PROJECT REPORT

Of

LITHIUM ION BATTERY

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding **Lithium Ion Battery**.

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

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PROJECT AT A GLANCE

1	Name of the Entreprenuer		xxxxxxxxxx	
2	Constitution (legal Status)	:	xxxxxxxxxx	
3	Father / Spouse Name		xxxxxxxxxxxx	
4	Unit Address	:	xxxxxxxxxxxxxxxxxxxxxxx	
			District : xxxxxxx Pin: xxxxxxx Mobile xxxxxxx	State: xxxxxxxxxx
5	Product and By Product	:	**Lithium Ion Battery**	
6	Name of the project / business activity proposed :		**Lithium Ion Battery Manufacturing Unit**	
7	Cost of Project	:	Rs.26.66 Lakhs	
8	Means of Finance Term Loan Own Capital Working Capital		 Rs.20 Lakhs Rs.2.67 Lakhs Rs.4 Lakhs	
9	Debt Service Coverage Ratio	:	1.84	
10	Pay Back Period	:	5	Years
11	Project Implementation Period	:	5-6	Months
12	Break Even Point	:	40%	
13	Employment	:	12	Persons
14	Power Requirement	:	10	HP
15	Major Raw materials	:	Cells, Nickle, BMS, Sleeve etc.	
16	Estimated Annual Sales Turnover (Max Utilized Capacity)	:	140.06	Lakhs
17	Detailed Cost of Project & Means of Finance			

COST OF PROJECT

(Rs. In Lakhs)

Particulars	Amount
Land	Own/Rented
Building /Shed 2000 Sq ft	Own/Rented
Plant & Machinery	21.00
Furniture & Fixtures	1.22
Working Capital	4.44
Total	**26.66**

MEANS OF FINANCE

Particulars	Amount
Own Contribution	2.67
Term Loan	20.00
Working Capital	4.00
Total	**26.66**

LITHIUM-ION BATTERY

Introduction

A lithium-ion battery or Li-ion battery (abbreviated as LIB) is a type of rechargeable battery. Lithium-ion batteries are commonly used for portable electronics and electric vehicles and are growing in popularity for military and aerospace applications. The technology was largely developed by John Goodenough, Stanley Whittingham, Rachid Yazami and Akira Yoshino during the 1970s–1980s, and then commercialized by a Sony and Asahi Kasei team led by Yoshio Nishi in 1991.

In the batteries, lithium ions move from the negative electrode through an electrolyte to the positive electrode during discharge, and back when charging. Li-ion batteries use an intercalated lithium compound as the material at the positive electrode and typically graphite at the negative electrode. The batteries have a high energy density, no memory effect (other than LFP cells) and low self-discharge. They can however be a safety hazard since they contain a flammable electrolyte, and if damaged or incorrectly charged can lead to explosions and fires. Samsung were forced to recall Galaxy Note 7 handsets following lithium-ion fires, and there have been several incidents involving batteries on Boeing 787s.

Benefits of using Lithium-ion Batteries

Lithium-ion (Li-ion) batteries are inarguably the most popular type of rechargeable battery for consumer electronics. They can be used for a variety of products from mobile phones to cars, and their qualities are superior compared to other rechargeable batteries.

At Night Searcher we use high-quality lithium-ion (Li-ion) batteries for all but a few of our rechargeable flashlights, searchlights, head torches, and floodlights, as they allow us to provide the high-performance, durable products our customers are used to.

Below we've listed the biggest advantages of lithium-ion batteries from the customers' point of view and delved into the science behind each characteristic.

- **Eco-friendly:** Lithium-ion batteries contain relatively low levels of toxic heavy metals found in other types of batteries, such as lead-acid and nickel-cadmium (NiCd) batteries. Cadmium, lead, and mercury have been battery stalwarts for years, but prolonged exposure to, and inadequate disposal of these metals is harmful to humans, animals, and plants. Although Li-ion batteries are safer than many other types of batteries they still require proper recycling, so never put your used batteries in with your regular rubbish.
- **Lightweight and compact:** Electrodes commonly used in lithium-ion batteries, lithium and carbon, are lightweight on their own, making for much smaller and lighter batteries than their older counterparts such as lead-acid batteries. For comparison's sake, a typical 51Ah (= ampere-hour) lithium-ion battery weighs about the same as a 24Ah lead-acid battery (about 6-7kg), but provides over twice the capacity.
- **High energy density**: Lithium is a highly reactive element with the ability to release and store large amounts of energy, allowing li-ion batteries to pack a high energy capacity in a small size. This translates to lithium-ion batteries lasting much longer between charges than other rechargeable batteries, while still maintaining their high level of performance.
- **Low maintenance:** Older types of rechargeable batteries, such as nickel-cadmium or nickel-metal hydride batteries had a so-called "memory effect", or "lazy battery effect": If they were repeatedly partially discharged before being recharged, ultimately the battery would only deliver the amount of energy that was used during the partial discharges before its voltage would drop. To avoid this, NiCd and NiMH batteries would need to be regularly maintained by completely discharging and recharging them.

Description of Lithium-ion Battery Machine

Different types of machinery are used for Lithium-ion batteries manufacturing unit. Which are as follow:

a) Sorting Machine

b) Grading Machine

c) CDS

d) BMS Testing Machine

e) Hot Air Gun

f) Spot welding Machine

Lithium-ion Battery Analysis & Potential

These batteries are utilized in mobile phone, notebook and similar devices there shape and size varies based on application. The lithium-ion battery market is expected to grow exponentially in the next five years in India and its recycling offers a $1000 million opportunity by 2030.

The lithium-ion battery market in India is expected to increase from 2.9 GWh in 2018 to about 132 GWh by 2030 (CAGR of 35.5%). The increasing volume of lithium-ion batteries would, in turn, lead to a growing capacity of 'spent' batteries in the ecosystem which if left untreated would lead to health and environmental hazards.

Initiatives by the centre that will accelerate the growth of lithium-ion battery market in India include National Electric Mobility Mission Plan 2020, with a projection of getting 6-7 million electric vehicles on Indian roads by 2020, installation of 175 GW of renewable energy by 2022.

Lithium-ion Battery Manufacturing Process

1. Grading: In this process all the cells are graded before moving towards battery manufacturing process.
2. Welding: After grading, welding of cells are done in series and parallel as per customer requirement. Like: voltage
3. Soldering: Then solider BMS with the welded battery pack.
4. Testing: After soldering test the battery packs and then fix up the BMS with battery.
5. Charging & discharging: After the mounting of BMS, we have to check the battery charging and discharging, Whether it is charging or not.

PROJECTED BALANCE SHEET

PARTICULARS	I	II	III	IV	V
SOURCES OF FUND					
Capital Account					
Opening Balance	-	3.45	5.91	9.43	13.02
Add: Additions	2.67	-	-	-	-
Add: Net Profit	0.99	3.20	6.02	8.59	11.25
Less: Drawings	0.20	0.75	2.50	5.00	7.50
Closing Balance	3.45	5.91	9.43	13.02	16.77
CC Limit	4.00	4.00	4.00	4.00	4.00
Term Loan	17.78	13.33	8.89	4.44	-
Sundry Creditors	0.94	1.08	1.24	1.41	1.60
TOTAL :	**26.16**	**24.32**	**23.55**	**22.87**	**22.36**
APPLICATION OF FUND					
Fixed Assets (Gross)	22.22	22.22	22.22	22.22	22.22
Gross Dep.	3.27	6.06	8.43	10.46	12.18
Net Fixed Assets	18.95	16.16	13.79	11.76	10.04
Current Assets					
Sundry Debtors	2.66	3.17	3.63	4.13	4.67
Stock in Hand	4.20	4.73	5.37	6.07	6.83
Cash and Bank	0.35	0.27	0.77	0.91	0.82
TOTAL :	**26.16**	**24.32**	**23.55**	**22.87**	**22.36**
	-	-	-	-	-

PROJECTED PROFITABILITY STATEMENT

PARTICULARS	I	II	III	IV	V
A) SALES					
Gross Sale	79.75	95.00	108.84	123.84	140.06
Total (A)	**79.75**	**95.00**	**108.84**	**123.84**	**140.06**
B) COST OF SALES					
Raw Mateiral Consumed	56.25	64.97	74.42	84.65	95.72
Electricity Expenses	1.12	1.23	1.34	1.46	1.57
Repair & Maintenance	0.40	0.47	0.54	0.62	0.70
Labour & Wages	8.78	9.66	10.62	11.68	12.85
Depreciation	3.27	2.79	2.37	2.02	1.72
Cost of Production	69.82	79.12	89.31	100.43	112.56
Add: Opening Stock /WIP	-	2.33	2.56	2.89	3.25
Less: Closing Stock /WIP	2.33	2.56	2.89	3.25	3.64
Cost of Sales (B)	67.49	78.89	88.98	100.07	112.17
C) GROSS PROFIT (A-B)	12.26	16.11	19.87	23.76	27.89
	15.37%	**16.96%**	**18.25%**	**19.19%**	**19.91%**
D) Bank Interest (Term Loan)	2.17	1.77	1.28	0.79	0.31
ii) Interest On Working Capital	0.44	0.44	0.44	0.44	0.44
E) Salary to Staff	6.27	6.90	7.59	8.35	9.18
F) Selling & Adm Expenses Exp.	2.39	3.80	4.35	4.95	5.60
TOTAL (D+E)	**11.27**	**12.91**	**13.66**	**14.53**	**15.53**
H) NET PROFIT	0.99	3.20	6.20	9.23	12.36
	1.2%	**3.4%**	**5.7%**	**7.5%**	**8.8%**
I) Taxation	-	-	0.19	0.64	1.11
J) PROFIT (After Tax)	0.99	3.20	6.02	8.59	11.25

PROJECTED CASH FLOW STATEMENT

PARTICULARS	I	II	III	IV	V
SOURCES OF FUND					
Own Contribution	2.67	-			
Net Profit	0.99	3.20	6.20	9.23	12.36
Depreciation & Exp. W/off	3.27	2.79	2.37	2.02	1.72
Increase In Cash Credit	4.00				
Increase In Term Loan	20.00	-	-	-	-
Increase in Creditors	0.94	0.15	0.16	0.17	0.18
TOTAL :	**31.86**	**6.14**	**8.74**	**11.43**	**14.27**
APPLICATION OF FUND					
Increase in Fixed Assets	22.22	-	-	-	-
Increase in Stock	4.20	0.52	0.64	0.70	0.76
Increase in Debtors	2.66	0.51	0.46	0.50	0.54
Repayment of Term Loan	2.22	4.44	4.44	4.44	4.44
Taxation	-	-	0.19	0.64	1.11
Drawings	0.20	0.75	2.50	5.00	7.50
TOTAL :	**31.50**	**6.23**	**8.24**	**11.28**	**14.35**
Opening Cash & Bank Balance	-	0.35	0.27	0.77	0.91
Add : Surplus	0.35	- 0.09	0.50	0.14	- 0.09
Closing Cash & Bank Balance	**0.35**	**0.27**	**0.77**	**0.91**	**0.82**

COMPUTATION OF LITHIUM ION BATTERY MANUFACTURING UNIT

Items to be Manufactured Lithium Ion Battery

Manufacturing Capacity per Day		50.00	Batteries
No. of Working Hour		8	
No of Working Days per month		25	
No. of Working Day per annum		300	
Total Production per Annum		15,000	Batteries
Year		Capacity	Lithium Ion Battery
		Utilisation	
I		50%	7,500
II		55%	8,250
III		60%	9,000
IV		65%	9,750
V		70%	10,500

COMPUTATION OF RAW MATERIAL

Item Name		**Quantity of Raw Material**	**Unit**	**Unit Rate of**	**Total CostPer Annum (100%)**
Raw Material Consumed		15,000.00		750.00	11,250,000.00
Total		**15,000.00**			**11,250,000.00**

Total Raw material in Rs lacs at 100% Capacity 112.50

Cost per Battery (In Rs) **750.00**

Raw Material Consumed	**Capacity Utilisation**	**Rate**	**Amount (Rs.)**
I	50%	750.00	56.25
II	55%	787.50	64.97
III	60%	826.90	74.42
IV	65%	868.20	84.65
V	70%	911.60	95.72

COMPUTATION OF CLOSING STOCK & WORKING CAPITAL

PARTICULARS	I	II	III	IV	V
Finished Goods					
(10 Days requirement)	2.33	2.56	2.89	3.25	3.64
Raw Material					
(10 Days requirement)	1.88	2.17	2.48	2.82	3.19
Closing Stock	**4.20**	**4.73**	**5.37**	**6.07**	**6.83**

COMPUTATION OF WORKING CAPITAL REQUIREMENT

Particulars	Amount	Margin(10%)	Net Amount
Stock in Hand	4.20		
Less:			
Sundry Creditors	0.94		
Paid Stock	**3.26**	**0.33**	**2.94**
Sundry Debtors	2.66	0.27	2.39
Working Capital Requirement			**5.33**
Margin			0.59
MPBF			**5.33**
Working Capital Demand			**5.00**

BREAK UP OF LABOUR

Particulars		Wages Per Month	No of Employees	Total Salary
Plant Operator		15,000.00	1	15,000.00
Unskilled Worker		8,500.00	4	34,000.00
Helper		5,000.00	2	10,000.00
Security Guard		7,500.00	1	7,500.00
				66,500.00
Add: 10% Fringe Benefit				6,650.00
Total Labour Cost Per Month				73,150.00
Total Labour Cost for the year (In Rs. Lakhs)			8	8.78

BREAK UP OF SALARY

Particulars		Salary Per Month	No of Employees	Total Salary
Accountant cum store keeper		10,000.00	1	10,000.00
Administrative Staffs		12,500.00	3	37,500.00
Total Salary Per Month				47,500.00
Add: 10% Fringe Benefit				4,750.00
Total Salary for the month				52,250.00
Total Salary for the year (In Rs. Lakhs)			4	6.27

COMPUTATION OF DEPRECIATION

Description	Land	Building/shed	Plant & Machinery	Furniture	**TOTAL**
Rate of Depreciation			**15.00%**	**10.00%**	
Opening Balance	Own/Rented		-	-	-
Addition	-		21.00	1.22	22.22
	-		21.00	1.22	22.22
TOTAL		-	21.00	1.22	22.22
Less : Depreciation	-	-	3.15	0.12	3.27
WDV at end of Ist year	-	-	17.85	1.10	18.95
Additions During The Year	-	-	-	-	-
	-	-	17.85	1.10	18.95
Less : Depreciation	-	-	2.68	0.11	2.79
WDV at end of IInd Year	-	-	15.17	0.99	16.16
Additions During The Year	-	-	-	-	-
	-	-	15.17	0.99	16.16
Less : Depreciation	-	-	2.28	0.10	2.37
WDV at end of IIIrd year	-	-	12.90	0.89	13.79
Additions During The Year	-	-	-	-	-
	-	-	12.90	0.89	13.79
Less : Depreciation	-	-	1.93	0.09	2.02
WDV at end of IV year	-	-	10.96	0.80	11.76
Additions During The Year	-	-	-	-	-
	-	-	10.96	0.80	11.76
Less : Depreciation	-	-	1.64	0.08	1.72
WDV at end of Vth year	-	-	9.32	0.72	10.04

REPAYMENT SCHEDULE OF TERM LOAN 11.0%

Year	Particulars	Amount	Addition	Total	Interest	Repayment	Cl Balance
I	Opening Balance						
	Ist Quarter	-	20.00	20.00	0.55	-	20.00
	Iind Quarter	20.00	-	20.00	0.55	-	20.00
	IIIrd Quarter	20.00	-	20.00	0.55	1.11	18.89
	Ivth Quarter	18.89	-	18.89	0.52	1.11	17.78
					2.17	2.22	
II	Opening Balance						
	Ist Quarter	17.78	-	17.78	0.49	1.11	16.67
	Iind Quarter	16.67	-	16.67	0.46	1.11	15.55
	IIIrd Quarter	15.55	-	15.55	0.43	1.11	14.44
	Ivth Quarter	14.44		14.44	0.40	1.11	13.33
					1.77	4.44	
III	Opening Balance						
	Ist Quarter	13.33	-	13.33	0.37	1.11	12.22
	Iind Quarter	12.22	-	12.22	0.34	1.11	11.11
	IIIrd Quarter	11.11	-	11.11	0.31	1.11	10.00
	Ivth Quarter	10.00		10.00	0.27	1.11	8.89
					1.28	4.44	
IV	Opening Balance						
	Ist Quarter	8.89	-	8.89	0.24	1.11	7.78
	Iind Quarter	7.78	-	7.78	0.21	1.11	6.67
	IIIrd Quarter	6.67	-	6.67	0.18	1.11	5.56
	Ivth Quarter	5.56		5.56	0.15	1.11	4.44
					0.79	4.44	
V	Opening Balance						
	Ist Quarter	4.44	-	4.44	0.12	1.11	3.33
	Iind Quarter	3.33	-	3.33	0.09	1.11	2.22
	IIIrd Quarter	2.22	-	2.22	0.06	1.11	1.11
	Ivth Quarter	1.11		1.11	0.03	1.11	- 0.00
					0.31	4.44	

Door to Door Period	60	Months
Moratorium Period	6	Months
Repayment Period	54	Months

CALCULATION OF D.S.C.R

PARTICULARS	I	II	III	IV	V
CASH ACCRUALS	4.26	5.99	8.39	10.62	12.97
Interest on Term Loan	2.17	1.77	1.28	0.79	0.31
Total	6.43	7.76	9.68	11.41	13.28
REPAYMENT					
Repayment of Term Loan	2.22	4.44	4.44	4.44	4.44
Interest on Term Loan	2.17	1.77	1.28	0.79	0.31
Total	4.39	6.22	5.73	5.24	4.75
DEBT SERVICE COVERAGE RATIO	**1.46**	**1.25**	**1.69**	**2.18**	**2.80**
AVERAGE D.S.C.R.			**1.84**		

COMPUTATION OF SALE

Particulars	I	II	III	IV	V
Op Stock	-	250.00	275.00	300.00	325.00
Production	7,500.00	8,250.00	9,000.00	9,750.00	10,500.00
	7,500.00	8,500.00	9,275.00	10,050.00	10,825.00
Less : Closing Stock(10 Days)	250.00	275.00	300.00	325.00	350.00
Net Sale	7,250.00	8,225.00	8,975.00	9,725.00	10,475.00
Avg Sale Price per Battery	1,100.00	1,155.00	1,212.75	1,273.39	1,337.06
Sale (in Lacs)	**79.75**	**95.00**	**108.84**	**123.84**	**140.06**

COMPUTATION OF ELECTRICITY

(A) POWER CONNECTION				
Total Working Hour per day		Hours	8	
Electric Load Required		HP	10	
Load Factor			0.7460	
Electricity Charges		per unit	7.50	
Total Working Days			300	
Electricity Charges				1.34
Add : Minimim Charges (@ 10%)				
(B) DG set				
No. of Working Days			300	days
No of Working Hours			0.5	Hour per day
Total no of Hour			150	
Diesel Consumption per Hour			8	
Total Consumption of Diesel			1,200	
Cost of Diesel			65.00	Rs. /Ltr
Total cost of Diesel			0.78	
Add : Lube Cost @15%			0.12	
Total			**0.90**	
Total cost of Power & Fuel at 100%				2.24
Year		**Capacity**		**Amount**
				(in Lacs)
I		50%		1.12
II		55%		1.23
III		60%		1.34
IV		65%		1.46
V		70%		1.57

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