

Power Generation Module

Full Description

Module 2 of the [Annex in Asset Recycling](#).

This module sets out sector-specific asset recycling guidelines for power generation sector, including sector-specific due diligence requirements, [sample risk allocation matrix](#) and [sample terms of reference \(TOR\)](#) for selection of transaction advisors. *Find more below, or visit the [Guidelines for Implementing Asset Recycling Transactions](#) section and [Content Outline](#), or [Download the Full Report](#)*

Due Diligence for Power Generation

The Relevant Authority should undertake a due diligence study of the power generation asset that is considered for asset recycling. This should form part of the asset recycling transaction preparation process. The due diligence process for a power generation asset should include:

- [Technical due diligence](#)
- [Commercial structuring and feasibility assessment](#)
- [Legal due diligence](#)
- [E&S and climate resilience due diligence](#)

Technical Due Diligence

The objective of the technical due diligence is to identify potential technical issues with respect to the Asset Recycling Asset. This exercise should form the basis for determining the scope for management, maintenance and refurbishment of the Asset Recycling Asset that the Concessionaire may need to invest in to ensure required performance specifications can be met.

The Relevant Authority should carry out the following steps in conducting technical due diligence of the Asset Recycling Asset.



- **Availability and accessibility of technical data:**

- Review relevant documentation: Review available data and documentation with respect to the Asset Recycling Asset, including but not limited to previous feasibility studies, technical reports (engineering drawings and design), financial statements, existing commercial agreements.

- Organization of data: Data collected should then be organized according to categories – collation and categorization helps to minimize accessibility issues for bidders when data is made available during the bidding process.
- **Asset performance and condition:** The assessment should include a study on the existing asset condition, understanding of any major technical or operation issues, and identification of potential plant process and equipment improvement alternatives:

Historical – review period: past (3 to 5) years

- Undertake an assessment of the general condition of the Asset Recycling Asset;
 - site layout
 - power generation units
 - electrical and control system
 - auxiliary systems
 - emission monitoring system
 - supporting facilities (such as workshops / warehouse, etc.)
 - emission factor (if the Asset Recycling Asset is a thermal generation asset)
- Identify any deficiencies in the asset's functions and operations, including staffing plan, sufficiency of experts and manpower;
- Assess annual operational costs of the asset (fixed cost, variable cost and fuel cost);
- Assess annual maintenance costs of the asset (pro-active, preventive, and corrective), maintenance schedule compliance, major maintenance outages and assets upgrades;
- Assess potential replacement / overhaul / major maintenance required;
- Assess remaining useful life of the assets;

- Assess detailed historical performance data and overall performance (i.e. power generation rate, auxiliary consumption rate, constraints on dispatch or curtailment, [fuel consumption & heat rate – for thermal plants] against benchmark KPIs – local and international as well as downtime incidents assessment) and capacity of the assets (asset reliability and asset availability), including performance in relation to safety systems (near-misses, incidents and fatalities);
- (If applicable,) assessment of historical fuel (supply) data (for thermal power plants) and hydrology data (for hydro power plants);
- Environmental and social and climate change impact assessment, including assessing emission factors and identifying (if applicable) asset refurbishment or upgrades required to comply with international standards (e.g. WBG-EHS guidelines);

Future / Forecast

- Define service specifications required to meet the future needs;
 - Identify any change required in technology (including identify potential risks related to obsolescence of that technology (e.g. due to carbon transition, climate policy)) used and assess costs required for implementation;
 - Gap Analysis, including sufficiency of fuel supply with generation plan
 - Assess if asset condition is sufficient to provide satisfactory service levels; document any gaps (gap analysis) where the efficiencies of private sector can be leveraged.
- **Capital, operational and life-cycle expenditure plans:**
 - Assess expenditure plan (for improvement of service levels, technological upgrade or increasing capacity) to meet expected growing demand/offtake and service level of the asset over the contemplated concession/power purchase agreement;
 - Assess any proposed timeline/ implementation plan and phasing of the expenditure plan.

The outcome of the technical due diligence should be provided as a report. As a minimum, it should report on the overall performance and conditions of the Asset Recycling Asset, assess future capital, operational, and life-cycle expenditure plans.

Commercial Structuring and Feasibility Assessment

Financial feasibility assessment

- Review initial forecast / budgeted revenue, capex and opex, tax, capital structure, funding schedule and conduct adjustment to the assumptions based on the latest available information, key project documents or term sheets, and benchmarking
- Review existing debt funding facilities
- Develop a project financial feasibility model based the updated assumptions, parameters and value to identify project IRR, NPV, payback period and other relevant investment feasibility indicators.

Commercial parameters

- Identify the key objectives and key commercial drivers for the implementation of Asset Recycling
- Identify key project risks and risk mitigation action plans in place
- Prepare a preliminary asset recycling commercial structure for the transaction considering key bankability requirements including:
 - Offtake structure
 - Service obligation
 - Key performance indicators
 - Concession period
 - Asset ownership
 - Capital funding structure
 - Payment scheme to GCA
 - Fuel supply arrangement (if applicable)
 - Tariff structure and tariff adjustment provision
 - Termination regime

- Other project bankability structuring considerations
- Identify any VGF or government support (if required) to achieve financial feasibility

Legal Due Diligence

The Relevant Authority should consider the following points when conducting its legal due diligence of assets in the power generation sector (assuming IPP model):

- Corporate documents
 - Shareholder agreements among IPP developer shareholders (shareholding structure, governance of IPP company, reserved matters, shareholder's exit and transfer of shares provisions) and share certificates
 - Legality of IPP company including members of board of commissioners and board of directors
 - Adequacy and validity of key business operation permits and licenses, including from external technology or intellectual property providers
 - Legality of IPP developer ownership over the Asset Recycling Assets
- Key Project Agreements, i.e.
 - Power Purchase Agreement
 - Power generation requirements (minimum generation, curtailment, dispatch credits, penalty)
 - Offtake mechanism
 - Tariff provision (base tariff and adjustments)
 - Consider applicable arrangements in terms of feedstock supply fuel or other primary energy source (such as steam or hydrology resource) to the Operator (if relevant to the asset) including risk allocation in case of fuel supply issues.
 - Liquidated damages
 - Termination regime

- Metering arrangement calibration
 - Payment regime
 - Assets transfer requirements
 - Dispute resolution
- Fuel supply agreement (if applicable)
- Financing Agreement (restrictions to asset recycling implementation)
- Land ownership / utilization permit or agreement
- Workforce arrangement and agreement
- Insurance agreements (insurance coverage, premium, etc.)
- Adequacy of permits related to Health Safety and Environment (“HSE”) for the operation of the existing assets and compliance of HSE reporting to Relevant Authority
- Historical environmental issues and litigation against IPP company
- Good corporate governance policy and standard operating procedures
- Termination rights of the parties and consequences of termination.
- Any other contingent liabilities

E&S and Climate Resilience Due Diligence

The Relevant Authority should consider the following points when conducting its E&S due diligence of a power generation asset:

- identify gaps between national applicable law and GIIP/Lenders requirements and way to bridge them with related timeline for implementation;
- key E&S risks may include, but not limited to: land acquisition and/or clearing, resettlement, impact on livelihood, presence of sensitive receptors in the project area of influence with potential limitation in

access to residential and commercial activities and increase in noise levels, air emissions, pollution, dust, wastewater and storm water management, waste management, and hazardous material/waste handling, presence and close proximity of the alignment with key biodiversity areas, legacy issue (if any);

- applicable E&S permitting and E&S studies to be developed and to be considered in the risks allocation between the government contracting party and the private sector.

The Climate Resilience Due Diligence should include at least

- assessment of GHG emissions baseline of the power generation asset;
- historical climate data and natural disaster events affecting the power generation asset;
- review of climate and natural disasters risks of the power generation asset (e.g. insufficient cooling water; temperature of cooling water before and after use; floods risks, particularly in coastal infrastructure; reduced efficiency of solar energy; drought and/or reduced average precipitations affecting output from hydropower generation);
- assessment of the Disaster Risk Management plan or Emergency Preparedness and Response plan (if any in place); and
- assessment of integration of climate resilience concepts in maintenances regimes.

Related Content

[Guidelines for Implementing Asset Recycling Transactions \(Download PDF version\) - Now Available!](#)

Additional Resources

[Energy and Power PPPs](#)

[Energy Laws and Regulations](#)

[Energy Agreements](#)

Page Specific Disclaimer

The Guidelines have not been prepared with any specific transaction in mind and are meant to serve only as general guidance. It is therefore critical that the Guidelines be reviewed and adapted for specific transactions To find more, visit the Guidelines to Implementing Asset Recycling Transactions [Section Overview](#) and [Content Outline](#), or [Download the Full Report](#).