or design used to identify a specific product and to differentiate it from its competitors.

Revenue: the total value of sales.

Variable costs: the outlays of a business that vary with the level of output.

Fixed costs: costs that remain unchanged at all levels of output in the short-run. e.g. interest charges on loans, salary of staff, pension rights of retired employees, insurance premiums.

Overheads: costs arising from the general running of a business e.g. rent, rates.

Profit: money which is earned in trade or business, especially after paying the costs of producing and selling goods and services.





GLOSSARY

Net profit: the gross profit less all fixed overheads and other expenses. Also known as operating profit.

Cash flow: the movements of cash into and out of a business in a given period of time.

Payback: investment appraisal that evaluates the worth of a capital investment project according to how long it takes before its cost is fully recovered.

Break-even: the output level at which total revenue equals total cost i.e. no profit or loss is made.

Deducting fixed costs from the gross profit gives the other common measure of profit – **net profit**. This money represents a **cash flow** that allows the company to purchase further resources and provide a return for the shareholders.

$$\text{Gross profit} = £60\text{m} - 38\text{m} = £22\text{m}$$

$$\text{Gross profit margin} = \frac{\text{gross profit}}{\text{sales}} \times 100 = \frac{22}{60} \times 100 = 36.7\%$$

$$\text{Net profit} = £60\text{m} - 48\text{m} = £12\text{m}$$

$$\text{Net profit margin} = \frac{\text{net profit}}{\text{sales}} \times 100 = \frac{12}{60} \times 100 = 20\%$$

These figures are for illustrative purposes only.

McCain has installed wind turbines and a wastewater treatment system at the Whittlesey plant. These will provide alternative and sustainable sources of energy. However, the two projects together cost nearly £15 million. McCain therefore needed to evaluate the expected financial benefits of both projects before the company could decide to proceed:

- In the cash flow analysis of the two projects, the cash outflows are the initial investment (in year 0) and the maintenance costs (in years 1 to 5).
- The cash inflows represent the savings that the two projects will produce in McCain's energy bill. They increase over time to reflect the potential savings arising from not paying increased gas and electricity prices.

Year	Cash outflow £ million		Cash inflow £ million		Net cash flow £ million		Cumulative cash flow £ million	
	wind turbines	wastewater lagoon	wind turbines	wastewater lagoon	wind turbines	wastewater lagoon	wind turbines	wastewater lagoon
0	10.0	5.00	0	0	(10.0)	(5.00)	(10.0)	(5.00)
1	0.1	0.05	2.6	1.37	2.5	1.32	(7.5)	(4.68)
2	0.1	0.05	2.8	1.39	2.7	1.34	(4.8)	(3.34)
3	0.1	0.10	3.0	1.60	2.9	1.50	(1.9)	(1.84)
4	0.2	0.10	3.2	1.80	3.0	1.70	1.1	(0.14)
5	0.2	0.10	3.4	1.90	3.2	1.80	4.3	1.66

These figures are for illustrative purposes only.

Investment appraisal

A business needs to assess if an investment is worth doing - will it recover its costs, will it make savings, will it provide a profit on the original investment? There are several methods of analysing an investment:

Payback

The simplest test to understand if an investment will pay for itself is to calculate its **payback** period. This is the time it will take for the original investment to pay for itself through savings.

The largest cost of most projects occurs at set-up. From the cash flow examples, at the end of year 3, the wind turbines project has a cumulative negative cash flow of £1.9 million. This means that the savings made are still paying back the original costs. It needs £1.9 million more to reach **break-even**. The project will break even during year 4. The wastewater lagoon needs £0.14 million more at the end of year 4 and will break even in year 5.

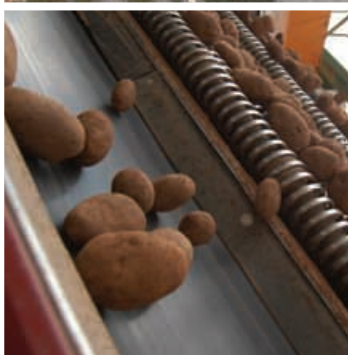
McCain can calculate exactly how long it will take to achieve the additional £1.9 million and £0.14 million for the projects.

Payback period for wind turbines	Payback period for lagoon
$1.9/3.0 \times 12 \text{ months} = 7.6 \text{ months}$	$0.14/1.8 \times 12 \text{ months} = 0.9 \text{ months}$

These figures are for illustrative purposes only.

McCain can predict payback for the wind turbines in just under three years and eight months. The lagoon shows payback in just under four years and one month.

Payback is a simple measure – it does help to assess risk but does not consider the value of cash flows after the payback period. Financial forecasts are more uncertain the further they are projected into the future.



Average rate of return

McCain also looks for any investment not just to pay for itself but also to contribute to its profitability. One method of calculating this is the **average rate of return (ARR)**. This shows the expected average return over the life of the project as a percentage of the original investment. The ARR values help McCain to decide if the projects will give sufficient return.

The wind turbines give a net return of £4.3 million and the lagoon £1.66 million over the assumed project life of five years. The ARR is calculated as:

Wind turbines ARR	Wastewater lagoon ARR
$\frac{£4.3\text{m return}/5 \text{ year} = £0.86\text{m}}{£0.86\text{m}/£10.0\text{m} \times 100 = 8.6\%}$	$\frac{£1.66\text{m return}/5 \text{ years} = £0.33\text{m}}{£0.33\text{m}/£5.0\text{m} \times 100 = 6.6\%}$

These figures are for illustrative purposes only.

If McCain needed to choose one project only, the higher percentage return would be better.

Discounted cash flow

A business must consider whether the value of investing in a particular project will be greater than the value it might lose from not investing in other projects. This is known as **opportunity cost**. Discounted cash flow helps a business consider what the value of money likely to be received in the future is worth today. It takes into account the effect of time on an investment. It also shows how interest rates affect the present value of future revenues.

For example, if a business places £100 in a savings account with 10% interest it will grow to be worth £110 in a year's time. Put another way, £110 in a year's time is worth £100 today. By a similar calculation, £100 in a year's time is worth £90.90 ($100 \times 100/110$) today. This is its **present value**.

At a 10% discount rate, the discount factor for year 1 is 0.909.

At a 10% discount rate, £100 in two years' time has a present value of $100 \times (100/110)^2 = £82.60$. The discount factor for year 2 is 0.826.

Future years discount factors are calculated in the same way.

The **net present value (NPV)** shows the return on investment less the costs of the project. This would help McCain decide whether each project is worth investing in.

Net present value 10% discount rate

EOY	Net cash flow		Discount factor		Present value	
	wind turbine £ million	lagoon £ million	wind turbine	lagoon	wind turbine £ million	lagoon £ million
0	(10.00)	(5.00)	1.000	1.000	(10.00)	(5.00)
1	2.5	1.32	0.909	0.909	2.27	1.20
2	2.7	1.34	0.826	0.826	2.23	1.11
3	2.9	1.50	0.751	0.751	2.18	1.13
4	3.0	1.70	0.683	0.683	2.05	1.16
5	3.2	1.80	0.621	0.621	1.99	1.12
Net present value (NPV) Turbines £ million			0.72			
Net present value (NPV) Lagoon £ million			0.72			

These figures are for illustrative purposes only.

This shows NPV on both projects is identical and profitable after discounting the expected cash flows. However, a business will take other important factors into consideration when planning a project, for example, the value of social or environmental impacts.

Internal rate of return

Internal rate of return (IRR) also uses discounted cash flow. A business must find the rate of return where the NPV is zero. This is compared to the market interest rate to assess if the investment will give a better return than, for example, investing in a bank. The IRR is usually calculated by computer. However, an approximation can be found using trial and error. For example, if a discount rate of 12% is applied to the net present value of the wind turbine project, the NPV is only just positive. This means that the IRR must be just over 12%.



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GLOSSARY

Average rate of return:

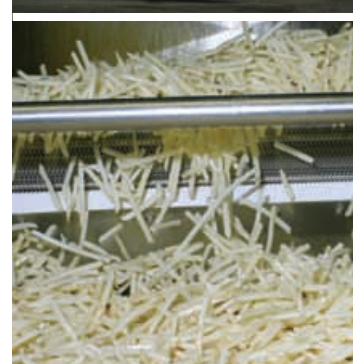
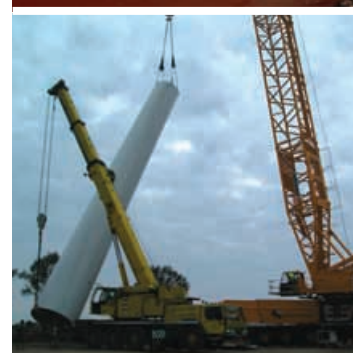
measures the net return per year as a percentage of the initial expenditure.

Opportunity cost: the cost of the next best alternative use that a resource or capital could be put to.

Present value: the current value of a sum of money to be received in the future.

Net present value (NPV): the present value of future income from an investment, less the costs.

Internal rate of return (IRR): the rate of return at which the net present value is zero.



GLOSSARY

Stakeholders: individuals or groups with an interest in the decisions made by an organisation.

Shareholders: persons owning or holding a share or shares of stock; a stockholder.

Carbon footprint: the quantity of carbon dioxide created by individuals, businesses or countries as a result of their activities.

Net present value of the turbines project, 12% discount rate

End of year	Cash flow	Discount factor	Present value
0	(10.0)	1.000	(10.00)
1	2.5	0.893	2.23
2	2.7	0.797	2.15
3	2.9	0.712	2.06
4	3.0	0.636	1.91
5	3.2	0.568	1.82
Net present value (NPV)			£0.17m

These figures are for illustrative purposes only.

The evidence of all the calculations shows that McCain should continue with the projects. However, there are still risks in the projects. If McCain has estimated the future prices of energy as higher than they will be or if the costs of the project increase, savings will be less than expected.

Investment for sustainability

Sustainable business needs a long term plan. There are a number of pressures that businesses need to respond to from:

- customers
- government
- **stakeholders** including **shareholders**
- environmental pressure groups, such as Friends of the Earth.

As market leader, McCain Foods can influence industry standards. It adopts business practices that go further than its legal obligations. The company is committed to improving its performance on environmental protection for both government and environmental groups. McCain also looks for ways to reduce its costs without compromising on quality for customers. It has developed a plan to support both these goals.

The wind turbines will generate enough power to provide up to 60% of the plant's electricity requirements. By using wind power, McCain will:

- eliminate 10,300 tonnes of carbon dioxide emissions each year, reducing air pollution
- reduce its use of electricity from the national grid, resulting in cost savings and protecting the company against increasing energy prices in the years ahead.

The new wastewater lagoon will generate power through the capture of methane gas. This will produce nearly 6,000 megawatt-hours, resulting in annual savings of around 10% in energy costs.

McCain's investment in renewable energy is not just about cost-savings. It will bring other business benefits. The projects help to demonstrate its corporate responsibility and strengthen both its reputation and the brand. The public is concerned about environmental and healthy-living issues. McCain is aware of the need to respond to public opinion. It needs to support healthy eating and sustainable farming and seek to reduce its **carbon footprint**. Its investment in sustainable energy sources shows that it is listening to its stakeholders and adopting sustainable business practice. This will help it retain its market leadership.

Conclusion

A business needs to ensure that it will get a good return on investments. Ensuring profitability is the basic goal of every business. However, rather than simply switching energy providers to cut costs, McCain looked for a more sustainable solution.

McCain invested in the wind turbines and lagoon to save energy costs. By calculating the set-up and maintenance costs against its current (and estimated future) gas and electricity costs, the company forecast that these projects would deliver savings in the longer term. These projects also support its corporate responsibility programme.

Questions

1. What is investment appraisal?
2. Explain the advantages and disadvantages of the payback method of appraisal.
3. Why is the discounted cash flow method of appraisal more useful to a business?
4. Evaluate why environmental issues are important to McCain Foods' future business.



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