

Sample Financial Feasibility 200 kWp Grid-Tied Solar Upgradable For Battery System

DATA ANALYSIS

- Helioscope /PV Size Analysis
- Data Logging
- Consumption vs PV Production
- Feedback
- Payback
- Finance Comparisons
- Gen Set Integration
- Diesel Savings
- Battery Upgrade Options
- Tax Benefit (Optional)
- Wheeling (Future)

PREPARED BY:-

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INTRODUCTION & OVERVIEW

PV Consult are pleased to deliver our Recommendations & Financial Feasibility report for **XXXXXXXXXXXXXX**

Enclosed provides suitable information to make an informed decision on the options to install a +/- 200 kWp Base GRID TIED solar system, upgradable for load shedding.

- The Solar will be linked to the GEN SET to provide +/- 15% Diesel savings.
- This can be upgraded for BATTERY & LOAD SHEDDING to achieve +/- 100% Diesel Savings for min 2 hours*

DESIGNED FOR

- Replace +/- 40% of day time kWh otherwise purchased from COCT at R2.64.
- Allows phase 2 of seamless battery storage to be added.
- Any excess to be fed back to the COCT

ROOF CHALLENGES/DRONE

Without a single suitable North facing roof we are proposing a mix of roof options..

- It may be prudent to integrate, or replace the existing panels into the new system
- The current design requires the use of the nearest residential units, this adds some additional cost.
- After a detail drone, the allocation of panels may vary.

KEY OUTPUTS (PHASE1) NPO

Est CAPEX Grid tied Solar	SOLAR SAVINGS	Est DIESEL SAVINGS	TOTAL SAVINGS	ROI TOTAL
R 2,612,000	R 850,000	R 200,000	R1,040,000	1.8 Years 40%

POTENTIAL 125% TAX CREDIT R 1,730.781 (NET)

CAPEX GROSS	125% TAX CREDIT	27% TAX	NET COST	ROI
R 2,612,000	R 3,265,625	R 881,718	R 1,730,781	1.5 Years 60%

Phase 2

- Options to add BESS / Battery as separate component.

Executive Overview

SAMPLE PPA PHASE 1 SAVINGS / INCOME

339212 kWh	TARIFF	PV SAVINGS OR INCOME	DIESEL SAVINGS 2 Hours	TOTAL
COCT	R 2.65	R 855,585	R 191,160	R 1,046,745
PPA Option	R 1.26	R 435,567*	R 191,160	R 626,727

NEW INCOME OPPORTUNITY

* The R 435,567 can be taken as Income

PHASE 2 BATTERY SAVINGS

- Options to add BESS / Battery as separate component.

LOAD SHEDDING	BATTERY COST*	NET DIESEL SAVINGS (Inc Battery Charge)
2 Hours	R 2M- R 5M	R 892,240
3 Hours	R 3M-R6M	R 1,341,360
4 Hours	R 4M- R8M	R 1,788,480

- Variances in battery cost will depend on what items are selected for the back-up environment.



Phase 2 BESS (Battery Energy Storage System)

Battery/Hybrid Systems (BESS)

- The system is being designed to accommodate battery storage, options will be discussed as to the level and extent .
- A key benefit of the hybrid battery / solar allows for the PV Solar to operate and provide extended loadshedding capability during day light hours.
- For a Minimum 2 Hours to avoid the use of running DIESEL GEN SETS

Cost v Benefit (Diesel Savings)

The general accepted way to value the batteries in the replacement of running Gen Sets

A BESS system is designed mainly for loadshedding, albeit if no loadshedding can secure certain ROI when used for arbitrage/cycling, i.e.. charging under solar and discharging at peak times.

Diesel Savings*	2 Hours	3 Hours	4 Hours
Current Diesel Cost	R 1.2M	R 1.9M	R 2.5M

Typically, under stage 2 load shedding then a 2.5 Hour battery time should be considered sufficient.

CRITICAL LOADS & CHALLENGES

- The Inverter size and battery is a function of **Amount Of Output** (Peak) that is needed to operate the consumption profile of each item, or all items combined at any one point in time. The second consideration being the **Duration** required and the amount of time (measured in kWh) kilowatt hours that you need the items to operate. The key to any efficient design is to eliminate the non-critical loads from the battery and only back-up the emergency circuits.
- In an environment such as PINEWOOD that was never designed for load shedding, a cost is involved to achieve the dedicated emergency circuits. Other designs could include distributed / add-hoc UPS's strategically located at each residential unit
- The final design and cost between re-wiring and/ or using wi-fi breakers has yet to be determined.

BATTERY COST

Typically the savings generated from solar are used to offset the cost of the battery systems, which can amount to 2-3 times the solar cost according to size requirements.

PPA ALLOCATION

Many clients choose the PPA finance option and as an alternative to savings invest in the battery, hence achieving a net status whilst adding loadshedding.

Finance Options

Finance Considerations

The key challenge for many Retirement homes is to secure the finance to install.

The recommendations here are to view the savings achieved on the PV solar to subsidise the investment in load shedding & battery components.

This can be achieved via:-

- Bank / Lease Finance 5-10 years
- PPA Finance 10-20 years
- Combination Of Above

BANK / LEASE OR PPA

- The options exist to finance via a PPA (if available), is NIL deposit and the repayments are linked to kWh generated. As an example for basic (ex battery) at +/- R1.25 kWh V COCT R2.63 kWh.
- As an example by adding CAPEX to secure battery the tariff moves from R1.25 to R 2.25, with a fixed 7% escalation V COCT 12%
- Bank / Lease Finance is an option with specialist solar companies. Typically R 1m equates to +/- 20,000 per month over 10 years and pro-rata. If shorter period more expensive.
- Clients can also choose between the PPA on the PV solar and Finance on the battery
- As an alternative to savings

FINANCE INPUT / SECURITY

PV Consult would need to secure finance based on the clients security and / or ability to pay.

Key Requirements

- Last 2-3 years financials /Latest management /Last 6 months COCT electricity payments

SARS TAX CREDIT

We have made the assumption that you are an NPO and cannot benefit.

- If the system was purchased by a taxable entity, then the benefit of 125% of the value is available as a tax credit. This is currently valid until Feb 2025.
- The impact improves your ROI and Payback.
- This can also be applied to external investors.

FUTURE WHEELING

- Wheeling provides the ability to purchase electricity from an IPP (Independent Power Producer) becomes available then such can be negotiated.

Typically to cover :-

- Up to 24 Hour via Solar & Wind
- 10% - 25% discount from COCT
- 5-20 Year Contracts
- Expected 2024/5

NEXT STAGE

Once a clear decision is made on the enclosed options, specifically securing finance and whether to escalate for BESS (Battery), the project can proceed further.

PV Consult will re-engage to complete the tender with the various suppliers and escalate for revised opportunities on both:-

- Final Data Logging
- Analysis of Loadshedding Critical Load Identification
- EPC Equipment & Final BOM / Build Costs
- Finance Option Selection (If Applicable)

CONCLUSION / CAVEAT

The enclosed is designed as a guide

We thank you for the opportunity and look forward to further assisting on your green journey transition.

I thank you in advance

Prepared By
Eric Putsman
Dated 12 / 03/ 2024



Note Size / Assumptions

- Errors & Omissions Excluded, this report is based on provisional tender results and excludes most recent Rand/USD variations/Interest rate adjustments, hence allow a +/- 5% variation.
- Estimated Build at R13,00 per Watt, Subject to tender.
- Savings Exclude any Carbon Tax offset or Wheeling
- Our Data Modelling is based on estimating clients energy consumption patterns, based on available 11-months COCT Bills , compared to our standard Old Age Home Consumption Profile Patterns (and thus can exclude recent load-shedding or increased consumption). A further update can be secured prior to the contract.
- Includes 8,1 % SSEG Feed-In at COCT R1,12 per kWh
- Finance proposals are based on Grid Tied Inverter & PV only
- **Panel Warranty 25 years**
- **Inverter Warranty 10 years**

CONTENTS

Client Data
System Savings
Budget Cost
Helioscope Design
Battery Systems
Finance Models

Tender Phase

PV Consult have pleasure in presenting our detailed financial feasibility study.

This includes the data modelling & the key client information being :

- **Recommended System Size**
- **An Industry Budget Cost (Subject To Tender)**
- **Annual Savings /ROI/Payback**
- **Tariff Swop**
- **Finance Options /Cashflow**
- **PPA Examples**

Project Outline

Phase 1 Independent Solar Finance Proposal

Phase 1 of the proposal is presented to the client for financial approval, if accepted (in principle) to move to Phase 2

- Finance Options Can Be Established & Escalated
- Competitive PPA Options etc

Phase 2 Tender Process

The tender process commences once a client has approved in principle to escalate. This includes the following:-

- Extended Site Visits/Initial Roof Survey (not for insurance)
- Tie In Points/Update Helioscope for Build /Line Drawings
- BOM (Bill Of Materials)
- Technical Line Drawings

Suppliers are then to tender based on a set of standards & specifications. Options /alternatives may be presented.

Supplier Selection

PV Consult will assist the client to make an informed choice from a range of potential suppliers that have been pre evaluated.

- Negotiate Contract & Payment Terms
- Negotiate Service Level & Warranty Terms

Note Costs

Once the client initiates the tender, whilst this is done on good faith at no cost that the client will secure solar within the foreseeable future (i.e., 6 months). In event of client unilateral cancel /delay the costs relating to the tender process are chargeable

PV Consult only offer this as guide as accurate to “best endeavours” based on available or assumed data. Specifics per site may vary according to multiple factors, including but not limited to aspects such as Helioscope inputs, manufacture variances, system losses, shading, or weather conditions, inputs relating to changing municipal / NERSA regulations, grid capacity, load shedding

Clients are advised to check with their chosen EPC for definitive warranties and assurances as part of their SLA.

GRID TIED (excl. Battery)



Pv System Size

209 kWp

Expected Peak

192 kWp

kWh Solar Production (Annual)

339200 kWh

Number Panels

380

Inverter Brand Grid-Tied

Goodwe/Sungrow/Huawei

Inverter Brand Hybrid

Atess/Sunsynk/Fox

Roof Type

Tiled

Client Specific

Operational Days	Mon-Sun
Operational Hours	-/+60% Day ; +/-40% Night
Address	5 University Drive, Pinelands
Peak Demand Time	N/A
Tariff Structure	COCT Small Power User
Average Rate	R2.64
SSEG/Rebate Rate	R1.12
Estimated Feedback %	8.1%

Consumption Activity

Peak Demand Savings	N/A
COCT Tariff Inflation	10% (Estimated)
SLA Inflation	5%
Data Obtained	12 Month Bills
Tariff Swap	N/A
Data Analysed	No

Electrical & Roof Information

Main Db	TBC
Roof Assessment	TBC
Incoming KVA	TBC
Cash Or PPA	TBC
Gen Set Integration	TBC

Overview Information

Grid Tied (excl. Battery/Gen Set Diesel Savings)

Financial Information

	Nil Tax Credit	125% Tax Credit
Total Annual Savings (Year 1)	R855 585	R855 585
ROI	33%	49%
Payback	2,7 Years	2 Years

Additional Savings Analysis

	N/A	N/A
Tou Peak Demand	N/A	N/A
Gen Set / Diesel	SEE ADENDUM	SEE ADENDUM
Arbitrage	SEE ADENDUM	SEE ADENDUM

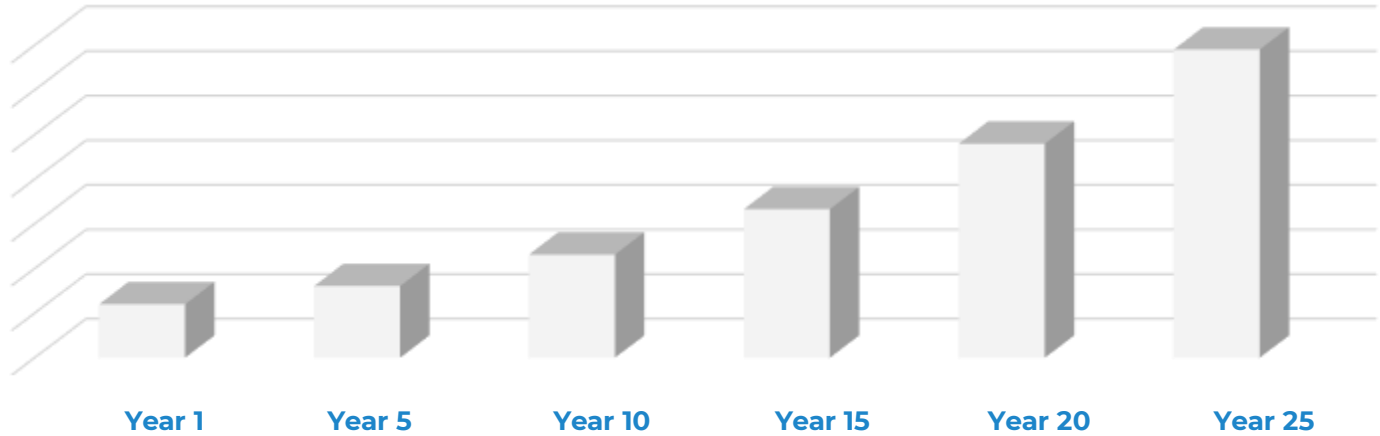
Standard Investment Savings Summary

Estimated Capex	R2 612 500	R2 612 500
125% Tax Credit	n/a	R3 265 625
27% Tax Deduction	n/a	R881 719
Net Cost	R2 612 500	R1 730 781

Cumulative Savings & ROI Grid Tied (excl. Battery/ excl. Gen Set Diesel Savings)



Cumulative 25 Years Inc 10% PA



	Year 1	Year 5	Year 10	Year 15	Year 20	Year 25
Actual Savings	R824 801	R1 183 620	R1 859 051	R2 919 914	R4 586 157	R7 203 237
Rebate	R30 783	R30 783	R30 783	R30 783	R30 783	R30 783
Cumulative Savings	R855 585	R5 134 563	R13 111 321	R25 552 168	R45 004 525	R75 469 496
ROI / IRR	33%	46%	72%	113%	177%	277%

Amortized New kWh Rates 25 Years

INTERNAL DEPRECIATION	FIXED RATE PER KW	ONGOING
5 Years	R1,54	20 Year Free Electricity
10 Years	R0,77	15 Years Free Electricity
20 Years	R0,39	5 Years Free Electricity

Bill Summary

Month	Days/Period	Monthly KWh	Daily Average kWh	Bill
Jan	34	62745	1845	R148 968
Feb	29	57264	1975	R133 699
Mar	29	54286	1872	R126 867
Apr	31	66131	2133	R154 199
May	30	65672	2189	R153 067
Jun	29	90361	3116	R209 624
Jul	29	98971	3413	R248 865
Aug	34	100561	2958	R274 508
Sep	29	79171	2730	R216 330
Oct	28	78554	2805	R214 570
Nov	34	80609	2371	R220 683
Dec	29	58356	2012	R148 541
TOTALS	365	892681	2452	R2 249 921

2023 Average Consumption/Bill Summary

Annual kWh	Monthly Average kWh	Daily Average kWh	Total Annual Bill	Average Monthly Bill
892681	74390	2446	R2 249 921	R187 493

2024 Estimated Average Consumption/Bill Summary

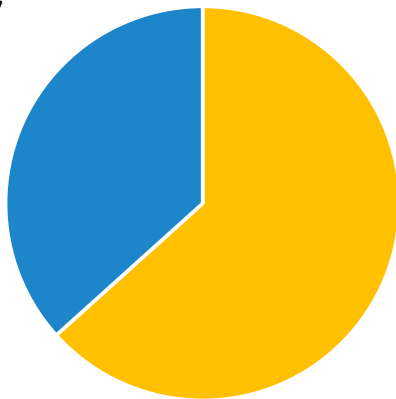
Annual kWh	Monthly Average kWh	Daily Average kWh	Total Annual Bill	Average Monthly Bill
892681	74390	2446	R2 536 560	R211 380

Production & Consumption

Pre/Post Bill	Monthly	Annual
Rand Savings	R68 733	R824 801
SSEG Feedback (Estimated)	R2 565	R30 783
Total Savings	R71 299	R855 585
Average Bill Pre-Solar	R199 566	R2 394 788
Average Bill Post-Solar	R130 832	R1 569 986

Before/After Solar	Monthly kWh	Annual kWh
Average Units Pre-Solar	74 390	892 681
Total PV Production	28 268	339 212
Solar Usable Units	25 977	311 727
SSEG Rebate Units	2 290	27 485

non Solar
196 397
37%



Solar
Production
339 212
63%

Daytime Production Vs Consumption (kWh)

Annual Units	100%	892 681
Day-Time	60%	535 609
Night-Time	40%	357 072
Solar Production		339 212
Daytime Purchased Units Post Solar		196 397

- Solar Production
- Day Time Units Post Solar

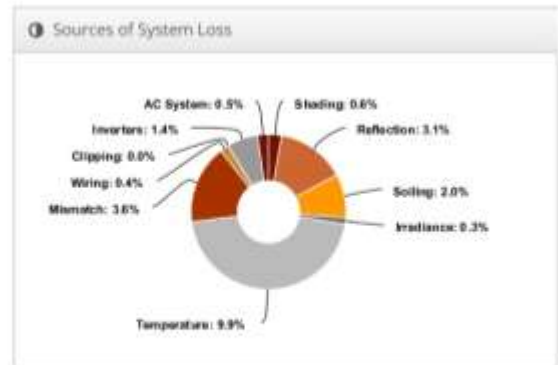
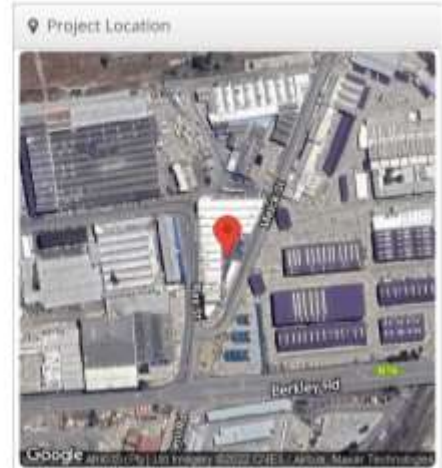
Design 1 Richard (Huawei) (copy) Alpen Foods, Alpen foods

Report

Project Name: Alpen Foods
 Project Address: Alpen foods
 Prepared By: Info Info, info@pvconsult.co.za

System Metrics

Design	Design 1 Richard (Huawei) (copy)
Module DC Nameplate	359.1 kW
Inverter AC Nameplate	400.0 kW Load Ratio: 0.90
Annual Production	613.1 MWh
Performance Ratio	79.8%
kWh/kWp	1,707.4
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Simulator Version	dcb8478Bad-6be92f920b-482bf4118a-262a1e83af



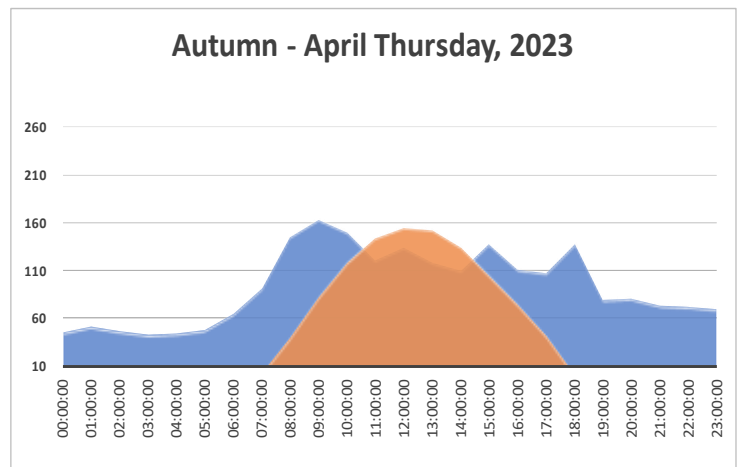
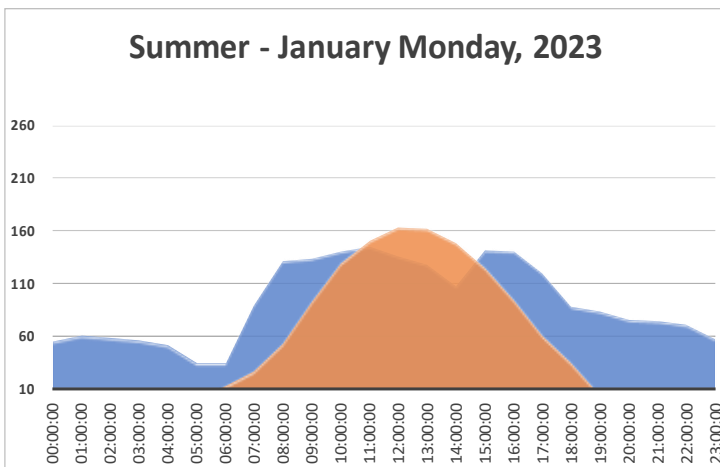
Components

Component	Name	Count
Inverters	SUN2000-100KTL-M1 (380/400) (Huawei)	4 (400.0 kW)
Strings	6 mm2 (Copper)	38 (2,336.8 m)
Module	JA Solar, JAM72S30-540/MR (1000V) (2021) (540W)	665 (359.1 kW)



Summer/Autumn

Time	kWh	Solar Production	Net Consumption	Feedback Units	Feedback Rands	COCT SPU		
						Rate	Total Pre-Solar	Total Post Solar
00:00:00	55	0	55	0	R0,00	R2,64	R145	R145
01:00:00	60	0	60	0	R0,00	R2,64	R160	R160
02:00:00	59	0	59	0	R0,00	R2,64	R155	R155
03:00:00	56	0	56	0	R0,00	R2,64	R149	R149
04:00:00	51	0	51	0	R0,00	R2,64	R135	R135
05:00:00	34	0	34	0	R0,00	R2,64	R91	R91
06:00:00	34	13	21	0	R0,00	R2,64	R90	R56
07:00:00	89	27	62	0	R0,00	R2,64	R235	R164
08:00:00	131	52	78	0	R0,00	R2,64	R346	R208
09:00:00	133	93	40	0	R0,00	R2,64	R352	R107
10:00:00	141	129	12	0	R0,00	R2,64	R372	R31
11:00:00	144	150	-	6	R6,61	R2,64	R382	R0
12:00:00	136	163	-	28	R31,10	R2,64	R359	R0
13:00:00	128	162	-	34	R38,12	R2,64	R337	R0
14:00:00	107	148	-	41	R45,53	R2,64	R284	R0
15:00:00	141	125	16	0	R0,00	R2,64	R373	R42
16:00:00	140	94	46	0	R0,00	R2,64	R371	R123
17:00:00	120	61	59	0	R0,00	R2,64	R318	R157
18:00:00	88	35	54	0	R0,00	R2,64	R234	R142
19:00:00	84	4	80	0	R0,00	R2,64	R222	R211
20:00:00	76	0	76	0	R0,00	R2,64	R200	R200
21:00:00	75	0	75	0	R0,00	R2,64	R198	R198
22:00:00	70	0	70	0	R0,00	R2,64	R186	R186
23:00:00	57	0	57	0	R0,00	R2,64	R150	R150
	2 210	1 257	1 062				R5 846	R2 809

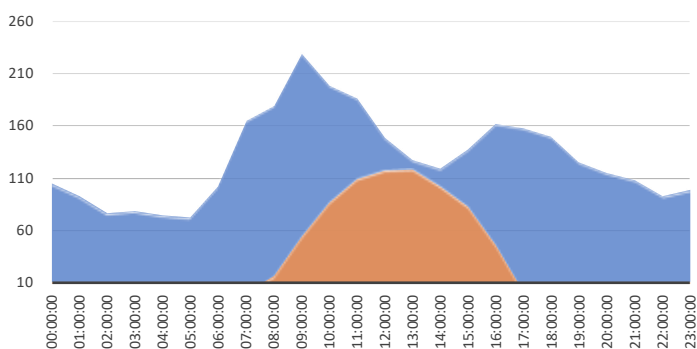


Client Consumption █
Solar Production █

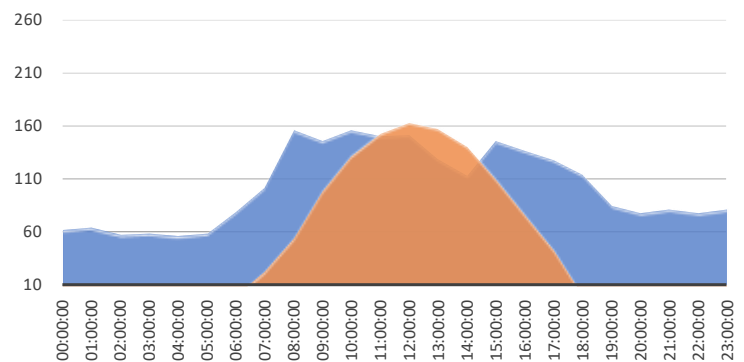
Winter/Spring

Time	kWh	Solar Production	Net Consumption	Feedback Units	Feedback Rands	COCT SPU		
						Rate	Total Pre-Solar	Total Post Solar
00:00:00	105	0	105	0	R0	R2.64	R278.81	R278.81
01:00:00	93	0	93	0	R0	R2.64	R244.99	R244.99
02:00:00	76	0	76	0	R0	R2.64	R201.69	R201.69
03:00:00	79	0	79	0	R0	R2.64	R208.14	R208.14
04:00:00	74	0	74	0	R0	R2.64	R195.82	R195.82
05:00:00	73	0	73	0	R0	R2.64	R192.03	R192.03
06:00:00	102	0	102	0	R0	R2.64	R269.53	R269.53
07:00:00	165	0	165	0	R0	R2.64	R437.02	R437.02
08:00:00	179	16	163	0	R0	R2.64	R473.49	R431.47
09:00:00	229	54	175	0	R0	R2.64	R605.46	R463.31
10:00:00	198	87	112	0	R0	R2.64	R524.46	R295.16
11:00:00	186	109	77	0	R0	R2.64	R491.78	R204.75
12:00:00	149	118	31	0	R0	R2.64	R393.54	R82.60
13:00:00	127	118	9	0	R0	R2.64	R336.50	R23.68
14:00:00	119	102	18	0	R0	R2.64	R315.85	R46.75
15:00:00	138	82	56	0	R0	R2.64	R364.36	R147.00
16:00:00	162	46	116	0	R0	R2.64	R428.87	R306.40
17:00:00	157	1	156	0	R0	R2.64	R416.27	R413.53
18:00:00	150	0	150	0	R0	R2.64	R396.00	R396.00
19:00:00	125	0	125	0	R0	R2.64	R330.06	R330.06
20:00:00	115	0	115	0	R0	R2.64	R303.63	R303.63
21:00:00	108	0	108	0	R0	R2.64	R285.82	R285.82
22:00:00	92	0	92	0	R0	R2.64	R244.42	R244.42
23:00:00	99	0	99	0	R0	R2.64	R261.28	R261.28
	3,100	732	2,368		R0.00		R8,199.82	R6,263.88

Winter- July Wednesday, 2023



Spring- September Thursday ,2023



Client Consumption
Solar Production



*Errors & Omissions Excluded

Expected Impact On SSEG Feed In

COCT fixed Rate

Month	Rebate kWh Units	Feed in credit (R1.12 Fixed Tariff)
Jan	4830	R5 409
Feb	3952	R4 427
Mar	6852	R7 674
Apr	1422	R1 593
May	888	R994
Jun	5	R5
Jul	25	R28
Aug	8	R9
Sep	814	R912
Oct	1335	R1 496
Nov	1235	R1 383
Dec	6119	R6 854
TOTAL	27485	R30 783

SSEG Feedback

Summary	
Seasons	kWh
summer	14901
Autumn	9162
Winter	38
Spring	3384
Total Annual Rebate Units	27485kWh
Annual % Feedback	8,1%

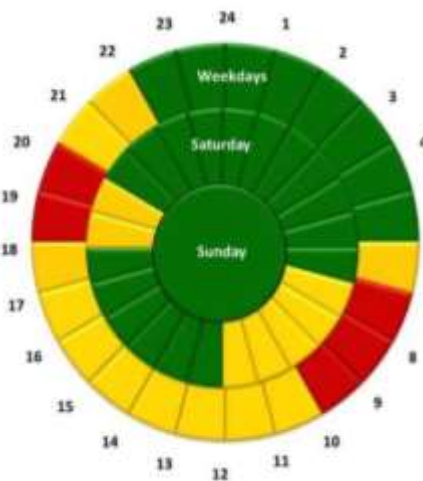
COCT Tariff Structures 2024



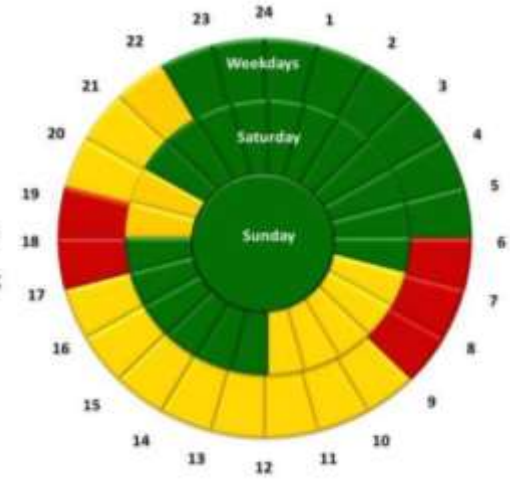
COCT	Energy Tariff	Peak Demand	Service Charge
Small Power User (H/V)	R2.64	R0.00	R92.75
Small Power User (L/V)	R4.63	R0.00	R7.31

COCT	TOU Summer	TOU Winter	Peak Demand	Service Charge
Time of Use (L/V)	Peak – R2.27 Std – R1.69 Off Peak – R1.23	Peak – R6.06 Std – R2.14 Off Peak – R1.36	R258.64	R157.22
Time of Use (M/V)	Same as above	Same as above	R154.41	R154.14
Time of Use (H/V)	Peak – R2.19 Std – R1.64 Off Peak – R1.20	Peak – R5.84 Std – R2.07 Off Peak – R1.32	R38.81	R154.14

Summer



Winter



A Genset Integration with a solar system offers several advantages

Backup Power & Cost Savings

Gensets can act as backup power sources during periods of load shedding. This ensures continuous power supply even when solar is available.

When integrated with solar, the Gen Set runs at lower speeds hence reduced gen set speeds reflected in lower diesel costs.

Gen Set Controller Software

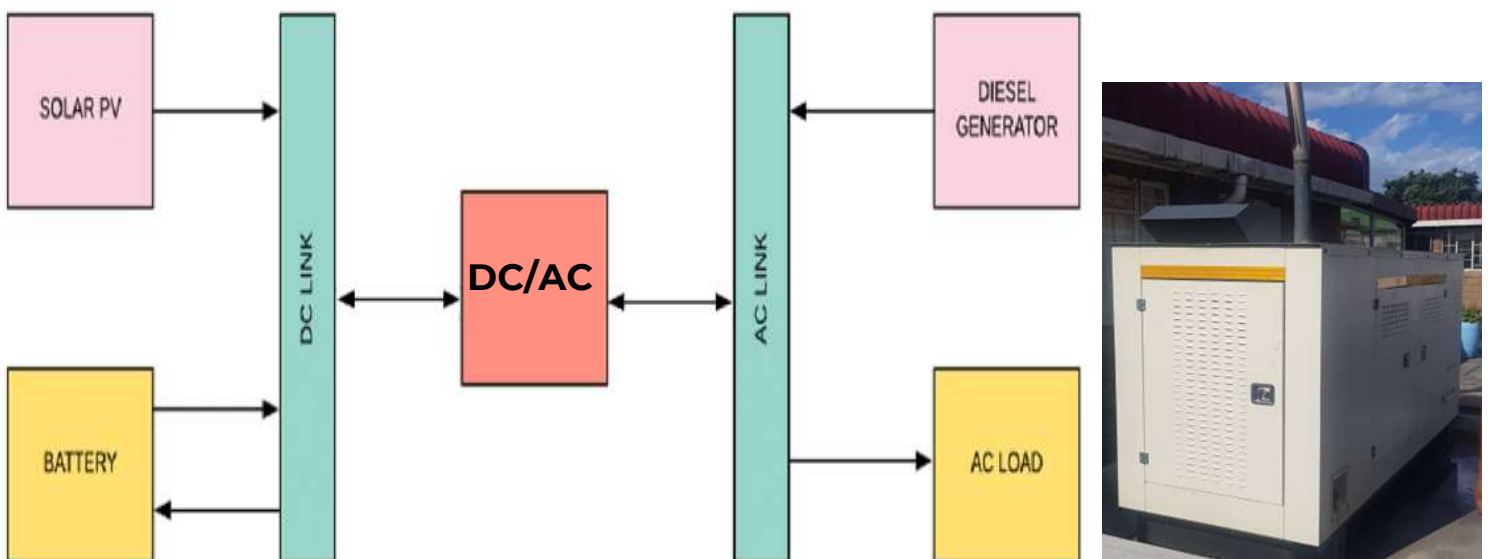
Gen Set Controller Software Integrates with Solar

- Manage Times Gen Set can run
- Operate only on Minimum Draw (kVa)

Gen Set Integration / Costs:

Whilst most modern inverters (both Grid Tied and Hybrid) allow for gen set integration, the cost of such (on small systems) may not be viable.

Genset Integration Made Simple



PV Genset Integration Diesel Savings Summary

209kWp Pv Genset Integration							
Genset Load Capacity %	Diesel Consumption (Litres)/Hour	Loadshedding Hours	Daily Diesel Litres	Diesel Cost @R30/Litre Blended with Maintenance	Monthly Diesel Cost	Annual Diesel Cost	Diesel Savings 15% (p/a)
60%	59	1	59	R1 770	R53 100	R637 200	R95 580
60%	59	2	118	R3 540	R106 200	R1 274 400	R191 160
60%	59	3	177	R5 310	R159 300	R1 911 600	R286 740
60%	59	4	236	R7 080	R212 400	R2 548 800	R382 320

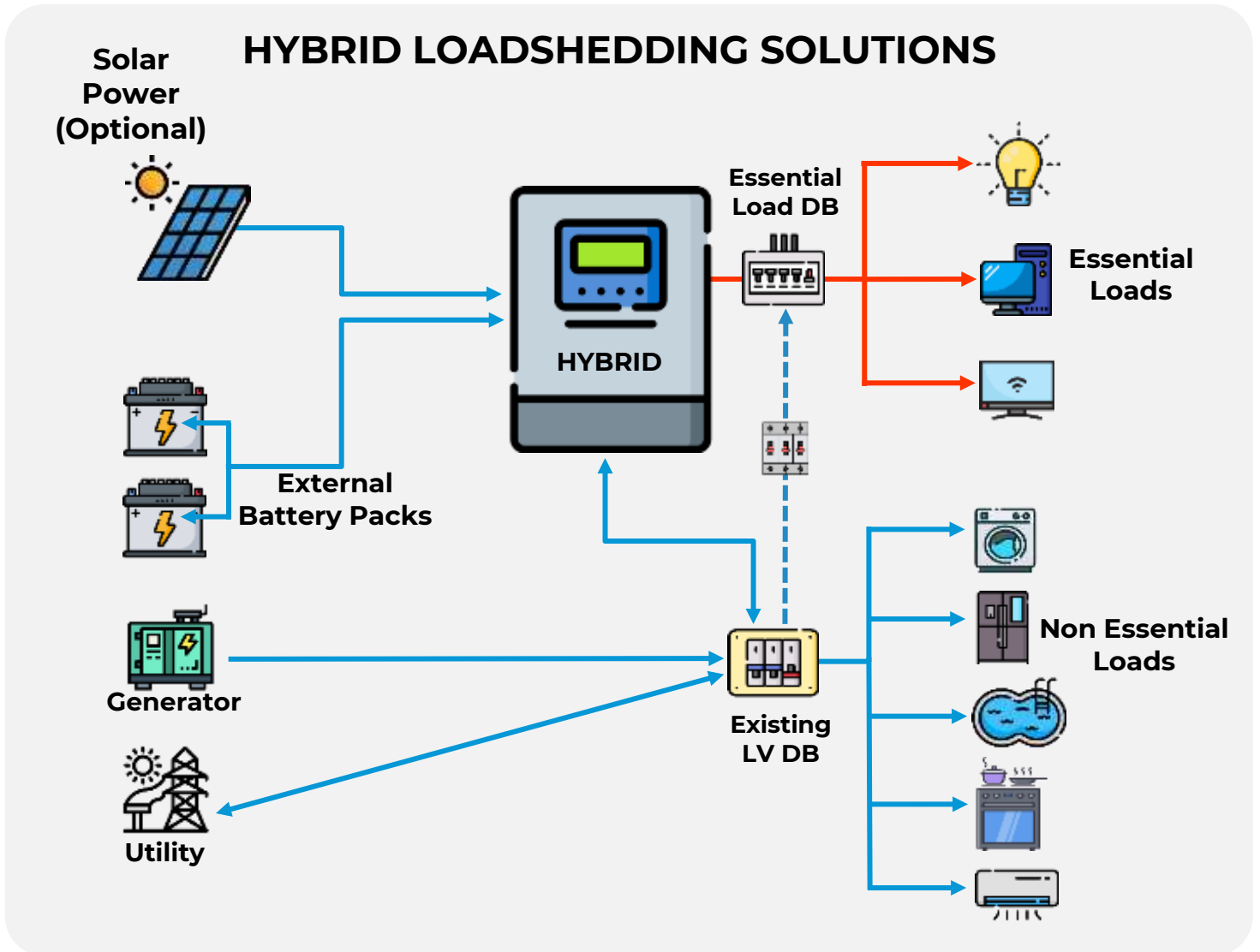




Hybrid Configuration

HYBRID INVERTERS

These are available as either single or 3 phase and are best suited when integrating with solar. Typically twice the cost of GRID TIED



CYCLING

When not using the battery for load shedding the batteries can be cycled at specific times and the power is then input into the system, hence saving on purchase kWh from the municipality.

GEN SET

It is possible to integrate a GEN SET with a GRID TIED system and this can assist with reducing the GEN SET speed and save fuel.

EXTENDED LOAD SHEDDING

During daytime load shedding, the solar panels, will power the batteries and inverter.

Essential Appliances

Non Essential Appliances

Bess Vs Gen Set Diesel Savings Summary

Diesel Cost Calculations

Battery Size kWh	Average kWh Consumption	Diesel Consumption (Litres)/Hour	Loadshedding Hours	Genset Daily Diesel Litres	Genset Diesel Cost @R30/Litre Blended With Maintenance	Monthly Diesel Cost	Annual Diesel Cost
240	200	59	1	59	R1 770	R53 100	R637 200
480	200	59	2	118	R3 540	R106 200	R1 274 400
720	200	59	3	177	R5 310	R159 300	R1 911 600
960	200	59	4	236	R7 080	R212 400	R2 548 800

Diesel Cost Savings

Loadshedding Hours	Genset Diesel Cost @R30/Litre Blended With Maintenance	Monthly Diesel Cost	Annual Diesel Cost	Battery Cost to Charge/kWh @R2.64 /kw	Battery Monthly Cost To Charge	Annual Battery Cost To Charge	Annual Diesel Cost Savings
1	R1 770	R53 100	R637 200	R528	R15 840	R190 080	R447 120
2	R3 540	R106 200	R1 274 400	R1 056	R31 680	R380 160	R894 240
3	R5 310	R159 300	R1 911 600	R1 584	R47 520	R570 240	R1 341 360
4	R7 080	R212 400	R2 548 800	R2 112	R63 360	R760 320	R1 788 480

Savings Summary

Loadshedding Hours	Battery Size (kWh)	Capex (Estimated)	Annual Diesel Savings	ROI	Payback Years
1	240kWh	R2 600 000	R447 120	17,2%	5,8
2	480kWh	R5 000 000	R894 240	17,9%	5,6
3	720kWh	R7 000 000	R1 341 360	19,2%	5,2
4	960kWh	R9 000 000	R1 788 480	19,9%	5

BANK FINANCE

+/- Prime 7%

- ON BALANCE SHEET
- 10%- 30% DEPOSIT
- 2 – 8 YEARS
- 125% TAX ALLOWANCE YEAR 1



RENT TO BUY

INC FULL WARRANTY

- OFF BALANCE SHEET
- OPTIONAL DEPOSIT
- 2 – 8 YEARS
- OWNERSHIP AT END



PPA / SHARED SAVINGS

DISCOUNTED ELECTRICITY

NO RISK

Get 10%- 40% OFF

- OFF BALANCE SHEET
- OPTIONAL DEPOSIT
- 10 – 25 YEARS
- FULL MAINTENANCE / SLA
- EARLY SETTLEMENT BUY OUT OPTIONS



LANDLORD

ROOF RENTAL

INCOME

- PASSIVE INCOME
- ANNUAL / QUARTERLY / MONTHLY
- FULL MAINTENANCE / SLA
- EARLY SETTLEMENT BUY OUT OPTIONS



SAMPLE BESS UPGRADE OPTIONS

Budget Prices for battery only inverters and batteries(Upgradable) EST		
Consumption (emergency items only)		
Item	Size	Costings
Proposed Inverter	100kW	R390,000
Bypass Cabinet	100kW	R90,000
Minimum Battery Size	158kWh	R895,000
Battery Components/Inverter installation	Per 100kW	R250,000
Reticulation/Splitting Essential and Non-Essential		T.B.A.
Grid Tied / Battery Inverter integration (AC-Coupling)		T.B.A.
Generator Integration		T.B.A.

BESS (Notes)

Please note that the above inverters can be installed in parallel (up to 4) – depending on your essential circuit requirements.

Batteries can be stacked to the required kWh capacity.



All values are VAT exclusive*

*Errors & Omissions Excluded

Warranty 10 years / 5000 Cycles

BUDGET FINANCE STANDARD Includes O & M / INSURANCE		
VALUE	NIL ESCALATION	6% ESCALATION
R 500K	R 11,000	R 8,750
R 1M	R 22,000	R 17,500
R 1.5M	R 33,000	R26,250

Warranty 10 years / 5000 Cycles

BUDGET FINANCE TAX BENEFIT (S 12B ONLY APPLICABLE) Includes O & M / INSURANCE		
VALUE	NIL ESCALATION	6% ESCALATION
R 500K	R 9,000	R 7,250
R 1M	R 18,000	R 14,500
R 1.5M	R 27,000	R 21,750

Notes 12B Tax Benefits [N/A]

- Client is assumed a SARS Tax Payer for Company Tax and would have benefited from the 125% Tax benefit
- Tax amount saved is refunded to finance company
- VAT Paid up-front and reclaimed

BESS WARRANTY / O&M

Typically “back to back” from manufacture being 10 years or 5000 cycles, whichever the greater. Finance company manages the O & M and Insurance

Financial Cashflow

Grid Tied (excl. Battery/Diesel Savings)

Cash Option

Quickest Payback

Cash Purchase

kWh Production	339200	337504	335816	334137	332467	330804	329150	327505	325867	324238	316212	308386	300753	
Year	1	2	3	4	5	6	7	8	9	10	15	20	25	
Capex	-2613													
Tax Savings	0													
Electricity Savings	856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234	
Cummulative Savings	856	1789	2808	3920	5135	6461	7909	9492	11221	13111	25552	45005	75469	
SLA & Monitoring	0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160	
Net Cash Flow	-2613	856	881	964	1055	1154	1263	1382	1513	1656	1813	2852	4491	7074
Cumulated Cash F	-2613	-1757	-876	88	1143	2297	3560	4942	6454	8110	9923	21916	40796	70532
Elec Savngs(Excl SSEG)	825	903	988	1081	1184	1295	1418	1552	1699	1859	2920	4586	7203	

8 Year Term

8 Year Bank Funded Options

Bank Funded 8 Years / 25% Deposit (Prime +1)

Year	1	2	3	4	5	6	7	8	9	10	15	20	25	
Capex	-653													
Tax Savings	0													
Electricity Savings	856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234	
Loan Repayment	-392	-392	-392	-392	-392	-392	-392	-392						
SLA & Monitoring	0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160	
Net Cash Flow	-653	464	487	569	660	759	868	987	1117	1652	1809	2847	4485	7234
Cumulated Cash F	-653	-189	297	867	1526	2285	3153	4140	5257	6909	8718	20689	39541	69408

Bank Funded 8 Years / 50% Deposit (Prime +1)

Year	1	2	3	4	5	6	7	8	9	10	15	20	25	
Capex	-1306													
Tax Savings	0													
Electricity Savings	856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234	
Loan Repayment	-261	-261	-261	-261	-261	-261	-261	-261						
SLA & Monitoring	0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160	
Net Cash Flow	-1306	594	617	700	790	890	998	1117	1248	1652	1809	2847	4485	7234
Cumulated Cash F	-1306	-712	-95	605	1396	2286	3284	4401	5649	7301	9110	21081	39933	69800

Financial Cashflow

Grid Tied (excl. Battery/Diesel Savings)

5 Years Bank Funded Options



5 Year Term

Bank Funded 5 Years / 10% Deposit (Prime+1)

	Year	1	2	3	4	5	6	7	8	9	10	15	20	25
Capex	-261													
Tax Savings		0												
Electricity Savings		856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234
Loan Repayment		-709	-709	-709	-709	-709								
SLA & Monitoring		0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160
Carbon Tax		0	0	0	0	0	0	0	0	0	0	0	0	0
Net Cash Flow	-261	146	169	252	342	442	1260	1379	1509	1652	1809	2847	4485	7234
Cumulated Cash Flow	-261	-115	54	306	649	1090	2350	3729	5238	6890	8699	20669	39521	69389

Bank Funded 5 Years / 25% Deposit (Prime +1)

	Year	1	2	3	4	5	6	7	8	9	10	15	20	25
Capex	-653													
Tax Savings		0												
Electricity Savings		856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234
Loan Repayment		-532	-532	-532	-532	-532								
SLA & Monitoring		0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160
Carbon Tax		0	0	0	0	0	0	0	0	0	0	0	0	0
Net Cash Flow	-653	324	347	429	520	619	1260	1379	1509	1652	1809	2847	4485	7234
Cumulated Cash Flow	-653	-330	17	446	966	1585	2845	4223	5732	7385	9193	21164	40016	69884

Bank Funded 5 Years / 50% Deposit (Prime +1)

	Year	1	2	3	4	5	6	7	8	9	10	15	20	25
Capex	-1306													
Tax Savings		0												
Electricity Savings		856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234
Loan Repayment		-355	-355	-355	-355	-355								
SLA & Monitoring		0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160
Carbon Tax		0	0	0	0	0	0	0	0	0	0	0	0	0
Net Cash Flow	-1306	501	524	607	697	796	1260	1379	1509	1652	1809	2847	4485	7234
Cumulated Cash Flow	-1306	-805	-281	325	1022	1819	3078	4457	5966	7618	9427	21397	40250	70117

All values are VAT exclusive*

Financial Cashflow

Grid Tied (excl. Battery / Diesel Savings)

Lease Options

Rent-to-Own 8yr / Nil Deposit

	Year	1	2	3	4	5	6	7	8	9	10	15	20	25
Capex	0													
Tax Savings	0													
Electricity Savings		856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234
Loan Repayment		-538	-538	-538	-538	-538	-538	-538	-538	-261				
SLA & Monitoring		0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160
Net Cash Flow	0	317	340	423	513	613	721	840	971	1391	1809	2847	4485	7234
Cumulated Cash F	0	317	658	1081	1594	2207	2928	3768	4739	6130	7939	19909	38762	68629

Rent-to-Own 8yr / 25% Deposit

	Year	1	2	3	4	5	6	7	8	9	10	15	20	25
Capex	-653													
Tax Savings	0													
Electricity Savings		856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234
Loan Repayment		-404	-404	-404	-404	-404	-404	-404	-404	-196				
SLA & Monitoring		0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160
Net Cash Flow	-653	452	475	558	648	747	856	975	1105	1456	1809	2847	4485	7234
Cumulated Cash F	-653	-201	274	831	1479	2226	3082	4057	5163	6619	8428	20398	39250	69118

Rent-to-Own 8yr / 50% Deposit

	Year	1	2	3	4	5	6	7	8	9	10	15	20	25
Capex	-1306													
Tax Savings	0													
Electricity Savings		856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234
Loan Repayment		-269	-269	-269	-269	-269	-269	-269	-269	-131				
SLA & Monitoring		0	-52	-55	-58	-60	-64	-67	-70	-74	-77	-99	-126	-160
Net Cash Flow	-1306	586	610	692	783	882	990	1110	1240	1521	1809	2847	4485	7234
Cumulated Cash F	-1306	-720	-110	582	1364	2246	3237	4346	5586	7108	8916	20887	39739	69607

Financing Options

Grid Tied (excl. Battery / Diesel Savings)

20 YEAR PPA FINANCING OPTIONS / DISCOUNTED ELECTRICITY

Power Purchase Agreement Payment (Nil Deposit)

Year	1	2	3	4	5	6	7	8	9	10	15	20	25	
Capex	0													
Tax Savings	0													
Electricity Savings	856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234	
PPA Repayment	-420	-437	-460	-485	-510	-537	-565	-594	-625	-657	-846	-1088	0	
SLA & Monitoring	0	0	0	0	0	0	0	0	0	0	0	0	0	
Carbon Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	
Net Cash Flow	0	436	496	558	628	705	790	884	989	1104	1232	2104	3529	7234
Cumulated Cash Flow	0	436	932	1490	2118	2822	3612	4496	5485	6589	7822	16427	30947	61412

PPA Rates	R1.26	R1.34	R1.42	R1.50	R1.59	R1.69	R1.79	R1.90	R2.01	R2.13	R2.85	R3.82
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Power Purchase Agreement Payment (25% Deposit)

Year	1	2	3	4	5	6	7	8	9	10	15	20	25	
Capex	-653													
Tax Savings	0													
Electricity Savings	856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234	
PPA Repayment	-337	-351	-370	-389	-410	-431	-453	-477	-502	-528	-680	-874	0	
SLA & Monitoring	0	0	0	0	0	0	0	0	0	0	0	0	0	
Carbon Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	
Net Cash Flow	-653	-135	582	649	723	805	895	995	1106	1227	1362	2271	3743	7234
Cumulated Cash Flow	-653	-135	447	1096	1819	2624	3520	4515	5621	6848	8210	17570	33061	63526

PPA Rates	1.01	R1.07	R1.14	R1.21	R1.28	R1.36	R1.44	R1.52	R1.62	R1.71	R2.29	R3.07
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Power Purchase Agreement Payment (50% Deposit)

Year	1	2	3	4	5	6	7	8	9	10	15	20	25	
Capex	-1306													
Tax Savings	0													
Electricity Savings	856	934	1019	1112	1214	1326	1449	1583	1729	1890	2951	4617	7234	
PPA Repayment	-255	-265	-279	-294	-309	-325	-342	-360	-379	-399	-513	-660	0	
SLA & Monitoring	0	0	0	0	0	0	0	0	0	0	0	0	0	
Carbon Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	
Net Cash Flow	-1306	-705	668	740	818	905	1001	1106	1223	1350	1491	2438	3957	7234
Cumulated Cash Flow	-1306	-705	-37	703	1521	2426	3427	4534	5756	7107	8598	18713	35175	65640

PPA Rates	0.77	R0.81	R0.86	R0.91	R0.97	R1.02	R1.09	R1.15	R1.22	R1.29	R1.73	R2.32
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Financing Options Grid Tied (excl. Battery / Diesel Savings)

20 YEAR PPA FINANCING OPTIONS / DISCOUNTED ELECTRICITY

<p>NO RISK</p> <p>NIL OR OPTIONAL DEPOSIT</p> <p>ONLY PAY FOR WHAT YOU USE</p>	<p>TERM</p> <p>10 -20 YEARS</p> <p>MAINTENANCE /SLA</p> <p>FULLY INCLUDED</p>	<p>OFF BALANCE SHEET</p> <p>EARLY SETTLEMENT</p> <p>OWNERSHIP AT END OF TERM</p>
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DEPOSIT	CURRENT TARIFF	INDICATIVE PPA RATE	INDICATIVE DISCOUNT	1st YEAR SAVINGS	CUMULATIVE SAVINGS
NIL	R2.64	R1.26	52%	R435,567	R30,946,774
10%	R2.64	R1.10	59%	R470,305	R32,049,034
25%	R2.64	R1.01	62%	R518,243	R33,713,910
50%	R2.64	R0.77	71%	R600,920	R36,481,040

Ownership at End
OR
Early Settlement

6 % Escalation
Fully Maintained
Includes
O&M / Insurance

Monthly Variable
Payments

Landlords Roof Income Grid Tied (excl. Battery)



Get A Rental Income

	ANNUAL INCOME
YEAR 1	R435,567
YEAR 5	R704,527
YEAR 10	R1,232,446
YEAR 15	R2,104,342
YEAR 20	R3,528,992
YEAR 25	R7,234,021
	ANNUAL INCOME
20 Years	R30,946,774

Expected PV Production Over 25 Years

YEAR	kWh
1	339200
2	337504
3	335816
4	334137
5	332467
10	324238
15	316212
20	308386
25 +	300753

Panels are not limited to 25 years

Carbon Savings

CARBON SAVINGS (Co2)



93,28 Tonnes

BAGS OF 10 KG COAL SAVED



4240 Bags

CARBON TAX



Not Applicable

NO SOLAR PANELS REQUIRED



**MIX
GENERATION
WIND and SOLAR IPP
FARMS**



**OFF TAKER
(The Client)**

1 Wheeling is in essence the paying for the transmission of power generated from point A to point B using the ESKOM/MUNICIPALITY infrastructure.

2 The process whilst complex and subject to many NERSA / ESKOM regulations is applicable to clients with insufficient roof space for their own self generation.

3 The key opportunities are to match either one, or a mix of IPP's (Independent Power Producers) to clients known as **OFF TAKERS**.

4 As Independent consultants we facilitate with mediating through the process of acquiring power at a lower cost to the utility.

Wheeling From IPP (Independent Power Producer)



Build Your Own Solar Farm?

Wheel To Yourself



Recommended Implementation Partners



Sample Tender Process



PV Consult Tender Recommended Components & Costings

Item no.	Description	Quantity	Unit Price	Total Cost (Ex. VAT)
1	Solar Modules / Panels			R0.00
2	Inverters			R0.00
3	Electronics and Communications (Modem, routers)			R0.00
4	Mounting Structures			R0.00
5	AC Materials			R0.00
6	DC Materials			R0.00
7	Trunking & Cabling			R0.00
8	Construction & Installation & Labour			R0.00
9	Sundries			R0.00
10	Logistics Cost (E.g., Cherry picker)			R0.00
11	Professional Services			R0.00
12	COC			R0.00
13	1 Year Warranty			R0.00
			Sub Total (Ex. VAT)	R0.00

You may add additional components to the costings relating to the project.
Any recommendations is welcome on the alternative costing sheet.

Sample Tender Company Profile

PV Consult Tender Company Profile

Item No.	Description	Answer	
1	Company Name		
2	Registration		
3	Date of Incorporation		
4	Tax Number		
5	Annual Turnover		
6	Part of any group/holding company	Yes	No
7	Sales Staff		
8	Implementation Staff		
9	Management & Admin Staff		
10	Staff in Cape Town		
11	Own Construction	Yes	No
11.1	Outsources Team		
12	Total Staff		
13	Office Locations		
13.1	Office 1		
14	PV Greencard		
15	SAPVIA Membership		
16	Total number of sites sold		
17	Largest Site	Name	Size
18	Total MW Installed		
19	Total number of sites installed		
20	Client References	Name	Size
20.1	Reference 1		
21	Hardware Suppliers / Imports	Name	Credit Limit
21.1	Supplier 1		
22	Preferred Inverters		
22.1	Inverter 1		
23	Preferred Panels		
23.1	Panel 1		
24	Site References		
24.1	Site 1		
25	Finance Partners		
25.1	Partner 1		
26	PPA Partners		
26.1	Partner 1		
27	Bank Approvals		
27.1	Bank 1		
28	Lease Rental Option		
28.1	Option 1		

PV Consult Tender Sample Documents And Certification

Item no.	Description	Yes	No
1	Helioscope Design		
2	Health and Safety Certificates		
3	Valid Letter of Good Standing		
4	Service Level Agreements		
5	O&M Manuals & Maintenance Reports		
7	COC		
8	Product Certificates and Datasheets		
9	Environmental Policy		
10	Method Statement		
11	Work Process, Quality Control Plan & Policy		
12	Project Lists & References		
13	Single Line Diagram		
14	Standard Terms & Conditions		
15	Professional Indemnity Insurance		
16	Insurance Contract		
17	Electrical Contractors Certificate		
18	Pr Engineers		
19	Pr Engineers		
20	Wiremans Licence		
21	Bargaining Council		

You may attach any additional information relating to the project.

Supplier Notes

Topic	Notes To Client
Panels & Warranty	Tier1 Options Canadian Solar / Ja / Jinko / Other 12 Years Product / 25 Years Output Performance
Inverter & Warranty	Tier1 Options GoodWe / Huawei / SMA / Solar Edge /Other 5-12 Years Warranty
Year 1 Sla Warranty	To Include Water Proofing, Wiring And On-site Support Monthly System Monitoring Annual On-site System Check
Panel Cleaning	Optional
Ongoing Sla	% Capex
COC	To Be Included
System Training	To Be Included
Walkways	Not Essential
Weather Station	Not Essential
Single Line Diagram	To Be Provided
Construction	TBA
Support / Sla	TBA
PV Greencard / COC / Key Staff	TBA

PV System Notes

By securing the data direct from the COCT or ESKOM we can obtain a detail insight of your consumption patterns.

We offer a data modelling option to accurately size the system and provide a very detailed cost benefit analysis.

Data Source

We can analyse your daily consumption V solar production up to 365 days.

The data analysis also considers the different tariff options and peak demand management, or SSEG feedback that will be available.

Alternatively, we can offer a data logger service at a nominal cost.

By calculating the hourly PV generation, we can (1) differentiate between Off-Peak, Peak and Standard Tariffs for the TOU (Time of Use) structures and compare to alternative Tariff options

The forecasted financial savings for a PV system are generated in the following ways:

Savings Calculator

- Through offsetting energy that would have been purchased from the municipality.
- Variable savings according to your existing tariff structure.
- Through a reduction of the monthly peak demand (if applicable).
- Tariff Swap (If applicable)

Peak Demand

Our analysis can run for a 30-day period to assess the Peak Demand reduction due to (1) Solar and / or Tariff Optimization. These two savings are combined to forecast the return on investment in the financial model.

PV Calculator

We use the HELIOSCOPE licensed software to model the actual kWh production to be generated. Typically, we present as DAILY / MONTHLY and TOTAL ANNUAL production.

SSEG Feedback

The value included in this proposal will depend upon whether we have exact data, otherwise we have estimated your unused PV production and the rates applicable.

SSEG is a variable amount according to each municipality and cannot be guaranteed..

TOU Blended Tariff

The blended tariff is a calculation based upon the weighted average of the Time of Use variable units that are replaced by the PV Solar system, calculated at their rand value for Peak, Standard & Off Peak. It excludes any Peak Demand.

Standard Terms Of Engagement



Terms Of Engagement	PV. Consult act for the client and will bill accordingly for services rendered in an open and transparent manner. Unless otherwise agreed we consult from project inception to final installed system. A client may choose to terminate at the conclusion of each phase and will only be liable pro-rata.
Add-hoc Hours	R 1000 Hour Pure Consulting R 750 Hour Data Modelling PLUS, TRAVEL beyond 25 klm
Professional Indemnity	R 2M per claim
On Risk Feasibility Study & Tender Only (Guide Price)	<p>PV Consult will secure a commission from the supplier at pre agreed % . Unless otherwise agreed the below is a typical cumulative sliding scale</p> <ul style="list-style-type: none"> • 100 kWp 10% • 250 kWp 5% • 500kWp 2.5% <p>Subject to site survey Excludes Post Sale Project management</p>
Post Sale Project Management	Hourly According To Client Requirements
On Risk Tariff Swap KVA Reduction	<p>Where PV Consult provide consulting services “ON RISK” and/or at a reduced fee, then we are entitled to claim for any benefit obtained from the use of the intellectual property provided. The standard being 20% of the savings achieved for 2 years. This can include Tariff Optimisation/ Tariff Swap and/ or identifying kVa reduction.</p> <p>Our fees, unless agreed in advance being 20% of the savings achieved over 2 years. I.e., Client keeps 80% of savings.</p>
Included	A client name includes for all sites that may benefit from the report and / or tender process / supplier selected.
Excluded	<p>Given that each client may have unique, or additional requirements that are not always possible to quantify at the outset, the agreement allows for further negotiation on cost Vs deliverables on a case-by-case basis.</p> <p>Any out-of-pocket expenses, or specialized services, such as data logging, structural engineers reports that are agreed with the client in advance would be billed separately.</p>
Council Approval	Errors and emissions subject to final council approval. PV Consult shall not be liable for any direct, indirect, incidental, consequential, or special damages arising out of or in any way related to the use of our advice, services, or website. This includes but is not limited to damages for loss of profits, data, or other intangible losses.
On Risk Cancellation	There is nil cost for the Financial Feasibility If appointed to Tender and client does not proceed within 3 months then 50% of fees are applicable