

The background of the top half of the page is a photograph of a solar farm. Rows of dark blue solar panels are tilted towards the sun, which is low on the horizon, creating a warm, golden glow. The panels are set in a lush green field with trees in the distance under a blue sky with scattered clouds.

# Auditing the Solar Power Industry - Key Challenges

Solar energy sector has emerged as a significant player in the grid connected power generation capacity over the years. Specifically in India, it supports the government agenda of sustainable growth, while, emerging as an integral part of the solution to meet the nation's energy needs and an essential player for energy security. India stands 5th in solar PV deployment across the globe at the end of 2022<sup>1</sup>.

Solar power companies face unique accounting challenges that require the accountants and auditors to have careful consideration and expertise. We will delve into these accounting challenges and also the focus will be to understand auditors consideration towards specific issues in this industry.

## 1. Revenue Recognition for Solar Energy Sales under Power Purchase Agreements (PPAs)

**Accounting Issue:** Solar power developer companies generate revenue from the sale of solar energy to off-takers, such as utility companies, under power purchase agreements (PPAs).

**The Timing** of revenue recognition depends on the transfer of control over the energy generated, which may occur over time or at a specific point in time. **Measurement** is based on the volume of energy delivered, often subject to adjustments for performance incentives or penalties outlined in the PPAs. Fulfilling **performance obligations**, such as meeting energy production targets and ensuring facility reliability, is integral to revenue recognition

### Auditor's Approach:

#### (i) Evaluate PPA Structure:

- a. **Fixed Pricing:** Review, if the revenue recognized aligns with the predetermined price per unit over the contract term. Look into consistency and confirm that the revenue matches the fixed rate without adjustments for market fluctuations.

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<sup>1</sup> (Ref. REN21's Global Status Report 2023 & IRENA's Renewable Capacity Statistics 2023)

b. **Index-Based Pricing:** Review how the energy price is adjusted based on specific indexes (e.g., inflation, commodity prices). Evaluate the accuracy of these adjustments and their impact on revenue.

c. **Market Referenced Pricing:** Assess how prevailing market rates and any adjustments or floor prices affect the revenue. Verify that revenue recognition reflects current market conditions and contractual terms.

**(ii) Verify Energy Generation:** Review energy generation records and metering data. Assess the reliability of monitoring systems and data collection processes to ensure they meet contractual commitments and reflect actual energy delivered.

**(iii) Assess Revenue Measurement:** Scrutinize revenue calculations to ensure they comply with relevant accounting standards. Verify the accuracy of adjustments for performance incentives or penalties and ensure consistency in measurement practices across reporting periods.

**(iv) Review Revenue Recognition Methods:** Ensure the company's revenue recognition policies are consistent with PPA terms and accounting standards<sup>2</sup>. Review application of contract terms and performance obligations in the revenue recognized.

## 2. Project Costs Capitalization and Cost Allocation

**Accounting Issue:** Solar power developer companies undertake substantial costs throughout the lifecycle of solar energy projects, encompassing development, construction, and operational phases. These costs include expenditures for land acquisition, engineering, procurement, construction, equipment, labor, and overheads. Capitalization practices involve identifying costs directly attributable to the construction of solar facilities and those necessary to bring the asset to its intended use. Moreover, effective cost allocation ensures that expenses are allocated to the relevant projects in a manner that reflects their usage and benefits, thereby facilitating the accurate measurement of project profitability and financial performance.

### Auditor's Approach:

**(i) Review Capitalization Policies:** Examine the policies for capitalizing project costs, including criteria for direct costs, interest during construction, and overhead allocation. Assess the consistency and appropriateness of these policies across project phases.

**(ii) Verify Capitalized Costs:** Verify capitalized project costs by reviewing project records, invoices, and capitalization schedules. Ensure costs directly related to construction and necessary for bringing the asset to its intended use are accurately identified and segregated.

**(iii) Assess Cost Allocation:** Evaluate how costs are allocated to projects, ensuring methods reflect usage and benefits. Consider the reasonableness of allocation methods based on project size, duration, and complexity.

**(iv) Verify Compliance with Accounting Standards:** Check adherence to Accounting standards regarding cost capitalization and allocation. Ensure alignment with relevant standards on Property, plant and equipment for accurate recognition and reporting<sup>3</sup>.

**(v) Assess Consistency and Disclosure:** Evaluate consistency in capitalization and cost allocation practices across reporting periods and projects. Review financial statement disclosures to ensure transparency and compliance with accounting standards.

## 3. Impairment Testing for Solar Energy Facilities

**Accounting Issue:** Impairment Testing for Solar Energy Facilities entails unique characteristics of these assets, including their long useful lives and susceptibility to technological advancements. Determining whether impairment indicators exist necessitates a comprehensive evaluation of factors such as changes in market conditions, evolving technology, and regulatory developments. Additionally, estimating the recoverable amount demands consideration of future cash flows, discount rates, and other pertinent factors, all within a dynamic and uncertain operating environment. Properly addressing this issue requires robust methodologies, sound judgment, and transparent disclosures to ensure accurate financial reporting and compliance with accounting standards.

### Auditor's Approach:

**(i) Understand Facility Characteristics:** Review details of solar energy facilities, including location, design, capacity, and operational history. Assess the client's methods for estimating useful life, residual value, and future cash flows

**(ii) Assess Impairment Indicators:** Whether the management has identified potential impairment

<sup>2</sup> ASC 606/ IFRS 15/ Ind AS 115 etc on Revenue from Contracts with Customers

<sup>3</sup> ASC 360/ IAS 16/ Ind AS 16 etc



indicators such as declines in market prices, technological obsolescence, or adverse regulatory changes and has applied guidance given in accounting standards<sup>4</sup>. Review testing reports.

- (iii) **Disclosure Compliance:** Ensure the client has disclosed the impairment testing process, assumptions used, and potential impacts on financial statements. Verify that these disclosures are transparent and clear for users of the financial statements.

#### 4. Lease Accounting for Solar Panel Installations/Solar Panel Rooftop Leases

**Accounting Issue:** Lease Accounting for Solar Panel Installations/Rooftop leases introduces complexities for solar power developer companies due to the diverse nature of lease agreements and the requirements outlined in Accounting Standards<sup>5</sup>. Key challenges include accurately classifying leases as operating or finance leases, determining the appropriate recognition and measurement methods, and ensuring compliance with the detailed disclosure requirements. Given the long-term nature of solar panel installations and the potential variability in lease terms, including maintenance and service agreements, proper accounting treatment demands careful assessment of lease terms, economic incentives, and lease payments over the lease term. Effective management of these considerations is crucial for providing transparent financial reporting and meeting regulatory requirements.

##### Auditor's Approach:

- (i) **Understand Lease Agreements:** Review lease agreements for solar panel installations, including duration, payment terms, and any embedded services. Assess the substance of the lease arrangements by examining contracts and related documents.
- (ii) **Classification of Leases:** Determine if leases are operating or finance leases. Consider factors such as ownership transfer, bargain purchase options, and lease term relative to the asset's economic life. Verify correct classification and accounting treatment.
- (iii) **Test Recognition and Measurement:** Validate lease recognition and measurement by reviewing lease commencement dates, payments, discount rates, and lease liabilities. Conduct analytical procedures and recalculations to ensure compliance with standards.
- (iv) **Evaluate Disclosure Requirements:** Check if disclosures on lease liabilities, terms, significant

judgments, and future commitments meet accounting standard requirements<sup>6</sup>.

#### 5. Asset Retirement Obligation (ARO) for Solar Facilities

**Accounting Issue:** Accounting for Asset Retirement Obligations (ARO) for Solar Facilities presents a significant challenge for solar power developer companies as they are tasked with decommissioning and dismantling solar energy facilities at the end of their useful lives. Estimating the future costs associated with these obligations and appropriately recognizing corresponding liabilities requires careful consideration of various factors, including regulatory requirements, technological advancements, environmental considerations, and potential changes in decommissioning methodologies.

- (i) **Understand Regulatory Requirements:** Review the relevant regulations and standards on 'Leases' and 'Asset Retirement and Environmental Obligations', to ensure compliance in estimating and reporting AROs. Familiarize with applicable laws and industry guidelines.
- (ii) **Evaluate ARO Estimation Methodologies:** This includes reviewing how retirement obligations are identified, decommissioning costs are estimated, and the timing of cash outflows is determined. Examine supporting documentation like engineering studies and cost estimates.
- (iii) **Assess Assumptions and Estimates:** Evaluate the reasonableness of key assumptions used in ARO calculations, including discount rates, inflation rates, technological advancements, and environmental remediation costs. Perform sensitivity analyses and compare with industry benchmarks and expert opinions.
- (iv) **Disclosures:** Evaluate the completeness and transparency of disclosures related to AROs in the financial statements, estimation methodologies, and their financial impact on the company's position and performance.

#### 6. Accounting for Government Incentives and Grants

**Accounting Issue:** Accounting for Government Incentives and Grants poses a significant challenge in this industry as they navigate the complexities of recognizing, measuring, and disclosing these incentives. Determining the timing and method of recognition requires careful consideration of the factors attached to the incentives, including whether they are conditional or unconditional,

<sup>4</sup> ASC 360-10/ IAS 36/ Ind AS 36 etc

<sup>5</sup> ASC 842/ IFRS 16/ Ind AS 116 on 'Leases'

<sup>6</sup> ASC 842/ IFRS 16/ Ind AS 116

and whether they represent a reimbursement of costs or a forgivable loan. Additionally, disclosure requirements demand transparency regarding the nature, terms, and impact of government incentives on the financial statements, providing users with a clear understanding of the company's reliance on such support and its potential effects on financial performance.

#### **Auditor's Approach:**

- (i) Understand Government Incentives:** Review the terms and conditions of government incentives and grants. Ensure a thorough understanding of the agreements, including any conditions or requirements attached.
- (ii) Assess Recognition Criteria:** Evaluate if the incentives meet recognition criteria per relevant accounting standards<sup>7</sup>, such as Determine if the incentives are conditional, unconditional, cost reimbursements, or forgivable loans.
- (iii) Test Recognition and Measurement:** Perform substantive testing to verify the accuracy of recognition and measurement of incentives. Review documentation supporting the incentives, and evaluate the appropriateness of accounting policies and estimates.
- (iv) Review Disclosure Requirements:** Assess the completeness and clarity of disclosures related to government incentives. Ensure that financial statements transparently detail the nature, terms, and impact of incentives on the company's financial position and performance.

### **7. Carbon Emissions Accounting and Reporting**

**Accounting Issue:** Carbon Emissions Accounting and Reporting presents a nuance for solar power developer companies, particularly concerning the measurement, monitoring, and disclosure of greenhouse gas emissions linked to solar energy operations. This entails navigating complex environmental regulations and sustainability initiatives that mandate accurate reporting of carbon emissions. Challenges include establishing reliable measurement methodologies, tracking emissions throughout the lifecycle of solar energy operations, and ensuring transparency and consistency in reporting practices.

#### **Auditor's Approach:**

- (i) Understand Environmental Regulations:** Review relevant laws, regulations, industry standards, and voluntary frameworks for carbon emissions accounting and reporting. Ensure the company complies with all applicable environmental and sustainability requirements.
- (ii) Assess Measurement Methodologies:** Evaluate the methodologies used for measuring and monitoring greenhouse gas emissions. Check the accuracy of emission factors, data collection processes, and estimation techniques.
- (iii) Test Data Integrity:** Perform substantive testing to verify the reliability of data used in carbon emissions accounting. Review source documents, data validation procedures, and internal controls related to data collection and reporting.
- (iv) Review Revenue Recognition Methods:** Ensure the company's revenue recognition policies are consistent with accounting standards<sup>8</sup>.
- (v) Review Disclosure Practices:** Assess the adequacy and transparency of disclosures in sustainability and annual reports. Ensure that disclosures about carbon emissions are complete, accurate, and meet regulatory and industry standards.

### **8. Depreciation of Power Generating Equipment and Distinguishment of Capital Expenditures and Repair Expenses**

**Accounting Issue:** Accounting for Depreciation of Power Generating Equipment is crucial for solar power developers to accurately allocate costs over the useful lives of their assets. Key accounting considerations include determining the appropriate depreciation methods, estimating useful lives, and assessing the residual values of power generating equipment, such as solar panels and inverters. Additionally, accounting for depreciation involves navigating complex regulations and industry standards, ensuring compliance with accounting principles while reflecting the economic benefits derived from these assets accurately.

Solar power developers incur capital expenditures for facility upgrades and expansions. Accounting for Capital Expenditures and Repair Expenses is crucial for solar power

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<sup>7</sup> ASC 958-605 (Not for Profit Entities)/IAS 20/ Ind AS 20 (Accounting for Government Grants and Disclosure of Government Assistance) or ASC 450 (Contingencies)/IAS 37/ Ind AS 37 (Provisions, Contingent Liabilities and Contingent Assets).

<sup>8</sup> ASC 606/ IFRS 15/Ind AS 115 on Revenue from Contracts with Customers)

developers to correctly classify and report costs associated with facility upgrades and expansions. Distinguishing between capital expenditures and repair expenses is essential for proper financial reporting regardless of the stage of the project. While repair expenses are for routine maintenance of the asset, capital expenditure goes into improving the asset.

#### **Auditor's Approach:**

- (i) Understand Depreciation Policies:** Review the company's depreciation policies for power generating equipment. Assess the methods used (e.g., straight-line, units-of-production, accelerated) and the rationale behind method selection.
- (ii) Assess Useful Lives:** Evaluate the company's estimates for the useful lives of power generating equipment. Review factors considered, such as technological advancements, wear and tear, and operational changes. Ensure these estimates are reasonable and align with industry practices.
- (iii) Review Residual Values:** After evaluating useful lives, review the company's estimates for residual values of equipment. Check assumptions and methodologies used for consistency with industry standards and current market conditions.
- (iv) Understanding Business Context:** Gain an understanding of the solar power developer's operations, strategic objectives, and industry dynamics. This context helps in assessing the nature and significance of capital expenditures and repair expenses.
- (v) Reviewing Expenditure Nature:** Evaluate the purpose and nature of expenditures to determine if they should be classified as capital expenditures or repair expenses. Determine if expenditures enhance asset functionality or extend its useful life, thereby qualifying as capital expenditures, versus costs for routine maintenance, which are repair expenses.
- (vi) Review Disclosure Requirements:** Evaluate the adequacy and completeness of disclosures to provide clear and relevant information on depreciation methods, useful lives, residual values, and the impact on financial performance.

### **9. Compliance with Borrowing Covenants**

Accounting Issue: Solar power developers depend heavily on external sources of funds, which can be in the form of obtaining long term loans or issuance of bonds etc. Solar power developers are obligated to comply with borrowing covenants outlined in loan agreements with

lenders. The compliance with debt covenants of such borrowings is a critical step to ensure that debts do not become repayable or there is no additional amount of interest/penal interest which the lenders may charge to the Company. Key considerations include understanding the terms and conditions of borrowing covenants, evaluating the company's compliance status, and mitigating risks associated with potential covenant breaches.

#### **Auditor's Approach:**

- (i) Review of Loan Agreements:** Thoroughly examine the terms and conditions of loan agreements entered into by the solar power developer, focusing on the specific borrowing covenants imposed by lenders. Identify the nature, scope, and significance of these covenants in relation to the company's financial position and operations.
- (ii) Assessment of Compliance Status:** Evaluate the company's compliance status with respect to borrowing covenants, considering factors such as debt-to-equity ratios, debt service coverage ratios, minimum liquidity requirements, and restrictions on dividend payments or capital expenditures.
- (iii) Analysis of Covenant Testing Procedures:** Review the procedures and methodologies used by management to test compliance with borrowing covenants. Assess the accuracy and reliability of calculations, assumptions, and inputs employed in covenant testing processes.
- (iv) Evaluation of Covenant Violations:** Identify any instances of actual or potential covenant violations and assess their implications for the company's financial stability and access to credit. Consider the severity of covenant breaches, potential remedies or waivers available, and the impact on financial reporting and disclosure obligations.
- (v) Documentation and Reporting:** Document audit procedures, findings, and conclusions regarding compliance with borrowing covenants. Communicate any significant issues or uncertainties related to borrowing covenants to stakeholders.

### **10. Interest Rate Risk Management**

Accounting Issue: Solar power developers generally engage in interest rate hedging arrangements to mitigate the risk associated with fluctuations in interest rates on borrowings. The accounting issue lies in accurately accounting for these hedging instruments and ensuring compliance with relevant accounting standards. Key considerations include the classification, measurement,

and presentation of hedging instruments, effectiveness testing, and disclosure of hedging activities in financial statements.

**Auditor's Approach:**

- (i) Understanding Hedging Strategies:** Gain insight into the solar power developer's interest rate risk management strategies, including the types of hedging instruments utilized, the objectives of hedging activities, and the underlying exposures being hedged.
- (ii) Assessment of Hedge Effectiveness:** Evaluate the effectiveness of interest rate hedging arrangements in mitigating interest rate risk. Assess compliance with hedge accounting requirements outlined in accounting standards such as ASC 815/ IFRS 9/ Ind AS 109, including documentation of hedge relationships and periodic effectiveness testing.
- (iii) Review of Hedge Accounting Treatment:** Review the accounting treatment applied to interest rate hedging instruments, including classification as fair value hedges, cash flow hedges, or net investment hedges. Assess the consistency and accuracy of hedge accounting methodologies and the appropriateness of fair value measurements.
- (iv) Analysis of Financial Statement Impact:** Analyze the impact of interest rate hedging activities on the company's financial position, results of operations, and cash flows. Consider the effects of hedge ineffectiveness, changes in fair value of hedging instruments, and reclassification adjustments on the financial statements.
- (v) Evaluation of Disclosure Requirements:** Ensure transparent disclosure of interest rate hedging activities in the financial statements and related disclosures. Assess compliance with disclosure requirements outlined in accounting standards, including qualitative and quantitative information about the company's risk management objectives, strategies, and exposures.
- (vi) Documentation and Reporting:** Document audit procedures, findings, and conclusions regarding interest rate risk management and hedging activities. Ensure clear and comprehensive disclosure of accounting policies, significant judgments, and estimates related to interest rate hedging in the financial statements. Communicate any significant issues or uncertainties related to interest rate risk management to stakeholders.

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