

## **ANG-181564-015182 - Due Diligence Analysis Market Study, Feasibility Study, Bankable Business Plan Solar Glass Project in Brazil**

We offer to conduct a comprehensive market and feasibility study as well as a bankable business plan, which will include:

- Collection and analysis of existing documentation and data sources.
- Verification and plausibility checks of the available information.
- Assessment of critical success factors for both solar glass production and raw material mining.
- Final evaluation and executive summary, outlining risks, opportunities, and strategic recommendations.

This structured approach will provide you with a clear decision-making basis, both for investment considerations and for potential partnerships in the Brazilian market.

For all of below 1.- to 3. our task will include to check, analyse, modify and complete the information you share in your data room.

## **1. Rolled Solar Glass Market Study**

This study provides a comprehensive macro-level view of the rolled solar glass industry. It aims to outline the market environment, highlight opportunities, and describe the competitive and technological framework that will guide strategic decision-making.

### **1.1. Executive Summary**

The executive summary will deliver a condensed overview of the study's findings. It synthesizes the most important insights, including market size, growth potential, and key dynamics. This section allows decision-makers to quickly understand the scope and conclusions of the research before diving into detailed analysis, tables, and charts presented in the full report.

### **1.2. Targets and Purpose**

This part defines the core objectives of the study, clarifying the client's specific goals and how the results will be used. It highlights the practical benefits of the study, such as improved market transparency, better strategic planning, and the identification of potential customers and partners. By tailoring the analysis to the recipient's requirements, it ensures relevance and direct applicability.

### **1.3. About Rolled Solar Glass**

Here we align the product itself with your findings, explaining what solar glass is, its technical specifications, and its importance within the photovoltaic (PV) industry. Benefits such as efficiency gains, and the role in enhancing PV module performance are elaborated. Typical customer expectations, pricing ranges, distribution channels, and conversion metrics from installed PV capacity to tons of glass are also included.

1. The term solar glass
2. Product description
3. Product benefits
4. Customer expectations
5. Approximate product price range
6. Product distribution channels
7. Typical units in the photovoltaic (PV) industry
8. Calculation from PV capacity to tons of glass

#### 1.4. Target Groups

This section identifies the main customer groups for rolled solar glass. Potential buyers such as PV module manufacturers, developers, and investors are mapped by region. Example customers and their theoretical demand potential are highlighted to demonstrate concrete opportunities.

#### 1.5. Facts and Figures about Rolled Solar Glass Markets

Short abstract view that quantifies the current and historical state of the solar glass market. It includes global and regional installed PV capacities, broken down into continents and target markets. The analysis covers both annual installations and total installed capacity, with trends over the last decade.

Calculated volumes of solar glass used, top ten PV markets, and their growth rates are presented with visual charts.

1. Installed PV capacities
  - Globally
  - In continents
  - In target region or country
2. Historic and current development
3. Calculated rolled solar glass quantities for above PV capacities
4. Top 10 global PV markets and recent growths
5. Regional solar markets
6. Recent installation shares and totally installed shares
7. Recent annually installed PV shares and capacities in GW in continents and target region
8. Totally installed PV shares and capacities in GW in continents and target region
9. Globally installed solar power in the past ten years
10. Globally installed solar glass for PV installations in the past ten years
11. Locally installed solar power and solar glass for PV installations in the past ten years

## 1.6. PV Installations and Forecast, Solar Glass Market Potential

We provide projections for PV installations until 2028, presenting low, medium, and high growth scenarios. The link between installed PV capacity and solar glass demand is quantified, resulting in a calculated forecast for the required volume of rolled solar glass. Regional forecasts, especially for South America, are examined in detail.

1. Expected development of installed PV capacities in global regions
2. PV installations and forecast until 2028
  - Low, medium, and high scenarios
  - Annual and total global scenarios
3. Growth prognosis to determine the volume of rolled solar glass
4. PV installations and forecast until 2028
5. Recent South American top solar PV markets and prospects until 2028
6. Total South American PV capacity forecast until 2028
7. Projected PV installations in your target region and calculated solar glass demand
8. Growth prognosis and project strategy

## 1.7. Competitor Analysis

This part maps existing producers of rolled solar glass, including their locations, capacities, and expansion plans. Market shares, product developments, and new entrants are assessed. By visualizing the competitive landscape, this analysis helps the client to identify potential positioning strategies.

1. Current capacities and production sites visualized in a map
  - Number of locations
  - Current production capacities
  - Forecast (where available from open source and projects we know)
2. Producers of rolled solar glass
3. Competitor market shares
4. Potential market share in your target region
5. Trends about production capacities
6. Trends seen within the main player groups incl. information about developments and expansions
7. New products in rolled solar glass
8. Solar glass developments
9. Recommended glass products for the rolled solar glass plant

## **1.8. Solar Glass Products, Trends, and Applications**

A review of product innovations and production trends within solar glass manufacturing. It describes technical specifications, coating requirements (including anti-reflective coatings), and applications such as thin-film modules. This section highlights which products will be most relevant for upcoming projects

1. View on production and product trends
2. Product specifications solar glass
3. Coating requirements
4. Anti-reflex coating
5. Coating requirements thin-film

## **1.9. General Conditions and Influencing Factors**

The development of the solar glass market is influenced by political, economic, social, technological, ecological, and legal factors (PESTEL analysis). This section examines such conditions in detail, offering insight into regulatory frameworks, sustainability requirements, and industry drivers that shape market dynamics

## 1.10 PV Modules

This chapter connects the demand for solar glass with trends in PV module manufacturing. It covers regional manufacturers, production volumes by technology, and emerging trends such as bifacial modules, glass-glass structures, and module dimension changes. The analysis also highlights South American PV manufacturers as potential customers.

1. South American PV module manufacturers
2. Potential customers by geographic region
3. South American PV module manufacturers, new players and expansion examples
4. South American PV module manufacturers, new players and solar glass demand
5. Annual PV production by technology
6. PV production by technology, percentage of global annual production
7. Market share of thin-film, percentage of total global PV production
8. Trends in the PV market
  - Module structure standard
  - Module structure glass-glass
  - Modules with slicing cells
  - Bifacial modules
  - Module dimensions
9. Trends in applications

## **2. Rolled Solar Glass Feasibility Study**

The feasibility study complements the market study by assessing the viability of setting up a solar glass factory. It evaluates the technical, commercial, market-related, and organizational conditions that need to be met in order to implement the project successfully.

### **2.1. Executive Summary**

The summary presents a high-level evaluation of the project's feasibility. It highlights the main findings of the technical, commercial, and organizational, supported by data, tables, and graphical illustrations.

### **2.2. Initial Position and Targets**

This section examines the current market position of the client and their strategic objectives. It clarifies whether adjustments are needed to align the project with realistic market opportunities and goals.

### 2.3. Technical Feasibility

Here, we analyze the technical requirements of the project. Typical and recommended plant capacities are outlined, together with facility location recommendations based on raw material availability, energy supply, and logistics. Different furnace types, their energy efficiency, and decarbonization trends are considered. Land, utilities, and certification requirements are also detailed.

1. Analysis of Best Available Technology (BAT) for a Rolled Solar glass production line, (e.g. Batch, Melting, Cooling, Inspection, Cutting, Coating)
2. Typical plant capacity
3. Recommended plant capacity
4. Recommendation for facility location depending on raw materials, energies and transport
5. Analysis of applicable furnace types with emphasis on energies and funding
6. Important trends in production, furnace decarbonization
7. Land requirements and construction specifications
8. Estimated energies, electricity, raw materials, utilities, and natural gas
9. Estimated raw materials
10. Conditions for electricity and natural gas
11. Recommendation about certification of products, requirements

#### **2.4. Commercial Feasibility**

The financial viability of the project is evaluated. This includes a cost-benefit analysis, expected return on investment, and an assessment of financial risks. Estimated capital expenditures (CAPEX), operating expenditures (OPEX), production costs, and payback periods are calculated to provide a realistic financial outlook.

1. Part of this is a cost-benefit analysis of the project, a forecast of the expected return on investment (ROI) and the calculation of possible financial risks
2. Estimated capital investment for a BAT production line (CAPEX)
3. Approximate OPEX calculation, production cost share
4. Average cost for raw materials, incl. transport and packing materials
5. Average utilities incl. water, electricity, gas for an applicable furnace
6. Estimated payback period for capital investment

#### **2.5. Market-related Feasibility**

We analyze the project's market prospects by assessing demand, competition, and potential sales volumes. This helps determine whether the project can succeed commercially within the chosen region and timeframe.

#### **2.6. Organizational Feasibility**

This part evaluates the organizational capacity of the client to carry out the project. It covers personnel requirements, company structure, and the legal framework. The study highlights whether the available resources and skills are sufficient to ensure project execution.

## **2.7. Critical Issues and SWOT Analysis**

A structured SWOT analysis identifies strengths, weaknesses, opportunities, and threats. It also provides strategies on how to capitalize on strengths, address weaknesses, exploit opportunities, and mitigate potential risks.

1. SWOT Analysis
2. How to use and capitalize strengths
3. How to improve weaknesses
4. How to exploit and benefit from opportunities
5. How to mitigate threats
6. Summary of Findings
7. Strategic Recommendations

## 2.8. Factory Analysis

This section provides a detailed view of the potential plant setup. It examines envisaged plant capacity, required investment, production cost shares, and expected payback period. Construction specifications, land requirements, and estimated consumption of raw materials, electricity, and natural gas are included. Important industry trends such as furnace decarbonization are also considered.

1. Typical plant capacity
2. Envisaged plant capacity
3. Estimated capital investment for a BAT production line
4. Basic cost calculation
5. Production cost share
6. Important trends in production, furnace decarbonization
7. Estimated payback period for capital investment
8. Land requirements and construction specifications
9. Estimated energies, electricity, raw materials, utilities, and natural gas
10. Estimated raw materials
11. Conditions for electricity and natural gas

### **3 Rolled Solar Glass Bankable Business Plan**

This business plan provides a detailed and bankable framework for developing a solar glass project in Brazil. It covers financial projections, capital investment, operational costs, and strategic considerations. The study offers an in-depth evaluation of the project's viability, combining technical, financial, and market perspectives.

#### **3.1. Projection of the financials**

This chapter presents a full financial forecast for the solar glass project, outlining revenues, costs, and returns across the investment lifecycle. The projection helps investors and stakeholders evaluate the project's profitability and sustainability

#### **3.2 Summary of the project cost**

A breakdown of all major capital expenditures is provided, including land acquisition, construction, technology, and infrastructure. This summary highlights the total investment needed for project execution.

#### **3.3 Cost of the land**

Land costs are determined based on the required surface area and prevailing prices in the selected industrial region. This ensures realistic budgeting and helps in comparing alternative locations.

#### **3.4 Cost for civil engineering and office equipment**

This section details the construction-related expenses such as structural works, infrastructure setup, and office equipment procurement, which are essential for operational readiness.

#### **3.5 Capital investment for a BAT production line**

The project will use EU Best Available Technology (BAT) for solar glass production. This ensures compliance with international standards and guarantees state-of-the-art efficiency and environmental performance.

#### **3.6 Cost for vehicles and internal transport**

Internal transport systems, including forklifts, trucks, and handling equipment, are budgeted here to secure efficient logistics within the plant.

### **3.7 Pre-operative expenses**

Expenses incurred before operations start, such as consultancy, licensing, feasibility studies, and project management, are accounted for in this category.

### **3.8 Contingency and escalation**

A financial buffer is added to mitigate unforeseen cost escalations due to inflation, technical changes, or delays.

### **3.9 Working capital requirements**

Day-to-day operations during the ramp-up phase require working capital to finance raw materials, labor, utilities, and inventory until stable cash flows are achieved.

### **3.10 Costs of sales**

This includes direct production costs (raw materials, utilities, wages), operating expenses (administration, marketing), and financial costs.

### **3.11 Utilities**

The energy requirements of the plant, including gas and electricity, are estimated to calculate annual utility costs.

### **3.12 Annual salaries and wages calculation**

Payroll costs are forecasted based on the organizational structure, required staff headcount, and local wage benchmarks.

### **3.13 Estimate for factory expenses**

Administrative costs such as HR, accounting, IT, legal services, and insurance are budgeted here.

### **3.14 Estimate for administrative expenses**

Administrative costs such as HR, accounting, IT, legal services, and insurance are budgeted here.

**3.15 Estimate for sales expenses**

This includes the salaries of sales staff and their travel costs for customer acquisition and business development.

**3.16 Estimate of depreciation**

Depreciation of capital assets such as buildings, equipment, and vehicles is calculated to assess long-term cost impact.

**3.17 Cash flow statement**

Depreciation of capital assets such as buildings, equipment, and vehicles is calculated to assess long-term cost impact.

**3.18 Cost of interest if applicable**

The interest costs of external financing are estimated, considering the structure, amount, and rates of loans.

**3.19 Sales realization**

Expected revenue is forecasted based on planned production volumes and projected market prices for solar glass.

**3.20 Estimated Profit & Loss**

The P&L statement summarizes financial performance, showing operating profit, EBIT, and net profit after taxes.

**3.21 IRR calculation**

The Internal Rate of Return (IRR) measures profitability based on total capital and equity employed, indicating expected financial performance.

**3.22 Net Present Value**

The Net Present Value (NPV) provides the discounted value of future cash flows, serving as a key measure for project viability.

### **3.23 Projected balance sheet**

A forward-looking balance sheet is presented, including assets, liabilities, and equity at various project stages.

### **3.24 Sensitivity analysis**

The financial model is stress-tested by varying key parameters such as sales volumes, costs, and prices to assess the robustness of profitability.

### **3.25 Payback period**

This metric calculates how long it will take for net cash inflows to repay the initial investment.

### **3.26 Business plan executive summary**

A concise summary of the project's vision, investment highlights, financial outlook, and market opportunity.

### **3.27 Further content and information**

This includes additional details such as market analysis, regulatory frameworks, risk assessments, and potential strategic partnerships.

## **4. Financing**

After finalization of all contractual documents, we will connect with prospective investors. The findings will then be shared with our investment partners and potential co-investors in the project.

These services will include:

- Bank or Investor Identification & Outreach – targeted search and selection of potential investors who match the project's profile.
- Scheduling & Coordination – organization of investor meetings, including agenda preparation and time management.
- Meeting Facilitation & Moderation – hosting and conducting meetings with professional support to ensure smooth communication.
- Ongoing Investor Relations – structured communication and reporting to maintain strong investor engagement throughout the project lifecycle.
- Travelling cost, if requested, see 5.4.

## **5 Miscellaneous**

Both glassglobal and Homerun will name project responsible persons that are to follow up the project in close cooperation.

It is understood that the defined Scope of Work as above may be modified upon mutual agreement of both parties if modification to the Scope of Work is to the benefit of your company, if necessary also against additional cost.

The language of the contract and any documentation is English.

It is also understood that we arrange to obtain above information within the company policies e.g. confidentiality agreements or business relationships etc. and will provide you the information, overviews and forecast subject to availability and capability to obtain these, whereas we will do our utmost to reply as complete to the questions as possible.

### **5.1 Communication**

**5.1**

glassglobal will arrange intermediate phone meetings (via Teams or other) between the project responsables and, if necessary also with the Management. Topics e.g. to inform/ask/discuss about e.g.

- new requirements
- glass industry information ahead of reporting
- interview about new developments and technologies in the value chain, to evaluate importance or relevance.

### **5.2 Deliveries by Homerun**

**5.2**

Homerun is to provide initial project/requirement outlines (Data-room) and also replies to questions by glassglobal experts, data, specifications, prices and conditions that are necessary to execute the Market Study and Feasibility Study for internal and confidential use. If Homerun fails to communicate this requested information by set deadlines, this may influence the delivery time of the material. glassglobal will provide related information hereto.

### **5.3 Deliveries by glassglobal**

**5.3**

The official delivery time starts on receipt of down payment. Delivery time for full report is approx. 3-4 months. Delivery of the material will be effected by email as PDF

## 5.4

### Travelling

If travelling is requested on customer's behalf to have meetings with customer or investors following charges apply separately:

Cost to be charged:

- business class flight
- accomodation in an at least 4-5 star hotel
- the manpower rate for expert of 1,400.- Euro/day/person
- Duration of trip includes travelling days

