

NPV Calculations

Example 1

Project initial investment £8 million

Cash flow: £1.5m per year

Discount rate: 10%

Year	Initial cash	Expected cash flow	Discount factor	NPV	Cumulative NPV
0	£ 8,000,000	£ -	1.000	-£ 8,000,000	-£ 8,000,000
1		£ 1,500,000	0.909	£ 1,363,636	-£ 6,636,364
2		£ 1,500,000	0.826	£ 1,239,669	-£ 5,396,694
3		£ 1,500,000	0.751	£ 1,126,972	-£ 4,269,722
4		£ 1,500,000	0.683	£ 1,024,520	-£ 3,245,202
5		£ 1,500,000	0.621	£ 931,382	-£ 2,313,820
6		£ 1,500,000	0.564	£ 846,711	-£ 1,467,109
7		£ 1,500,000	0.513	£ 769,737	-£ 697,372
8		£ 1,500,000	0.467	£ 699,761	£ 2,389
9		£ 1,500,000	0.424	£ 636,146	£ 638,536
10		£ 1,500,000	0.386	£ 578,315	£ 1,216,851

To achieve £1.5million in 10 years you would have to invest £578,315 at a rate of 10% per year.

The project returns a positive cumulative NPV after 8 years, so is profitable.

Example 2

Our wind farm project

Initial investment £12,500,000

Refurbishment £1,250,000

Annual O&M £425,000

Annual gross income £2,700,000

Net annual income = £2,700,000 - £425,000

Interest rate 3%

Year	Cash In		Cash out		Net Cash Flow	Discount factor	NPV		Cumulative NPV
0	-£	12,500,000			£ -	1.000	-£	12,500,000	-£ 12,500,000
1	£	2,700,000	£	425,000.00	£ 2,275,000	0.971	£	2,208,738	-£ 10,291,262
2	£	2,700,000	£	425,000.00	£ 2,275,000	0.943	£	2,144,406	-£ 8,146,856
3	£	2,700,000	£	425,000.00	£ 2,275,000	0.915	£	2,081,947	-£ 6,064,909
4	£	2,700,000	£	425,000.00	£ 2,275,000	0.888	£	2,021,308	-£ 4,043,601
5	£	2,700,000	£	425,000.00	£ 2,275,000	0.863	£	1,962,435	-£ 2,081,166
6	£	2,700,000	£	425,000.00	£ 2,275,000	0.837	£	1,905,277	-£ 175,889
7	£	2,700,000	£	425,000.00	£ 2,275,000	0.813	£	1,849,783	£ 1,673,894
8	£	2,700,000	£	425,000.00	£ 2,275,000	0.789	£	1,795,906	£ 3,469,800
9	£	2,700,000	£	425,000.00	£ 2,275,000	0.766	£	1,743,598	£ 5,213,398
10	£	2,700,000	£	1,675,000.00	£ 1,025,000	0.744	£	762,696	£ 5,976,094
	£	14,500,000.00	£	5,500,000.00	£ 21,500,000.00				

Return on investment = $(21,500,000 - 12,500,000) / 12,500,000 = 72\%$

Internal rate of return

Use Excel IRR function on the net cash flow data

Net Cash Flow	
-£	12,500,000
£	2,275,000
£	2,275,000
£	2,275,000
£	2,275,000
£	2,275,000
£	2,275,000
£	2,275,000
£	2,275,000
£	2,275,000
£	1,025,000

Returns a value of 12%