

CASE • RWJJ CH 7-8

Gulf Coast Solar: the commercial rooftop division

A full capital budgeting case, from deciding which cash flows count to choosing between two projects. Sorting relevant from irrelevant costs, MACRS, after-tax salvage, working capital, and every major decision rule.

The situation

Gulf Coast Solar (GCS) sells and installs residential solar panel systems in Southwest Florida. Management is considering a **commercial rooftop division** that would serve office parks and strip malls along the Fort Myers to Naples corridor. You have been asked to decide whether the division is worth launching, and whether it beats the other use the company has for the money.

The company and its numbers are fictional.

The data

ITEM	VALUE
Feasibility study, completed and paid last quarter	\$95,000
Installation equipment, bought at launch	\$2,400,000
Depreciation	5-year MACRS
Project life	5 years
Equipment sale price at the end of Year 5	\$350,000
Net working capital needed at launch	\$300,000
Tax rate	25%
WACC	11%

Warehouse. GCS owns a warehouse in Bonita Springs, now rented to a logistics company for **\$80,000 a year after tax**. The new division would use it as its staging area, so the lease would end.

Financing. GCS plans to fund part of the project with a **\$2,000,000 term loan at 6.5%**.

Sales. Each commercial installation brings in \$30,000. Forecast installations:

YEAR	1	2	3	4	5
Installations	60	90	110	85	50

Costs. Variable costs are 40% of the division's revenue. The division adds \$250,000 a year of fixed costs.

Erosion. Some customers who would have bought a residential system will choose the commercial offer instead. GCS estimates this lowers the residential business's pre-tax profit by **\$120,000 a year** (the lost residential revenue net of the costs that would have gone with it).

MACRS rates, 5-year class. The half-year convention spreads the deduction over six tax years:

YEAR	1	2	3	4	5	6
Rate	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%

Any working capital invested at launch is recovered in full at the end of Year 5.

Questions

Part A: Which cash flows count?

For each item, say whether it belongs in the analysis, and explain why in one sentence.

1. The \$95,000 feasibility study
2. The warehouse rent GCS would give up
3. Interest on the 6.5% loan
4. The erosion of residential profit
5. The \$300,000 of net working capital
6. The equipment's sale price at the end of Year 5
7. The \$250,000 a year of fixed costs

Part B: Pro forma income statement

Build the pro forma income statement for Years 1 to 5 with MACRS depreciation. Show EBIT and net income for each year.

Part C: Operating cash flow

Using $OCF = EBIT - \text{Taxes} + \text{Depreciation}$, compute OCF for Years 1 to 5.

Part D: After-tax salvage

Find the equipment's book value at the end of Year 5, the taxable gain or loss on the sale, and the after-tax cash GCS receives from selling it.

Part E: Total project cash flows

Build the full cash flow timeline for Years 0 to 5: equipment, working capital invested and recovered, OCF, the warehouse opportunity cost, and after-tax salvage.

Part F: NPV, IRR and profitability index

Compute the NPV at 11%, the IRR and the profitability index. On all three, should GCS go ahead?

Part G: Payback

1. Compute the payback period from the Part E cash flows.
2. Compute the discounted payback period at 11%.

3. GCS has a policy of accepting only projects that pay back within 3 years. Does this project pass on each measure? Does either answer conflict with NPV? Explain why a payback cutoff can lead to the wrong decision.

Part H: The alternative

GCS could instead spend \$2,400,000 upgrading its residential operations. It cannot do both. The upgrade's cash flows:

YEAR	0	1	2	3	4	5
Cash flow (\$)	-2,400,000	700,000	700,000	700,000	700,000	700,000

1. Compute the NPV and IRR of the residential upgrade.
2. Do NPV and IRR agree on which project GCS should choose? If they conflicted, which rule should GCS follow, and why?
3. In general, when can NPV and IRR rank mutually exclusive projects differently? Give at least two reasons.

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