

Economic Analysis Report



Project name: Economic-Example-Mzimvubu

Project number: 2026-003A

Client: Eskom

Designer: Marco van Dijk

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Included sections

- | | |
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Executive Summary (Dashboard)



Total CAPEX

R 2,449,061,000

Annual OPEX

R 65,062,000/year

Annual energy

223.990 GWh/year

LCOE

R 1.183/kWh

NPV

R 13,659,772,000

IRR

15.31%

Technical summary

Design flow **10 m³/s**

Available / net head **326.6 m**

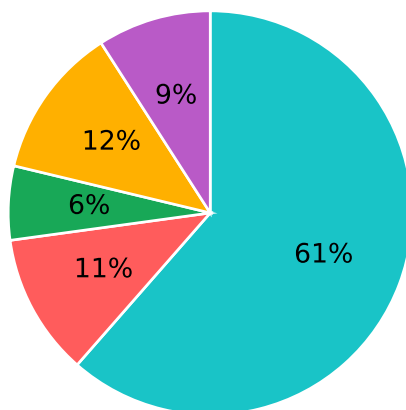
Installed capacity **28135 kW**

Capacity factor **91.8 %**

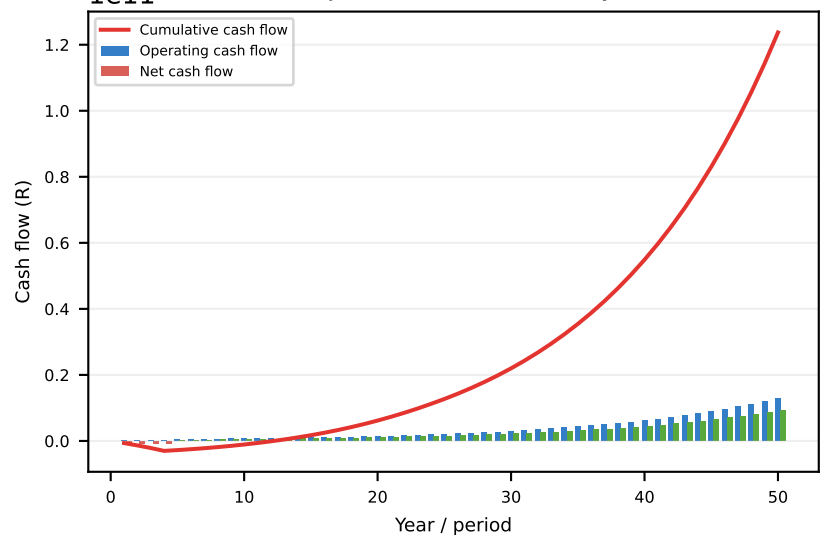
Number of turbines **3**

Turbine type **Pelton**

CAPEX breakdown



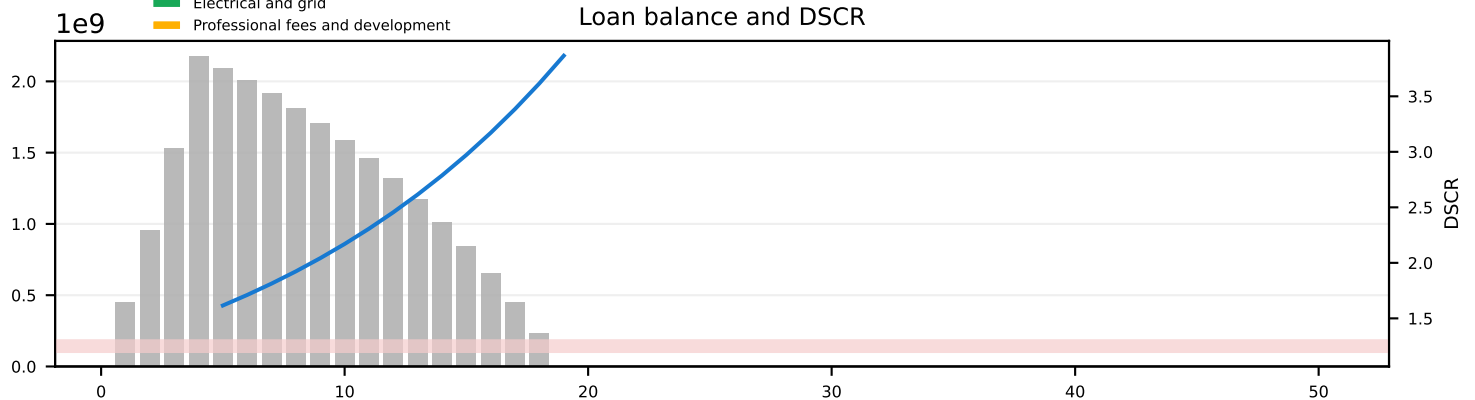
Project cash flow summary



Legend for Loan balance and DSCR:

- Civil works (blue)
- Electro-mechanical (red)
- Electrical and grid (green)
- Professional fees and development (yellow)

Loan balance and DSCR



Overall project rating

Favourable | NPV: R 13,659,772,000 | IRR: 15.31% | B/C ratio: 2.12

Project & Scheme Configuration



Input / indicator	Value
Project Name	Economic-Example-Mzimvubu
Client	Eskom
River System	Mzimvubu River
Country	South Africa
Province	Eastern Cape
Scheme Type	Run-of-river
Water Source	River
Conveyance	Penstock
Powerhouse Type	Surface powerhouse
Grid Connection	Existing substation
Development Status	Greenfield
Environmental	Low
Access	Good
Start Month	January
Start Year	2026
Implementation Months	48 months
Construction Months	36 months

Technical Inputs

Input / indicator	Value	Unit
Design flow	10	m ³ /s
Tailrace length	50	m
Weir length	225	m
Tailrace width	7	m
Weir height	10	m
Tailrace depth	2	m
Headrace length	0	m
New access road	4	km
Headrace width	0	m
Access road upgrade	0	km
Headrace depth	0	m
New transmission line	21.5	km
Penstock length	16800	m
Transmission line upgrade	0	km
Penstock diameter	2.2	m
Transmission losses	1	%
Number of penstocks	1	No.
Penstock velocity	2.631	m/s
Net head	326.6	m
Turbine type	Pelton	
Turbine efficiency	91	%
Generator efficiency	96.5	%
Overall efficiency	87.81	%
Installed capacity	28135	kW
Number of turbines	3	No.
Capacity per turbine	9378	kW
Capacity factor	91.8	%
Powerhouse length	50	m
Powerhouse width	25	m
Powerhouse height	10	m

Costing Assumptions



Input / indicator	Value	Unit
Cost base year	2026	year
Currency	ZAR - South African Rand	
ZAR/USD exchange rate	17	R/USD
ZAR/EUR exchange rate	19.5	R/EUR
Contingency allowance	10	%
Local procurement saving	15	%
Import allowance	21	%
Initial spares allowance	3	%
VAT included	No	Yes/No

Civil Costs

Component	Basis	Qty/%	Unit	Rate	Calculated	Override	Final
Land purchase / lease & land rights	Lump sum	1	lump sum	R 5,800,000	R 5,800,000		R 5,800,000
Site establishment & contractor's P&Gs	Cost per month	36.0	months	R 150,000	R 5,400,000		R 5,400,000
Weir / dam	Rate by height / lump sum	10	lump sum	R 29,200,000	R 292,000,000		R 292,000,000
Intake structure	Total structure cost	1	lump sum	R 28,000,000	R 28,000,000		R 28,000,000
Desilting basin	Total structure cost	0	lump sum	R 0	R 0		R 0
Headrace	Cost per unit length	0	m	R 0	R 0		R 0
Forebay	Total structure cost	1	lump sum	R 0	R 0		R 0
Penstock	Cost per unit length / size	16800	m	R 65,000	R 1,092,000,000		R 1,092,000,000
Surge tank / shaft	Total structure cost	0	lump sum	R 0	R 0		R 0
Powerhouse	Area × rate	1250.000	m ²	R 45,000	R 56,250,000		R 56,250,000
Tailrace	Cost per unit length / size	50	m	R 150,000	R 7,500,000		R 7,500,000
Access road new	Cost per unit length	4	km	R 4,500,000	R 18,000,000		R 18,000,000
Access road upgrade	Cost per unit length	0	km	R 0	R 0		R 0
Other	Lump sum	1	lump sum	R 0	R 0		R 0
TOTAL					R 1,504,950,000		R 1,504,950,000

Electro-mechanical Costs



Component	Basis	Qty/%	Unit	Rate	Calculated	Override	Final
Turbine package	Rate per kW installed capacity	28135	kW	R 9,400	R 264,469,000		R 264,469,000
Turbine(s)	% of turbine package	55	%	R 0	R 145,458,000		R 0
Generator(s)	% of turbine package	25	%	R 0	R 66,117,200		R 0
Main inlet valve(s)	% of turbine package	10	%	R 0	R 26,446,900		R 0
Turbine auxiliaries	% of turbine package	10	%	R 0	R 26,446,900		R 0
Overhead crane	Total package	1	lump sum	R 0	R 0		R 0
Inlet trash rack / intake screen	Total package	1	lump sum	R 0	R 0		R 0
Other auxiliaries	Lump sum	1	lump sum	R 0	R 0		R 0
Saving on turbine (local manufacture)	% of turbine package	15	%	R 0	R -39,670,400		R -39,670,400
Spare components	% of E-M package	3	%	R 0	R 6,744,000		R 6,744,000
Import costs	% of imported E-M cost	21	%	R 0	R 47,207,700		R 47,207,700
TOTAL					R 543,219,300		R 278,750,300

Electrical & Grid Costs



Component	Basis	Qty/%	Unit	Rate	Calculated	Override	Final
Transformer(s)	Rate per MVA	28.135	MVA	R 0	R 0		R 0
Switchyard / substation	Rate per MW installed capacity	28.135	MW	R 1,850,000	R 52,049,800		R 52,049,800
Transmission line (new)	Cost per unit length	21.5	km	R 4,250,000	R 91,375,000		R 91,375,000
Transmission line (upgrade)	Cost per unit length	0	km	R 0	R 0		R 0
Electrical Balance of Plant (EBoP)	Lump sum	1	lump sum	R 1,500,000	R 1,500,000		R 1,500,000
MV switchgear	% of EBoP	18	%	R 0	R 270,000		R 0
Protection	% of EBoP	12	%	R 0	R 180,000		R 0
Metering	% of EBoP	3	%	R 0	R 45,000		R 0
PLC	% of EBoP	8	%	R 0	R 120,000		R 0
SCADA	% of EBoP	10	%	R 0	R 150,000		R 0
Cabling	% of EBoP	20	%	R 0	R 300,000		R 0
Earthing	% of EBoP	5	%	R 0	R 75,000		R 0
Lightning protection	% of EBoP	2	%	R 0	R 30,000		R 0
Communications	% of EBoP	7	%	R 0	R 105,000		R 0
UPS / battery	% of EBoP	5	%	R 0	R 75,000		R 0
Station service	% of EBoP	10	%	R 0	R 150,000		R 0
TOTAL					R 146,424,800		R 144,924,800

Professional Fees



Component	Basis	Qty/%	Unit	Rate	Calculated	Override	Final
Prefeasibility study	Lump sum	1	lump sum	R 2,500,000	R 2,500,000		R 2,500,000
Detailed design & tender documentation	% of implementation cost	9	%	R 0	R 173,576,300		R 173,576,300
Legal and regulatory	% of implementation cost	1	%	R 0	R 19,286,300		R 19,286,300
Geotechnical investigations & surveys	Lump sum	1	lump sum	R 4,500,000	R 4,500,000		R 4,500,000
Environmental and social assessment	Lump sum	1	lump sum	R 1,500,000	R 1,500,000		R 1,500,000
Project management	% of implementation cost	3	%	R 0	R 57,858,800		R 57,858,800
Construction supervision / owner's engineer	% of implementation cost	2	%	R 0	R 38,572,500		R 38,572,500
Other / reserve fund	Lump sum	1	lump sum	R 0	R 0		R 0
TOTAL					R 297,793,900		R 297,793,900

Annual Operating Costs



Input / indicator	Value	Unit
Civil works maintenance	0.8%	% or entered basis
Electro-mechanical maintenance	4.0%	% or entered basis
Electrical maintenance	1.0%	% or entered basis
Operations (staff and administration)	1.5%	% or entered basis
Insurance	0.5%	% or entered basis
Major overhaul reserve	0.5%	% or entered basis
Transmission line maintenance	1.5%	% or entered basis
Water use charges	R 0.00	% or entered basis
Land / site lease	R 0	% or entered basis

Financial Assumptions



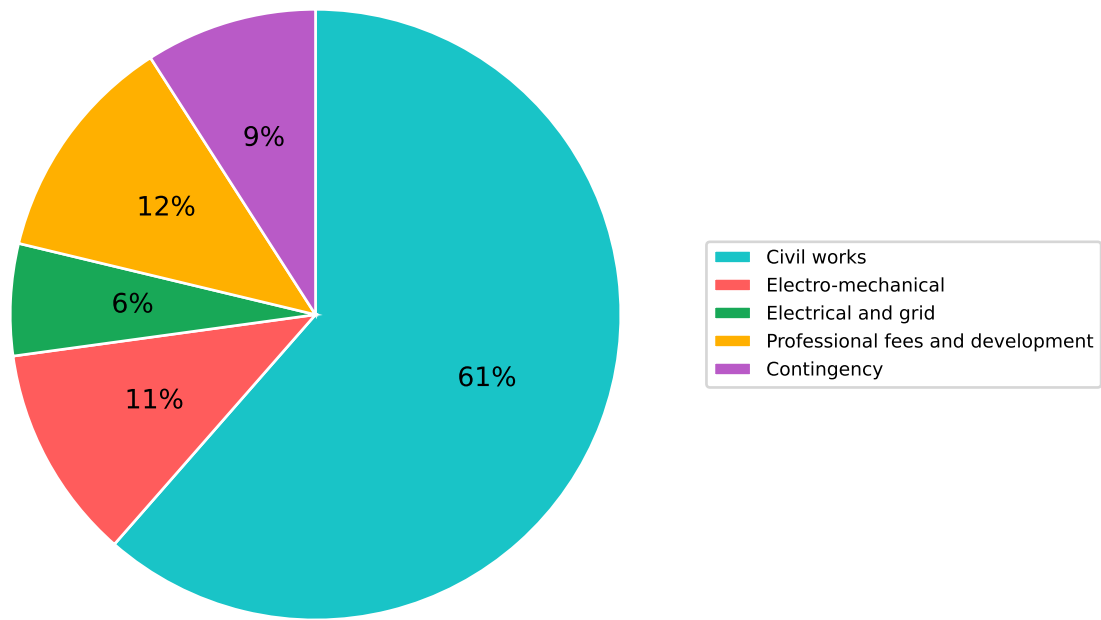
Input / indicator	Value	Unit
Analysis period	50	years
Construction period	36	months
Revenue start year	0	year
Loan required	Yes	Yes/No
Debt / loan amount	70	% of CAPEX
Loan tenor	15	years
Finance rate	8	%
Grace period required	Yes	Yes/No
Grace period	36	months
Grace-period treatment	Interest is capitalised	
Repayment profile	Equal instalments	
CAPEX escalation	5	%
Operations escalation	6	%
Maintenance escalation	6	%
General inflation	6	%
Energy price escalation	7.5	%
Carbon credit escalation	7.5	%
Discount rate (real)	6	%
Corporate tax rate	27	%
Depreciation period	20	years
Residual value	5	% of CAPEX
Average value of energy	1.36	currency/kWh
Carbon credit value	326	currency/MWh

CAPEX Summary



Category / indicator	Value
Civil works	R 1,504,950,000
Electro-mechanical	R 278,750,000
Electrical and grid	R 144,925,000
Professional fees and development	R 297,794,000
Contingency	R 222,642,000
Total CAPEX	R 2,449,061,000
Installed capacity	28,135 kW
Implementation cost per installed kW	R 87,047/kW

CAPEX composition

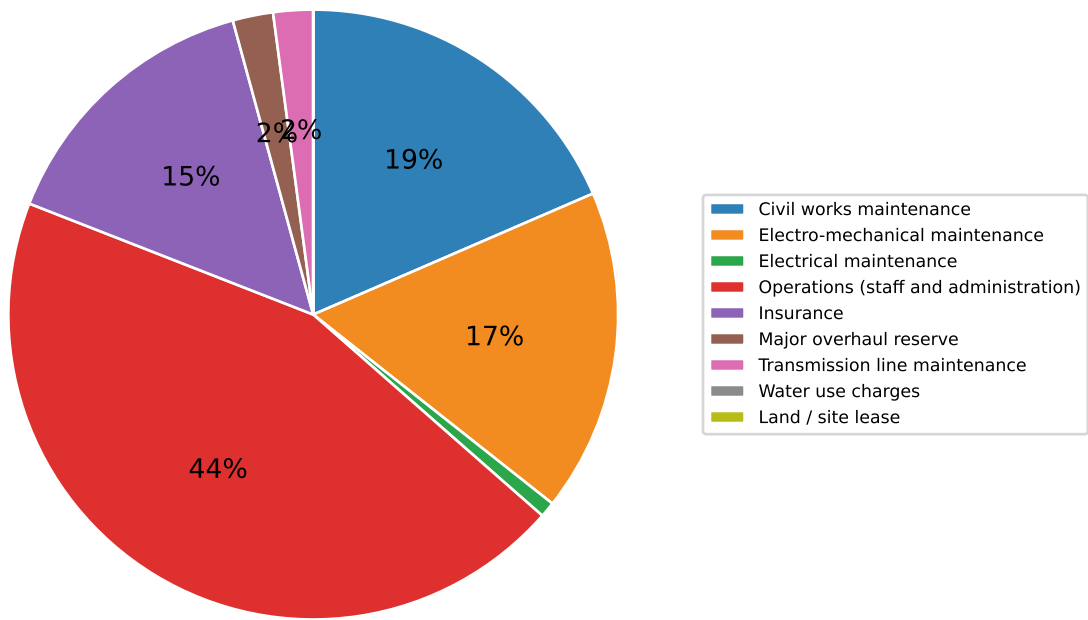


OPEX Summary



Cost item	Annual cost
Civil works maintenance	R 12,040,000/year
Electro-mechanical maintenance	R 11,150,000/year
Electrical maintenance	R 535,000/year
Operations (staff and administration)	R 28,929,000/year
Insurance	R 9,643,000/year
Major overhaul reserve	R 1,394,000/year
Transmission line maintenance	R 1,371,000/year
Water use charges	R 0.00/year
Land / site lease	R 0/year
Total annual OPEX	R 65,062,000/year

OPEX composition



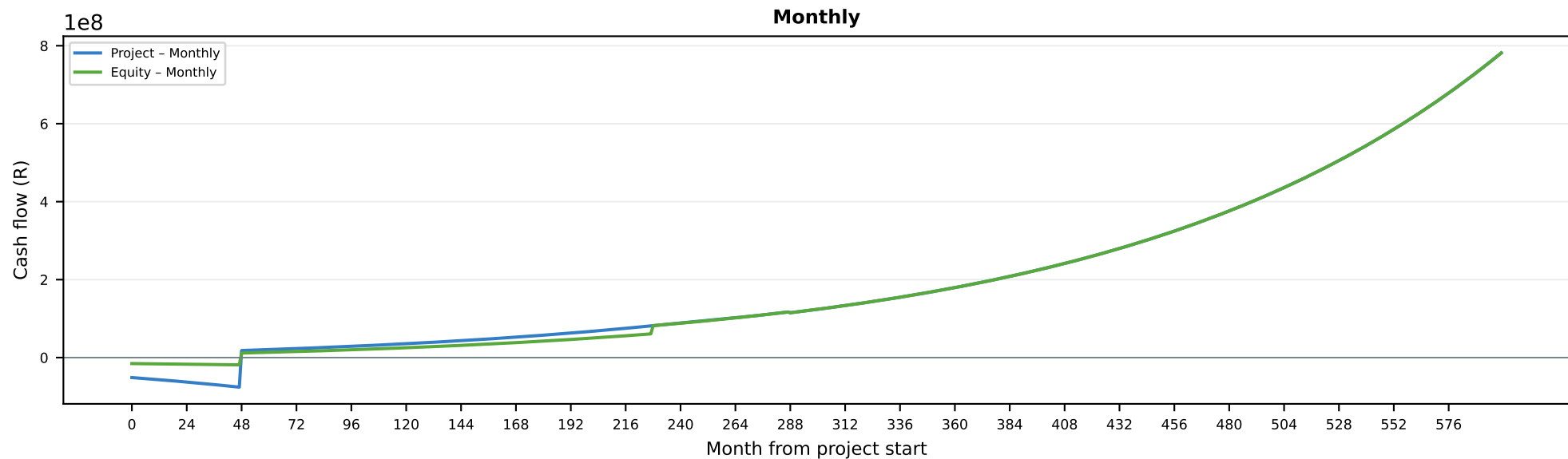
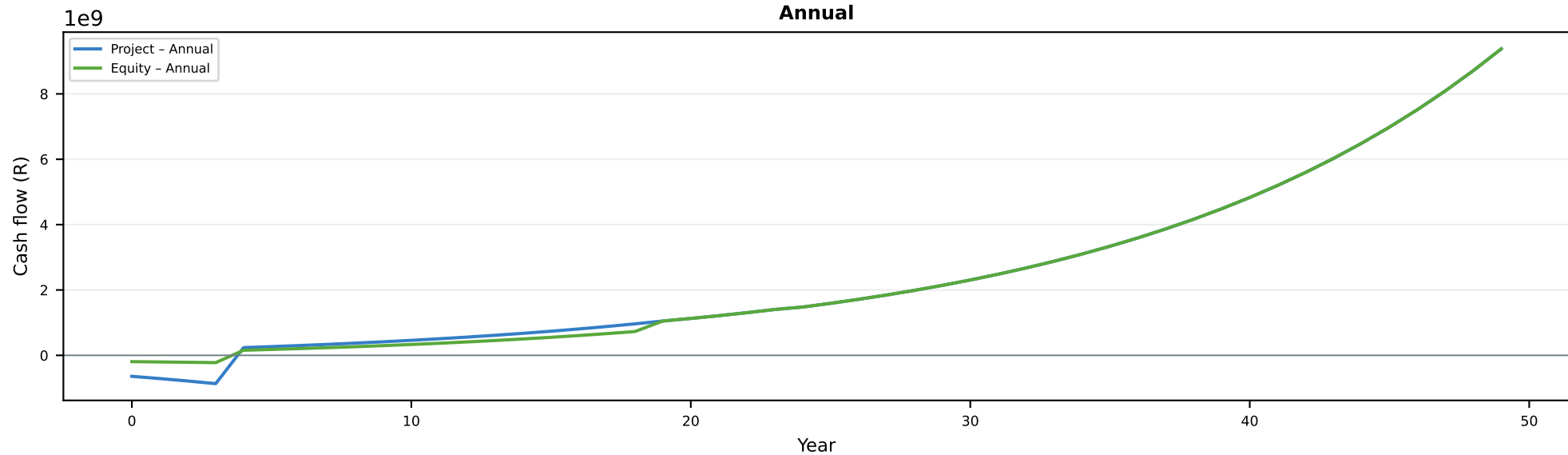
Economic Evaluation - Basic Indicators



Economic indicator	Project - Annual	Project - Monthly	Equity - Annual	Equity - Monthly
NPV of costs	R 12,185,781,000	R 12,186,790,000	R 11,344,674,000	R 11,312,258,000
NPV of revenue	R 26,013,349,000	R 25,846,562,000	R 26,013,349,000	R 25,846,562,000
Net Present Value	R 13,827,568,000	R 13,659,772,000	R 14,668,675,000	R 14,534,304,000
Internal rate of return	15.55%	15.31%	25.39%	25.13%
Benefit / cost ratio	2.13	2.12	2.29	2.28
Simple project payback period	9.0 years	8.4 years	5.0 years	4.3 years
Levelised Cost of Energy	R 1.183/kWh	R 1.183/kWh	R 1.101/kWh	R 1.098/kWh
Minimum Debt Service Coverage Ratio	1.62	1.56	1.62	1.56

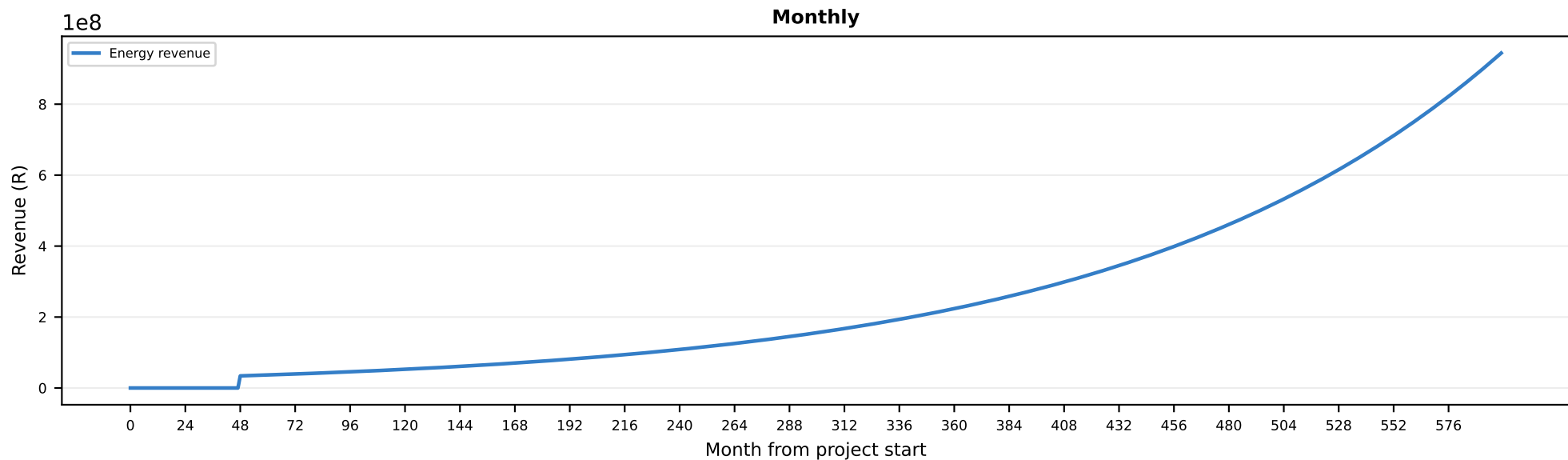
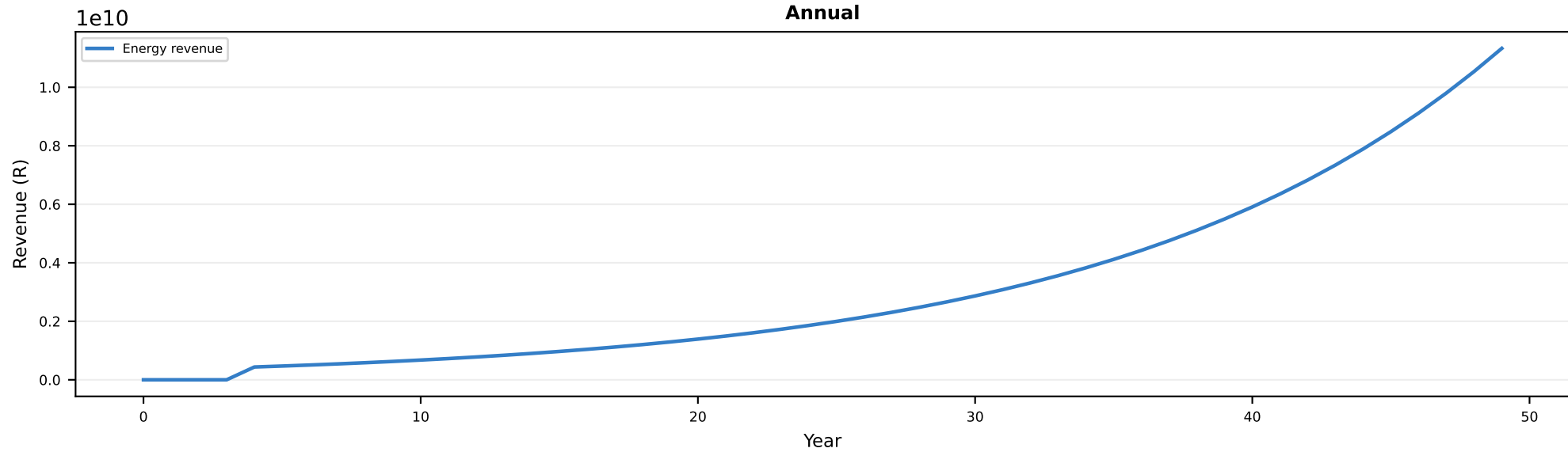
Economic Evaluation - Cash Flow

Economic-Example-Mzimvubu



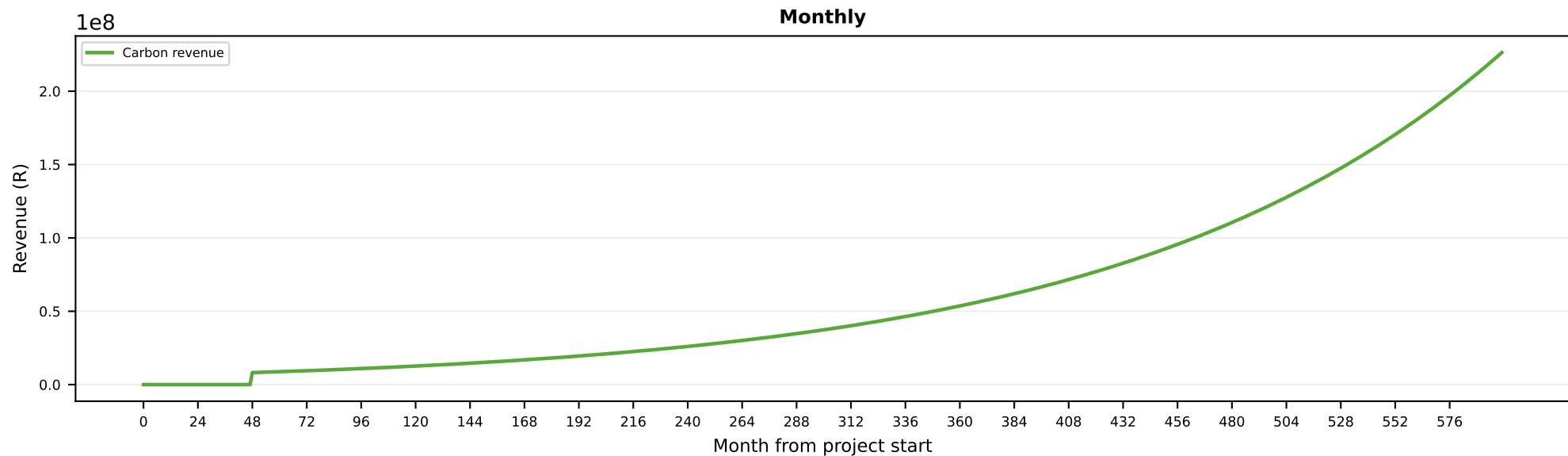
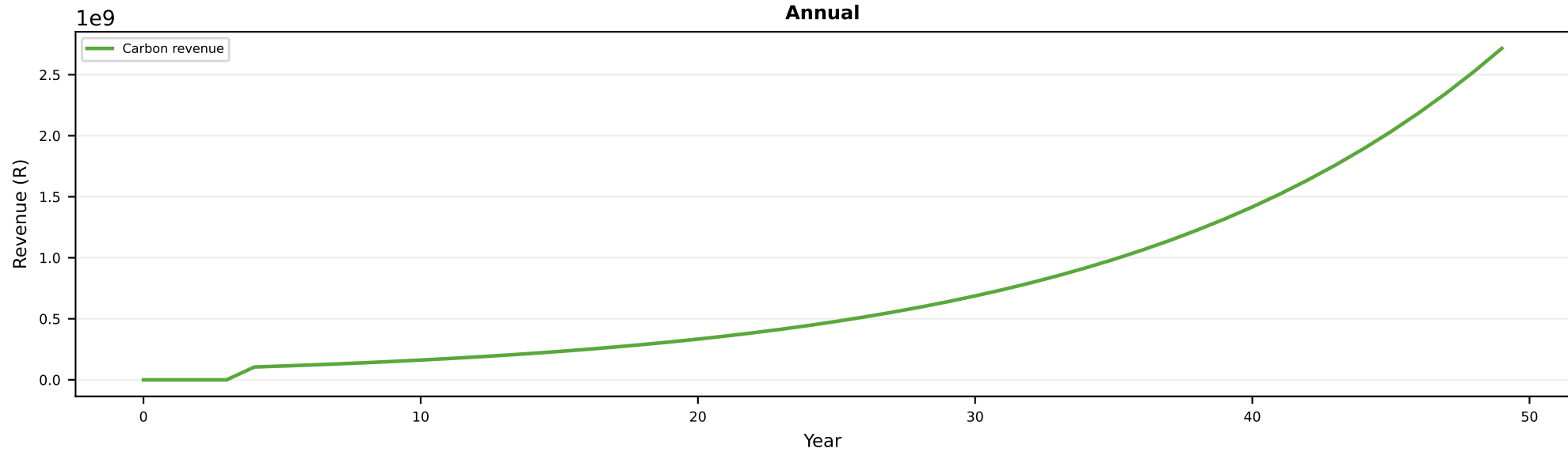
Economic Evaluation - Energy Revenue

Economic-Example-Mzimvubu



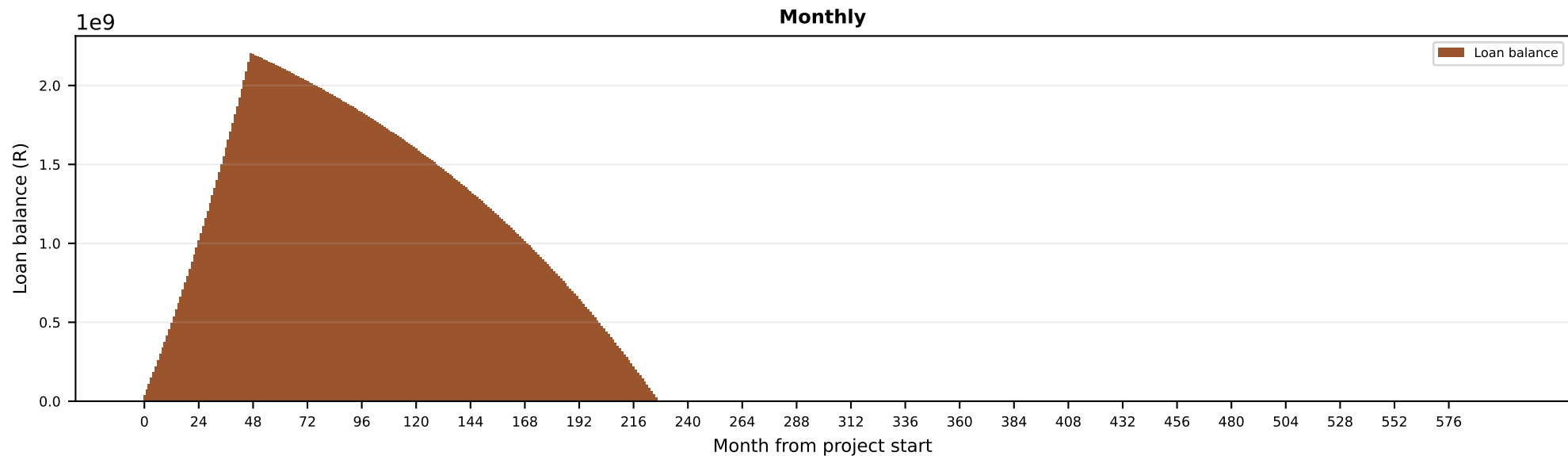
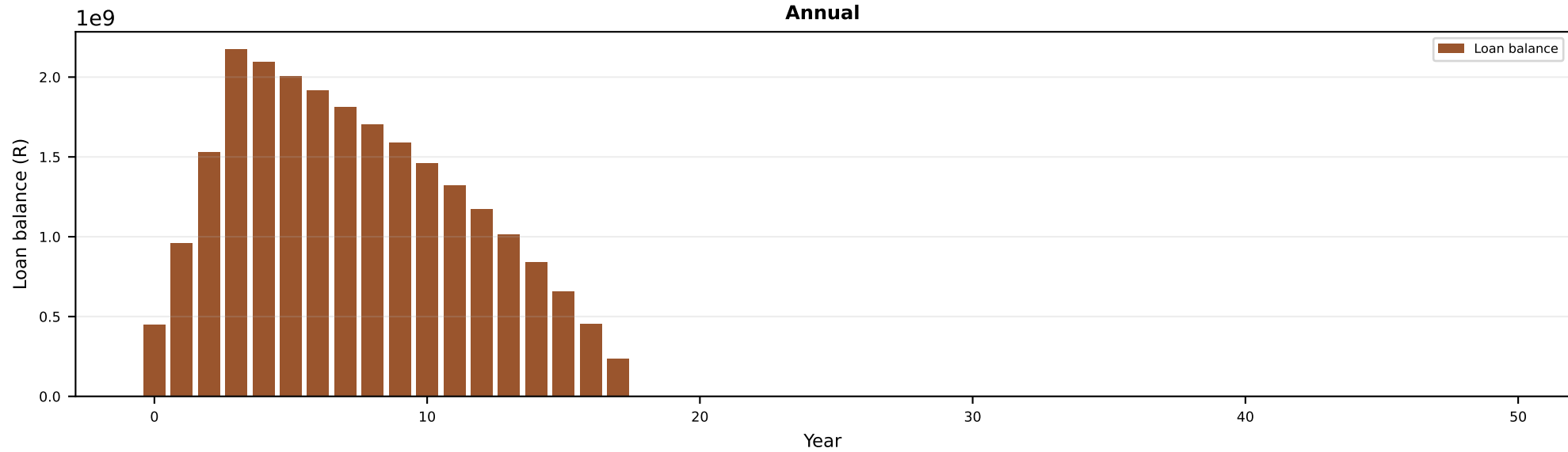
Economic Evaluation - Carbon Revenue

Economic-Example-Mzimvubu



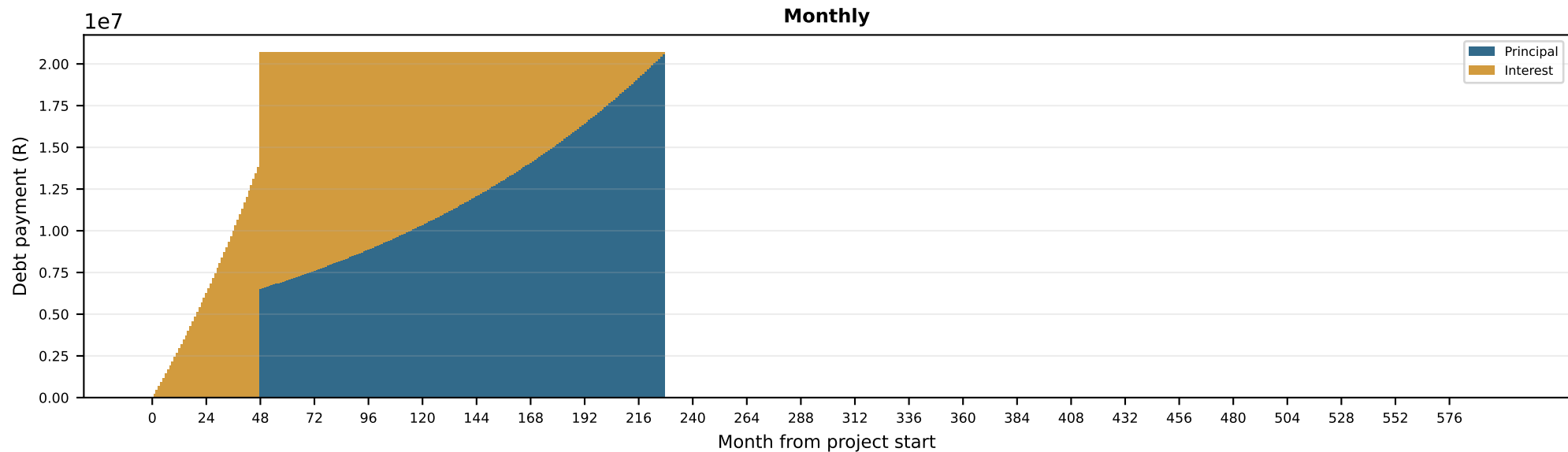
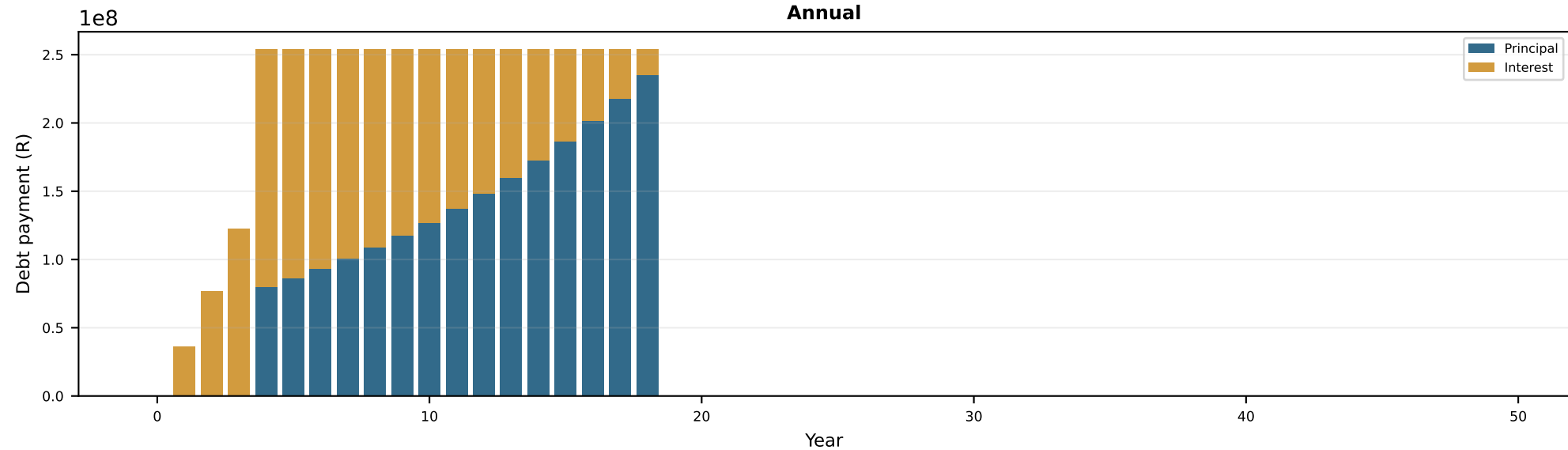
Economic Evaluation - Loan Balance

Economic-Example-Mzimvubu



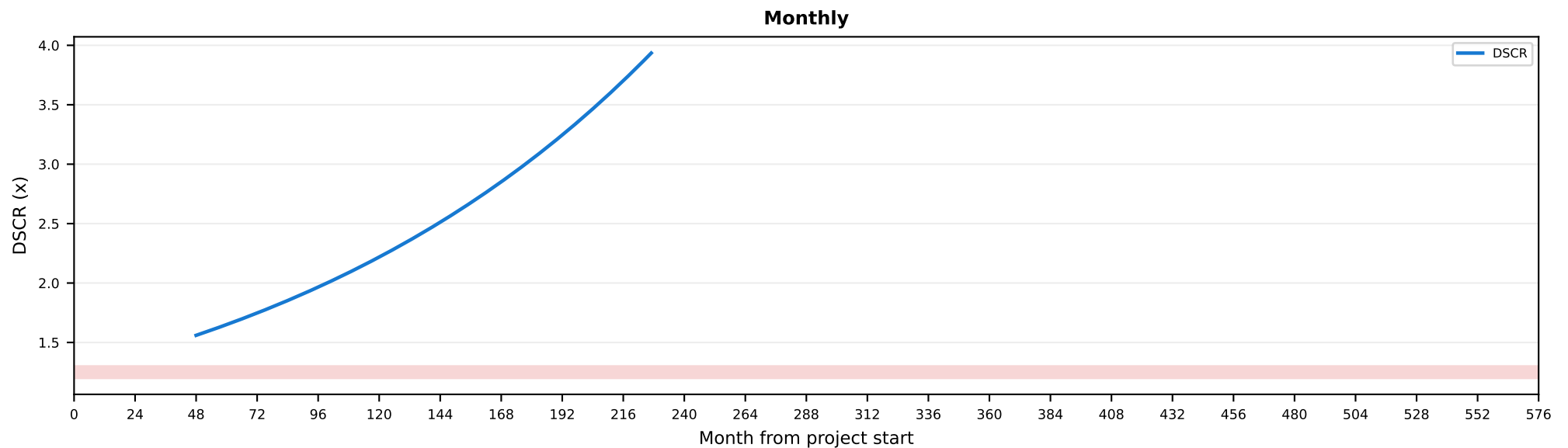
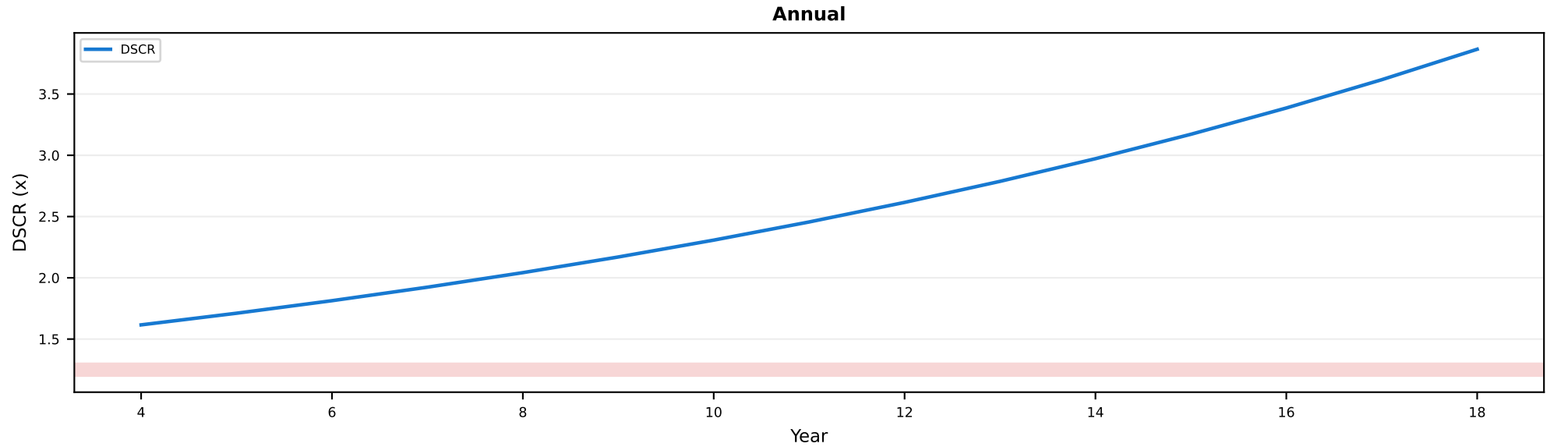
Economic Evaluation - Principal and Interest

Economic-Example-Mzimvubu



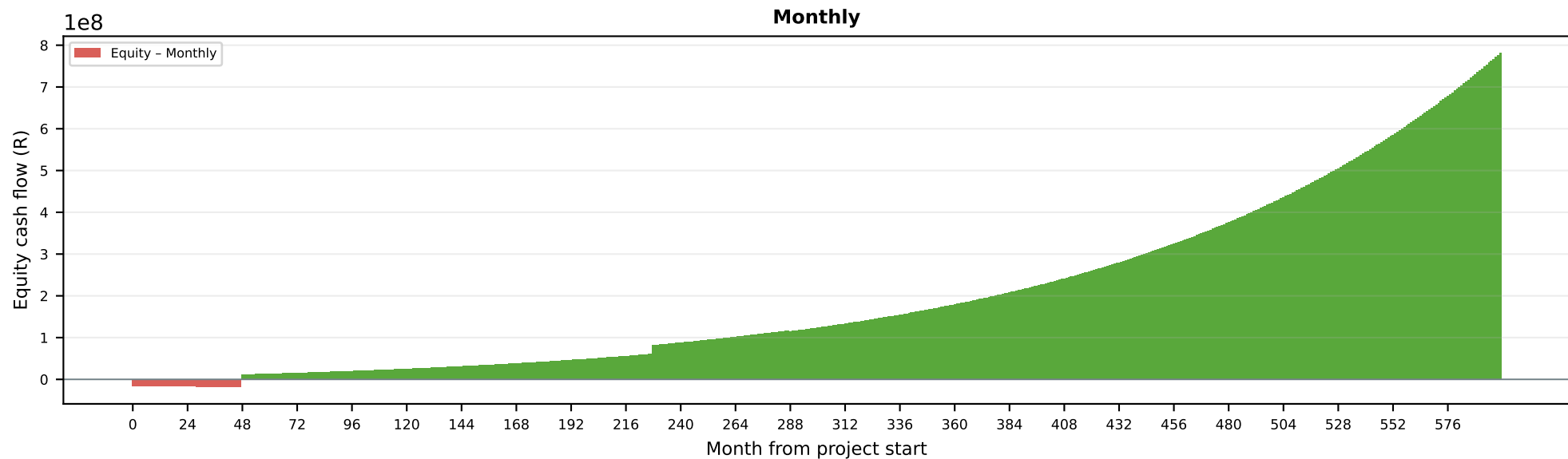
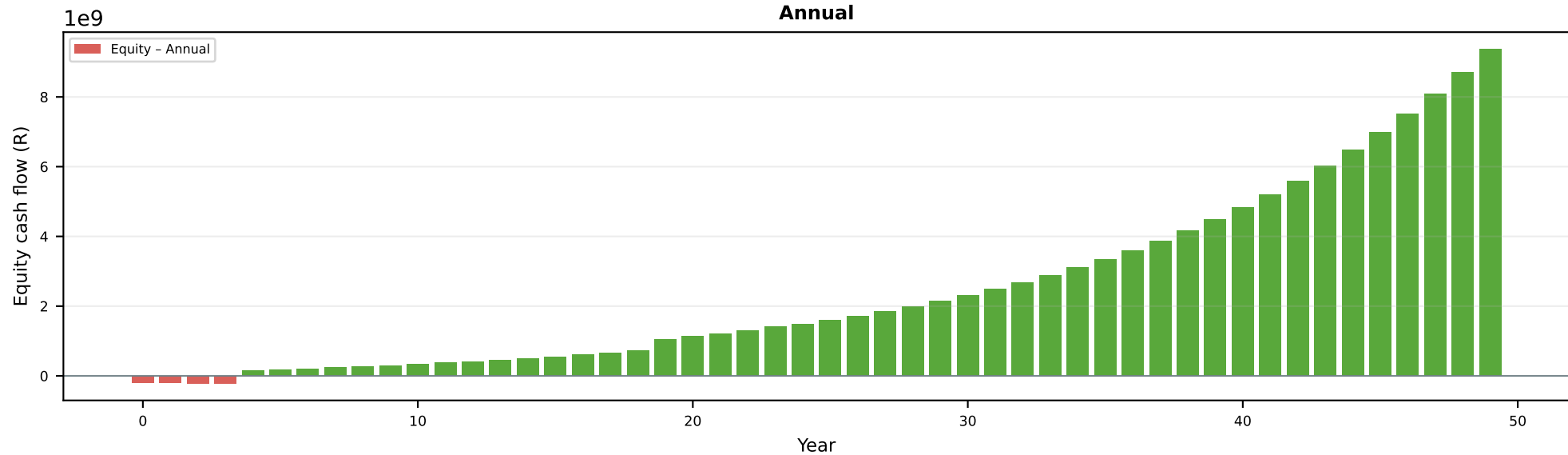
Economic Evaluation - DSCR

Economic-Example-Mzimvubu



Economic Evaluation - Equity Cash Flow

Economic-Example-Mzimvubu



Project Sensitivity Analysis



Annual base-case sensitivity

Selected sensitivity values

Low / medium / high changes: $\pm 4\%$, $\pm 8\%$, $\pm 10\%$

Selected variables

CAPEX • Annual OPEX • Annual energy generation • Energy tariff • Discount rate • Analysis period • Finance rate • Carbon credit value • Construction period

Base-case inputs

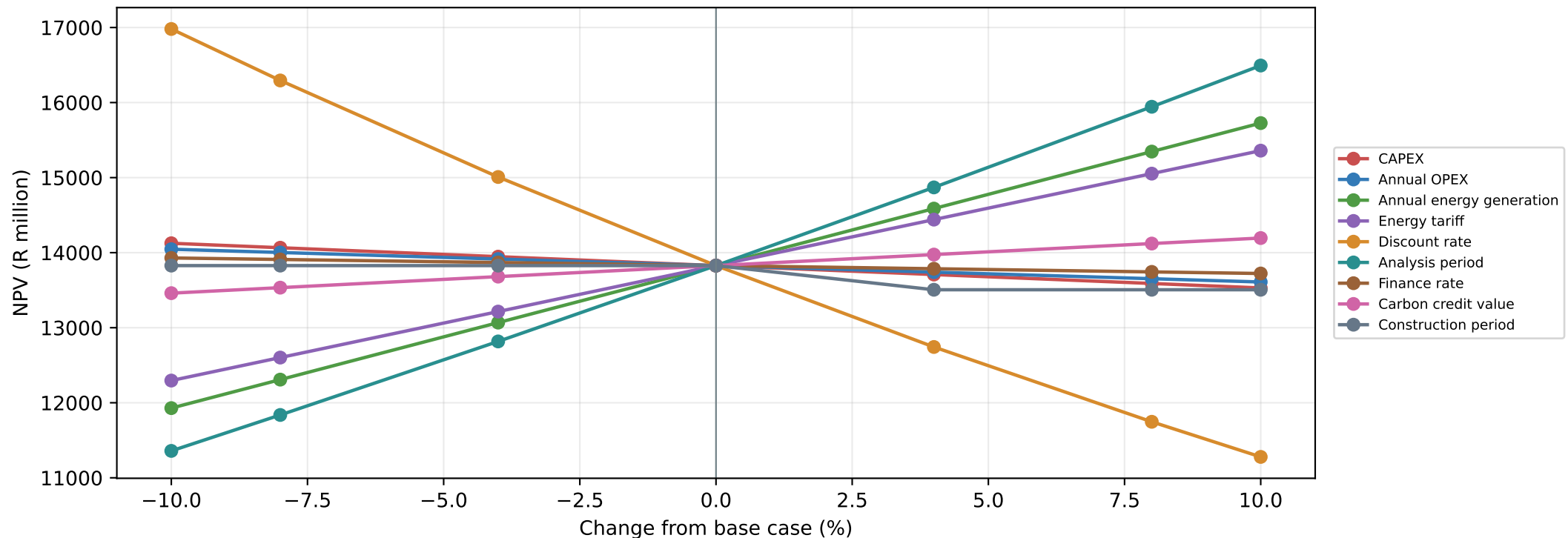
Item	Value
Total CAPEX	R 2,449,061,000
Annual OPEX	R 65,062,000/year
Annual energy generation	223.990 GWh/year
Energy tariff	R 1.360/kWh
Discount rate	6.00%
Finance rate	8.00%
Analysis period	50 years

Base-case economic results

Item	Value
Net Present Value	R 13,827,568,382
Internal Rate of Return	15.55%
Benefit / Cost Ratio	2.135
Simple Payback Period	9.00 years
Levelised Cost of Energy	R 1.183/kWh

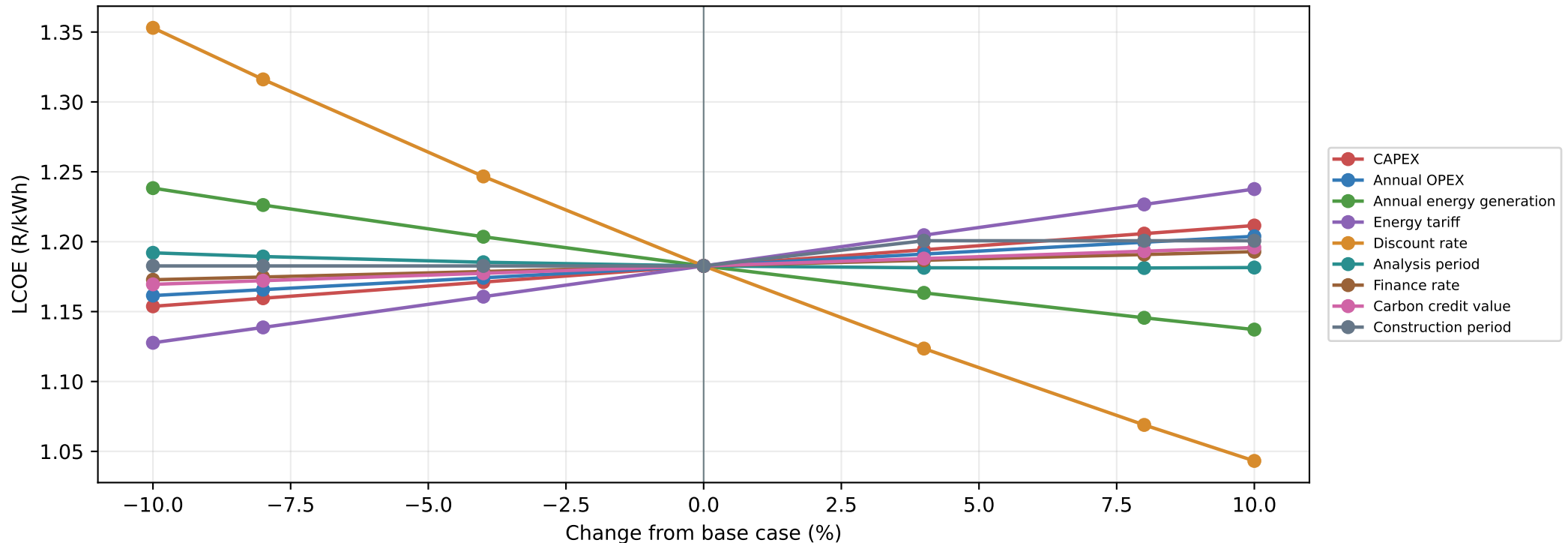
Project Sensitivity Analysis - NPV

Variable	-10%	-8%	-4%	Base	+4%	+8%	+10%
CAPEX	R 14,125,307,825	R 14,065,759,937	R 13,946,664,159	R 13,827,568,382	R 13,708,472,605	R 13,589,376,828	R 13,529,828,940
Annual OPEX	R 14,046,046,578	R 14,002,350,939	R 13,914,959,661	R 13,827,568,382	R 13,740,177,104	R 13,652,785,826	R 13,609,090,186
Annual energy generation	R 11,928,593,905	R 12,308,388,801	R 13,067,978,592	R 13,827,568,382	R 14,587,158,173	R 15,346,747,964	R 15,726,542,859
Energy tariff	R 12,295,774,024	R 12,602,132,895	R 13,214,850,639	R 13,827,568,382	R 14,440,286,126	R 15,053,003,869	R 15,359,362,741
Discount rate	R 16,980,312,702	R 16,294,349,841	R 15,008,127,422	R 13,827,568,382	R 12,743,211,296	R 11,746,496,773	R 11,278,554,927
Analysis period	R 11,358,659,765	R 11,837,337,571	R 12,817,136,085	R 13,827,568,382	R 14,869,507,591	R 15,943,851,725	R 16,493,463,248
Finance rate	R 13,929,475,653	R 13,909,363,646	R 13,868,735,754	R 13,827,568,382	R 13,785,860,400	R 13,743,610,729	R 13,722,282,435
Carbon credit value	R 13,460,388,264	R 13,533,824,288	R 13,680,696,335	R 13,827,568,382	R 13,974,440,430	R 14,121,312,477	R 14,194,748,501
Construction period	R 13,827,568,382	R 13,827,568,382	R 13,827,568,382	R 13,827,568,382	R 13,505,744,548	R 13,505,744,548	R 13,505,744,548



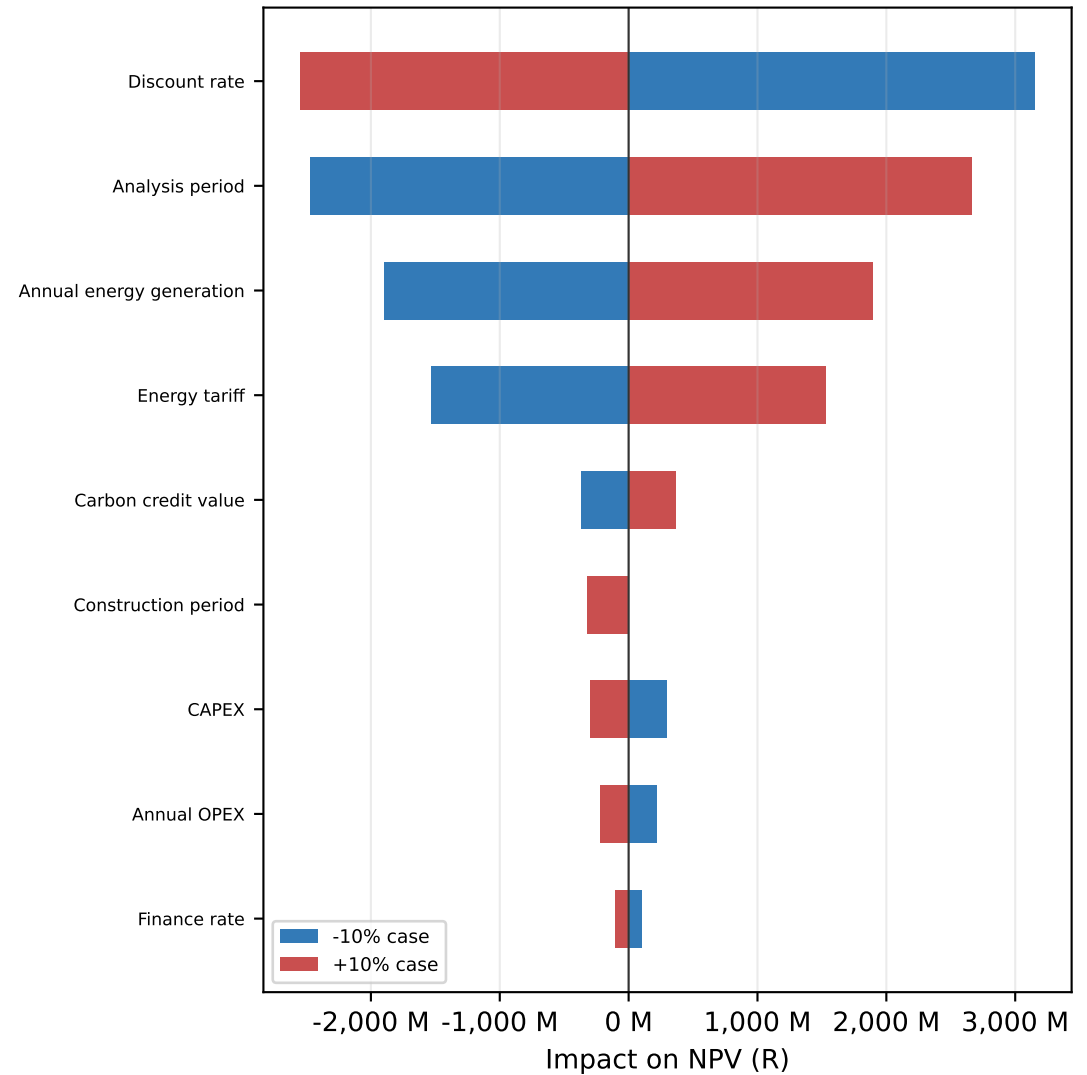
Project Sensitivity Analysis - LCOE

Variable	-10%	-8%	-4%	Base	+4%	+8%	+10%
CAPEX	R 1.154/kWh	R 1.160/kWh	R 1.171/kWh	R 1.183/kWh	R 1.194/kWh	R 1.206/kWh	R 1.212/kWh
Annual OPEX	R 1.161/kWh	R 1.166/kWh	R 1.174/kWh	R 1.183/kWh	R 1.191/kWh	R 1.200/kWh	R 1.204/kWh
Annual energy generation	R 1.238/kWh	R 1.226/kWh	R 1.204/kWh	R 1.183/kWh	R 1.163/kWh	R 1.146/kWh	R 1.137/kWh
Energy tariff	R 1.128/kWh	R 1.139/kWh	R 1.161/kWh	R 1.183/kWh	R 1.205/kWh	R 1.227/kWh	R 1.238/kWh
Discount rate	R 1.353/kWh	R 1.316/kWh	R 1.247/kWh	R 1.183/kWh	R 1.124/kWh	R 1.069/kWh	R 1.043/kWh
Analysis period	R 1.192/kWh	R 1.189/kWh	R 1.185/kWh	R 1.183/kWh	R 1.181/kWh	R 1.181/kWh	R 1.182/kWh
Finance rate	R 1.173/kWh	R 1.175/kWh	R 1.179/kWh	R 1.183/kWh	R 1.187/kWh	R 1.191/kWh	R 1.193/kWh
Carbon credit value	R 1.169/kWh	R 1.172/kWh	R 1.177/kWh	R 1.183/kWh	R 1.188/kWh	R 1.193/kWh	R 1.196/kWh
Construction period	R 1.183/kWh	R 1.183/kWh	R 1.183/kWh	R 1.183/kWh	R 1.201/kWh	R 1.201/kWh	R 1.201/kWh



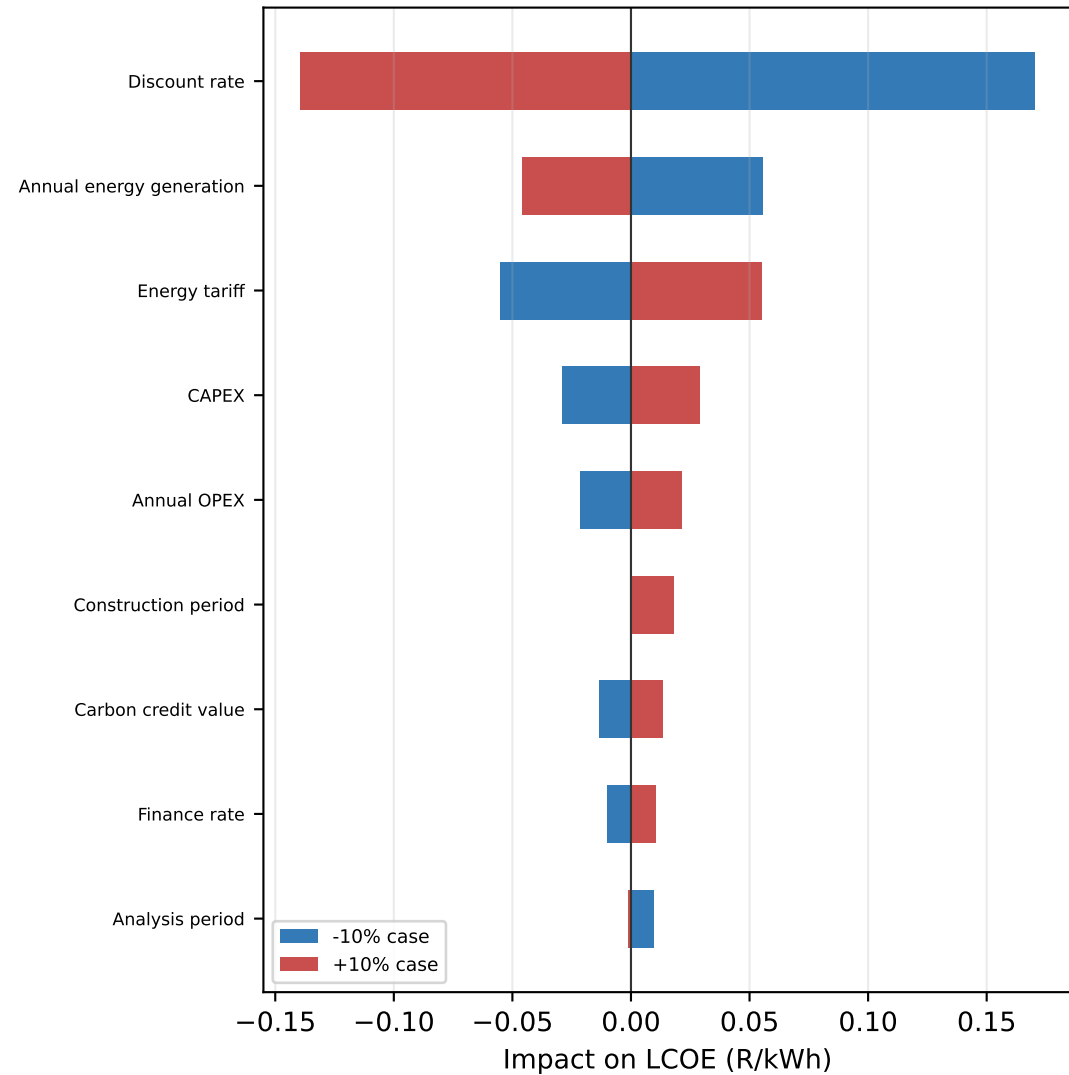
Project Tornado Analysis - NPV

Variable	-10%	Base	+10%
Discount rate	R 16,980,312,702	R 13,827,568,382	R 11,278,554,927
Analysis period	R 11,358,659,765	R 13,827,568,382	R 16,493,463,248
Annual energy generation	R 11,928,593,905	R 13,827,568,382	R 15,726,542,859
Energy tariff	R 12,295,774,024	R 13,827,568,382	R 15,359,362,741
Carbon credit value	R 13,460,388,264	R 13,827,568,382	R 14,194,748,501
Construction period	R 13,827,568,382	R 13,827,568,382	R 13,505,744,548
CAPEX	R 14,125,307,825	R 13,827,568,382	R 13,529,828,940
Annual OPEX	R 14,046,046,578	R 13,827,568,382	R 13,609,090,186
Finance rate	R 13,929,475,653	R 13,827,568,382	R 13,722,282,435



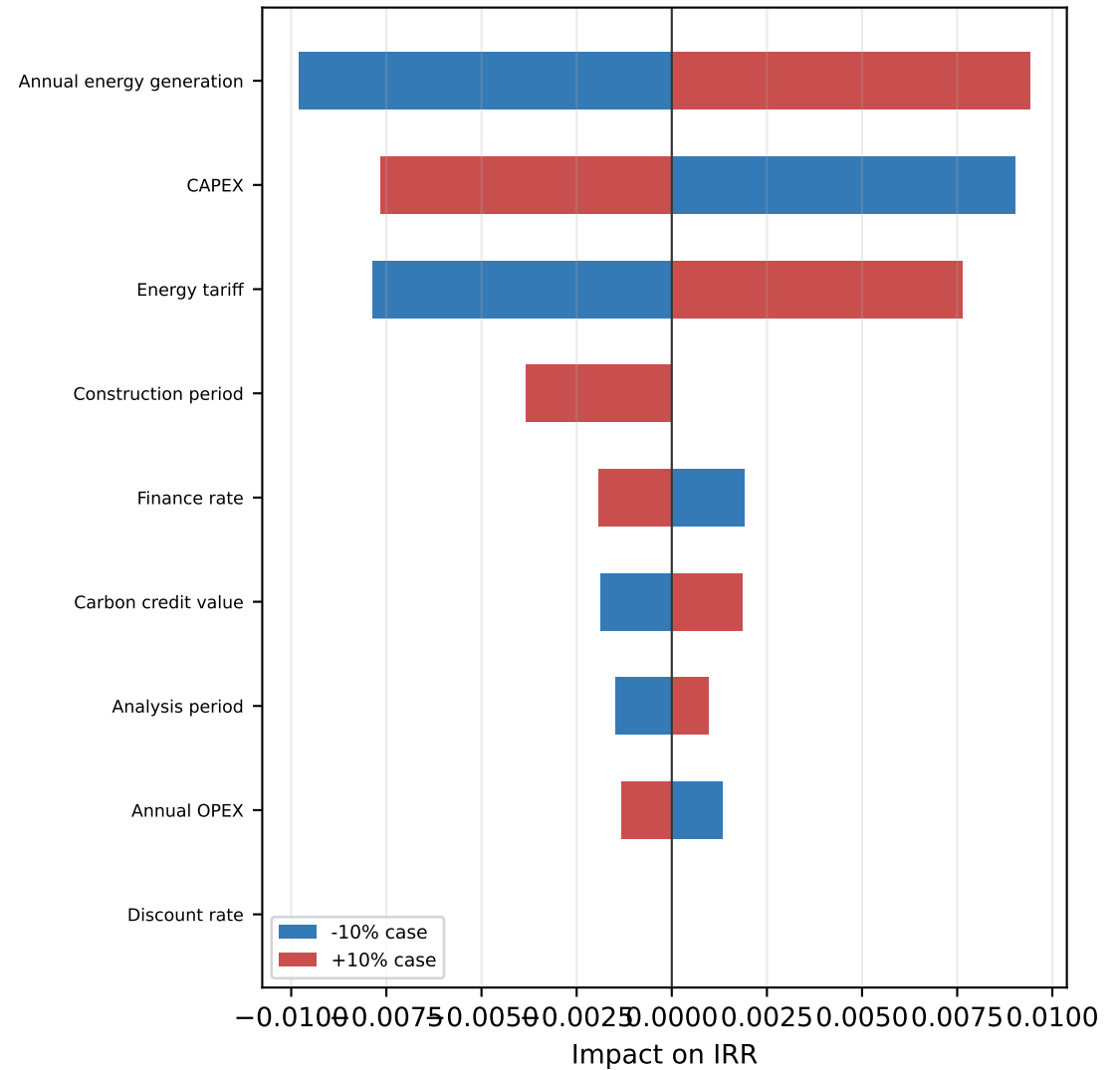
Project Tornado Analysis - LCOE

Variable	-10%	Base	+10%
Discount rate	R 1.353/kWh	R 1.183/kWh	R 1.043/kWh
Annual energy generation	R 1.238/kWh	R 1.183/kWh	R 1.137/kWh
Energy tariff	R 1.128/kWh	R 1.183/kWh	R 1.238/kWh
CAPEX	R 1.154/kWh	R 1.183/kWh	R 1.212/kWh
Annual OPEX	R 1.161/kWh	R 1.183/kWh	R 1.204/kWh
Construction period	R 1.183/kWh	R 1.183/kWh	R 1.201/kWh
Carbon credit value	R 1.169/kWh	R 1.183/kWh	R 1.196/kWh
Finance rate	R 1.173/kWh	R 1.183/kWh	R 1.193/kWh
Analysis period	R 1.192/kWh	R 1.183/kWh	R 1.182/kWh



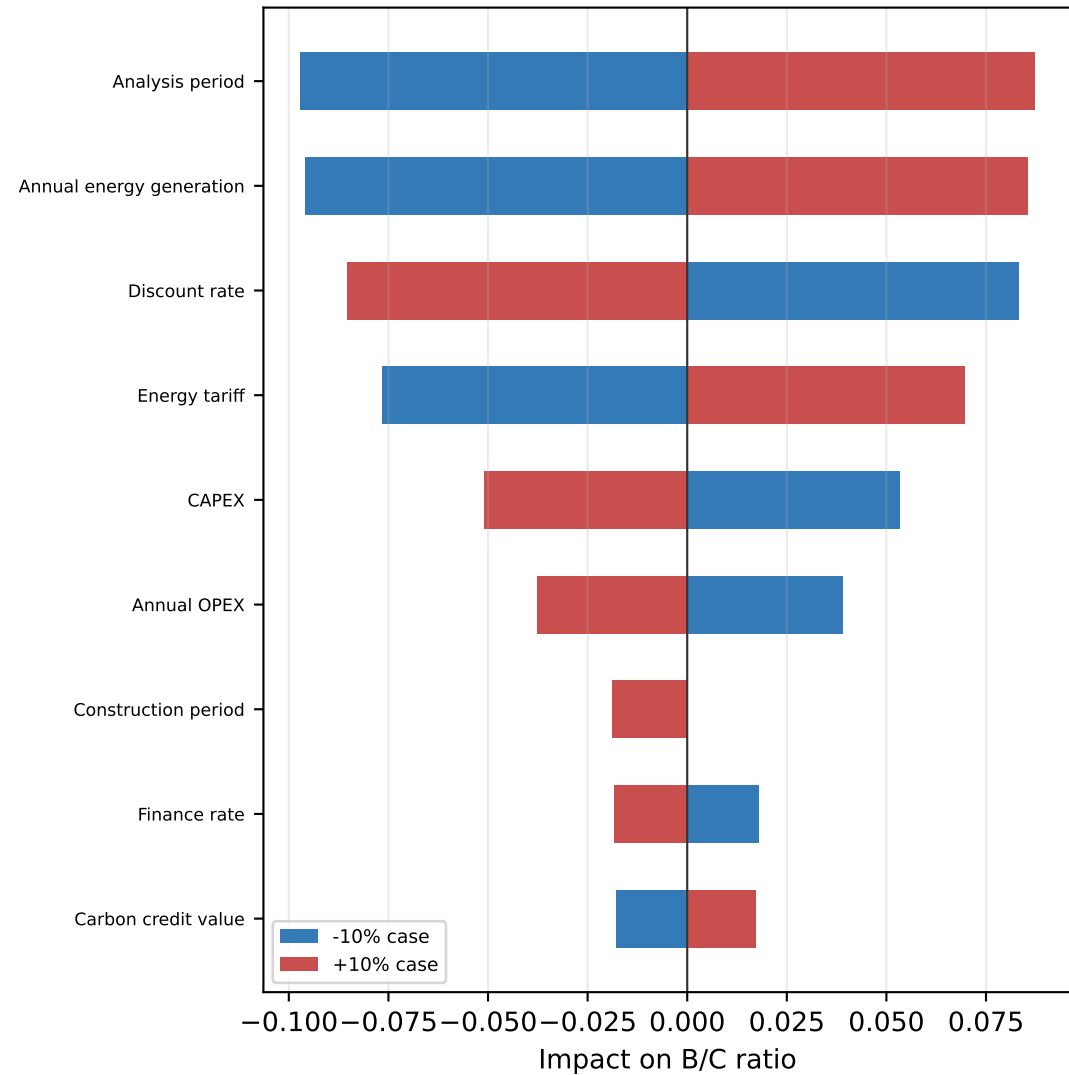
Project Tornado Analysis - IRR

Variable	-10%	Base	+10%
Annual energy generation	14.57%	15.55%	16.49%
CAPEX	16.45%	15.55%	14.78%
Energy tariff	14.76%	15.55%	16.31%
Construction period	15.55%	15.55%	15.16%
Finance rate	15.74%	15.55%	15.35%
Carbon credit value	15.36%	15.55%	15.73%
Analysis period	15.40%	15.55%	15.64%
Annual OPEX	15.68%	15.55%	15.41%
Discount rate	15.55%	15.55%	15.55%



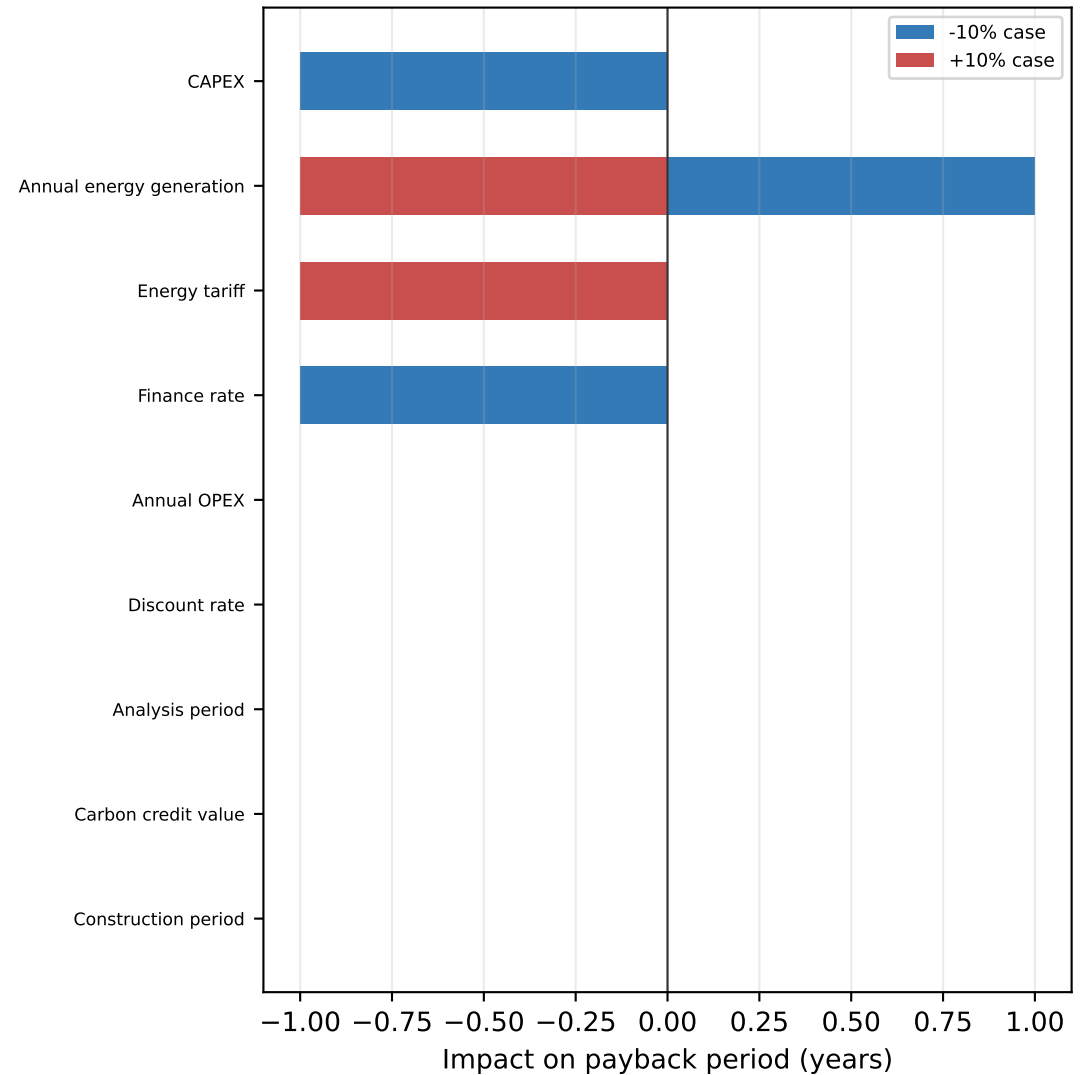
Project Tornado Analysis - B/C Ratio

Variable	-10%	Base	+10%
Analysis period	2.038	2.135	2.222
Annual energy generation	2.039	2.135	2.220
Discount rate	2.218	2.135	2.049
Energy tariff	2.058	2.135	2.204
CAPEX	2.188	2.135	2.084
Annual OPEX	2.174	2.135	2.097
Construction period	2.135	2.135	2.116
Finance rate	2.153	2.135	2.116
Carbon credit value	2.117	2.135	2.152



Project Tornado Analysis - Payback Period

Variable	-10%	Base	+10%
CAPEX	8.00 years	9.00 years	9.00 years
Annual energy generation	10.00 years	9.00 years	8.00 years
Energy tariff	9.00 years	9.00 years	8.00 years
Finance rate	8.00 years	9.00 years	9.00 years
Annual OPEX	9.00 years	9.00 years	9.00 years
Discount rate	9.00 years	9.00 years	9.00 years
Analysis period	9.00 years	9.00 years	9.00 years
Carbon credit value	9.00 years	9.00 years	9.00 years
Construction period	9.00 years	9.00 years	9.00 years



Equity Sensitivity Analysis



Annual base-case sensitivity

Selected sensitivity values

Low / medium / high changes: $\pm 4\%$, $\pm 8\%$, $\pm 10\%$

Selected variables

CAPEX • Annual OPEX • Annual energy generation • Energy tariff • Discount rate • Analysis period • Finance rate • Carbon credit value • Construction period

Base-case inputs

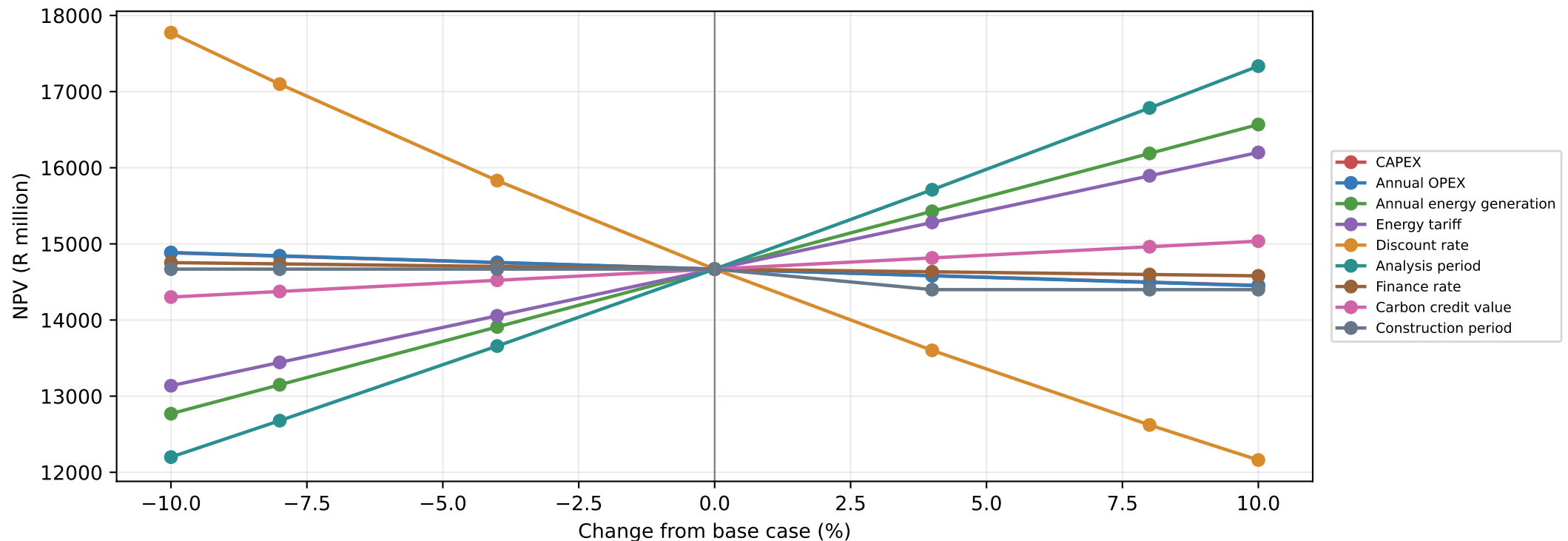
Item	Value
Total CAPEX	R 2,449,061,000
Annual OPEX	R 65,062,000/year
Annual energy generation	223.990 GWh/year
Energy tariff	R 1.360/kWh
Discount rate	6.00%
Finance rate	8.00%
Analysis period	50 years

Base-case economic results

Item	Value
Net Present Value	R 14,668,675,332
Internal Rate of Return	25.39%
Benefit / Cost Ratio	2.293
Simple Payback Period	5.00 years
Levelised Cost of Energy	R 1.101/kWh

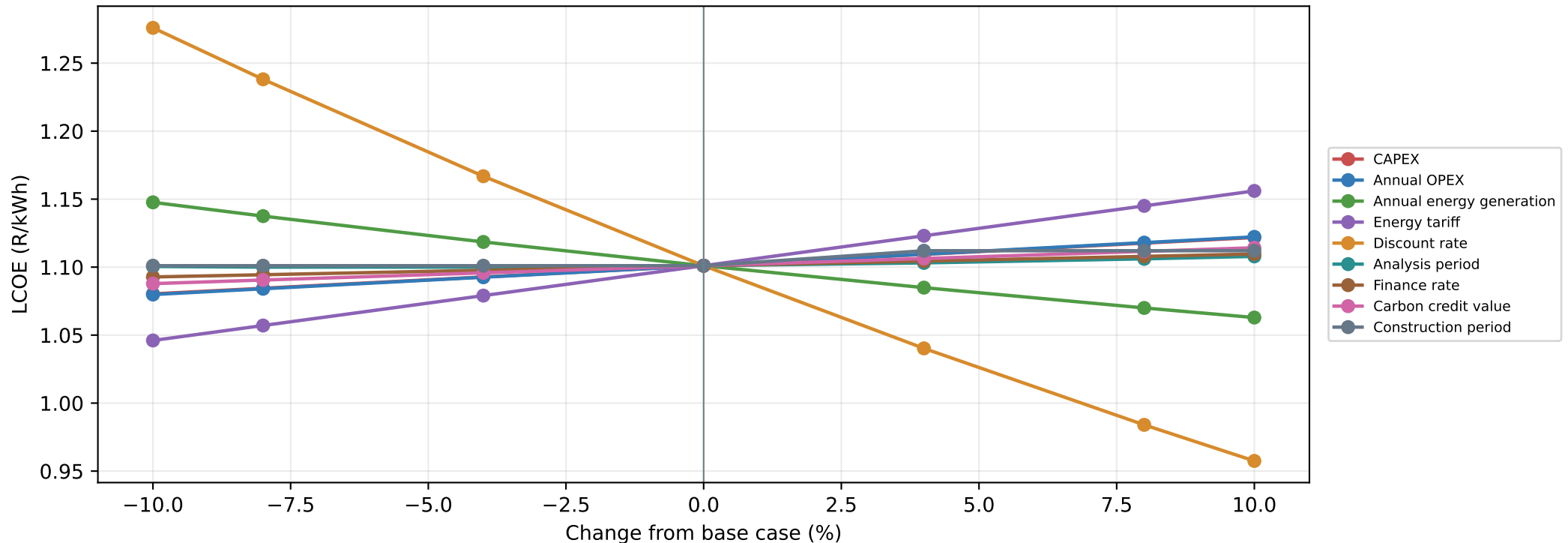
Equity Sensitivity Analysis - NPV

Variable	-10%	-8%	-4%	Base	+4%	+8%	+10%
CAPEX	R 14,882,304,079	R 14,839,578,330	R 14,754,126,831	R 14,668,675,332	R 14,583,223,832	R 14,497,772,333	R 14,455,046,584
Annual OPEX	R 14,887,153,528	R 14,843,457,888	R 14,756,066,610	R 14,668,675,332	R 14,581,284,053	R 14,493,892,775	R 14,450,197,136
Annual energy generation	R 12,769,700,855	R 13,149,495,750	R 13,909,085,541	R 14,668,675,332	R 15,428,265,122	R 16,187,854,913	R 16,567,649,809
Energy tariff	R 13,136,880,973	R 13,443,239,845	R 14,055,957,588	R 14,668,675,332	R 15,281,393,075	R 15,894,110,819	R 16,200,469,690
Discount rate	R 17,774,094,238	R 17,098,056,915	R 15,830,985,399	R 14,668,675,332	R 13,601,701,837	R 12,621,540,533	R 12,161,574,440
Analysis period	R 12,199,766,715	R 12,678,444,521	R 13,658,243,035	R 14,668,675,332	R 15,710,614,540	R 16,784,958,674	R 17,334,570,197
Finance rate	R 14,753,939,049	R 14,737,149,076	R 14,703,175,376	R 14,668,675,332	R 14,633,647,394	R 14,598,090,081	R 14,580,112,461
Carbon credit value	R 14,301,495,213	R 14,374,931,237	R 14,521,803,284	R 14,668,675,332	R 14,815,547,379	R 14,962,419,426	R 15,035,855,450
Construction period	R 14,668,675,332	R 14,668,675,332	R 14,668,675,332	R 14,668,675,332	R 14,399,260,813	R 14,399,260,813	R 14,399,260,813



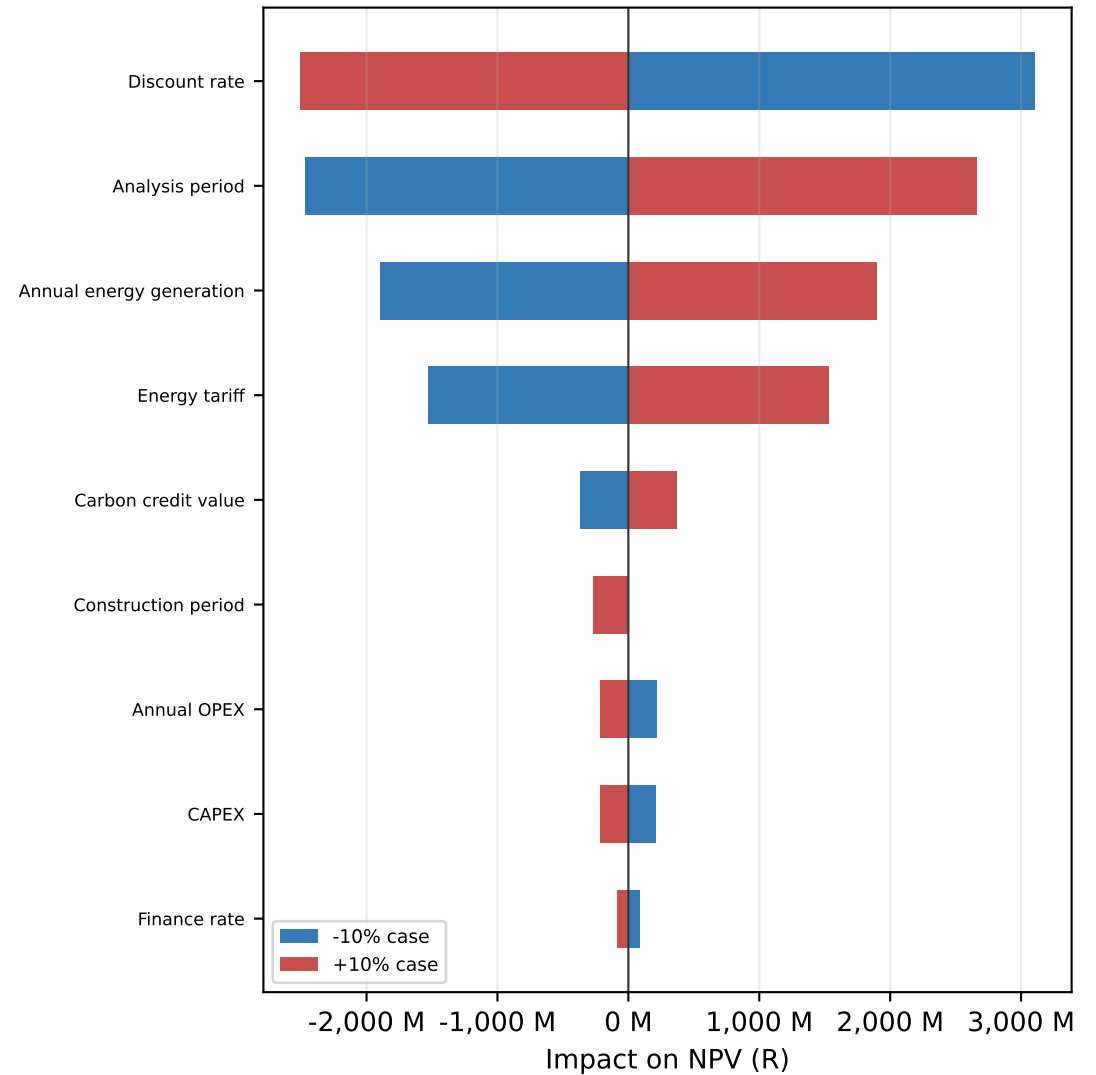
Equity Sensitivity Analysis - LCOE

Variable	-10%	-8%	-4%	Base	+4%	+8%	+10%
CAPEX	R 1.080/kWh	R 1.084/kWh	R 1.093/kWh	R 1.101/kWh	R 1.109/kWh	R 1.118/kWh	R 1.122/kWh
Annual OPEX	R 1.080/kWh	R 1.084/kWh	R 1.093/kWh	R 1.101/kWh	R 1.110/kWh	R 1.118/kWh	R 1.122/kWh
Annual energy generation	R 1.148/kWh	R 1.138/kWh	R 1.119/kWh	R 1.101/kWh	R 1.085/kWh	R 1.070/kWh	R 1.063/kWh
Energy tariff	R 1.046/kWh	R 1.057/kWh	R 1.079/kWh	R 1.101/kWh	R 1.123/kWh	R 1.145/kWh	R 1.156/kWh
Discount rate	R 1.276/kWh	R 1.238/kWh	R 1.167/kWh	R 1.101/kWh	R 1.040/kWh	R 0.984/kWh	R 0.957/kWh
Analysis period	R 1.100/kWh	R 1.100/kWh	R 1.100/kWh	R 1.101/kWh	R 1.103/kWh	R 1.106/kWh	R 1.108/kWh
Finance rate	R 1.093/kWh	R 1.094/kWh	R 1.098/kWh	R 1.101/kWh	R 1.104/kWh	R 1.108/kWh	R 1.110/kWh
Carbon credit value	R 1.088/kWh	R 1.091/kWh	R 1.096/kWh	R 1.101/kWh	R 1.106/kWh	R 1.112/kWh	R 1.114/kWh
Construction period	R 1.101/kWh	R 1.101/kWh	R 1.101/kWh	R 1.101/kWh	R 1.112/kWh	R 1.112/kWh	R 1.112/kWh



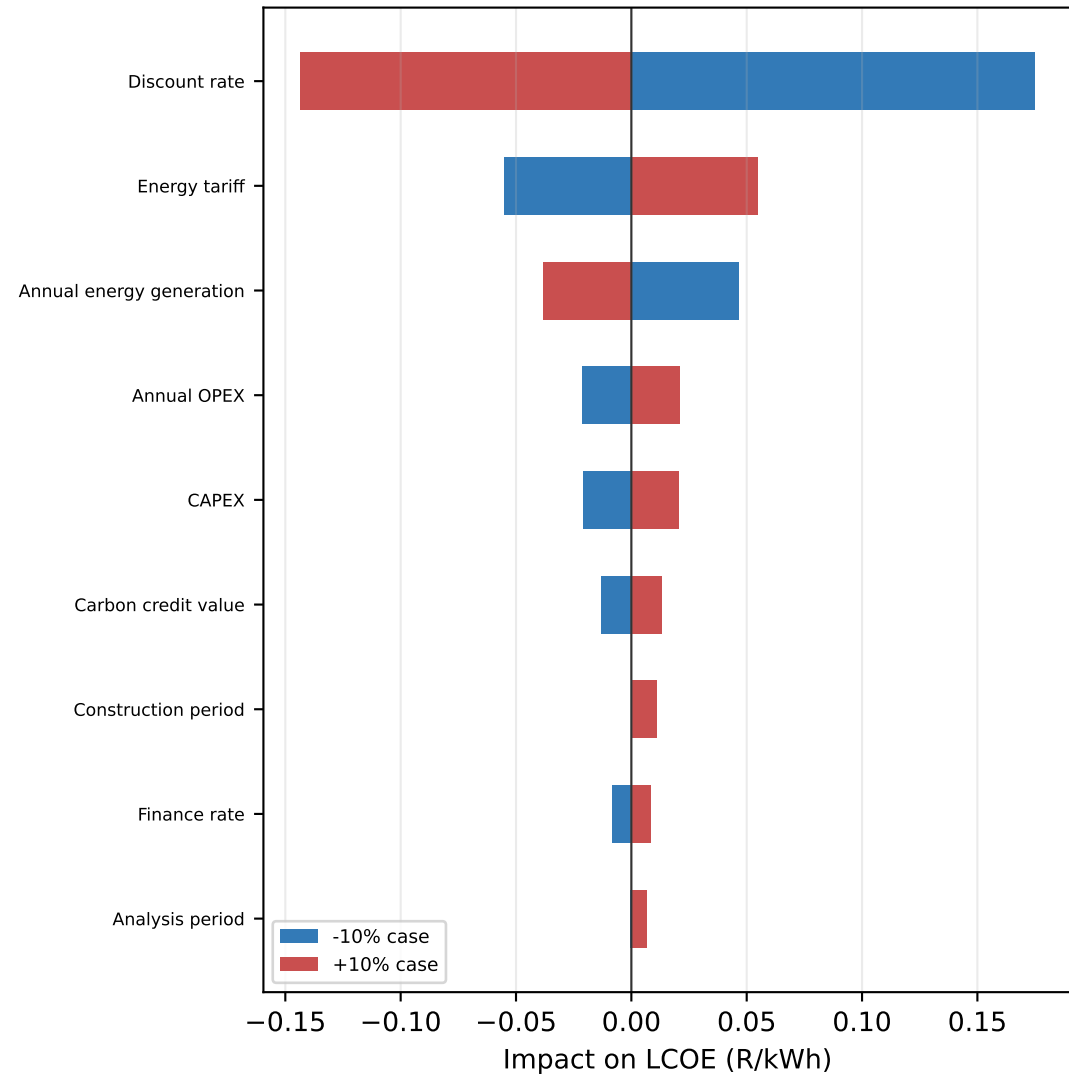
Equity Tornado Analysis - NPV

Variable	-10%	Base	+10%
Discount rate	R 17,774,094,238	R 14,668,675,332	R 12,161,574,440
Analysis period	R 12,199,766,715	R 14,668,675,332	R 17,334,570,197
Annual energy generation	R 12,769,700,855	R 14,668,675,332	R 16,567,649,809
Energy tariff	R 13,136,880,973	R 14,668,675,332	R 16,200,469,690
Carbon credit value	R 14,301,495,213	R 14,668,675,332	R 15,035,855,450
Construction period	R 14,668,675,332	R 14,668,675,332	R 14,399,260,813
Annual OPEX	R 14,887,153,528	R 14,668,675,332	R 14,450,197,136
CAPEX	R 14,882,304,079	R 14,668,675,332	R 14,455,046,584
Finance rate	R 14,753,939,049	R 14,668,675,332	R 14,580,112,461



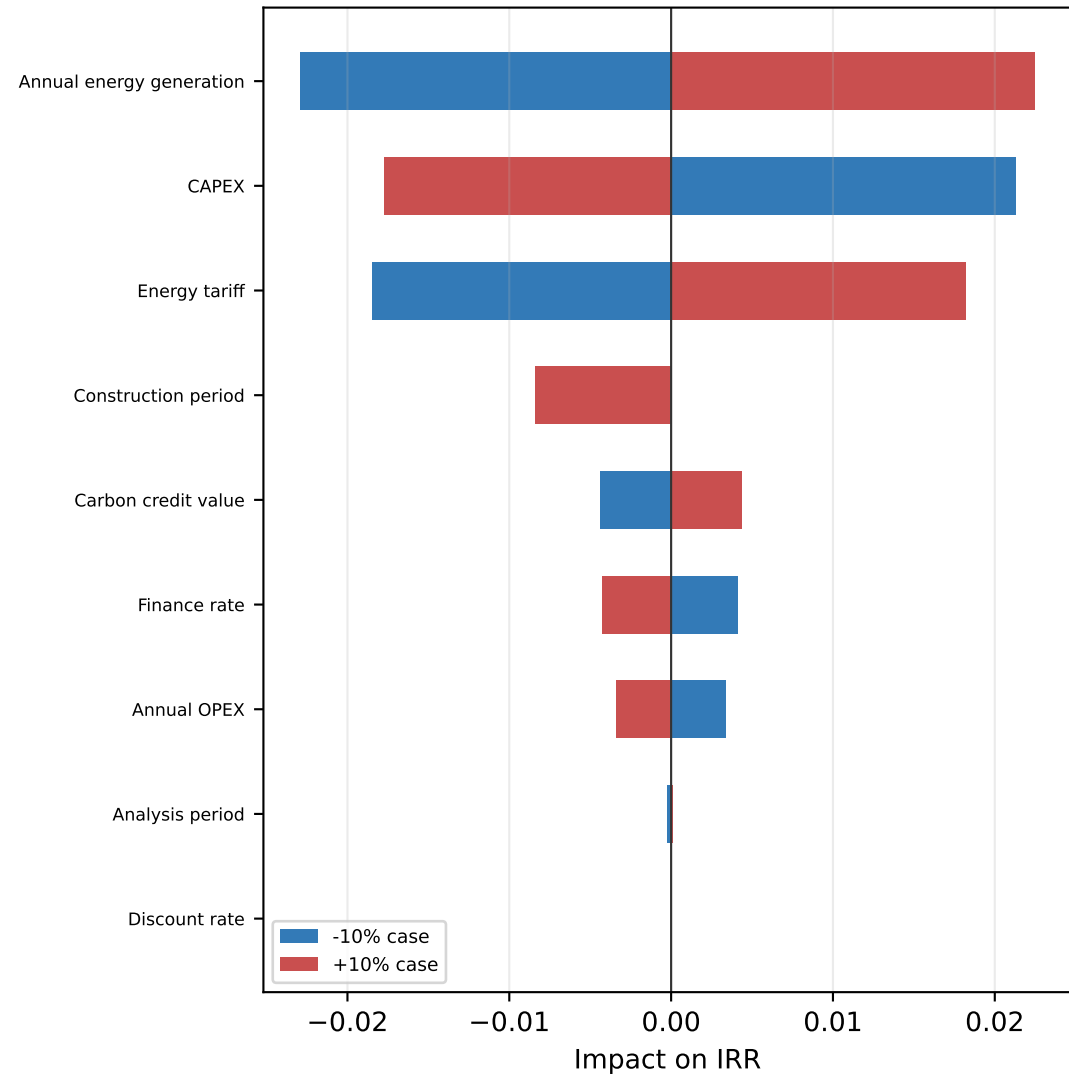
Equity Tornado Analysis - LCOE

Variable	-10%	Base	+10%
Discount rate	R 1.276/kWh	R 1.101/kWh	R 0.957/kWh
Energy tariff	R 1.046/kWh	R 1.101/kWh	R 1.156/kWh
Annual energy generation	R 1.148/kWh	R 1.101/kWh	R 1.063/kWh
Annual OPEX	R 1.080/kWh	R 1.101/kWh	R 1.122/kWh
CAPEX	R 1.080/kWh	R 1.101/kWh	R 1.122/kWh
Carbon credit value	R 1.088/kWh	R 1.101/kWh	R 1.114/kWh
Construction period	R 1.101/kWh	R 1.101/kWh	R 1.112/kWh
Finance rate	R 1.093/kWh	R 1.101/kWh	R 1.110/kWh
Analysis period	R 1.100/kWh	R 1.101/kWh	R 1.108/kWh



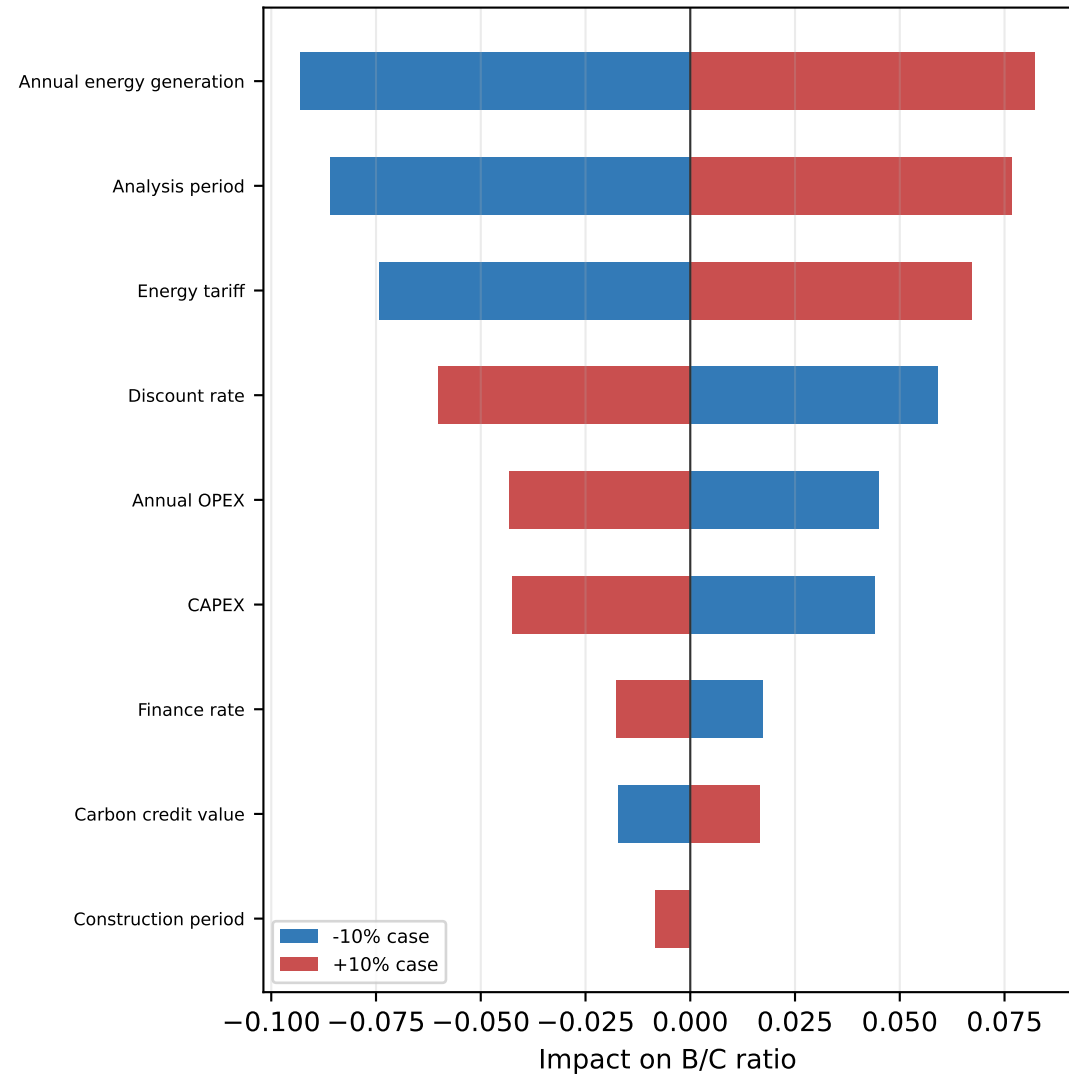
Equity Tornado Analysis - IRR

Variable	-10%	Base	+10%
Annual energy generation	23.09%	25.39%	27.63%
CAPEX	27.51%	25.39%	23.61%
Energy tariff	23.54%	25.39%	27.20%
Construction period	25.39%	25.39%	24.55%
Carbon credit value	24.95%	25.39%	25.82%
Finance rate	25.80%	25.39%	24.96%
Annual OPEX	25.72%	25.39%	25.05%
Analysis period	25.36%	25.39%	25.39%
Discount rate	25.39%	25.39%	25.39%



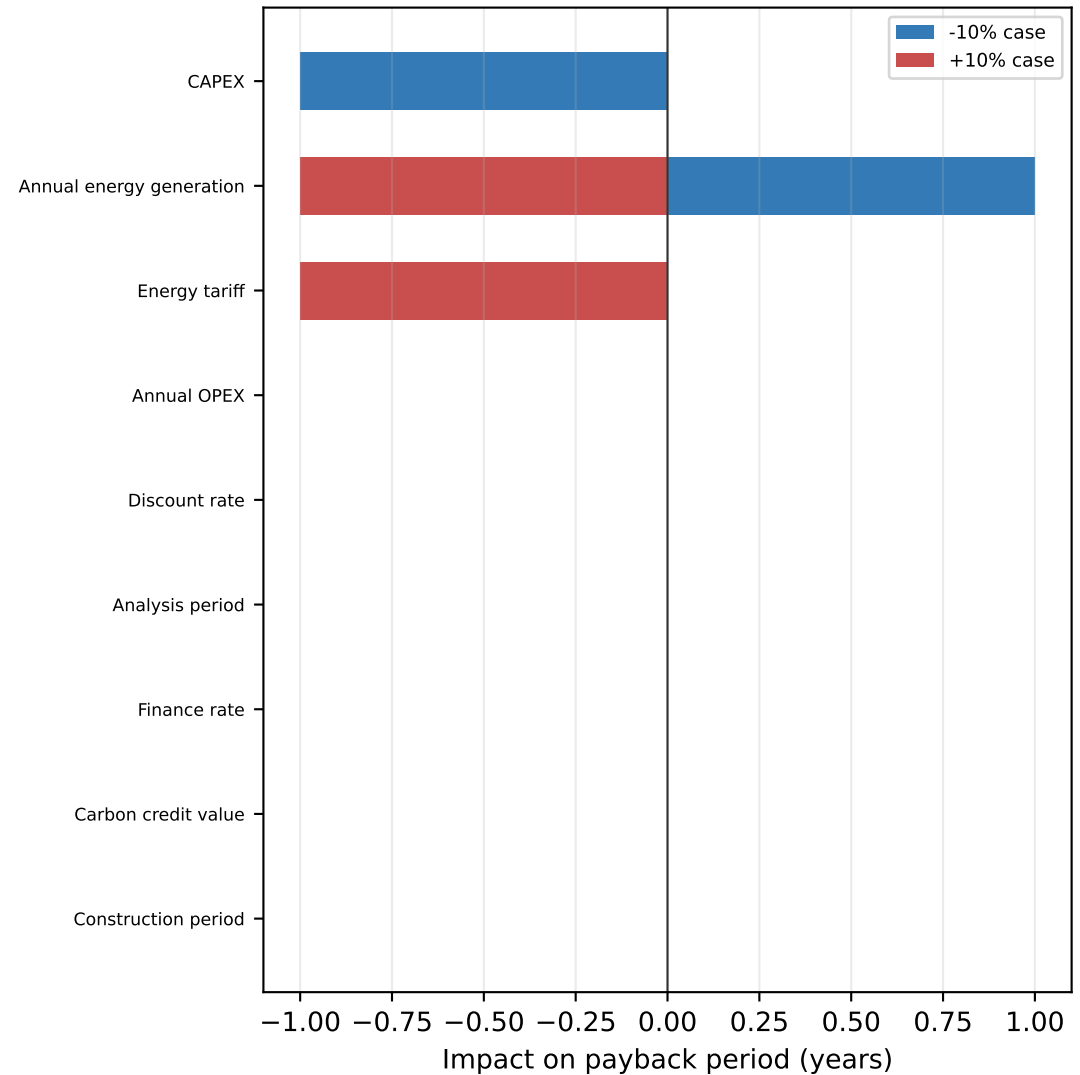
Equity Tornado Analysis - B/C Ratio

Variable	-10%	Base	+10%
Annual energy generation	2.200	2.293	2.375
Analysis period	2.207	2.293	2.370
Energy tariff	2.219	2.293	2.360
Discount rate	2.352	2.293	2.233
Annual OPEX	2.338	2.293	2.250
CAPEX	2.337	2.293	2.251
Finance rate	2.310	2.293	2.275
Carbon credit value	2.276	2.293	2.310
Construction period	2.293	2.293	2.285



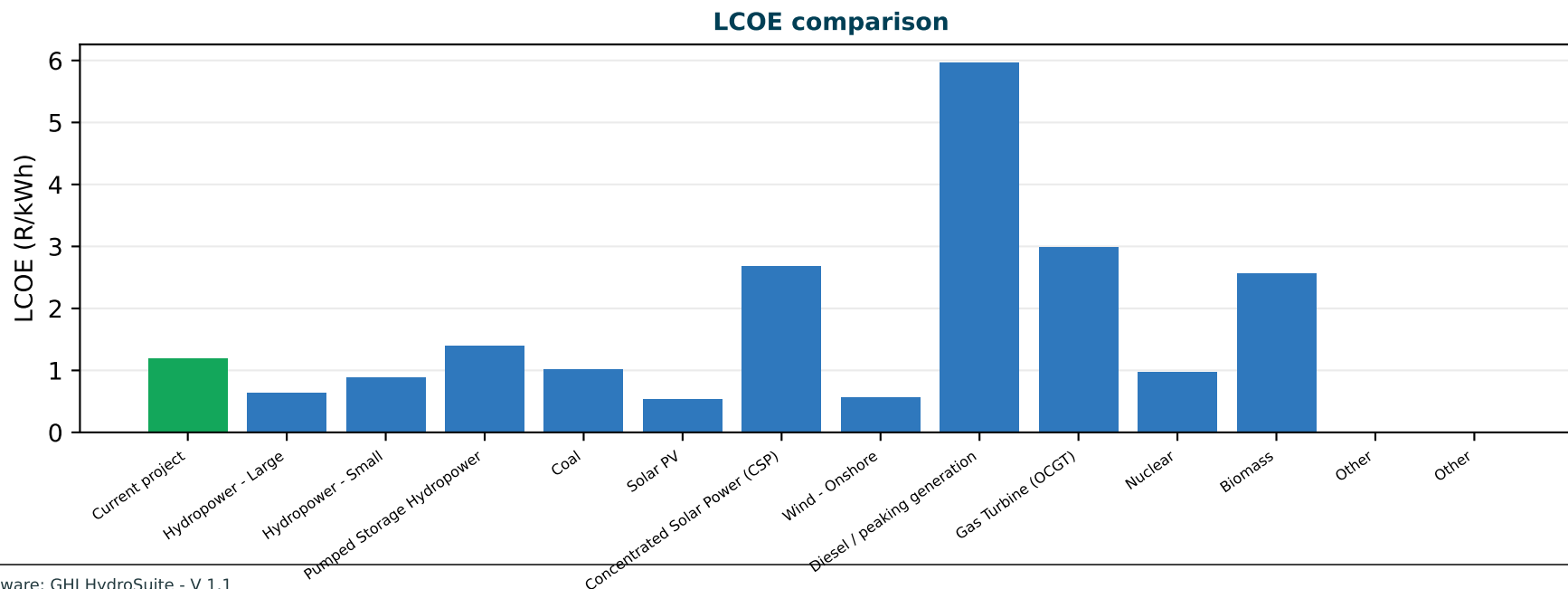
Equity Tornado Analysis - Payback Period

Variable	-10%	Base	+10%
CAPEX	4.00 years	5.00 years	5.00 years
Annual energy generation	6.00 years	5.00 years	4.00 years
Energy tariff	5.00 years	5.00 years	4.00 years
Annual OPEX	5.00 years	5.00 years	5.00 years
Discount rate	5.00 years	5.00 years	5.00 years
Analysis period	5.00 years	5.00 years	5.00 years
Finance rate	5.00 years	5.00 years	5.00 years
Carbon credit value	5.00 years	5.00 years	5.00 years
Construction period	5.00 years	5.00 years	5.00 years

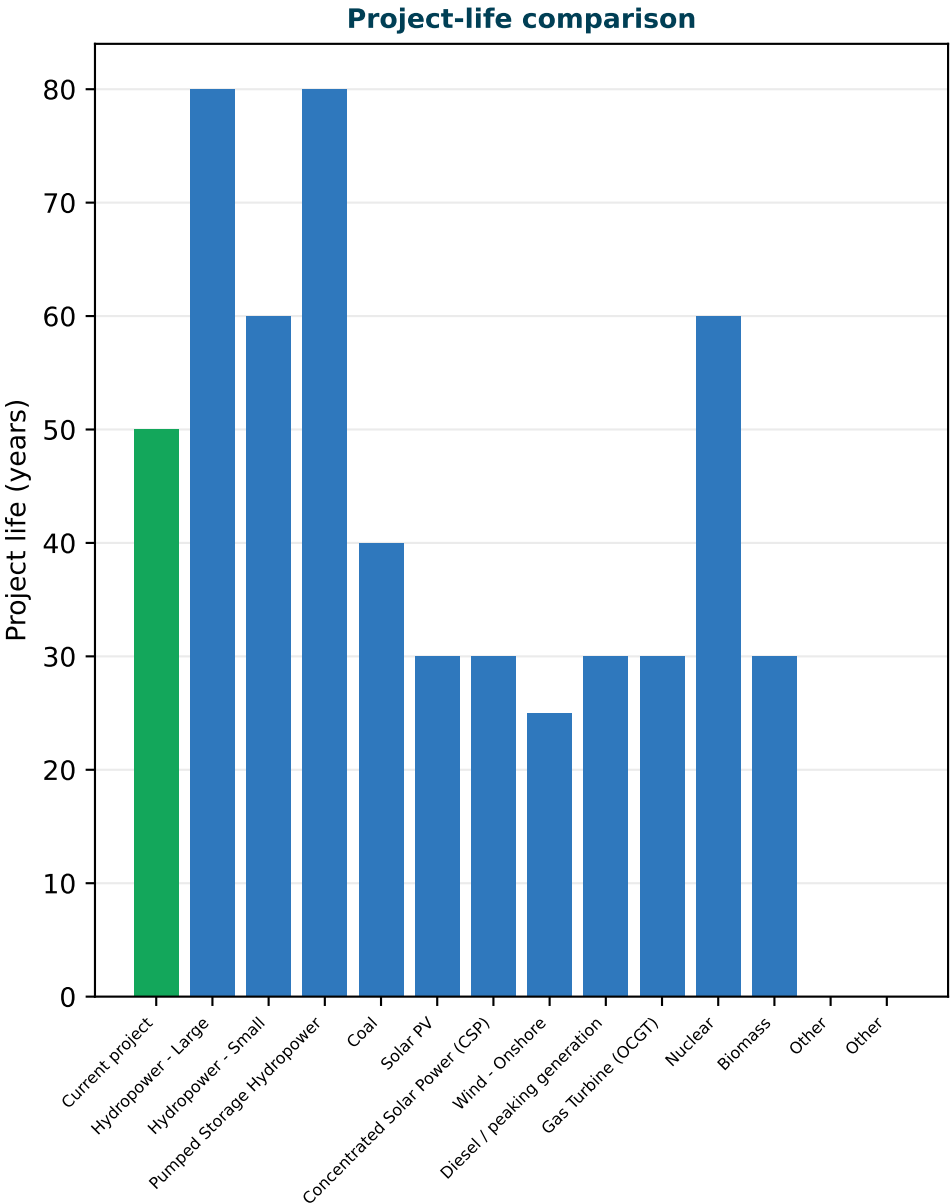
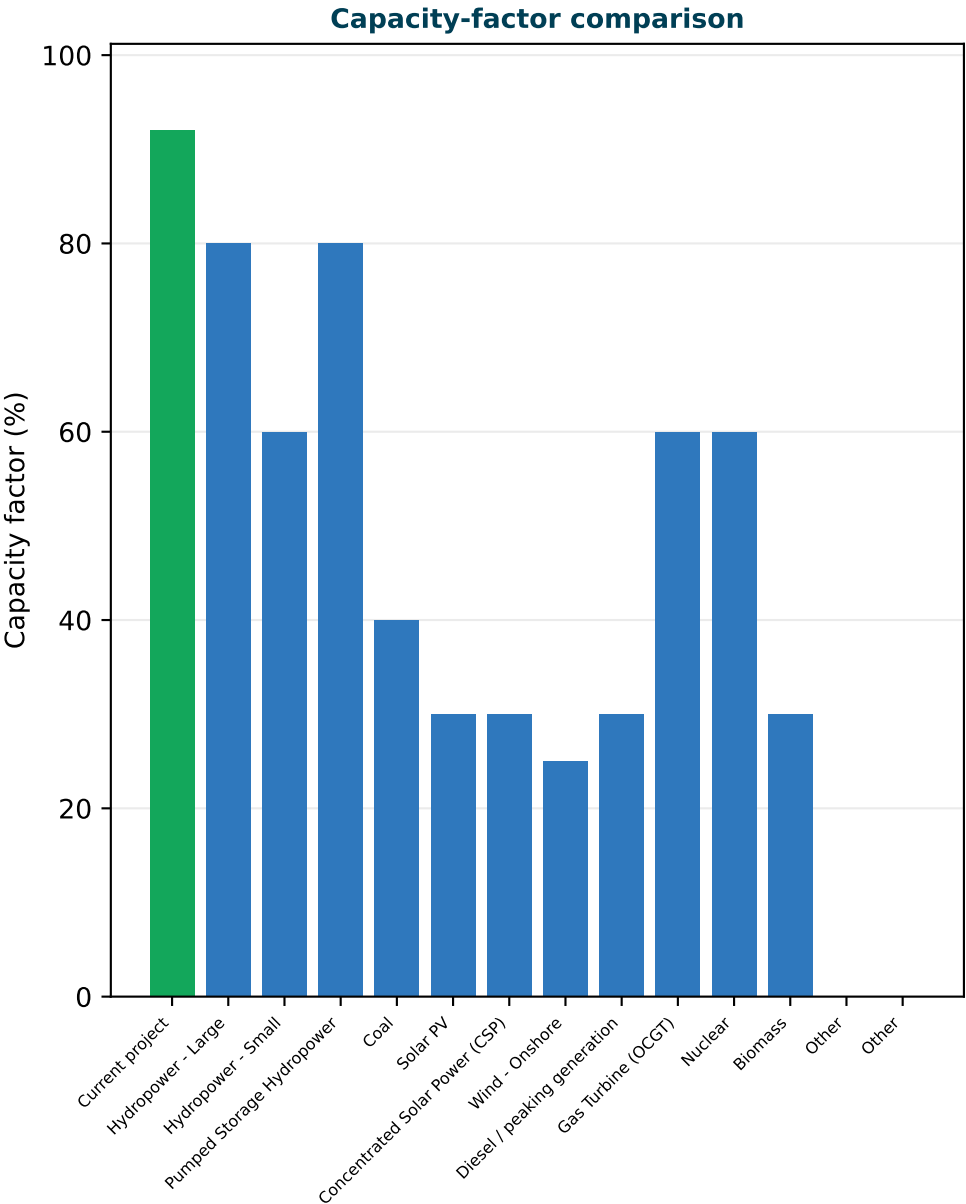


Cost Comparison

Generation option	LCOE	Capacity factor	Project life	Source / comment
Current project	R 1.183/kWh	92%	50	Calculated by HydroSuite
Hydropower - Large	R 0.64/kWh	80%	80	Benchmark reference
Hydropower - Small	R 0.89/kWh	60%	60	Benchmark reference
Pumped Storage Hydropower	R 1.39/kWh	80%	80	Peak-demand application
Coal	R 1.01/kWh	40%	40	Benchmark reference
Solar PV	R 0.54/kWh	30%	30	Benchmark reference
Concentrated Solar Power (CSP)	R 2.68/kWh	30%	30	With storage
Wind - Onshore	R 0.56/kWh	25%	25	Benchmark reference
Diesel / peaking generation	R 5.96/kWh	30%	30	Emergency / peak periods
Gas Turbine (OCGT)	R 2.99/kWh	60%	30	Peaking plant
Nuclear	R 0.97/kWh	60%	60	Benchmark reference
Biomass	R 2.56/kWh	30%	30	Dispatchable renewable
Other	R 0.00/kWh	0%		
Other	R 0.00/kWh	0%		



Cost Comparison Graphs



Conclusions



The economic assessment estimates total CAPEX of R 2,449,061,000, annual energy generation of 223.990 GWh/year, an LCOE of R 1.183/kWh, NPV of R 13,659,772,000, and IRR of 15.31%. These results are intended for comparative and prefeasibility assessment and should be refined as design quantities, supplier quotations, financing terms and operating assumptions become more certain.