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Legal counsel to the Book Running Lead Managers, as to International laws

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LSI Engineering & Consultants Limited

Addressed to:

Oswal Pumps Limited
("Company")
Oswal Estate, NH-1, Kutail Road, P.O. Kutail,
Karnal, Haryana – 132037, India

Oswal Solar Structure Private Limited
("OSSPL" or **"Subsidiary")**
Oswal Estate, NH-1, Kutail Road, P.O. Kutail,
Karnal, Haryana, India, 132037

Capital Expenditure Report for the Proposed Project by Oswal Solar Structure Private Limited
for the Manufacturing Unit at Karnal, Haryana

By:
LSI Engineering & Consultants Limited

Dated 26/05/2025

DISCLAIMER

Date: 26/05/2025

LSI Engineering & Consultants Limited has prepared this Capital Expenditure Study (CAPEX) on 26/05/2025 for the establishment of an expanded manufacturing infrastructure for PV Modules, EVA Encapsulant, and Aluminium Frames. This expansion is a strategic move to develop a fully integrated solar PV value chain, ensuring in-house production of key components and enhancing manufacturing efficiency.

Oswal Solar Structure Private Limited (OSSPL) plans to establish a 1,500 MW Solar PV Module manufacturing unit, two EVA Encapsulant manufacturing units, and an Aluminium Frame manufacturing unit. To facilitate this expansion, the PV Module and EVA Encapsulant production units will be developed at a new facility located at 1118, GT Road, Opposite Neelkanth Star Dhaba, 71/3 Delhi Side Milestones, Karnal (132001), Haryana. Meanwhile, the Aluminium Frame manufacturing unit will be integrated into OSSPL's existing facility at Opposite DD International Pvt Ltd, Link Road, Village Kutail, District Karnal, Haryana, India, 132037, where the company currently operates a 570 MW solar module manufacturing facility.

OSSPL has been engaged in solar module manufacturing for some time, and this expansion will significantly enhance its production capacity, supply chain efficiency, and market competitiveness. By consolidating key manufacturing processes, the company aims to create a self-sustained, high-performance solar module manufacturing ecosystem.

This report has been compiled with the utmost diligence, based on information provided by Oswal Solar Structure Private Limited. Additionally, I have carefully reviewed all relevant quotations, supporting documents, and project execution details. The assessment and recommendations are based on my extensive experience in handling similar project reports.

EXECUTIVE SUMMARY

Project Highlights:

Table 1: Project Highlights

<table>
<tr><td>Company</td><td>Oswal Solar Structure Private Limited (“OSSPL”)</td></tr>
<tr><td>Constitution</td><td>Private Limited Company</td></tr>
<tr><td>Registered Office Address of the Company</td><td>Oswal Estate, NH-1, Kutail Road, P.O. Kutail, Karnal, Haryana, India, 132037</td></tr>
<tr><td>Reg. / CIN No.</td><td>U29200HR2022PTC100779</td></tr>
<tr><td>Date of Incorporation</td><td>21/01/2022</td></tr>
<tr><td>Proposed Project Site Address</td><td>The company intends to manufacture Aluminum Frames at its existing facility, located at Opposite DD International Pvt Ltd, Link Road, Village Kutail, District Karnal, Haryana, India, 132037, with a total area of 20 Kanal 0 Marla.

Additionally, the company plans to establish a 1,500 MW Solar PV Module manufacturing unit and two EVA Encapsulant manufacturing units at its new facility, located at 1118, GT Road, Opposite Neelkanth Star Dhaba, 71/3 Delhi Side Milestones, Karnal (132001), Haryana.</td></tr>
<tr><td>Board of Directors</td><td><table><tr><th>Sr. No.</th><th>Director Name</th><th>DIN Number</th></tr><tr><td>1</td><td>Vivek Gupta</td><td>00172835</td></tr><tr><td>2</td><td>Amulya Gupta</td><td>08500306</td></tr><tr><td>3</td><td>Shivam Gupta</td><td>08500323</td></tr></table></td></tr>
<tr><td>Products</td><td>Solar PV Module, Aluminium Frame and EVA Encapsulant</td></tr>
<tr><td>Business Classifications</td><td>The Company is currently operating a PV module manufacturing facility</td></tr>
<tr><td>Scope of the Report</td><td>To prepare this report for the project to be undertaken by Oswal Solar Structure Private Limited at its existing and new facilities in Haryana.</td></tr>
<tr><td>Financial Indicators</td><td>Proposed Project Cost<table><tr><th>Sr. No.</th><th>Particulars</th><th>Cost in ₹ Millions</th></tr><tr><td>1</td><td>Equipment, Plant & Machinery</td><td>1,879.26</td></tr><tr><td>2</td><td>Freight/Transportation Charges for Machinery</td><td>54.49</td></tr><tr><td>3</td><td>Utility</td><td>304.51</td></tr></table></td></tr>
</table>

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4	Civil Work	489.32
5	Furniture & Fixtures	-
6	Office Equipment	-
7	Miscellaneous (Contingencies)	-
	Total Hard Costs (A)	2,727.58
	Other Soft Costs including Deposits, Margin Moneys, etc. (B)	0.00
	Total Project Cost (A + B)	2,727.58

Means of Finance:

Particulars	In ₹ Million	%
Internal Accruals	0.00	0.00%
From the Proceeds of the IPO	2,727.58	**100.00%**
Total	2,727.58	**100.00%**

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TABLE OF CONTENTS

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LIST OF TABLES

1. BRIEF BACKGROUND OF THE COMPANY AND PROMOTERS

Oswal Solar Structure Private Limited (OSSPL) is a leading manufacturer specializing in **solar PV** modules, dedicated to sustainability and advancing a greener future. Established in 2022, the company has been committed to innovation and excellence in solar energy solutions.

OSSPL has been manufacturing solar PV modules for some time at its existing facility, which has a production capacity of 570 MW, located at Opposite DD International Pvt Ltd, Link Road, Village Kutail, District Karnal, Haryana, India, 132037.

OSSPL manufactures high-performance solar PV modules using advanced technology and strict quality control. Its durable, efficient modules meet industry standards and evolving energy needs. Committed to innovation, OSSPL drives the shift toward sustainable energy solutions.

Table 2: Details of Directors in OSSPL

Name	Age (Years)	Qualification	Occupation	Experience (Years)	Designation
Mr.Vivek Gupta	55 Years	Bachelor's degree in commerce from Kurukshetra University, Haryana	Business	18+ years	Director
Mr. Amulya Gupta	30 Years	Bachelor's degree of science in business and management studies from University of Bradford, Bradford, West Yorkshire	Business	5+ year	Director
Mr. Shivam Gupta	28 Years	Bachelor's degree in commerce from University of Delhi, New Delhi and a master's degree in management from University of Liverpool, Liverpool	Business	3+ years	Whole Time Director

Details of Key Managerial Personnel

Table 3: Details of Managerial Personnel in OSSPL

Name	Designation
Key Managerial Personnel	
Shivam Gupta	Whole-time director
Manoj Kumar	Chief financial officer
Priyanka Kud	Company secretary

The Company is led by its promoter, namely Oswal Pumps Limited. The key managerial personnel of the Company are Manoj Kumar, the chief financial officer, Priyanka Kud, the company secretary, and Mr. Shivam Gupta, the whole time director.

2. PROMOTERS, BOARD OF DIRECTORS & KEY MANAGEMENT TEAM

Oswal Pumps Limited, established in 2003, is a leading Indian manufacturer specializing in solar pumps, submersible pumps, electric motors, and related components. With a state-of-the-art manufacturing facility and a strong focus on quality, innovation, and energy efficiency, the company has earned ISO 9001:2015 certification and multiple industry recognitions, including the National Udyog Rattan Award. Oswal Pumps Limited has a well-established domestic and international presence, exporting its products to over 20 countries. Leveraging its technological expertise and extensive manufacturing capabilities, the company is playing a key role in supporting Oswal Solar Structure Private Limited (OSSPL) in developing a fully integrated solar PV module manufacturing facility.

The Company's board of directors comprises executive and non-executive. Details of the present board of directors are given in the tables below:

Table 4: Details of Directors in OPL

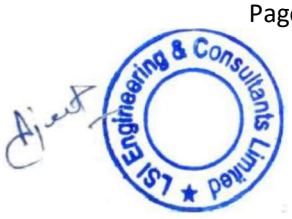
Name	DIN Number	Date of Appointment	Occupation	Designation
Amulya Gupta	08500306	21/01/2022	Non Executive Director	Non Executive Director
Vivek Gupta	00172835	21/01/2022	Non Executive Director	Non Executive Director
Shivam Gupta	08500323	01/04/2023	Whole-time director	Whole-time director

A brief description on key managerial personnel and the senior management team is provided below:

The Company has a very abled and dedicated team of professionals to lead various departments. Details of the Key Managerial Personnel are given in the tables below:

Table 5: Details of Managerial Personnel in OPL

Name	Age (Years)	Qualification	Experience (Years)	Designation
Key Managerial Personnel				
Shivam Gupta	28	B.Com, Master's degree in management	3+ Years	Whole Time Director
Manoj Kumar	40	B.A, CA Inter	20+ Years	Chief financial officer
Priyanka Kud	32	B.Com, CS, LLB	6+ Years	Company secretary



3. PRODUCTS AT OSSPL

As on the date of this Report, the product portfolio of OSSPL comprised of Solar PV Modules. According to the Report, in FY 23-24 the Company was in terms of sale of ₹ 593.22 million

Products Developed at OSSPL:

Solar Vertical

Table 6: Products at OSSPL

Sr. No.	Name
1	Solar PV Module

4. MANUFACTURING PROCESS & MANUFACTURING PHILOSOPHY

4.1 Manufacturing of solar PV (photovoltaic) Modules:

Involves a series of highly controlled and precise processes to ensure the efficiency and durability of the final product. Here's a step-by-step Manufacturing Process:

The process step by step mentioned below:-

- Stringer machine
- Glass feeder
- Lay-up
- Bussing
- Electroluminescence testing and inspection
- Rework
- Visual Inspection
- Laminator
- Frame Assembling
- Junction Box Fitting
- Module cleaning and packing

- **Stringer Machine**: - Stringer machine welder Fig.1 allows soldering without mechanical and thermal stress, which is indicated for very thin solar cells and for ribbon cells. The machine is available also with laser soldering system that is indicated also for lead free ribbon. Thanks to the high flexibility the machine is suitable for all types of standard photovoltaic modules but also for BIPV modules.

Figure 1: Stringer Machine

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- **Glass Feeder: -** When selecting a solar panel brand, people usually take a close look at topics such as the efficiency and wattage of a solar PV panel. An often-overlooked issue is the type of solar panel glass used as shown in Fig.2. Solar panel glass is one of the important barriers which protect solar photovoltaic cells against damaging external factors, such as water, vapor and dirt. The solar panel glass also offers low reflection, high transmissivity and high strength.

Figure 2: Glass Feeder

- **Lay-Up**:- Observation of the Lay-up process until familiarity was felt with the process.
- The workers would load the Ethylene-Vinyl Acetate (EVA) covered glass onto the Lay-Up table Fig.3; the strings were already arranged on it during the Tabbing & Stringing process. This was the first step of the Lay-Up process.
- The workers would tear up small pieces of adhesive tape and apply them on the cells to hold them in place. The time recording for this step was divided into two sub-steps – tearing of tape, and its deposition on the cells.
- Placements of a second layer of EVA sheet, polymer back-sheet and soldering strips were recorded in a similar way.
- The soldering operation of bus-bars with the string ribbons was recorded by breaking the operation into picking up the soldering iron, soldering, and placing their on back.
- Finally, allowances of 10 seconds and 5 seconds were given for the top-edge and bottom-edge operations respectively

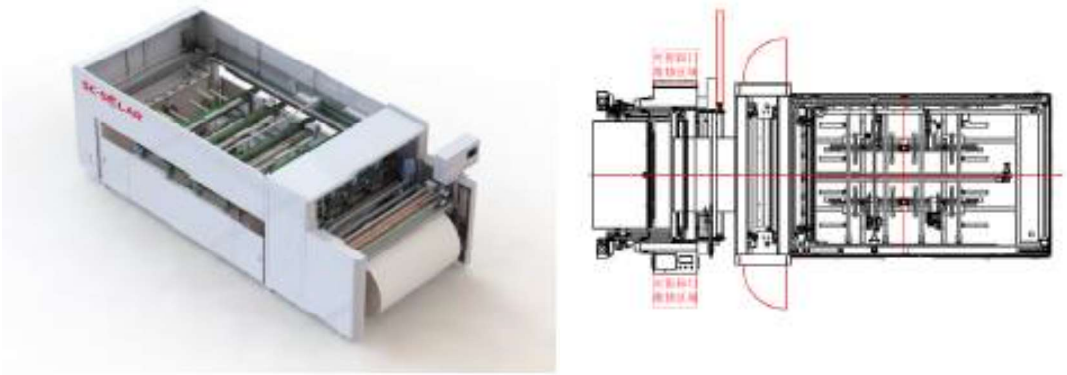

Figure 3" Lay-up Table

- **Bussing:-** In the bussing method of PV cells auto bussing machine adopts the method of separating the cell string from the glass and grab the Figure 4: Separation of Cell and its interconnection Cell string in the air, then it is to be interconnected solder to the head, middle and tail bus bar of the middle wire edition module at a certain height; it has the function of a roll feeding bus bar, bending U and L leads upwards Fig.5.

Figure 4: Bussing Machine

- **Electroluminescence Testing and Inspection: -** When current passes through PV cells, light emission occurs. This phenomenon is called Electroluminescence. Testing of modules using this phenomenon can detect hidden defects in the structure of PV cells. This method makes the current distribution visible in the PV module and helps detect defects. With the help of an EL test Fig.5, a PV manufacturer can evaluate the structural quality of the PV cells or any other defects generated while handling.

Figure 5: EL Test

- **Rework** Defects that can be found from EL testing machine and inspection machine are as given below.
  - Micro cracks.

- Cell cracks.
- Soldering defects.
- PID defects.
- Diode failure.
    - Dead cell.
    - Back sheet scratches.
    - Wafer defects.

Figure 6: Visual Inspection

- **Visual Inspection** Visual inspection of a PV module is performed before and after the module has been subjected to environmental, electrical or mechanical stress testing in the laboratory. Stress tests are usually used to evaluate module designs in the pre-phase of production, production quality and lifetime of the module.

Figure 7: Visual Inspection

- **Laminator** In order to laminate a solar panel Fig.8, two layers of Ethylene-Vinyl Acetate (EVA) are used in the sequence: glass / EVA / solar cell strings / EVA / tedlar polyester tedlar (TPT). Now it is ready for lamination. During the lamination process, the prepared 5-layer module is placed in the lamination machine and heated to maximum 135°C for a period of approximately 22 minutes. The laminate that comes out is complete.

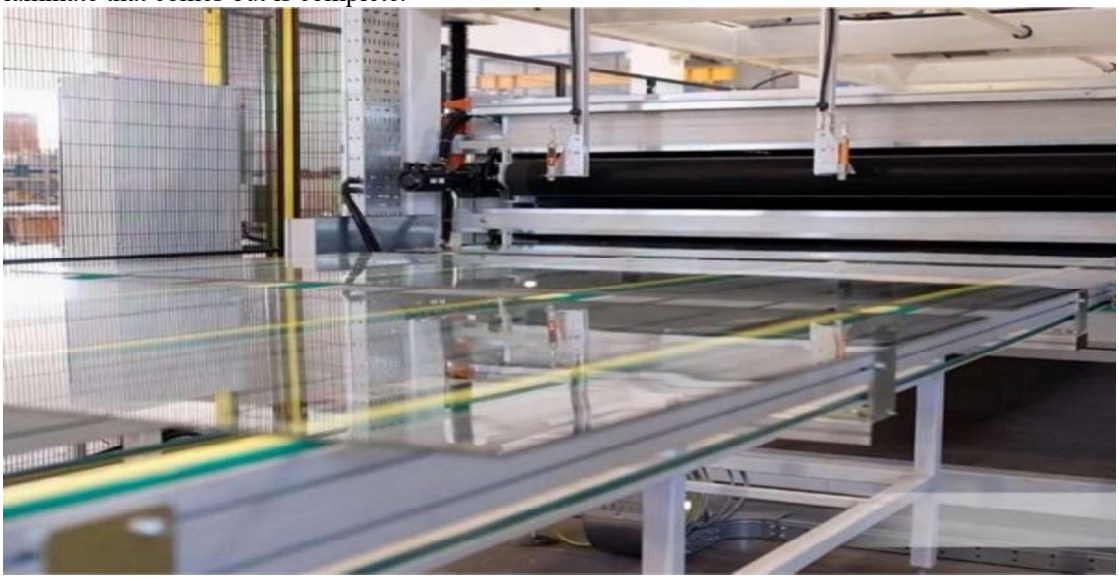

Figure 8: Laminator

- **Junction Box Fitting** A junction box Fig.9 has bypass diodes that keep power flowing in one direction and prevent it from feeding back to the panels. Frank Rosenkranz, product manager of solar for EMEA, India and Americas for connector and junction box manufacturer TE Connectivity, described the junction box as the "most important part on a panel". "Every string is protected by a diode (in the junction box)." He said, "The diode is the gateway that allows an endless stream of power".

Figure 9: Junction Box Fitting

- **Frame Assembling** The auto-framing machine Fig.10 frames the post-laminate, assembling four aluminium rails around the glass.
  - Adjustable panel dimensions
  - Automatic silicon dispensing system.
  - Manual frame loading
  - Controlled frame insertion.
  - Frame loading buffer as an option.
  - Optional frame loading buffer

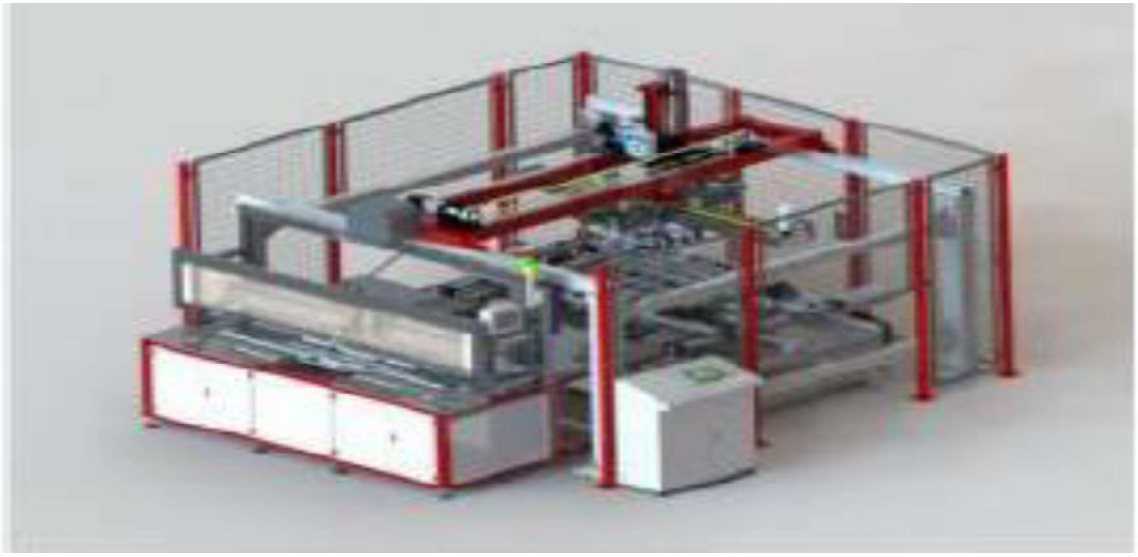

Figure 10: Frame Assembling

- **Module Cleaning and Packing**:- If you are able to safely climb up the roof for a closer wash, you can use isopropyl alcohol to clean oily smudges without leaving any marks. We don't recommend detergent or soap to clean stubborn stains, as they tend to leave residue on panel glass that can attract more dirt in the future.

  Make sure you do not stand on the solar modules under any circumstance. Any pressure on the solar panel's risk creating micro cracks that can reduce energy output. Packing of solar modules Solar panels are typically either horizontally or vertically stacked in a box. Usually, separators are placed between each module, and extra protections are added to the four corners of each module stack.

  In some cases, modules are also packed in individual cartons boxes to be packed into a large master carton box. The box on the pallet is then sealed and strapped followed by being wrapped in plastic film. Solar panels are then usually shipped via ocean on pallets, holding on average 28-30 panels and – depending on order quantities, with extra few panels stacked on top in extra small cartons.

4.2 Aluminium Frame

The step-by-step process involves: -

- Selection of Raw Materials
- Quality Check of Raw Material
- Extrusion of Aluminium Frame
- Aluminium Frame Straightening
- Aging
- Aluminium Frame Sandblasting
- Anodizing
- Aluminium Frame Coating
- Aluminium Frame Sawing
- Frame Punching
- Short Side and Corner Codes
- Inspection of Solar Aluminium Frame
- Packing

- **Selection of Raw Materials**
  The selection of raw materials is very strict, the content of each element must meet the following standards: Si 0.38-0.42%, Mg 0.53-0.57, Fe<0.18%, Chemical Composition is the Determinant of Aluminium Profile Performances

- **Quality Assurance of Raw Material:** Once obtained, the aluminium undergoes a rigorous quality check to ensure it meets specific requirements for solar panel production. The metal is then cleaned to remove any impurities, such as oxides or residues that may hinder efficient panel formation.

- **Extrusion of Aluminium Frame**: The aluminium round casting rod is placed into the extruder, where it is extruded and shaped by the aluminium frame mold. It is then immediately cold quenched and rapidly cooled.

  Extrusion Press

Figure 11: Extrusion Press

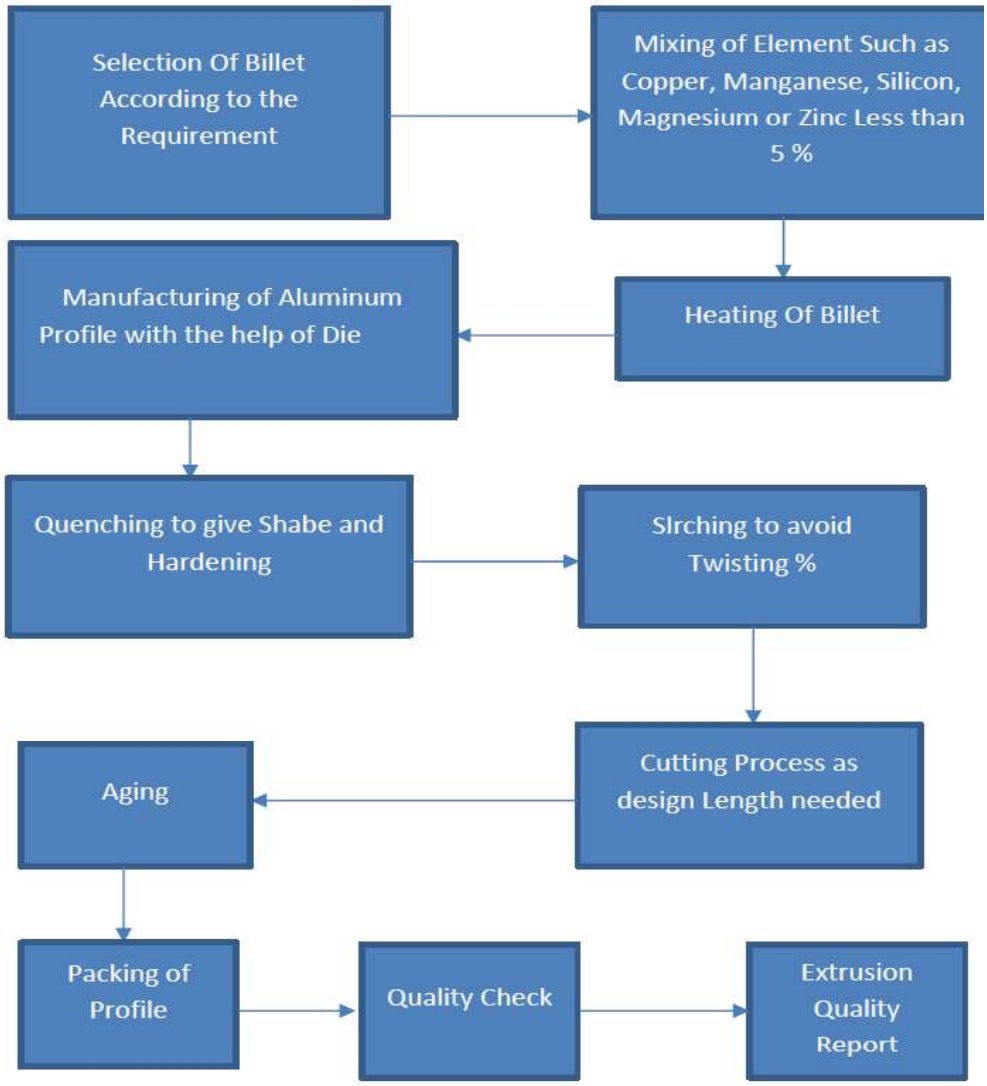

Figure 12: Extrusion Process

- **Aluminium Frame Straightening**: The freshly extruded aluminium profile is soft and may become bent or deformed, requiring straightening. The head and tail are then sawed off, and the profile is sent to the aging furnace for heat treatment.

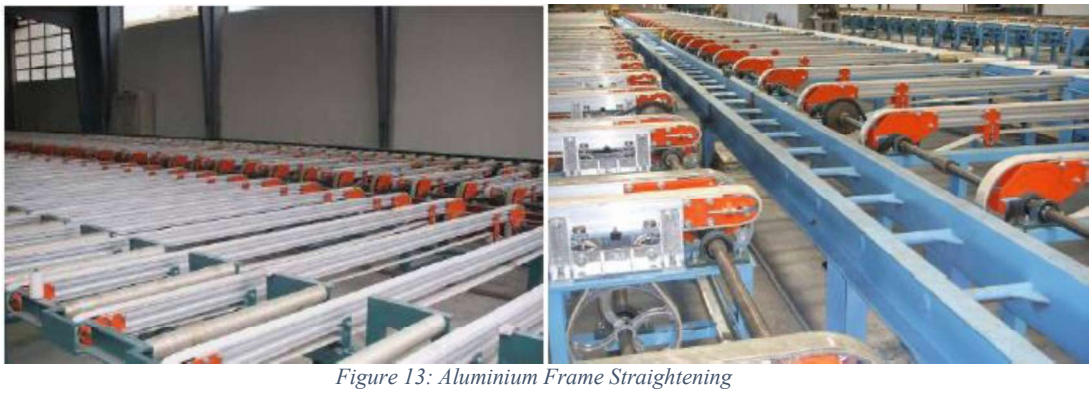

Figure 13: Aluminium Frame Straightening

- **Aging**: The aluminium profile is heated to a specific temperature and held for a set period, greatly improving its strength.

Figure 14: Aging

- **Aluminium Frame Sandblasting**: The aged aluminium profile is sent to a sandblasting machine for surface treatment. Sandblasting gives the surface a matte finish, enhancing its appearance.

Figure 15: Aluminium frame sandblasting

- **Anodizing**: The surface of the solar frame undergoes anodizing to enhance corrosion resistance. Generally, the oxide film on solar frames is thicker than on other materials, resulting in better corrosion resistance. There are two types of anodizing: black oxidation and natural oxidation. The difference between the two is an additional step in black oxidation, where the frame is immersed in a black metal salt solution before sealing, allowing the salt to be absorbed into the oxide film's pores.

Figure 16: Anodizing

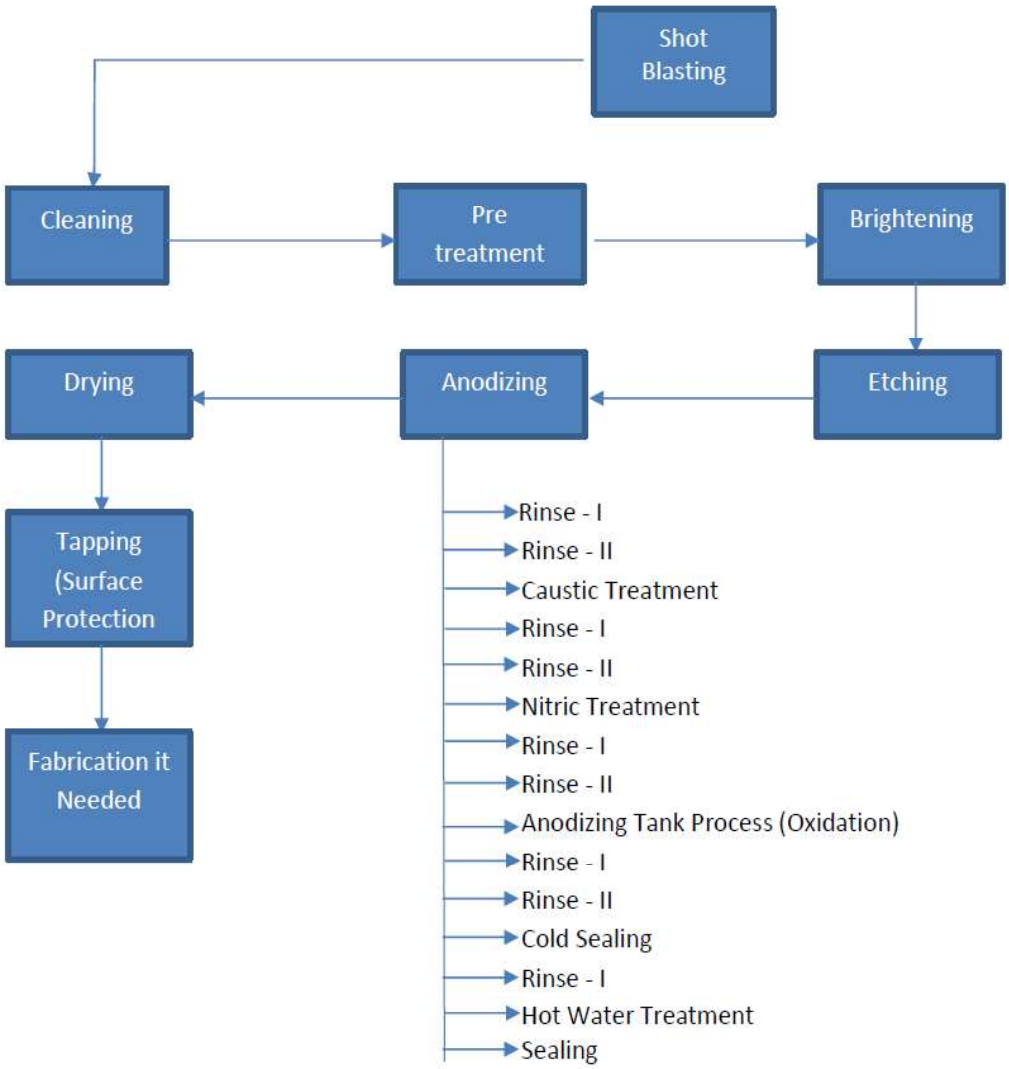

Figure 17: Anodizing Process

- **Aluminium Frame Coating**: Due to high surface quality requirements, the anodized aluminium profile must be coated to avoid any scratches.

- **Aluminium Frame Sawing**: The frame is cut according to the specified dimensions for the long and short sides using a double-ended saw with a 45-degree bevel, allowing for precise cuts in one step.

Figure 18: Aluminium Frame sawing

- **Frame Punching**: Mounting holes, grounding marks, and riveting points are punched using a combination die, which completes all steps in one go.

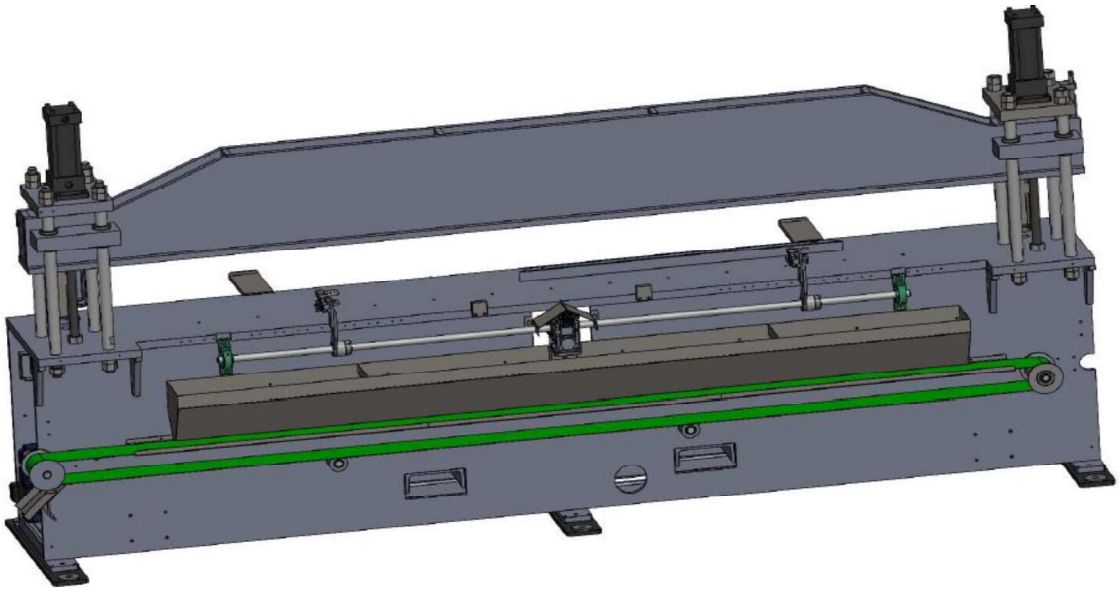

Figure 19: Frame Punching

- **Short Side and Corner Codes**: The two ends of the short side are fitted with corner codes, drilled, and riveted to ensure the corner codes are securely fixed.

Figure 20: Short side and Corner codes

- **Inspection of Solar Aluminium Frame**: Both machine and manual inspections are conducted. The stamped frame is placed on an inspection table to verify dimensions and check for any missing processing steps. A manual inspection follows to ensure there are no scratches, black spots, uneven color, or other defects.

Figure 21: Machine and Manual Inspection

- **Packing**: After inspection, the long and short sides are placed into their respective pallets, with paper separating each layer to prevent scratches. The pallets are then wrapped in plastic and secured with wrapping tape. For export, the pallets are fixed with wooden boards and packed into cartons.

Figure 22: Packing

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4.3 EVA Encapsulate

The manufacturing process of EVA (Ethylene Vinyl Acetate) sheets for solar applications involves several critical steps to ensure the production of high-quality encapsulant materials. Here's a detailed breakdown of the process:

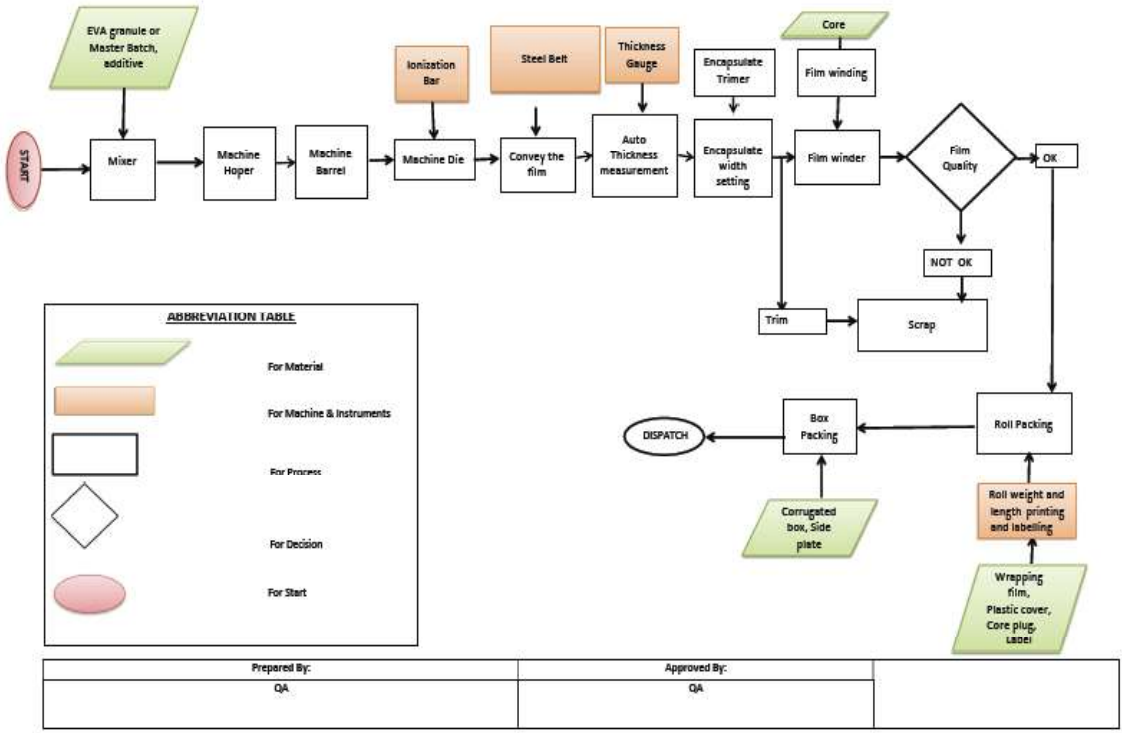


Figure 23: Flow Chart of EVA Encapsulant

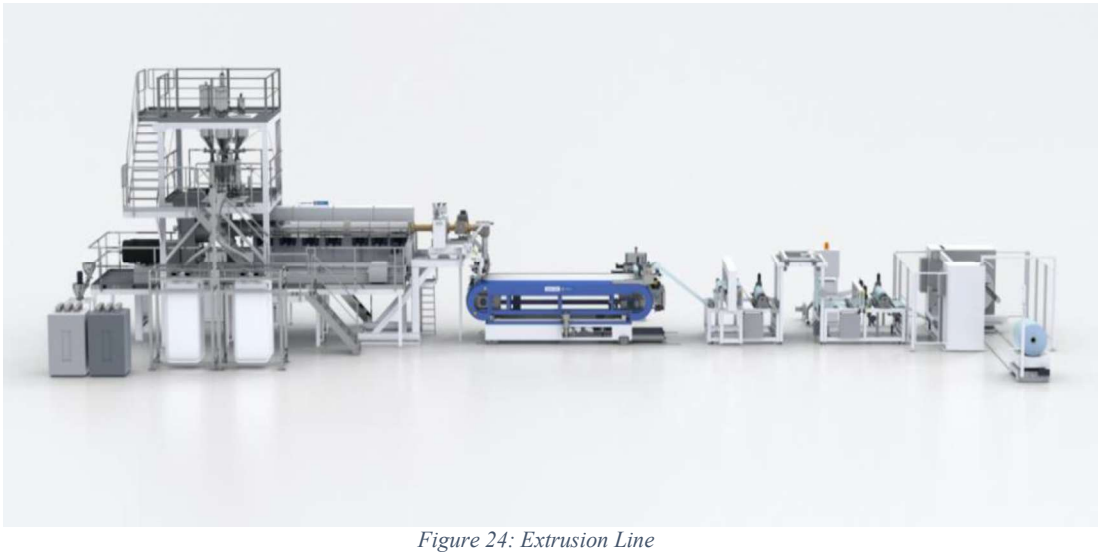


Figure 24: Extrusion Line

i. Raw Material Selection and Preparation

- **Ethylene and Vinyl Acetate**: The primary raw materials are ethylene and vinyl acetate. The percentage of vinyl acetate in the copolymer affects the properties of the EVA sheet.
- **Additives**: Additives such as UV stabilizers, antioxidants, and curing agents are mixed with the EVA copolymer to enhance performance.

Figure 25: Raw Material - Ethylene and Vinyl Acetate

ii. Compounding

- **Mixing**: The raw materials and additives are mixed in a compounding extruder. This step ensures a uniform distribution of all components.
- **Melting**: The mixture is heated and melted to form a homogenous blend. The temperature must be controlled precisely to avoid degradation of the materials.

Figure 26: Compounding

iii. Extrusion

- **Extruder**: The homogenous melt is fed into an extruder. The extruder shapes the molten EVA into a continuous sheet.

- **Sheet Formation**: The molten EVA is passed through a die to form a sheet of the desired thickness. The die controls the width and thickness of the EVA sheet.

Figure 27: Extrusion

iv. Calendaring

- Calendaring Rollers: The extruded sheet passes through calendaring rollers, which further refine the thickness and surface smoothness. This step ensures a uniform sheet thickness and smooth surface finish.

Figure 28: Calendaring

v. Cooling

- **Cooling Rollers**: After calendaring, the EVA sheet is passed through cooling rollers or a cooling belt. This step solidifies the sheet and prevents deformation.
- **Temperature Control**: Proper temperature control is critical to avoid internal stresses and ensure dimensional stability.

Figure 29: Cooling Rollers

vi. Winding and Cutting

- **Winding**: The cooled EVA sheet is wound onto rolls for easy handling and storage. The winding tension must be controlled to prevent stretching or deformation.
- **Cutting**: The EVA sheets are cut to the required dimensions for further processing or customer specifications.

Figure 30: EVA Encapsulant after Cutting and winding

vii. Quality Control

- **Thickness Measurement**: The thickness of the EVA sheets is measured to ensure it meets specifications.
- **Surface Inspection**: The surface of the sheets is inspected for any defects such as bubbles, voids, or impurities.
- **Mechanical Properties Testing**: Samples of the EVA sheets are tested for tensile strength, elongation, and other mechanical properties.
- **Thermal and UV Stability Testing**: The EVA sheets are tested for their thermal and UV stability to ensure long-term performance in solar applications.

Figure 31: Thermal and UV stability testing

viii. Packaging and Storage

- **Protective Film**: A protective film is applied to the EVA sheets to prevent contamination and damage during handling and transportation.
- **Packaging**: The EVA sheets are packaged in moisture-proof and UV-protected packaging to maintain their quality during storage and transit.
- **Storage Conditions**: The packaged EVA sheets are stored in a controlled environment to prevent exposure to extreme temperatures, humidity, and UV light.

Figure 32: Packaging

i) Additional Considerations

- **Curing:** In some processes, EVA sheets are pre-cured to improve their handling characteristics. This involves partial cross-linking of the polymer.
- **Quality Assurance**: Continuous monitoring and quality assurance practices are employed throughout the manufacturing process to ensure consistency and reliability.

By following these detailed steps, manufacturers can produce high-quality EVA sheets that meet the stringent requirements of the solar industry, ensuring effective encapsulation and long-term performance of photovoltaic modules.

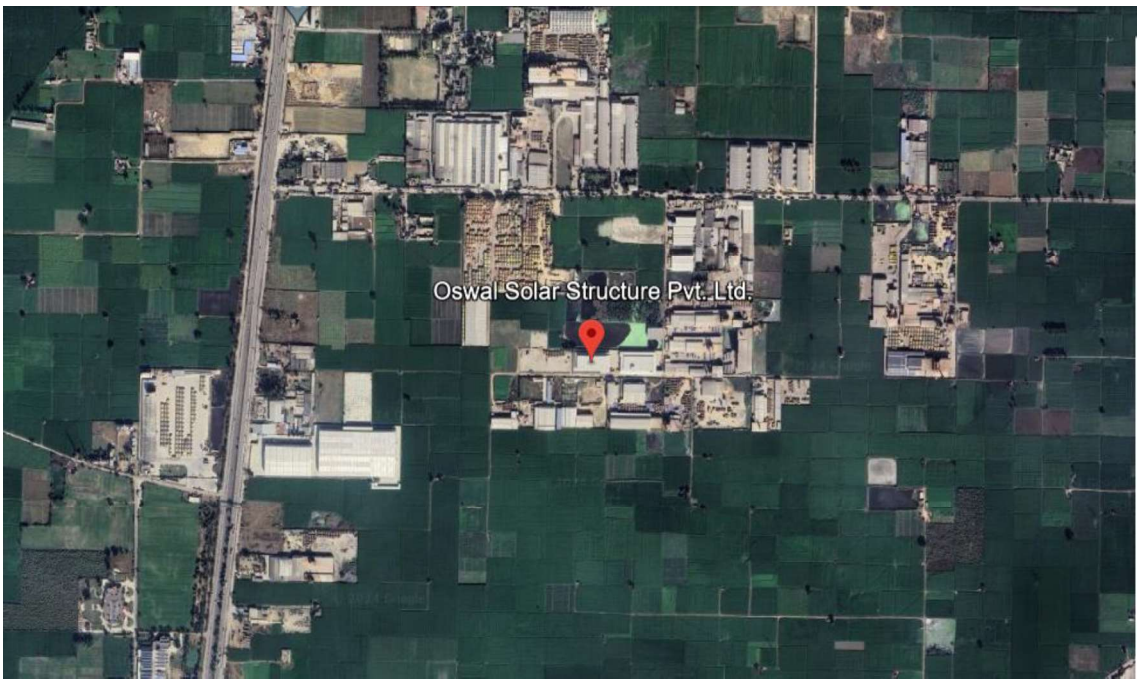
5. EXISTING FACILITY

As on the date of this Report, OSSPL operates a 570 MW solar module manufacturing facility in Karnal, Haryana, where it has been producing PV modules.

Table 7: Existing Facility

Sr. No.	Location	Facility Type (Manufacturing Facility / R&D Facility / Warehouse / Depot)	Area (in sq. metres.)	Owned / Lease
1.	Khewat No. 1112, Khotoni No. 1328, Murabba No. 156 Killa No. 2/2(1-1), 3(7-2), 4(7-2), 5/2/1(4-15) Kite 4 Rakba, Village. Kutail, Tehsil., Gharounda, Distt-Karnal, Haryana - 132037	570 MW Manufacturing Facility of Solar PV Module	11,002	Lease With Sh. Amulya Gupta (Lessor) The lease deed was signed for 15 years (which can be extended for another period as mutually agreed) commencing from August 16, 2024 to August 15, 2039

The same are demographically presented in the picture below:



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Statutory Clearances and Licenses OSSPL has been awarded till this day:

The Company has been successful in obtaining various licenses / certificates / approvals / permissions well in time.

Below mentioned are some of the certificates / permits / approvals / licenses that the Company has procured / availed / been awarded:

Table 8: Details of Approval/Licenses, OSSPL has availed

S.No	Document Name	Document No,	Issued by	Issue Date	Expiry Date
1	BIS	REG: CRS 2023-4578/R-91013935 Licence: R-91013935	Bureau Of Indian Standards	26/09/2023	25/09/2025
2	GST Registration Certificate	06AADCO6824E1ZL	Government of India	03-02-2023	NA
3	Consent to operate	313129024KARCTO52518878	Haryana State Pollution Control Board	28/03/2024	31/03/2027
4	Consent to establish (Existing Facility)	No. HSPCB/Consent/ :313129023KARCTE37706459	Haryana State Pollution Control Board	21-06-2023	20-06-2028
5	Certificate of Importer Exporter Code	IEC - AADCO6824E File No. - PNPIECPAMEND00000773AM25	Ministry of Commerce and Industry, Directorate General of Foreign	13-03-2023	NA

			Trade, Government of India		
6	LEI Registration	LEI - 984500D508XA5F73DQ04	LEI Register India Private Limited	15-07-2023	15-07-2026
7	ISO 9001:2015	IQ-23120401	Intercontinental Systemcert Pvt. Ltd. (Formerly Known as Indraprastha Systemcert Pvt. Ltd.)	26-11-2024	03-12-2025
8	ISO 14001:2015	IE-23120401	Intercontinental Systemcert Pvt. Ltd. (Formerly Known as Indraprastha Systemcert Pvt. Ltd.)	26-11-2024	03-12-2025
9	ISO 45001:2018	IO-23120401	Intercontinental Systemcert Pvt. Ltd. (Formerly Known as Indraprastha Systemcert Pvt. Ltd.)	26-11-2024	03-12-2025
10	Office Memorandum – ALMM	NA	Grid Solar Power Division Ministry of New & Renewable Energy	24-05-2024	NA
11	Pollution Certificate	313129023KARCTE3770 6459	Haryana State Pollution Control Board	21/06/2023	20/06/2028
12	Registration - Cum - Membership Certificate (RCMC)	RCMC/ECSEPC/00051/2 022-2023	EEPC India (formerly Engineering Export Promotion Council)	10/05/2025	31-03-2026
13	Tax Deduction Account Number (TAN)	RTKO03013D	Income Tax Department, Government of India	22-01-2022	NA
14	Udyam Registration Certificate	UDYAM-HR-10-0036916	Ministry of Micro, Small And Medium Enterprises, Government of India	24-02-2023	NA
15	PAN Card	AADCO6824E	Income Tax Department	NA	NA
16	Consent to Establish (New Facility)	329993524KARCTE8363 5280	Haryana State Pollution Control Board	04/12/2024	03-12-2029
17	Form INC-20A	NA	NA	05-02-2022	NA
18	FIRE NOC	Memo No: FS/2024/818	Director General Fire Service, Haryana, Punchkula	25-07-2024	3 years from issue
19	ESI LICENSE	24000855610000999	Employees State Insurance Corporation	21-01-2022	NA

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20	PF License	HRKNL2564657000	Employees' Provident Fund Organisation	21-01-2022	NA
21	Standing Order	CSO/2024/21942	Joint Labour Commission, Haryana Chandigarh	12-08-2024	NA
22	Factory License	KNL-ONLINE-CHD-O-401 KNL-ONLINE-CHD-O-402	Approved	24-12-2024	31-12-2025
23	Contract Labour	Reg No - CLA/PSA/KNL/LC-Cum-CIF/0010881 BIP ID -38694 Application ID - 47888	Obtained	19-09-2024	NA
24	BOCW Act Registration	20578, Dated 22-01-25	Industrial Safety and Health	28-01-2025	31-03-2028

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6. METHODOLOGY

➢ **METHODOLOGY:-**

1. SOLAR PV MODULE

- The first process in solar panel manufacturing is purifying the silicon from quartz sand. Once silicon is purified, it is collected into solid rocks. These rocks are then molten together, forming cylindrical ingots. A steel and cylindrical furnace is utilized to achieve the desired shape. When manufacturing is underway, there is a keen attention to have all atoms align in desired orientation and structure. Once the formed ingot cools, it is shinned and polished to leave flat sides. It is a fully automated process. Here we are using any cell of size greater than 72 mm. These cells are then assembled or soldered together.
- The upper Sun facing Side (Blue / Black side) is the negative part while the bottom white side is positive. Once the cells are stringed together, the machine transfers it to tempered glass, which already having ethylene vinyl acetate (EVA) encapsulation layer over it and then cells are examined by a technician for any fault or error in any string. After that a technician tapes the cells into a matrix alignment and forward the panels to the busing section and connections are then soldered together.
- Any excess material is cut out. The next step consists of insulating the connections by using a back sheet and EVA encapsulation. This process protects the module from any dust and moisture. The module is visually checked once again for any dust particle, color mismatch, etc. After that, EI Testing or Electroluminescence test is the real testing of the module made so far. It is a testing process, where the module is kind of scanned in an EI machine. We can easily spot any dead or low power cell, short circuit cells, cracks, etc. If any such error is spotted, the module is sent back for fixing the error. And now the module is laminated at 140-degree Celsius.
- This process takes approximately 20 minutes. After lamination, the modules are left for10-15 minutes to cool down till it reaches room temperature. This step involves cutting off the excess material of the back sheet to make perfectly shaped modules. After cutting of extra material the next step, frames of different sizes are cut out for bordering the panels. After assembling of aluminium frames, the silicon sealant is applied on the frame and pressed by a machine. A sealant protects the panels from air, dust, and moisture and helps the module to firmly attach on the frame. After the frame is attached to the module it is again sent to the framing machine, where it is punched to make sure it is permanently attached to the frame .
- A junction box is attached to the module using the sealant to firmly attach it to the structure. Connections are then soldered and left for 10-12 hours for curing, so that the structures are perfectly dry and attached properly. The module is then wiped outside to remove any traces or dust, foreign particles or extra sealant. After this process the module are connected to check its output current, voltage, power, etc. in a sun simulator. A report is generated for each module's output data. A back label (with all details) is pasted behind the module for the benefit of the users.
- Finally, the module is sent to the QC lab where it is tested for insulation resistance. A 3000V DC is passed through it for a minute. If the panel can endure the current, it is passed else failed. Then it is sent to Mechanical Load Test. After Final Quality Assurance (FQA), this is the last step in the module manufacturing process, where the modules are safely packed into large boxes for transportation and storage.

2. Aluminium Structure

- Extrusion of solar aluminium frame aluminium profile, put the aluminium round cast rod into the extruder, extrude it through the frame aluminium profile die, immediately air-cooled and quenched, and quickly cooled down.

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- The solar aluminium frame is straightened. The newly extruded aluminium profile is soft and will bend and deform, so it needs to be straightened by a straightening machine. Then saw off the ends and ends of the material and send it to the aging furnace.
- The aging of the solar aluminium frame is to increase the strength of the aluminium profile by heating to a certain temperature and holding it for a certain period of time.
- The solar aluminium frame is sandblasted, and the aged aluminium profile is sent to the sandblasting machine for surface sandblasting. The surface of the solar aluminium frame aluminium profile after sandblasting can form a matt effect.
- Anodizing, the surface of solar aluminium frame is anodized. In order to make the frame more corrosion-resistant, the oxide film thickness of the solar frame profile is generally thicker than the film thickness of the material, and the corrosion resistance is stronger.
- Generally, there are two types of solar aluminium frames: black oxidation and natural oxidation. The difference between black oxidation and natural color oxidation is one more process. The frame is put into a black metal salt solution before the hole is sealed, and the metal salt is adsorbed in the pores of the oxide film, and then the hole is sealed.
- Filming, because the solar aluminium frame surface requirements are very high, there can be no scratches, bumps, so the aluminium profile after oxidation treatment should be filmed.
- Sawing, according to the size requirements of the long and short sides of the solar aluminium frame, using a double-head saw, the saw blade is at a 45-degree oblique angle. In this way, a good one can be sawed in one step.
- The solar aluminium frame flushing hole, installation hole, grounding mark, punching riveting point, of which the falling water, installation hole and grounding mark can be completed in one step with a combination mold.
- The solar aluminium frame has corners on the short sides, and the corners on both ends of the short sides need to be plugged and riveted, so that the corners are fixed and will not loosen.
- Inspection of solar aluminium frame. This step includes machine inspection and manual inspection. The stamped frame is placed on the inspection table to check whether the processing size is qualified and whether there is any missing processing step. Then manually check whether there are scratches, black spots, uneven color, etc. on the surface.
- Solar aluminium framed pallets, the long and short sides after passing the inspection are respectively coded into their respective pallets, and each layer is separated by paper to prevent scratches. Then wrap it with stretch film and pack it with straps. If you need to export, you need to fix it with wooden boards, put it in a carton, and pack it.

3. EVA Sheet/Encapsulant

- Material Selection and Preparation
  - Selection: EVA resin is selected as the base material for encapsulation.
  - Additive Blending: EVA is blended with additives like UV stabilizers, curing agents, and antioxidants to improve its properties, such as UV resistance, mechanical strength, and durability.
- Extrusion Process
  - Melting: The blended EVA resin is melted in an extruder.
  - Sheet Formation: The molten EVA is extruded through a die to form a continuous sheet. The thickness of the sheet is precisely controlled.
  - Cooling: The extruded sheet is rapidly cooled using chill rollers or a water bath to solidify the material into its final form.
- Crosslinking and Curing
  - Incorporation of Curing Agents: Curing agents included during the extrusion initiate a crosslinking reaction.
  - Thermoplastic to Thermoset Conversion: Crosslinking converts the EVA from a thermoplastic to a thermoset, enhancing the sheet's mechanical strength and long-term stability.
- Cutting and Trimming

- Sheet Cutting: The cooled EVA sheet is cut into specific sizes according to the requirements of solar module manufacturers.
- Edge Trimming: The edges of the sheet are trimmed for uniformity and precise dimensions.

- Quality Control
  - Thickness Measurement: Consistency in thickness is verified.
  - Optical Testing: Transparency and light transmittance are tested to ensure optimal performance in solar modules.
  - Mechanical Testing: The sheet is tested for tensile strength and elongation to confirm its durability.
- Packaging and Storage
  - Vacuum Packing: The EVA sheets are vacuum-packed to prevent moisture absorption and contamination.
  - Controlled Storage: Sheets are stored in controlled environments to maintain quality before shipment.

7. PROPOSED PROJECT JUSTIFICATION

The Project Scheme Now Envisaged:

Oswal Solar Structure Private Limited (OSSPL) is embarking on a strategic expansion to develop a fully integrated solar PV manufacturing ecosystem at its facilities in Kutail, Karnal, Haryana. This initiative includes the establishment of:

- A 1,500 MW Solar PV Module Manufacturing Unit
- An Aluminium Frame Manufacturing Unit
- An EVA Encapsulant Manufacturing Unit

This expansion is designed to enhance operational efficiency, strengthen supply chain control, and position OSSPL as a leading player in the solar PV industry.

The company currently operates a 570 solar PV module manufacturing facility at Opposite DD International Pvt Ltd, Link Road, Village Kutail, District Karnal, Haryana, India, 132037. In addition, a new manufacturing facility is being developed at 1118, GT Road, Opposite Neelkanth Star Dhaba, 71/3 Delhi Side Milestones, Karnal (132001), Haryana.

The company has obtained the necessary licenses, approvals, and certifications for its existing facility and has already secured multiple approvals for the new facility. Additional licenses will be acquired as required at the appropriate stages. The presence of both facilities within Haryana offers a strategic advantage, as several regulatory approvals have already been obtained, streamlining the compliance process.

The company's expansion will take place in phases. The first phase is set to begin in August 2025, with commercial operations starting by December 2025. The second phase will follow in January 2026, with operations expected to begin by June 2026.

7.1 Facility Layout

7.1.1 Aluminium Frame Manufacturing Facility:

The Company plans to establish an Aluminium Frame Manufacturing Unit within its existing facility, which currently produces 570 MW of solar PV modules annually. The facility is located opposite DD International Pvt Ltd, Link Road, Village Kutail, District Karnal, Haryana, India, 132037

The facility is a two-story building:

- The Ground Floor houses the existing 570 MW solar PV module manufacturing setup, including module assembly, lamination, framing, testing, and final packaging.
- The First Floor will be constructed to accommodate machinery for aluminium frame manufacturing, including extrusion, cutting, processing, and profile packing.
- Additionally, the First Floor will have dedicated areas for dies storage, spares storage, and profile packing to support frame production.

Currently, only the ground floor is in use, while the first floor will be developed according to plan to smoothly incorporate aluminium frame manufacturing into the production process.

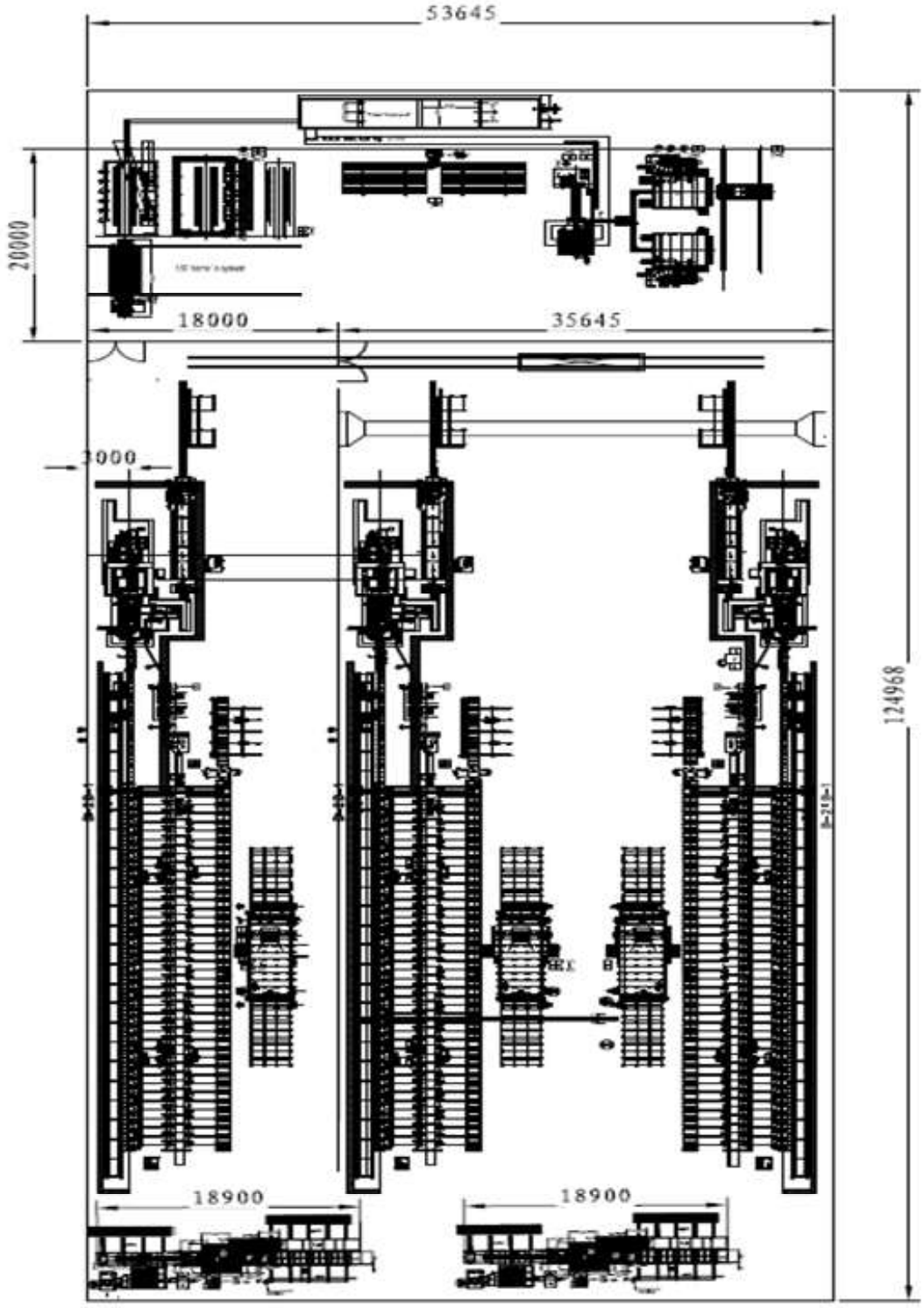

Figure 33: Layout of Ground Floor of the building

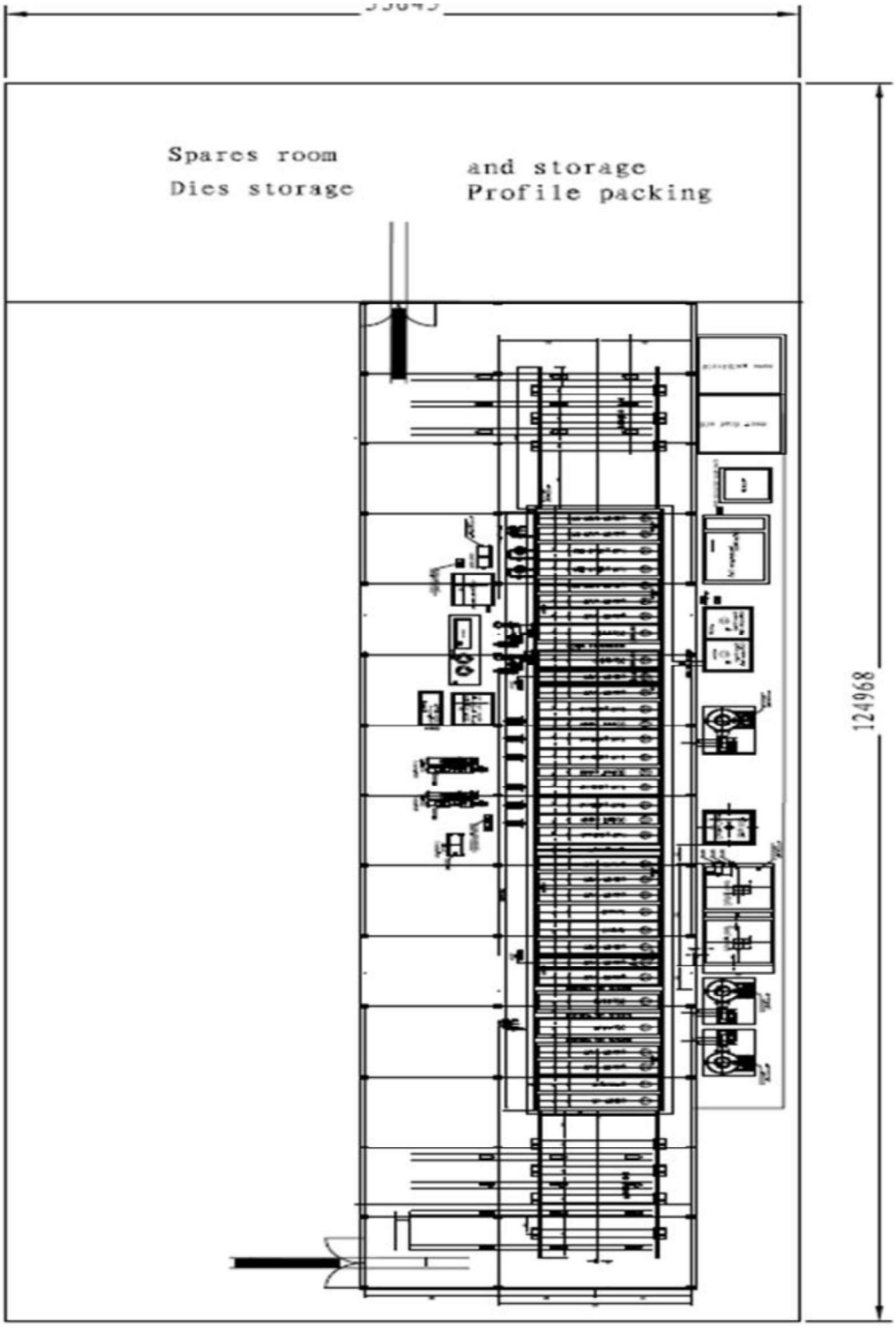

Figure 34:Layout of First Floor of the Building

7.1.2 Proposed New Facility for Module Manufacturing Facility & EVA Encapsulant:

The company has planned to establish its new facility at 1118, GT Road, Opposite Neelkanth Star Dhaba, 71/3 Delhi Side Milestones, Karnal (132001), Haryana, under a formal lease agreement between Sh. Vivek Gupta as the lessor and Oswal Solar Structure Private Limited as the lessee. The lease covers a total area of 13,983 square meters, with a monthly rent of ₹4,00,000, and is valid for 15 years, effective from 20/08/2024, with a provision for extension upon mutual agreement of both parties.

Table 9: Monthly rental of the land

Sr. No.	Particulars	UoM	Area	Per Unit Cost (₹)	Total Cost (in ₹ million)
1	• Manufacturing unit of PV Solar Module • EVA Encapsulant	Sq. Metres.	13,983	28.6	0.40
TOTAL					**0.40**

Layout Plan for the New Facility:

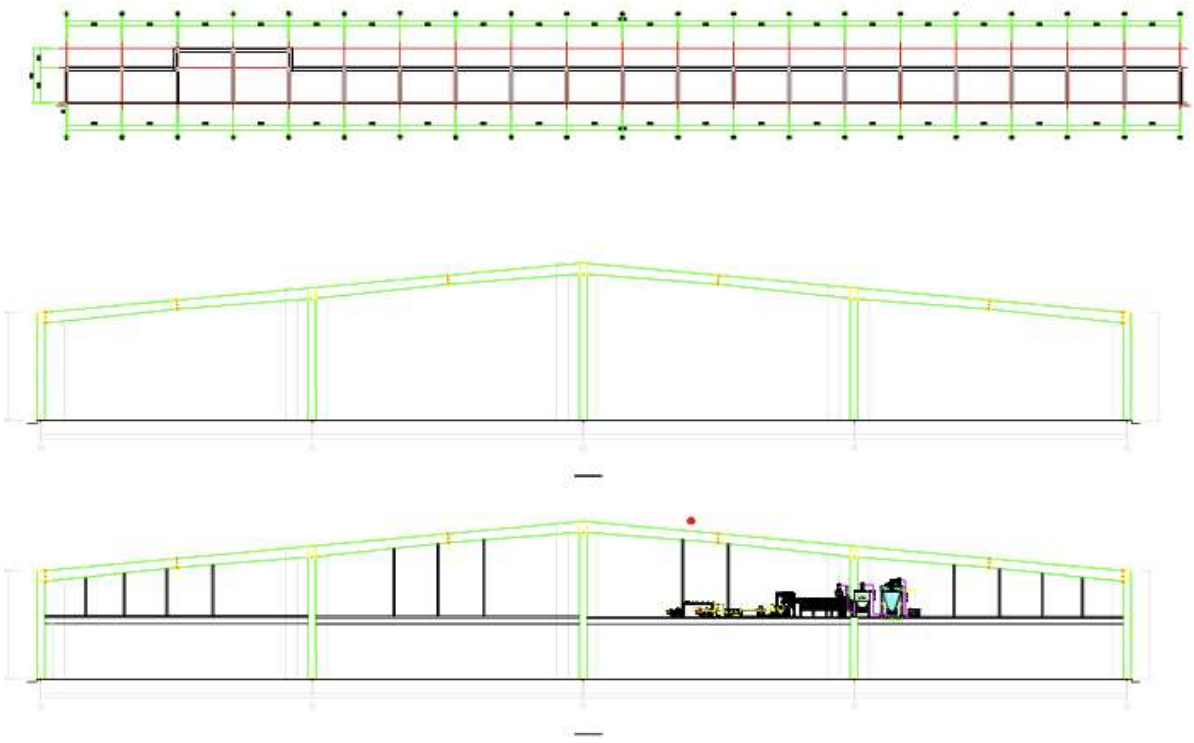

Figure 35: Manufacturing Facility Structural Plan

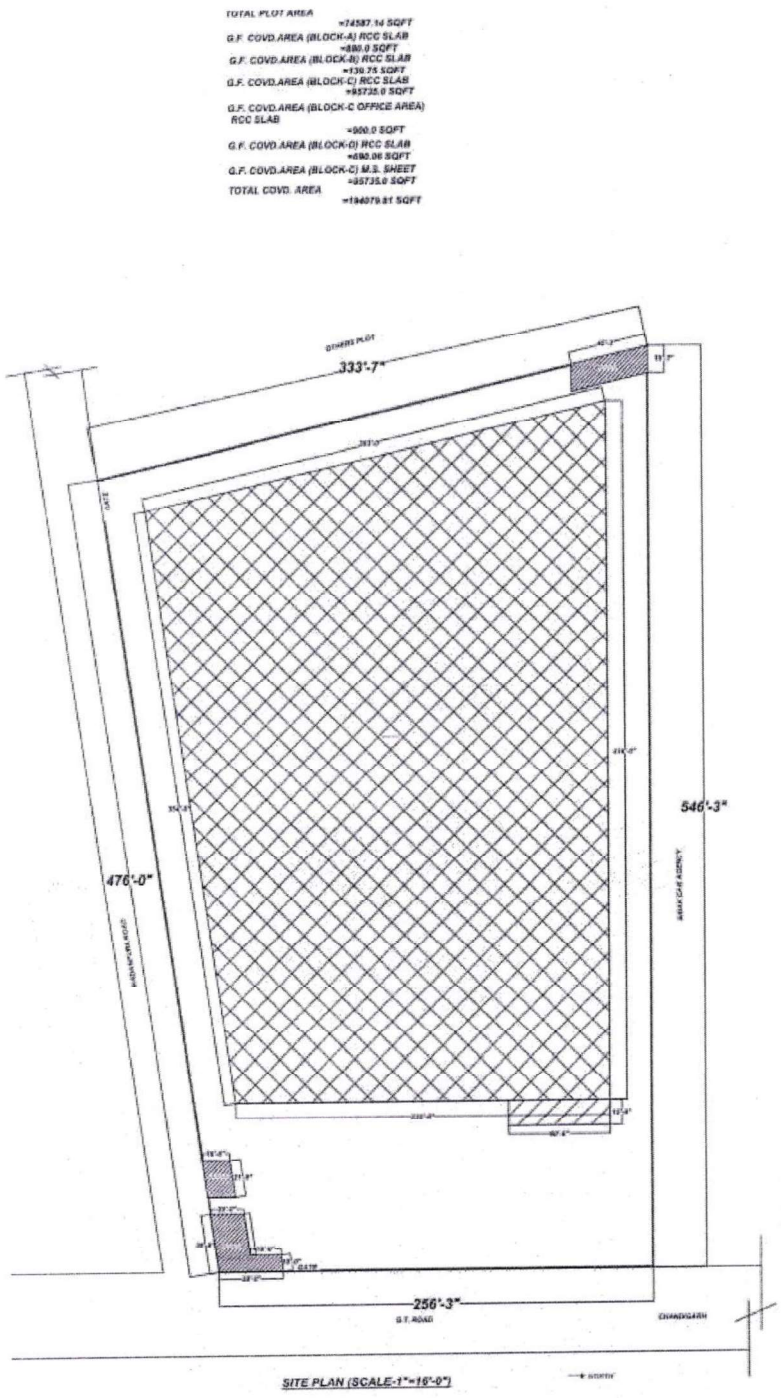

Figure 36: overview of the entire plot

7.1.2.1 Module Manufacturing Unit Layout:

The Ground Floor will be used for Solar PV Module Manufacturing as it requires heavy machinery, larger production space, efficient material handling, and better structural stability. This layout ensures smooth operations, safety, and cost effective logistics.

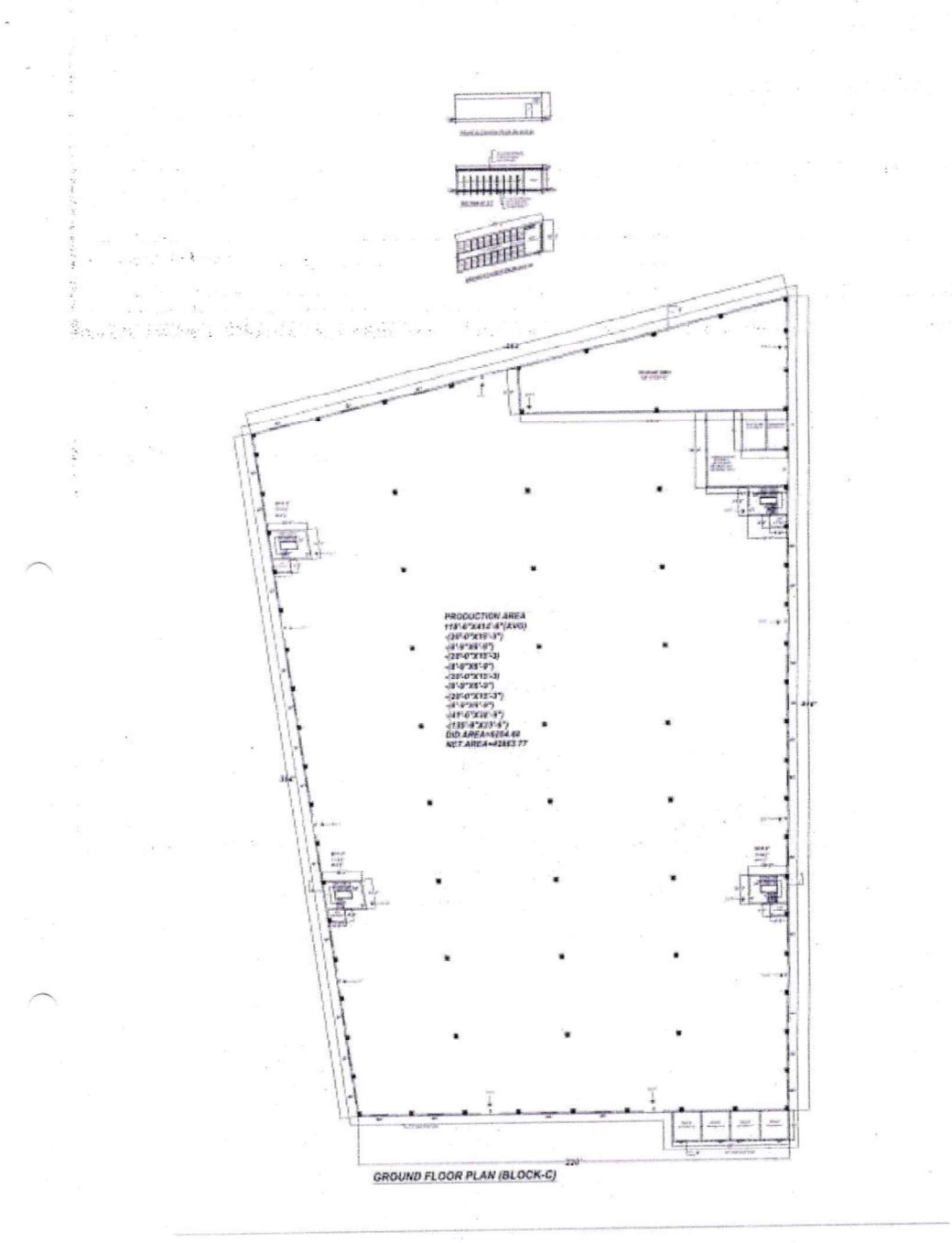

Figure 37: Ground Floor & Layout plan for Module Manufacturing setup

7.1.2.2 EVA Encapsulant Manufacturing Facility Layout

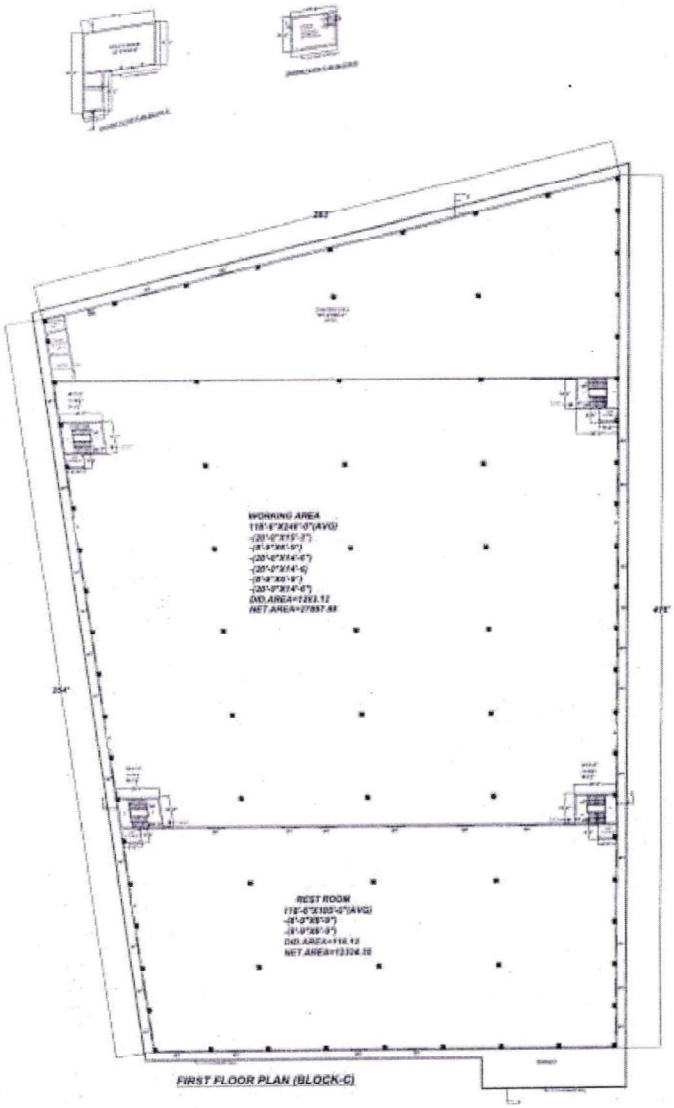

Figure 38: First Floor & Layout plan for EVA Encapsulant Manufacturing setup

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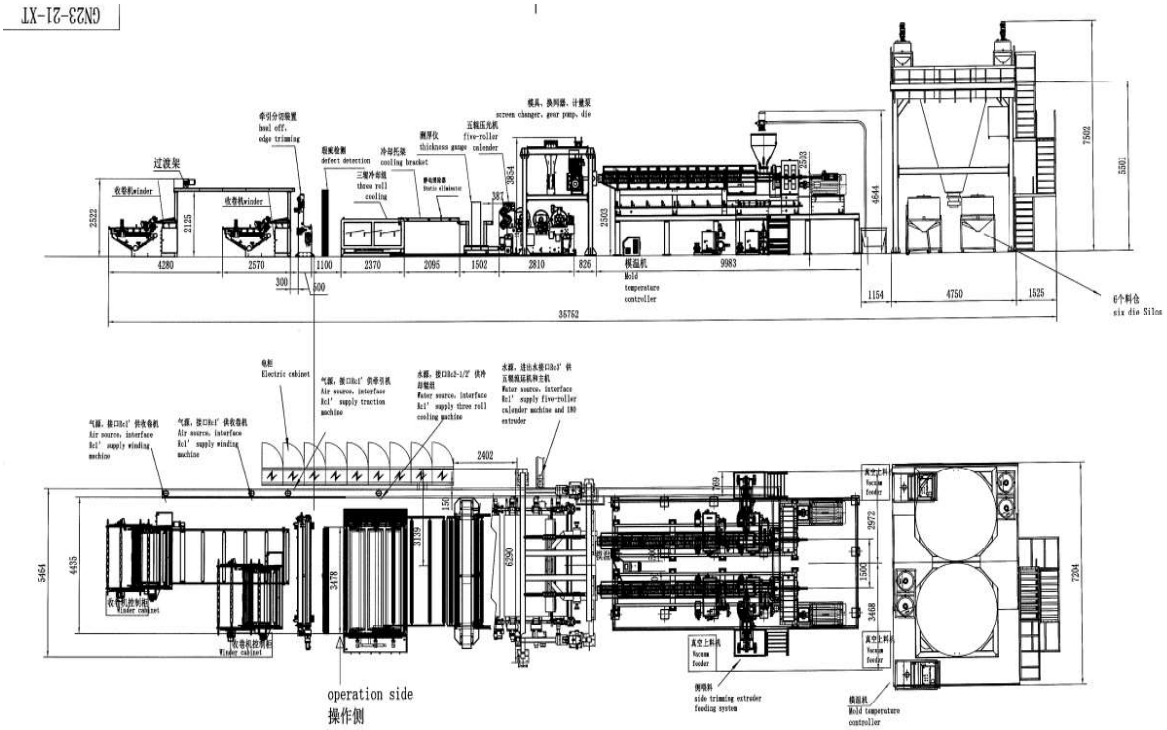

7.2 Utility Requirement

7.2.1 Utility Consumption at the Aluminium Frame Manufacturing Unit:

All Material approvals are already in place as this unit is being put in existing facility

Table 10: Utility Consumption at the Aluminium Frame Manufacturing Unit:

S. No	Particulars	Qty.	Unit
			Aluminium Structure Frame
1	Electricity	KW	4,500
2	Air	CFM	640
3	Water	Ltr.	1,00,000
4	Natural Gas	M3/ton	155

Electricity, Air and Water is to be 100% procured,

7.2.2 Utility Consumption at the New Facility

Table 11: Consumption of Utilities at New Facility

S. No			Unit	Unit	Total

	Particulars	Qty.	PV Module Manufacturing Unit	EVA Encapsulant Manufacturing	Consumption
1	Electricity	KW	4940	2500	7440
2	Air	CFM	2800	100	2900
3	Water	Ltr.	25000	50000	75000

Electricity, Air and Water is to be 100% procured,

7.1.2.3 PV Module Manufacturing Unit

Table 12: Consumption of Utilities in Module Manufacturing Facility

S.No	Particulars	Qty	Consumption
1	Electricity	KW	4940
2	Air	CFM	2800
3	Water	Ltr.	25000

***Power**:*

The plant's power supply will be sourced from the local grid. The total estimated power requirement at full capacity is 4940 KVA. To maintain uninterrupted operations, the facility will be equipped with three 1500 KVA DG Sets (KTA50 – G28) to provide backup during grid failures, two Eaton 93PRT 600 KVA UPS units for short-term power support, and a 4500 KVA (33kV/0.433kV) distribution transformer to regulate voltage levels for machinery. Additionally, three 1500 KVA automatic voltage regulators will be installed to stabilize voltage fluctuations, protecting sensitive equipment.

Power availability will be ensured as per operational needs, with all required permissions obtained in a phased manner as the project progresses.

***Air**:*

To meet the plant's air requirements, three Oil Injected Rotary Screw Air Compressors, including one VFD-equipped unit, will be deployed to provide efficient compressed air for industrial processes. The system will also include one Vertical Air Receiver of 5 M^3 and one of 15 M^3, ensuring consistent air supply and pressure stability. To maintain air quality, the setup will include three refrigerated air dryers, along with a filtration system consisting of three pre-filters, three post-filters, and three carbon filters to remove contaminants and moisture.

All necessary compliance requirements, including pollution control certification, have been addressed.

Water:

The plant's full-capacity water requirement is estimated at 25,000 liters per year, sourced from the local water utility and road tankers. The water supply meets industrial standards and is potable. Additionally, a 2000-liter storage capacity has been provisioned to ensure availability. An application for Permission to Extract Ground Water for Industrial Use has been approved.

Other Utilities:

Cooling System: For efficient cooling, three cooling towers will be installed. Additionally, six GWK Water-Cooled Compact Chillers will be deployed to support various plant operations.

7.1.2.4 EVA Encapsulant Manufacturing Unit

Table 13: Consumption of Utilities in EVA Encapsulant Manufacturing Facility

S.No	Particulars	Qty	Consumption
1	Electricity	KW	2500
2	Air	CFM	100
3	Water	Ltr.	50000

***Power**:*

The plant's power supply will be supported by two 1250 KVA DG Set (KTA50-G26) to ensure uninterrupted operations during grid failures. To regulate and distribute electricity efficiently, a 2500 KVA Distribution Transformer will be installed. Additionally, a 2500 KVA Digitally Microcontrolled Servo Voltage Stabilizer will be utilized to maintain stable voltage levels and protect sensitive equipment from fluctuations.

***Air**:*

To meet compressed air requirements, the facility will be equipped with a VFD Driven Oil Injected Rotary Screw Air Compressor with Direct Drive and an Integrated Permanent Magnet Motor. This system will provide consistent and energy-efficient compressed air for manufacturing processes.
The compressed air system will also include a Refrigerated Air Maker for moisture control, ensuring optimal air quality. Furthermore, Pre, Post, & Fine Line Filters will be integrated to remove impurities and maintain clean air supply. A Vertical Air Receiver will store compressed air, ensuring pressure stability and continuous availability.

***Water**:*

The annual Water requirement for the plant at full capacity is estimated at 50,000 Ltr, Water is available from Local Water Utility and through road tankers. The water supplied is of treated nature and has good potable qualities. Application for Permission to Extract Ground Water for Industrial use has been approved

Other Utility:

To maintain optimal temperatures for industrial equipment, the plant will deploy four water-cooled compact chillers—SKW 199 (52R) and WECO 91 (19TR)—to regulate machine temperatures, prevent overheating, and enhance operational efficiency. Additionally, two Cooling Tower will be installed to support heat dissipation and ensure effective cooling performance.

7.3 Machinery

7.3.1 For Aluminium Frame Manufacturing:

The company is procuring key manufacturing equipment from two major suppliers:

- **Enping Leader Auto Machinery Co., Ltd –** Supplying cast house, extrusion, and anodizing equipment, covering the entire metal processing and surface treatment stages.

- **Jinan Dega Machine Co., Ltd –** Providing CNC cutting, punching, and stacking equipment for precision fabrication of aluminum frames.

7.3.2 For Solar PV Module Manufacturing:

The company is procuring a 1.5 GW solar module manufacturing line from Suzhou UR Intelligent Technology Co., Ltd. The machinery covers pre-lamination, post-lamination, curing, automation, and testing processes to ensure high-efficiency solar module production.

7.3.3 For EVA Encapsulant Manufacturing:

The company is procuring two EVA/POE/EVA solar film extrusion lines from China GWELL Co., Ltd., a trusted manufacturer in the solar industry.

7.4 Project Schedule

Schedule for fiscal FY25-26 & FY26-27 is as follows:

7.4.1 Aluminium Frame Manufacturing Facility:

Table 14: Project Schedule for Establishment of Aluminium Frame Facility

S.N	Particulars	PHASE 1		PHASE 2	
		Estimated date of commencement	**Estimated date of completion**	**Estimated date of commencement**	**Estimated date of completion**
1	Procurement of the Land	Already Procured		Already Procured	
2	Initiation of the Digging of the Ground	Aug-25	Aug-25	-	-
3	Beginning of Building(s) Construction	Aug-25	Oct-25	-	-
4	Placing of Orders for the Plants / Machineries / Equipment	Aug-25	Aug-25	Jan-26	Jan-26
5	Completion of the Ground and Plinth Work	Aug-25	Sep-25	-	-
6	Beginning of the Structure Work	Aug-25	Oct-25	-	-
7	Receipt of the Plants / Machineries / Equipment	Oct-25	Nov-25	Apr-26	May-26
8	Installation of Plants / Machineries / Equipment	Oct-25	Nov-25	Apr-26	May-26
11	Commissioning of the Plant / Machineries / Equipment / Furniture / Office Equipment	Oct-25	Nov-25	May-26	May-26
12	Trial Run of the Project to Start from	Dec-25	Dec-25	May-26	Jun-26
13	Trial Run to complete by	Dec-25	Dec-25	Jun-26	Jun-26
14	Commercial Production to start from	Dec-25	Dec-25	Jun-26	Jun-26

7.4.2 Solar PV Module Manufacturing Facility:

Table 15: Project Schedule for Establishment of Module Manufacturing Facility

S.N	Particulars	PHASE 1 (750 MW)		PHASE 2 (750 MW)	
		Estimated date of commencement	**Estimated date of completion**	**Estimated date of commencement**	**Estimated date of completion**
1	Procurement of the Land	Already Procured		Already Procured	
2	Initiation of the Digging of the Ground	Aug-25	Aug-25	-	-
3	Building(s) Construction	Aug-25	Oct-25	-	-
4	Placing of Orders for the Plants / Machineries / Equipment	Aug-25	Aug-25	Jan-26	Jan-26
5	Ground and Plinth Work	Aug-25	Sep-25	-	-
6	Structure Work	Aug-25	Oct-25	-	-
7	Receipt of the Plants / Machineries / Equipment	Oct-25	Nov-25	Apr-26	May-26
8	Installation of Plants / Machineries / Equipment	Oct-25	Nov-25	Apr-26	May-26
9	Commissioning of the Plant / Machineries / Equipment / Furniture / Office Equipment	Oct-25	Nov-25	May-26	May-26
10	Trial Run of the Project to Start from	Dec-25	Dec-25	May-26	Jun-26
11	Trial Run to complete by	Dec-25	Dec-25	Jun-26	Jun-26
12	Commercial Production to start from	Dec-25	Dec-25	Jun-26	Jun-26

7.4.3 EVA Encapsulant Manufacturing Facility:

Table 16: Project Schedule for Establishment of EVA Encapsulant Facility

S.N	**Particulars**	**PHASE 1**		**PHASE 2**	
		Estimated date of commencement	**Estimated date of completion**	**Estimated date of commencement**	**Estimated date of completion**
1	Procurement of the Land	Already Procured		Already Procured	
2	Initiation of the Digging of the Ground	Aug-25	Aug-25	-	-
3	Building(s) Construction	Aug-25	Oct-25	-	-
4	Placing of Orders for the Plants / Machineries / Equipment	Aug-25	Aug-25	Jan-26	Jan-26
5	Ground and Plinth Work	Aug-25	Sep-25	-	-
6	Structure Work	Aug-25	Oct-25	-	-
7	Receipt of the Plants / Machineries / Equipment	Oct-25	Nov-25	Apr-26	May-26

8	Installation of Plants / Machineries / Equipment	Oct-25	Nov-25	Apr-26	May-26
11	Commissioning of the Plant / Machineries / Equipment / Furniture / Office Equipment	Oct-25	Nov-25	May-26	May-26
12	Trial Run of the Project to Start from	Dec-25	Dec-25	May-26	Jun-26
13	Trial Run to complete by	Dec-25	Dec-25	Jun-26	Jun-26
14	Commercial Production to start from	Dec-25	Dec-25	Jun-26	Jun-26

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8. PROJECT COST & MEANS OF FINANCE

The estimated cost of project and means of finance for the combined three Manufacturing Facilities are as under:

Table 17: Project Cost & Means of Finance

Project Sub-Heads	Project Costs	Amount deployed as of April 30, 2025 from our Company's internal accruals	Amount to be utilised from Net-Proceed (In ₹ *million*	Amount to be utilised from Net-Proceed (In ₹ *million*
			Fiscal 2026	Fiscal 2027
Machinery	1,879.26	Nil	1,045.65	833.61
Other Costs	54.49	Nil	35.78	18.71
Utility	304.51	Nil	204.96	99.55
Civil Work	489.32	Nil	489.32	0.00
Total Project Hard Costs (A)	**2,727.58**	Nil	**1,775.71**	**951.87**
Margin Money, Deposits (B)	**-**	**-**	**-**	**-**
TOTAL PROJECT COST (A+B)	**2,727.58**	Nil	**1,775.71**	**951.87**
Internal Accruals of the Company	**-**	**-**	**-**	**-**
Proceeds of the IPO	**2,727.58**	Nil	**1,775.71**	**951.87**

Comments: Company is planning to raise all the fund requirement for the project from IPO and there will not be any debt portion from the bank or any other financial institution.

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The estimated cost of project and means of finance for the manufacturing Facilities: **2,727.58 million**

Detailed Breakup of the Cost

8.1 Machinery Cost

8.1.1 Module Manufacturing Facility:

Table 18: Cost Breakdown of Equipment and Machinery for the 1500 MW Solar PV Module Manufacturing Unit

Manufacturing facility and location	Name of product	Vendor	Date of Quotation	Quantity	Cost per unit (in USD million)	Total estimated cost (in USD Million)	Total estimated cost (in ₹ million)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
1500 MW PV Module Manufacturing Unit **1118, GT Road, Opposite Neelkanth Star Dhaba , 71/3 Delhi**	**Equipments towards Pre lamination area**	**Suzhou UR Intelligent Technology Co., Ltd.**	**01-05-2025**						**FY25-26 & FY26-27**	**180 Days**
	Auto glass loader			2	0.05	0.10	8.49	8.49		
	Glass loading station			2	0.00	0.00	0.29	0.29		
	1st EVA double-shaft cutting and layup machine			2	0.04	0.09	7.33	7.33		
	EVA flatting & ironing machine			2	0.01	0.03	2.51	2.51		
	Reserved manual loading station			2	0.00	0.00	0.29	0.29		
	90 degree turning conveyor			36	0.00	0.11	9.03	9.03		
	Long-side buffer			14	0.01	0.19	16.2	16.2		
	Short-side buffer			10	0.01	0.14	11.57	11.57		
	Short-side conveyor			6	0.00	0.01	0.58	0.58		
	Short-side conveyor with transition			10	0.00	0.02	1.45	1.45		

Sidemilestons, Karnal(132001) Haryana	Foldable gate			10	0.00	0.01	0.48	0.48		
	Robert string layup machine			10	0.05	0.45	38.58	38.58		
	Long-side rotation conveyor			4	0.00	0.01	1.08	1.08		
	Long-side rotation conveyor with retractable passway			4	0.00	0.01	1.27	1.27		
	Long-side conveyor			14	0.00	0.02	1.35	1.35		
	Auto string taping machine			4	0.04	0.17	14.66	14.66		
	2nd EVA cutting and layup machine			2	0.04	0.09	7.33	7.33		
	TPT double-shaft cutting and layup machine			2	0.04	0.09	7.33	7.33		
	2nd auto glass loader			2	0.05	0.10	8.49	8.49		
	Glass loading station			2	0.00	0.00	0.29	0.29		
	Double glass lapping machine			2	0.02	0.04	3.47	3.47		
	Double glass lapping station			2	0.00	0.00	0.39	0.39		
	Long-side conveyor with transition			4	0.00	0.01	0.58	0.58		
	Double layer re-work station			8	0.00	0.02	1.93	1.93		
	Double-glass re-work machine			8	0.02	0.16	13.89	13.89		
	Double glass edge sealing machine			4	0.04	0.17	14.66	14.66		
	Long-side pneumatic lifter			4	0.00	0.02	1.35	1.35		
	Short-side pneumatic lifter			6	0.00	0.02	2.03	2.03		
	Long-Side Pneumatic foldable gate			4	0.00	0.01	0.58	0.58		
	Double layer 90 degree turning conveyor			12	0.01	0.07	6.02	6.02		
	Double layer short-side conveyor			6	0.00	0.01	1.16	1.16		
	Short-side rotation conveyor			2	0.00	0.01	0.50	0.50		
	Pneumatic foldable gate			4	0.00	0.01	0.58	0.58		
	Lifter for lamination			6	0.01	0.08	6.94	6.94		
	Equipments towards Post lamination precuring area									
	Lifter for lamination			6	0.01	0.08	6.94	6.94		

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	Pneumatic foldable gate			4	0.00	0.01	0.58	0.58		
	90 degree turning conveyor			18	0.00	0.05	4.51	4.51		
	Short-side conveyor			8	0.00	0.01	0.77	0.77		
	Short-side conveyor with retractable passway			4	0.00	0.01	0.58	0.58		
	Short-side conveyor with Alignment			2	0.00	0.00	0.29	0.29		
	Long-side buffer			8	0.01	0.11	9.26	9.26		
	Short-side buffer			2	0.01	0.03	2.31	2.31		
	Long-side rotation conveyor			22	0.00	0.07	5.94	5.94		
	Long-side rotation conveyor with retractable pass way			2	0.00	0.01	0.60	0.60		
	Auto trimming machine			2	0.02	0.05	4.05	4.05		
	2nd trimming machine			2	0.01	0.03	2.51	2.51		
	Foldable gate			2	0.00	0.00	0.10	0.10		
	90 degree turnover inspection			4	0.01	0.04	3.28	3.28		
	Long-side conveyor(NG exit)			2	0.00	0.00	0.29	0.29		
	Auto framing machine			4	0.10	0.38	32.8	32.8		
	Long-side conveyor			4	0.00	0.00	0.39	0.39		
	Manipulator for Auto glue filling			2	0.02	0.04	3.09	3.09		
	Loading machine for curing			2	0.02	0.04	3.47	3.47		
	Unloading machine for curing			2	0.02	0.04	3.47	3.47		
	Alignment station for loading and unloading			4	0.00	0.01	0.58	0.58		
	Curing line			2	0.05	0.10	8.39	8.39		
	Equipments towards Post curing area									
	90 degree turning conveyor			8	0.00	0.02	2.01	2.01		
	Short-side conveyor with folding passway			2	0.00	0.00	0.29	0.29		
	LongSide Conveyor			2	0.00	0.00	0.19	0.19		
	Long-side buffer			2	0.01	0.03	2.31	2.31		
	Auto corner filing machine			2	0.01	0.03	2.31	2.31		

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	Auto testing jig loading machine			2	0.04	0.08	6.75	6.75		
	Auto testing jig unloading machine			2	0.03	0.06	5.55	5.55		
	180 degree flipping machine			6	0.01	0.06	4.92	4.92		
	Golden sample marking machine			2	0.01	0.03	2.31	2.31		
	Alignment unit for IV tester			2	0.01	0.01	0.96	0.96		
	Tripple layer hi-pot tester			2	0.03	0.07	5.79	5.79		
	Lifter for hi-pot tester			4	0.01	0.05	3.86	3.86		
	Long-side rotation conveyor			10	0.00	0.03	2.70	2.70		
	Final inspection			4	0.01	0.05	4.63	4.63		
	Auto sorting machine			2	0.10	0.20	17.36	17.36		
	Unloading station			2	0.00	0.00	0.29	0.29		
	Sorting trolley			36	0.00	0.06	5.21	5.21		
	Return line for testing jig			2	0.01	0.02	1.70	1.70		
	Main and outsourced machines									
	Auto stringer 050FH with cell cutter			10	0.45	4.51	386.13	386.13		
	Auto string repair machine			2	0.02	0.04	3.34	3.34		
	Auto bus-bar welding machine			2	0.18	0.36	31.11	31.11		
	EL tester with visual inspection			6	0.03	0.20	17.36	17.36		
	Frame glue dispenser			4	0.11	0.44	37.47	37.47		
	Two-component glue filling machine			2	0.03	0.05	4.63	4.63		
	Auto back-sheet gluing machine			2	0.03	0.05	4.30	4.30		
	Back-Sheet Glue supply system			2	0.01	0.02	1.37	1.37		
	Laminator (2787) Double Layer/Three Chambers			6	0.42	2.53	217.03	217.03		
	Auto tape removing machine			2	0.04	0.08	7.09	7.09		
	IV tester			2	0.06	0.12	10.13	10.13		
	Final EL tester			2	0.04	0.08	6.58	6.58		
	Auto labelling machine			2	0.03	0.07	5.79	5.79		

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	Total Without GST	1,088.35		
	GST (18%)	**195.90**		
	Total with GST	**1,284.25**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*
2. These quotations are denominated in USD, for the purposes of the above table, USD-INR conversion rate of ₹ 85.64/-, as on May 9, 2025 as per RBI has been assumed. Any increase in the estimated costs due to fluctuation in the USD-INR conversion will be paid for by our Company through our internal accruals.
3. *Any other taxes, installation, transportation cost or incidental costs etc. other than above will be made by our Company through our internal accruals.*

8.1.2 EVA Encapsulant

Table 19: Equipment/Machinery of EVA Encapsulant Manufacturing Unit

Manufacturing facility and location	Name of product	Vendor	Date of Quotation	Quantity	Cost per unit (in USD million)	Total estimated cost (in USD Million)	Total estimated cost (in ₹ million)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
EVA Encapsulant Manufacturing Unit **1118, GT ROAD,OPPOSITE NEELKANTH STAR DHABA , 71/3 DELHI SIDEMILESTONES, KARNAL(132001) HARYANA**	EVA/POE/EVA solar film extrusion line	China GWELL Co., Ltd.	05-05-25	2	1.10	2.20	188.41	188.41	FY25-26 & FY26-27	9 months
	Total Without GST						**188.41**	**188.41**		
	GST (18%)						**33.91**	**33.91**		
	Total with GST						**222.32**	**222.32**		

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Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*
2. These quotations are denominated in USD, for the purposes of the above table, USD-INR conversion rate of ₹ 85.64/-, as on May 9, 2025 as per RBI has been assumed. Any increase in the estimated costs due to fluctuation in the USD-INR conversion will be paid for by our Company through our internal accruals
3. *Any other taxes, installation, transportation cost or incidental costs etc. other than above will be made by our Company through our internal accruals*

8.1.3 Aluminium Frame Manufacturing Facility

Table 20: Equipment/Machinery of Aluminium Frame Manufacturing Unit

Manufacturing facility and location	Name of product	Vendor	Date of Quotation	Quantity	Cost per unit (in USD million)	Total estimated cost (in USD Million)	Total estimated cost (in ₹ million)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
Aluminium Frame Manufacturing Unit **Opposite DD International Pvt Ltd, Link Road, Village Kutail, District Karnal, Haryana, India, 132037**	**500 MT Cast House**									
	6MT Melting Furnace	ENPING LEADER AUTO MACHINERY CO.,LTD	05-05-25	1	0.08	0.08	6.42	6.42	FY25-26 & FY26-27	270 days
	Launder and Filter Box			1	0.01	0.01	0.51	0.51		
	Regenerative Burner			1	0.04	0.04	3.00	3.00		
	Hot top casting plant			1	0.06	0.06	5.14	5.14		
	Dross separator			1	0.01	0.01	0.86	0.86		
	3MT hydraulic charger			1	0.02	0.02	1.71	1.71		
	15MT Homogenzing furnance group			1	0.20	0.20	16.7	16.7		
	Log cutter			1	0.03	0.03	2.57	2.57		
	Freight Charges			-	-	-	0.04	3.08		

Area: 20 Kanal 0 Marla	**6 inch line extrusion**									
	1500 MT Short stroke extrusion press	ENPING LEADER AUTO MACHINERY CO.,LTD	05-05-25	2	0.40	0.80	68.51	68.51	FY25-26 & FY26-27	270 days
	Handling Table L38000mm*W7500mm*H800mm			2	0.13	0.25	21.41	21.41		
	Double Puller			2	0.07	0.13	11.13	11.13		
	Gas single log furnace with hot shear			2	0.13	0.25	21.41	21.41		
	Die heater			2	0.02	0.03	2.57	2.57		
	6MT Aging oven			2	0.07	0.13	11.13	11.13		
	Shot blasting machine (8 spray guns)			1	0.08	0.08	7.11	7.11		
	Freight Charges			1	0.12	0.12	0.12	10.28		
	1500 MT per month / anodising plant	ENPING LEADER AUTO MACHINERY CO.,LTD	05-05-25	1	1.00	1.00	85.64	85.64	FY25-26 & FY26-27	270 days
	Freight Charges			1	0.06	0.06	5.14	5.14		
	Fabrication, Cutting & Punching									
	Photo voltaic Aluminum Frame CNC Automatic Feeding, Cutting, Punching Production Line for Small Frame	Jinan Dega Machine Co., Ltd.	05-05-25	1	0.12	0.12	10.28	10.28	FY25-26 & FY26-27	270 days
	Fully Automatic Small Frame Stacking Machine			1	0.05	0.05	4.28	4.28		
	Photo voltaic Aluminum Frame CNC Automatic Feeding, Cutting, Punching Production Line for Long Frame			1	0.12	0.12	10.28	10.28		
	Fully Automatic Long Frame Stacking Machine			1	0.05	0.05	4.28	4.28		

	CNC Corner Connector Cutting saw			1	0.01	0.01	0.43	0.43		
	Freight Charges				0.00	0.02	1.97	1.97		
	Total Without GST						315.84	315.84		
	GST (18%)						56.85	56.85		
	Total with GST						**372.69**	**372.69**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*
2. These quotations are denominated in USD, for the purposes of the above table, USD-INR conversion rate of ₹ 85.64/-, as on May 9, 2025 as per RBI has been assumed. Any increase in the estimated costs due to fluctuation in the USD-INR conversion will be paid for by our Company through our internal accruals
3. *Any other taxes, installation, transportation cost or incidental costs etc. other than above will be made by our Company through our internal accruals.*

8.2 Other Cost

Table 21: Other Costs of 1500 MW Solar PV Module Manufacturing Unit

Manufacturing facility and location	Name of product	Vendor	Date of Quotation	Quantity	Cost per unit (in USD million)	Total estimated cost (in USD Million)	Total estimated cost (in ₹ million)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
1500 MW PV Module Manufacturing Unit 1118, GT Road,Opposite Neelkanth Star	Packing costs	Suzhou UR Intelligent Technology Co.,Ltd.	01-05-2025	2	0.08	0.17	14.47	14.47	FY25-26 & FY26-27	180 Days
	Inland Transportation Fee + Insurance			2	0.02	0.05	3.98	3.98		
	Customs declaration & port charges etc.			2	0.06	0.13	10.85	10.85		
	Installation and commissioning costs(include air tickets, VISA , board and lodging and local transportation costs)			1	0.17	0.17	14.47	14.47		

Dhaba , 71/3 Delhi Sidemilestons, Karnal(132001) Haryana	Complete automation System			2	0.01	0.03	2.41	2.41		
	Total Without GST							46.18		
	GST (18%)							**8.31**		
	Total with GST							**54.49**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*
2. These quotations are denominated in USD, for the purposes of the above table, USD-INR conversion rate of ₹ 85.64/-, as on May 9, 2025 as per RBI has been assumed. Any increase in the estimated costs due to fluctuation in the USD-INR conversion will be paid for by our Company through our internal accruals.
3. *Any other taxes, installation, transportation cost or incidental costs etc. other than above will be made by our Company through our internal accruals.*

8.3 Utility Cost

8.3.1 Module Manufacturing Facility:

Table 22: Cost Breakdown of Utilities for 1500 MW Solar PV Module Manufacturing Unit

Manufacturing facility and location	Name of Machinery	Vendor	Date of Quotation	Quantity	cost per unit (in ₹ Million	Total Amount (in ₹ Million)	Amount with GST (18%) (in ₹ million)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
1500 MW PV Module Manufacturing	1500 KVA DG Set (KTA50 - G28) with DOC	Sudhir Power Limited	28-03-25	3	12.13	36.39	6.55	42.94	FY25-26 & FY26-27	180 days
	Eaton 93PRT 600 KVA on line Double Conversion UPS including accessories	Comcon Electronics Pvt. Ltd.	28-03-25	2	5.48	10.95	1.97	12.92		180 days

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Unit	GWK Water Cooled Compact Water Chiller with accessories	Prasad GWK Cooltech Pvt. Ltd.	28-03-25	6	4.52	27.09	4.88	31.97		180 days
1118, GT Road,Opposite Neelkanth Star Dhaba , 71/3 Delhi Sidemilestons, Karnal(132001) Haryana	Oil Injected Rotary Screw Air Compressor	Chicago Pneumatic Compressors	29-03-25	2	2.71	5.43	0.97	6.40		180 days
	Oil Injected Rotary Screw Air Compressor with VFD			1	4.78	4.78	0.86	5.64		
	Refrigerated Air Dryer			2	1.25	2.50	0.45	2.95		
	Refrigerated Air Dryer			1	1.06	1.06	0.19	1.25		
	Pre Filter			3	0.05	0.14	0.02	0.16		
	Post Filter			3	0.05	0.14	0.02	0.16		
	Carbon Filter			3	0.05	0.15	0.03	0.18		
	Vertical Air Receiver of 5 M3 with all required accessories			1	0.37	0.37	0.07	0.44		
	Vertical Air Receiver of 15 M3 with all required accessories			1	0.88	0.88	0.16	1.04		
	Automatic Voltage Regulator - 1500 KVA	Jindal Electric & Machinery Corp	29-03-25	3	2.23	6.69	1.20	7.89		180 days
	33 KV , HT PANEL - VCB PANEL - 2500 KVA Transformer	SSR ELECTECH	28-03-25	1	5.85	5.85	1.05	6.90		180 days
	33 / 0.433 V , 2500 KVA Off Load Tap changeover Transformer			4	4.90	19.60	3.53	23.13		
	Main LT PCC Panel for 4 Nos - 2500 KVA Transformer			1	6.50	6.50	1.17	7.67		
	APFC Panel 1500 KVAR			4	3.35	13.40	2.41	15.81		
	Caballing			1	5.50	5.50	0.99	6.49		
	Distribution Transformer - 4500 KVA	Pooja Electrotech Pvt. Ltd	29-03-25	1	4.70	4.70	0.84	5.54		180 days
	Cable	DEVCO Engineering & Technologies (P) Ltd	28-03-25		-	14.57	2.62	17.19		180 days

	Cooling Tower	Superflow Cooling Towers Pvt. Ltd.	28-03-25	3	0.34	1.01	0.18	1.19		180 days
	Total Cost					**167.70**	**30.16**	**197.86**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*
2. *Any other taxes, installation, transportation cost or incidental costs etc. other than above will be made by our Company through our internal accruals.*

8.3.2 EVA Encapsulant

Table 23: Utilities of EVA Encapsulant Manufacturing Unit

Manufacturing facility and location	Name of Machinery	Vendor	Date of Quotation	Quantity	cost per unit (in ₹ Million	Total Amount (in ₹ Million)	Amount with GST (18%) (in ₹ million)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
EVA Encapsulant Manufacturing Unit	1250 KVA DG Set KTA50-G26	Sudhir Power Limited	31-Mar-25	2	10.50	21.00	3.78	24.78	FY25-26 & FY26-27	180 days
1118, GT ROAD,OPPOSITE NEELKANTH STAR DHABA , 71/3 DELHI SIDEMILESTONES	Distribution Transformer - 2500 KVA	Pooja Electrotech Pvt. Ltd	29-Mar-25	1	3.89	3.89	0.70	4.59		180 days
	Water Cooled Compact Water Chiller SKW 199 (52R) including accessories	PRASAD GWK COOLTECH PVT. LTD.	28-Mar-25	2	3.26	6.52	1.17	7.69		180 days
	Water Cooled Compact Water Chiller WECO 91(19TR) including accessories	PRASAD GWK COOLTECH PVT. LTD.	28-Mar-25	2	1.75	3.50	0.63	4.13		180 days

, KARNAL(132001) HARYANA	VFD Driven Oil Injected Rotary Screw Air Compressor Direct Drive with Integrated Permanent Magnet Motor	Chicago Pneumatic Compressor	29-Mar-25	1	-	0.54	0.10	0.64		180 Days
	Refrigerated Air Maker			1	-	0.17	0.04	0.21		
	Pre, Post & Fine Line Filter Maker			3	-	0.05	0.01	0.06		
	Vertical Air Receiver			1	-	0.10	0.01	0.11		
	DIGITALLY MICROCONTROLLED SERVO VOLTAGE STABILIZER - 2500 KVA	Voltaire Power Systems LLP	28-Mar-25	1	2.68	2.68	0.48	3.16		180 Days
	Cooling Tower	Superflow Cooling Towers Pvt. Ltd.	28-Mar-25	2	0.16	0.32	0.06	0.38		180 Days
	Total					**38.77**	**6.98**	**45.75**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*
2. *Any other taxes, installation, transportation cost or incidental costs etc. other than above will be made by our Company through our internal accruals.*

8.3.3 Aluminium Frame Manufacturing Facility

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Table 24: Utilities of Aluminium Frame Manufacturing Unit

Manufacturing facility and location	Name of Machinery	Vendor	Date of Quotation	Quantity	cost per unit (in ₹ Million	Total Amount (in ₹ Million)	Amount with GST (18%) (in ₹ million)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
Aluminium Frame Manufacturing Unit **Opposite DD International Pvt Ltd, Link Road, Village Kutail, District Karnal, Haryana, India, 132037** **Area: 20 Kanal 0 Marla**	1500 KVA DG Set (KTA50 - G28) with DOC	Sudhir Power Limited	28-Mar-25	3	12.13	36.39	6.55	42.94	FY25-26 & FY26-27	180 days
	Distribution Transformer - 4500 KVA	Pooja Electrotech Pvt. Ltd	29-Mar-25	1	4.70	4.70	0.84	5.54		180 days
	Automatic Voltage Regulator - 1500 KVA	Jindal Electric & Machinery Corp	29-Mar-25	3	2.23	6.68	1.21	7.89		180 days
	Oil Injected Rotary Screw Air Compressor	Chicago Pneumatic Compressor	29-Mar-25	1	2.57	2.57	0.46	3.03		180 days
	Refrigerated Air Dryer			1	0.91	0.91	0.16	1.07		
	Pre Filter			1	0.03	0.03	0.01	0.04		
	Post Filter			1	0.03	0.03	0.01	0.04		
	Carbon Filter			1	0.03	0.03	0.01	0.04		
	Vertical Air Receiver of 3 M3 with all required accessories			1	0.26	0.26	0.05	0.31		
	Total Cost					**51.60**	**9.30**	**60.90**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*
2. *Any other taxes, installation, transportation cost or incidental costs etc. other than above will be made by our Company through our internal accruals.*

8.4 Civil Cost

8.4.1 Module Manufacturing Facility & EVA Encapsulant

Table 25: Civil work for PV Module Manufacturing and EVA Manufacturing Facilities:

Name of Work	Description and intended use	Vendor	Date of Quotation	UOM	Quantity	cost per unit	Total Amount (in ₹ Million)	Amount (in ₹ Million) with GST (18%)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
Excavation 1.5	Civil Work	Nakul Babbar group of construction	24-Feb-25	Cum	21,333	240	5.12	0.92	6.04	FY25-26 & FY26-27	270 Days
PCC 1:4:8				Cum	16,000	5,800	92.80	16.70	109.50		
Steel .IS1786 Fe. 500				MT	16,000	78	1.25	0.22	1.47		
Shuttering / Form Work				sqm	16,000	475	7.60	1.37	8.97		
Concrete M- 25/ RMC				cum	1,334	6,800	9.07	1.63	10.70		
Plaster Internal Wall -12mm				sqm	3,200	390	1.25	0.22	1.47		
External Double Plaster				sqm	8,000	600	4.80	0.86	5.66		
Tile Terracing				sqm	427.2	2,200	0.94	0.17	1.11		
W.P Admixture				ltr.	693.6	350	0.24	0.05	0.29		

Earth Filling & Compacting				cum	3,200	450	1.44	0.26	1.70		
Brick work 4*1/2"				sqm	2,134	5,200	11.09	2.00	13.09		
Brick work 9"				cum	3,200	6,800	21.76	3.92	25.68		
Brick work 200*400*600				sqm	3,733	7,500	28.00	5.04	33.04		
Purlin Frame Structure				sq ft	2,13,334	425	90.67	16.32	106.99		
Total							**276.03**	**49.68**	**325.71**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*

8.4.2 Aluminium Frame Manufacturing Facility

Table 26: Civil Work for Aluminium Frame Manufacturing unit

Name of Work	Description and intended use	Vendor	Date of Quotation	UOM	Quantity	cost per unit	Total Amount (in ₹ Million)	Amount (in ₹ Million) with GST (18%)	Amount proposed to be funded from the Net Proceeds (in ₹ million)	Proposed Deployment in fiscal	Validity of date of quotations
Excavation 1.5	Civil Work	Nakul Babbar	24-Feb-25	Cum	13,333	240	3.20	0.58	3.78	FY25-26 & FY26-27	270 Days
PCC 1:4:8				Cum	8,000	5,800	46.40	8.35	54.75		
Steel .IS1786 Fe. 500				MT	8,000	78	0.62	0.12	0.74		

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Shuttering / Form Work		group of construction		sqm	8,000	475	3.80	0.68	4.48		
Concrete M- 25/ RMC				cum	667	6,800	4.54	0.81	5.35		
Plaster Internal Wall - 12mm				sqm	1,600	390	0.62	0.12	0.74		
External Double Plaster				sqm	4,000	600	2.40	0.43	2.83		
Tile Terracing				sqm	213.6	2,200	0.47	0.08	0.55		
W.P Admixture				ltr.	346.4	350	0.12	0.02	0.14		
Earth Filling & Compacting				cum	1,600	450	0.72	0.13	0.85		
Brick work 4*1/2"				sqm	1,066	5,200	5.55	0.99	6.54		
Brick work 9"				cum	1,600	6,800	10.88	1.96	12.84		
Brick work 200*400*600				sqm	1,866	7,500	14.00	2.52	16.52		
Purlin Frame Structure				sq ft	1,06,666	425	45.33	8.17	53.50		
Total							**138.65**	**24.96**	**163.61**		

Notes:

1. *GST rates considered at 18% and have been included in the costs mentioned in the table above. Any other taxes will be paid by our Company through our internal accruals.*

8.5 Detailed Payment Schedule

8.5.1 Module Manufacturing Facility

Planned phased deployment of payment in fiscal FY25-26 & FY26-27 : The Table is a total cost for the solar module facility & Utilities which *Includes (i) procurement of the land; (ii) digging of the ground; (iii) building(s) construction, (iv) placing of orders for the plants / machineries / equipment, (v) ground and plinth work, (vi) structure work;*

(vii) receipt of the plants / machineries / equipment; (viii) installation of plants / machineries / equipment; (ix) commissioning of the plant / machineries / equipment / furniture / office equipment; (x) trial run of the project; and (xi) commercial production

Table 27: Payment schedule for 1500 MW Solar Module Manufacturing Facility

S.No	Particulars	PHASE 1 (750 MW) (in ₹ million)	PHASE 2 (750 MW) (in ₹ million)
1	1500 MW PV Module Manufacturing Unit	642.13	642.12
2	Other Costs	35.78	18.71
3	Utilities	**133.76**	**64.10**
	Total	**811.67**	**724.93**

8.5.2 EVA Encapsulant Facility

Planned phased deployment of payment in fiscal FY25-26 & FY26-27 : The Table is a total cost for the EVA Encapsulant Facility & Utilities which *Includes (i) procurement of the land; (ii) digging of the ground; (iii) building(s) construction, (iv) placing of orders for the plants / machineries / equipment, (v) ground and plinth work, (vi) structure work; (vii) receipt of the plants / machineries / equipment; (viii) installation of plants / machineries / equipment; (ix) commissioning of the plant / machineries / equipment / furniture / office equipment; (x) trial run of the project; and (xi) commercial production*

Table 28: Payment schedule for EVA Encapsulant Manufacturing Unit

S.No	Particulars	PHASE 1	PHASE 2
1	EVA Encapsulant Manufacturing Unit	111.17	111.15
2	Utilities	27.24	18.51
	Total	**138.41**	**129.66**

8.5.3 Aluminium Frame Manufacturing Facility

Planned phased deployment of payment in fiscal FY25-26 & FY26-27 : The Table is a total cost for the solar Aluminium Frame Manufacturing Facility & Utilities which *Includes (i) procurement of the land; (ii) digging of the ground; (iii) building(s) construction, (iv) placing of orders for the plants / machineries / equipment, (v) ground and plinth work, (vi) structure work; (vii) receipt of the plants / machineries / equipment; (viii) installation of plants / machineries / equipment; (ix) commissioning of the plant / machineries / equipment / furniture / office equipment; (x) trial run of the project; and (xi) commercial production*

Table 29: Payment schedule for implementation of the Aluminium Structure Manufacturing Unit

S.No	Particulars	PHASE 1	PHASE 2
1	Aluminium Structure Manufacturing Unit	292.35	80.34
2	Utilities	43.96	16.94
	Total	**336.31**	**97.28**

9. Proposed Capacity

Particulars	Capacity	
	As of and/ or for the nine months ended December 31, 2024	Expected upon completion of the facility
Solar Module Facility (in MW)	570.00	2,070.00
EVA Encapsulant Facility (in MW)	-	1,500.00
Aluminium Frame Facility		
Cast house (in MT/ Year)	-	6,000.00
6 inch line extrusion (in MT/ Year)	-	11,600.00
Anodising plant (in MT/ Year)	-	15,000.00
Fabrication, cutting and punching (in millon frames/ Year)	-	9.36

10. Certifications / Licenses / Approvals - Timelines:

The company has successfully applied for and obtained the necessary licenses, approvals, and certifications for its new facility, where it plans to set up a PV Module Manufacturing Unit and an EVA Encapsulant Manufacturing Unit. Approvals and licenses for the Aluminium Frame Facility are already in place, as it is being established within an existing facility.

Taking into consideration the experience of the Company, the team, which is involved in the Proposed Project, the Company is very well placed to apply for and get the approvals / licenses / certifications for their Proposed Project

I, the Chartered Engineer of the Company, hereby affirm and certify as under for the various licenses / approvals / permits / certifications needed by Oswal Solar Structure Private Limited for their Proposed Project:

Table 30: Approval/Licenses for New Facility

S. No.	Document Name	Status	Issued by	Date of application
1	Consent to Establish (CTE)	Approval received on December 4, 2024	Haryana State Pollution Control Board	NA
2	Extract Ground Water	Approval received on April 8, 2025	Haryana Water Resource Authority	NA
3	Building and other construction work	Approval received on January 22, 2025	Office of the Registering Officer, Government of Haryana	NA
4	Building Plan Approval	Applied for	Local Municipal Corporation	Applied for by way of application dated December 9, 2024. Approval is pending
5	Consent to Operate (CTO)	To be applied at appropriate stage	Haryana State Pollution Control Board (HSPCB).	To be applied at the appropriate stage
6	Electricity Connection	To be applied at appropriate stage	State Electricity Board	To be applied at the appropriate stage
7	Factory License	To be applied at appropriate stage	Chief Inspector of Factories, Haryana	To be applied at the appropriate stage
8	Fire NOC	To be applied at appropriate stage	Assistant Divisional Fire Office/Fire Station Office Fire Station Office Karnal	To be applied at the appropriate stage

Project Deliverables:

According to the company's estimates, the PV Module Manufacturing Unit, Aluminium Frame Manufacturing Unit, and EVA Manufacturing Unit in Karnal, Haryana, are expected to be operational by December 2025.

11.Risk Mitigation

Risk Category	Risk Level	Risk Description
Experience and Capability	Low	OSSPL, a 100% subsidiary of OPL, manufactures solar panels. Incorporated in January 2022, it commenced commercial operations in October 2023. The promoter, OPL, has been operating since 2003 and has a strong track record in manufacturing pumps, motors, and agricultural equipment. The company has a CRISIL rating of A/Stable/CRISIL A1. Given the group's extensive experience and operational capability, the risk is perceived as low.
Time Overrun	Low	The company has secured leased land and received quotations for machinery, utilities, and civil works. The existing facility already has the necessary approvals, and for the new facility, major licenses have been obtained, with the remaining to be acquired as needed. Considering the project planning and buffer periods, the risk is assessed as low.
Cost Overrun Risk	Low to Moderate	The project involves setting up PV Module and EVA Encapsulant production units at a new facility in Karnal, Haryana. The Aluminium Frame manufacturing unit will be integrated into the existing 570 MW solar module manufacturing facility. The project cost is estimated at ₹2,727.58 million. As the project is still in the initial stages, with land leased, machinery quotations received, and Bill of Quantities finalized, the risk is considered low to moderate.
Marketing Risk	Low	Solar energy has witnessed significant growth in India, with solar module installations increasing at a CAGR of ~25% from FY14 to FY25. With favorable government policies and increased adoption of solar, the demand outlook is strong.
Operational Risk	Low	The project site in Haryana offers good connectivity, and equipment is being procured from reputable suppliers, including Suzhou UR Intelligent Technology Co., Ltd. and Enping Leader Auto Machinery Co., Ltd. Adherence to standard O&M practices will be essential to minimize operational risks.
Government Policies	Low to Moderate	The solar manufacturing sector is supported by policies like the Public Procurement (Preference to Make in India) Order for Renewable Energy Sector, 2018 ("Make in India Renewable Energy Order") and Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirement for Compulsory

		Registration) Order, 2019 ("ALMM Order"). However, any policy changes could impact cash flow. Align project strategy with state and central policy. Maintain communication with SECI and MNRE. Develop a contingency fund to mitigate cash flow disruptions.
Raw Material Availability/Price Volatility	Low to Moderate	The project relies on imported raw materials. Price volatility and supply chain disruptions may occur. Establish long-term vendor agreements with multiple suppliers across different regions. Maintain buffer inventory for critical components to cover 3 months of production. Negotiate flexible procurement terms to mitigate price risks.
Technology and Plant Performance	Low	The plant is being equipped with technology from Suzhou UR Intelligent Technology Co., Ltd. and Enping Leader Auto Machinery Co., Ltd. Adopting industry-standard technology reduces the risk of obsolescence.
Competition Risk	Moderate	Despite protection from tariffs, the Indian solar module market faces competition from established Indian and Chinese manufacturers. OSSPL must differentiate through product quality and branding.
Forex Fluctuation	Moderate	International sourcing of raw materials exposes the project to foreign exchange risks, particularly given the INR-USD exchange rate volatility. Implement a hedging strategy that includes forward contracts and currency swaps. Align import payments with export revenues to create a natural hedge
Force Majeure	Low to Moderate	Unforeseen events such as pandemics, natural disasters, or geopolitical tensions could disrupt project timelines and supply chains. Obtain comprehensive insurance coverage for project assets and include robust force majeure clauses in all major contracts to safeguard against uncontrollable disruptions.

12. CONCLUSIONS & RECOMMENDATIONS

Oswal Solar Structure Private Limited (OSSPL) currently operates a 570 MW solar module manufacturing facility in Karnal, Haryana, and is now expanding its production capacity. As part of this expansion, the company is adding an Aluminium Frame Manufacturing Unit to its existing facility. In addition, OSSPL is setting up a new 1,500MW Solar PV Module Manufacturing Facility along with two EVA Encapsulant Manufacturing Units in Karnal.

With its experience in solar module manufacturing, the company is focused on integrating the entire solar PV module value chain under one roof. Both the existing and upcoming facilities, located in Kutail, Karnal, Haryana, India, will support this goal, allowing for end-to-end manufacturing of key solar components. This expansion will help OSSPL strengthen its position in the renewable energy sector.

The project will be executed in two phases:

- Phase 1 begins in August 2025, with three months of construction and one month of trial runs, leading to commercial operations starting in December 2025.
- Phase 2 will start in January 2026, with full-scale operations expected by June 2026.

OSSPL has already secured key licenses and certifications, including a BIS license, leveraging its prior experience in module manufacturing. The company is setting up a Mono c-Si PERC Module manufacturing facility, with module capacities ranging from 265Wp to 700Wp and efficiencies between 19.06% and 21.31%. The facility will use N-type doping technology with half-cut cells and will be equipped with imported tabber stringers, laminators, and Sun simulators to ensure high-performance solar PV module production.

In a major step toward streamlining its production process, OSSPL is also establishing an Aluminium Frame Manufacturing Facility and an EVA Encapsulant Manufacturing Facility. By producing high-quality Aluminium frames in-house, the company will reduce its dependence on external suppliers, lower production costs, and enhance product quality. This initiative will not only support the company's growth but also contribute to local job creation and technological advancement.

OSSPL has partnered with renowned suppliers for its machinery and utilities to ensure high manufacturing standards. The raw materials required for production will be sourced from both domestic and international markets.

The company also has the option to sell Aluminium frames in both local and international markets. Currently, the plan is to export 100% of its Aluminium frame production. Meanwhile, raw materials for Solar PV Modules will be sourced from a mix of local and global suppliers, ensuring quality and supply chain efficiency.

12.1 Critical Success factors

- **Foreign Exchange Rate**:

As per the proposed plan, the Company plans to sell its products both domestically and internationally. The proceeds from international sales will be received in USD, while domestic sales will be in INR. The raw materials required for manufacturing are mainly imported and paid for in USD, creating a

natural hedge for the Company. Due to this, there is no need for forward contracts, as there is an opportunity for benefit if the value of the USD rises. Therefore, forex fluctuation risk is minimized in this case.

- **Government Duty and Incentives - Production Linked Incentive (PLI) Scheme Expansion**

  The Government of India has continued to support the growth of the solar industry, particularly domestic manufacturing, with the expansion of the Production Linked Incentive (PLI) Scheme. Originally, the scheme had a financial outlay of ₹4,500 crore (US$616 million) to support the production of high-efficiency solar PV modules with a capacity of 10 GW. However, following an overwhelming response from the industry, which saw bids totaling 54.8 GW—over four times the initial capacity—the government increased the financial support by an additional ₹19,500 crore (US$2.5 billion). This expansion is designed to further encourage vertical integration in solar module production and to significantly boost domestic manufacturing capacity.

  Alongside the PLI scheme, the Government of India has also introduced the Scheme for Promotion of Manufacturing of High-Efficiency Solar PV Modules (SPECS), reinforcing its commitment to strengthen the domestic solar sector. These initiatives aim to reduce reliance on imports and encourage self-sufficiency by providing financial incentives to offset the high capital costs associated with setting up and expanding manufacturing facilities.
  With this robust support, the Indian solar industry is expected to continue its growth, ensuring greater domestic production capabilities and a reduction in import dependency, making India more competitive on the global solar market.

- **Achieving Projected Revenue**

  Since April 1, 2022, the Government of India has imposed a 40% Basic Customs Duty (BCD) on solar module imports and a 25% BCD on solar cell imports. This move was intended to encourage domestic manufacturing of solar components and reduce dependency on imports. However, it has led to an increase in production costs for solar developers, impacting project economics.
  In response to these increased costs, the Ministry of New and Renewable Energy (MNRE) has recognized the imposition of the BCD as a 'change in law' event, which allows solar projects to pass these additional costs on to tariffs. This could potentially lead to an increase in electricity tariffs by 50–70 paise per unit, helping ease the financial strain for solar developers.
  Moreover, in November 2022, the Indian government introduced a significant update by granting exemptions for 6 GW of already awarded solar projects from the BCD. This move was aimed at mitigating the financial burden on developers who had already received project allocations before the new duties came into effect.
  Despite the challenges posed by the BCD, the government's initiatives to support domestic manufacturing, combined with the tariff adjustment provisions and exemptions for certain projects, are designed to ensure the continued growth of India's solar energy sector while promoting local manufacturing capacity.

- **Fluctuations in Module and Raw Material Prices**

  The solar power sector has faced significant fluctuations in module and raw material prices in recent years, further impacted by the imposition of Basic Customs Duty (BCD). To navigate these challenges, OSSPL must closely monitor market conditions and adjust its pricing strategy accordingly. While solar cell prices— a major component of production costs— tend to vary, the overall trend in the industry points toward a gradual decline in prices over time.

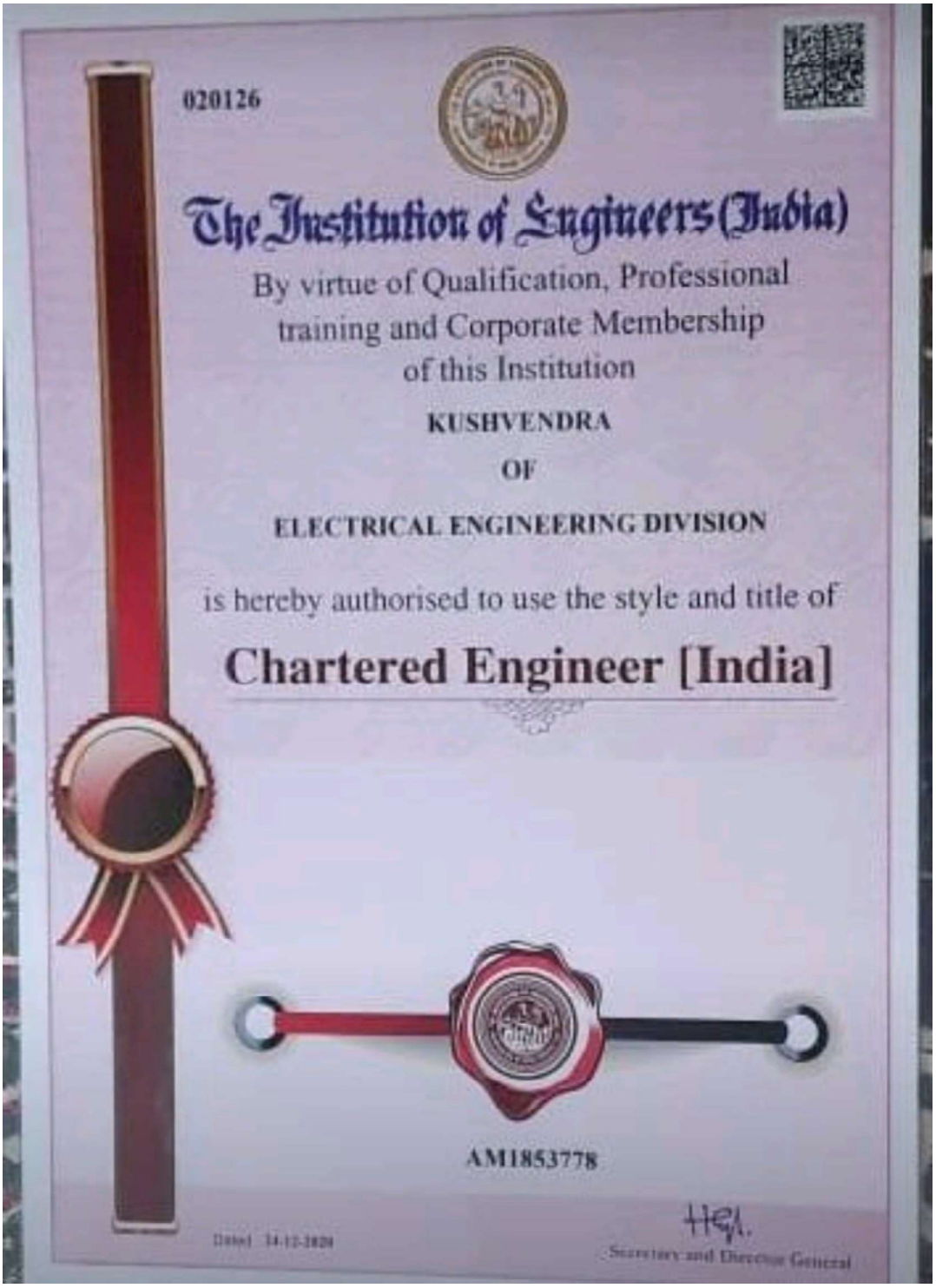
- **Focus on Innovation and Efficiency**

To overcome the challenges of fluctuating input costs and tight profit margins, OSSPL should prioritize product innovation by developing higher-efficiency solar modules. Staying at the forefront of technological advancements will help the company maintain a competitive edge in an industry where both production costs and market prices are constantly evolving

Yours faithfully,

Chartered Engineer
Membership No.: AM1853778
Place: New Delhi, India
Date: 26/05/2025

13. Schedule



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The Institution of Engineers (India)

By virtue of Qualification, Professional training and Corporate Membership of this Institution

KUSHVENDRA

OF

ELECTRICAL ENGINEERING DIVISION

is hereby authorised to use the style and title of

Chartered Engineer [India]

AM1853778

Dated: 14-12-2020

Secretary and Director General

LSI Engineering & Consultants Limited