INSTITUTE OF CHARTERED ACCOUNTANTS OF THE MALDIVES

# Guideline for Valuation of Property, Plant and Equipment and Investment Property for Financial Reporting Purposes

(Based on IFRS 13, IVS 300 and IVS 400)

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## Disclaimer

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INSTITUTE OF CHARTERED ACCOUNTANTS OF THE MALDIVES

## Content

## 1. Preamble

This guideline provides a framework for determining the fair value of Property, Plant and Equipment (PPE) and Investment Property in accordance with IFRS Accounting Standards and International Valuation Standards (IVS). It aims to promote consistency, transparency, and reliability in valuations undertaken for financial reporting in the Maldives.

## 2. Objective and Scope

IFRS 13 – Fair Value Measurement provides a single framework for defining, measuring, and disclosing fair value for financial reporting purposes. In contrast, the International Valuation Standards (IVS) offer comprehensive guidance on the valuation process.

This guideline has been prepared based on IFRS 13 and IVS 300 and 400 and is intended as a non-mandatory reference. Professionals such as accountants, auditors and valuers may use this guideline to assist in applying IFRS 13 and IVS requirements when valuing Property, Plant and Equipment (PPE) and Investment Property for financial reporting purposes.

The guideline applies to entities across sectors, including tourism, commercial, industrial, and public infrastructure, and aims to promote consistency, transparency, and reliability in valuations undertaken for financial reporting in the Maldives.

## 3. Governing Standards and Hierarchy

The valuation process must comply with the following hierarchy of standards:

1. IFRS 13 – Fair Value Measurement (defines fair value and disclosure)
2. IAS 16 – Property, Plant and Equipment
3. IAS 40 – Investment Property
4. IVS 300 – Valuations for Financial Reporting
5. IVS 400 – Real Property Interests

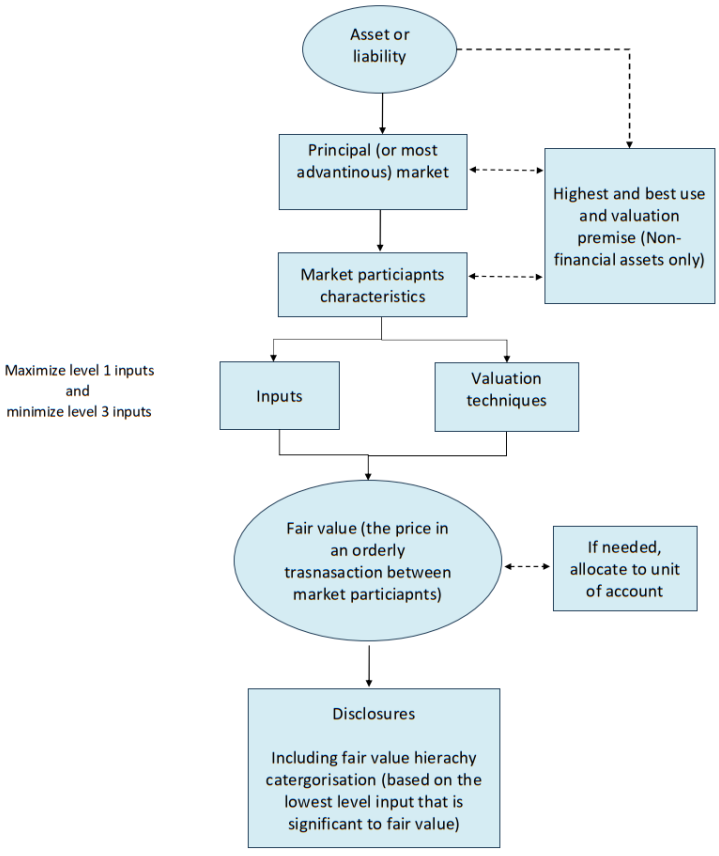
# 4. Fair Value

## 4.1 The fair value measurement framework in IFRS 13

The objective of a fair value measurement is "to estimate the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions". Considering the objective, when measuring fair value, an entity must determine all of the following with regards to the property, plant & equipment and Investment Properties.

1. The particular asset that is the subject of the measurement
2. For a non-financial asset, the valuation premise that is appropriate for the measurement
3. The principal (or most advantageous) market for the asset
4. The valuation techniques appropriate for the measurement, considering the availability of data with which to develop inputs that represent the assumptions that market participants would use when pricing the asset and the level of the fair value hierarchy within which the inputs are categorized

The following diagram illustrates our view of the interdependence of the various components of the



## 4.2 The particular asset that is the subject of the measurement

The identification of exactly what asset or liability is being measured is fundamental to determining its fair value. Fair value may need to be measured for either 1. A stand alone asset or 2. A group of assets.

**Characteristics of the asset**

When measuring fair value, IFRS 13 requires an entity to consider the characteristics of the asset. Examples of such characteristics could include the condition and location of an asset, Restrictions, if any, on the sale or use of an asset .

An asset may not be in the condition or location that market participants would require for its sale at an observable market price. In order to determine the fair value of the asset as it currently exists, the market price needs to be adjusted to the price market participants would be prepared to pay for the asset in its current condition and location.

IFRS 13 indicates that the effect on fair value of a restriction on the sale or use of an asset will differ depending on whether the restriction is deemed to be a characteristic of the asset or the entity holding the asset. A restriction that would transfer with the asset in an assumed sale would generally be deemed a characteristic of the asset and, therefore, would likely be considered by market participants when pricing the asset. Conversely, a restriction that is specific to the entity holding the asset would not transfer with the asset in an assumed sale and, therefore, would not be considered when measuring fair value.

**Illustrative example**

*A company owns a manufacturing plant located in an industrial zone on the outskirts of a major city. The plant includes land, buildings, and specialized machinery used for producing automotive parts. The key characteristic of the asset is as follows;*

- *The plant is in an industrial zone with good access to highways and suppliers. This increases its marketability to other manufacturers.*
- *The building is 10 years old but well-maintained. Machinery is modern and fully operational.*
- *The facility spans 50,000 sq. ft. with room for expansion, which adds value.*
- *The company owns the land (freehold) and has all necessary permits for industrial use.*
- *Zoning laws restrict the land to industrial use only — this is a market-based restriction and must be considered.*

- *The plant is purpose-built for automotive parts but could be adapted for other manufacturing uses.*

*The valuer uses a suitable valuation technique to estimate the fair value, incorporating the above characteristics. The zoning restriction (industrial use only) shall be factored in because it limits the highest and best use of the land which is a key principle under IFRS 13.*

## 4.3 For a non-financial asset, the valuation premise that is appropriate for the measurement

**Highest and best use**

Highest and best use refers to "the use of a non-financial asset by market participants that would maximise the value of the asset or the group of assets within which the asset would be used".

In determining the highest and best use of a non-financial asset, IFRS 13.28 indicates uses that are physically possible, legally permissible and financially feasible should be considered. As such, when assessing alternative uses, entities should consider the physical characteristics of the asset, any legal restrictions on its use and whether the value generated provides an adequate investment return for market participants.

**Illustrative example**

*An entity acquires land in a business combination. The land is currently developed for industrial use as a site for a factory. The current use of land is presumed to be its highest and best use unless market or other factors suggest a different use. Nearby sites have recently been developed for residential use as sites for high-rise apartment buildings. On the basis of that development and recent zoning and other changes to facilitate that development, the entity determines that the land currently used as a site for a factory could be developed as a site for residential use (ie for high-rise apartment buildings) because market participants would take into account the potential to develop the site for residential use when pricing the land.*

*The highest and best use of the land would be determined by comparing both of the following:*

*(a) the value of the land as currently developed for industrial use (ie the land would be used in combination with other assets, such as the factory, or with other assets and liabilities).*

*(b) the value of the land as a vacant site for residential use, taking into account the costs of demolishing the factory and other costs (including the uncertainty about whether the entity would be able to convert the asset to the alternative use) necessary to convert the land to a vacant site (ie the land is to be used by market participants on a stand-alone basis.*

*The highest and best use of the land would be determined on the basis of the higher of those values. In situations involving real estate appraisal, the determination of highest and best use might take into account factors relating to the factory operations, including its assets and liabilities.*

## 4.4 The principal (or most advantageous) market for the asset

A fair value measurement contemplates an orderly transaction to sell the asset or transfer the liability in either 1) the principal market for the asset or liability 2) In the absence of a principal market, the most advantageous market for the asset or liability.
IFRS 13 is clear that, if there is a principal market for the asset or liability, the fair value measurement represents the price in that market at the measurement date (regardless of whether that price is directly observable or estimated using another valuation technique). The price in the principal market must be used even if the price in a different market is potentially more advantageous.

The principal market is the market for the asset or liability that has the greatest volume or level of activity for the asset or liability. There is a general presumption that the principal market is the one in which the entity would normally enter into a transaction to sell the asset, unless there is evidence to the contrary. In practice, an entity would first consider the markets it can access. Then it would determine which of those markets has the greatest volume and liquidity in relation to the particular asset or liability.

**Illustrative example**

*An asset is sold in two different active markets at different prices. An entity enters into transactions in both markets and can access the price in those markets for the asset at the measurement date. In Market A, the price that would be received is CU26, transaction costs in that market are CU3 and the costs to transport the asset to that market are CU2 (ie the net amount that would be received is CU21). In Market B, the price that would be received is CU25, transaction costs in that market are CU1 and the costs to transport the asset to that market are CU2 (ie the net amount that would be received in Market B is CU22).*

*If Market A is the principal market for the asset (ie the market with the greatest volume and level of activity for the asset), the fair value of the asset would be measured using the price that would be received in that market, after taking into account transport costs (CU24).*

*If neither market is the principal market for the asset, the fair value of the asset would be measured using the price in the most advantageous market. The most advantageous market is the market that maximises the amount that would be received to sell the asset, after taking into account transaction costs and transport costs (ie the net amount that would be received in the respective markets).*

*Because the entity would maximise the net amount that would be received for the asset in Market B (CU22), the fair value of the asset would be measured using the price in that market (CU25), less transport costs (CU2), resulting in a fair value measurement of CU23. Although transaction costs are taken into account when determining which market is the most advantageous market, the price used to measure the fair value of the asset is not adjusted for those costs (although it is adjusted for transport costs)*

## 4.5 Valuation Approaches (IFRS 13 and IVS 105)

Consideration must be given to the relevant and appropriate valuation approaches. One or more valuation approaches may be used in order to arrive at the value in accordance with the basis of value. The three approaches described and defined below are the principal valuation approaches

- Market Approach
- Income Approach
- Cost Approach

The selection of the approach should seek to maximize the use of observable inputs, as appropriate. The goal in selecting valuation approaches and methods for an asset is to find the most appropriate method under the particular circumstances of the valuation. No single method is suitable in every possible situation. In their selection process, the valuer should consider at a minimum;

a) the appropriate basis(es) of value and premise(s) of value, determined by the terms and intended use of the valuation,

b) the respective strengths and weaknesses of the possible valuation approaches and valuation methods,
c) the appropriateness of each method in view of the nature of the asset(s), and the valuation approaches or valuation methods used by participants in the relevant market,
d) the availability of reliable information needed to apply the method(s), and
e) price information from an active market.

The valuer is not required to use more than one method for the valuation of an asset, particularly when the valuer has a high degree of confidence in the accuracy and reliability of a single method, given the facts and circumstances of the valuation.

However, more than one valuation approach or valuation method should be considered and may be used to arrive at an indication of value, particularly when there are insufficient factual or observable inputs for a single method to produce a reliable conclusion.

Where more than one valuation approach and valuation method is used, or even multiple methods within a single approach, the value based on those multiple approaches and/or methods should be reasonable and the process of analysing and reconciling the differing values into a single conclusion, without averaging, should be described by the valuer in the report.

The determination of the appropriate technique(s) to be applied requires significant judgement, sufficient knowledge of the asset or liability and an adequate level of expertise regarding the valuation techniques. Within the application of a given approach, there may be a number of possible valuation techniques.

In certain instances, adjustments to the output from a valuation technique may be required to appropriately determine a fair value measurement in accordance with IFRS 13. An entity makes valuation adjustments if market participants would make those adjustments when pricing an asset or liability (under the market conditions at the measurement date). This includes any adjustments for measurement uncertainty (e.g., a risk premium).

Regardless of the valuation technique(s) used, the objective of a fair value measurement remains the same - i.e., an exit price under current market conditions from the perspective of market participant. As such, if the transaction price is determined to represent fair value at initial recognition and a valuation technique that uses unobservable inputs will be used to measure the fair value of an item in subsequent periods, the valuation technique must be calibrated to ensure the valuation technique reflects current market conditions. In other words, at initial

recognition the output from the valuation technique should be adjusted to equal the transaction price.

Calibration ensures that a valuation technique incorporates current market conditions. The calibration also helps an entity to determine whether an adjustment to the valuation technique is necessary by identifying potential deficiencies in the valuation model. For example, there might be a characteristic of the asset or liability that is not captured by the valuation technique.

The standard requires that valuation techniques used to measure fair value be applied on a consistent basis among similar assets or liabilities and across reporting period. This is not meant to preclude subsequent changes, such as a change in its weighting when multiple valuation techniques are used or a change in an adjustment applied to a valuation technique.

IFRS 13 provides the following examples of circumstances that may trigger a change in valuation technique or relative weights assigned to valuation techniques:

- New markets develop
- New information becomes available
- Information previously used is no longer available
- Valuation techniques improve
- Market conditions change

**Inputs to valuation techniques**

When selecting the inputs to use in a valuation technique, IFRS 13 requires that they:

- Be consistent with the characteristics of the asset or liability that market participants would take into account
- Exclude premiums or discounts that reflect size as a characteristic of the entity's holding, rather than a characteristic of the item being measured
- Exclude other premiums or discounts if they are inconsistent with the unit of account

In all cases, if there is a quoted price in an active market (i.e., a Level 1 input) for the identical asset or a liability, an entity shall use that price without adjustment when measuring fair value.

Regardless of the valuation techniques used to estimate fair value, IFRS 13 requires that these techniques maximise the use of relevant observable inputs and minimise the use of unobservable inputs. This requirement is consistent with the idea that fair value is a market-

based measurement and, therefore, is determined using market-based observable data, to the extent available and relevant.

**The fair value hierarchy**

The fair value hierarchy classifies the inputs used to measure fair value into three levels, which are described below.

| | Level 1 | Level 2 | Level 3 |
|---|---|---|---|
| **Definition** | Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at the measurement date. | Inputs other than quoted prices included within level 1 that are observable for the asset or liability, either directly or indirectly. | Unobservable inputs for the asset or liability. |
| **Examples** | In practice, **Level 1 inputs are rarely available for PPE**, because these assets are often unique, specialized, or not traded in active markets. However, in **limited cases**, Level 1 inputs may be available.<br>• A listed vehicle (e.g., a truck or construction equipment) traded on a public auction platform with frequent transactions | • Prices of similar industrial buildings in nearby locations<br>• Sale prices of similar used machinery sold in a secondary market<br>• Rental rates for similar commercial properties used to estimate income approach | • Projected cash flows used in a discounted cash flow calculation.<br>• Estimated remaining useful life of a unique piece of equipment<br>• Cost to replace a bespoke production line with similar functionality |

# 5. Valuation of Property, Plant and Equipment (PPE) including Investment Properties

Property, plant and equipment covers the tangible assets that are usually held by an entity for use in the manufacturing/production or supply of goods or services, for rental by others or for administrative purposes and that are expected to be used over a period of time.

## 5.1 Valuation of Property (Land and Buildings)

To qualify for a property, the reporting entity shall have;

- the superior interest in any defined area of land. The owner of this interest has an absolute right of possession and control of the land and any buildings upon it in perpetuity, subject only to any subordinate interests and any statutory or other legally enforceable constraints,
- a subordinate interest that normally gives the holder rights of exclusive possession and control of a defined area of land (where the building is developed) for a defined period, eg, under the terms of a lease contract

Property is valued at fair value when entities adopt the revaluation model under IAS 16 or fair value model under IAS 40. Additionally the measurement of fair value is also crucial in sale and purchase transactions various properties. The methodology of valuation is subjective to the asset and its circumstances. ***'IVS 400 Real Property Interest'*** shall be referred when conducting the valuation of properties.

### 5.1.1 Market approach

Property interests are generally heterogeneous (ie, with different characteristics). Even if the land and buildings have identical physical characteristics to others being exchanged in the market, the location will be different. Notwithstanding these dissimilarities, the market approach can be applied for the valuation of real property interests.

In order to compare the subject of the valuation with the price of other real property interests, the valuer should adopt generally accepted and appropriate units of comparison that are considered by participants, dependent upon the type of asset being valued.

Units of comparison that are commonly used might include:

a) price per square metre (or per square foot) of a building or per hectare (or per acre) for land,
b) price per room, and
c) price per unit of output (eg, megawatt, crop yields).

A unit of comparison is only useful when it is consistently selected and applied to the subject property and the comparable properties in each analysis. The reliance that can be applied to any comparable price data in the valuation is determined by comparing various characteristics of the property and transaction from which the data was derived with the property being valued.

Specific differences that should be considered in valuing properties include, but are not limited to:

a) the type of property providing the price evidence and the type of property being valued,
b) the respective locations,
c) the respective quality of the land,
d) the age and specification of the improvements,
e) the permitted use or zoning at each property,
f) the circumstances under which the price was determined and the basis
g) of value required,
h) the effective date of the price evidence and the valuation date, and
i) market conditions at the time of the relevant transactions and how they differ from conditions at the valuation date.

### 5.1.2 Income Approach

Under income approach value of the property is based upon an actual or estimated income that either is, or could be, generated by an owner of the property. In the case of an investment property, that income could be in the form of rent; in an owner-occupied building, it could be an assumed rent (or rent saved) based on what it would cost the owner to lease equivalent space.

The income-generating ability of the property should be closely tied to a particular use or business/trading activity (for example, cinemas, cafés, clinics, hotels, etc). Where a building is suitable for only a particular type of trading activity, the income is often related to the actual or potential cash flows that would accrue to the owner of that building from the trading activity.

When the potential income used in the income approach represents cash flow from a business/trading activity (rather than cash flow related to rent, maintenance and other real property-specific costs), and includes intangible assets then this is no longer solely a real property valuation and the valuer should also comply as appropriate with the requirements of IVS 200 Businesses and Business Interests and, where applicable, IVS 210 Intangible Assets.

Income approach should be applied and afforded significant weight under the following circumstances:

- the income-producing ability of the asset is the critical element affecting value from a participant perspective, and/or
- reasonable projections of the amount and timing of future income are available for the subject asset, but there are no relevant and reliable market comparable

For the valuation of properties, various forms of discounted cash flow models may be used. These vary in detail but share the basic characteristic that the cash flow for a defined future period is adjusted to a present value using a discount rate. The sum of the present day values for the individual periods represents an estimate of the property value. The discount rate in a discounted cash flow model will be based on the time value of money and the risks and rewards of the income stream in question.

#### 5.1.2.1 Discounted Cash Flow (DCF) method

Under the DCF method the forecasted cash flow is discounted back to the valuation date, resulting in a present value of the asset.

For long-lived or indefinite-lived assets, DCF may include a terminal value which represents the value of the asset at the end of the explicit projection period (example: in the case of valuing a building). In other circumstances, the value of an asset may be calculated solely using a terminal value with no explicit projection period (example: in the case of valuing a land). This is sometimes referred to as an income capitalisation method.

***The key steps in the DCF method are***:

a) choose the most appropriate type of cash flow for the nature of the subject asset and the valuation (ie, pre-tax or post-tax, total cash flows or cash flows to equity, real or nominal, etc),

b) determine the most appropriate explicit period, if any, over which the cash flow will be forecast,
c) prepare cash flow forecasts for that period,
d) determine whether a terminal value is appropriate for the subject asset at the end of the explicit forecast period (if any) and then determine the appropriate terminal value for the nature of the asset,
e) determine the appropriate discount rate, and
f) apply the discount rate to the forecasted future cash flow, including the terminal value, if any.

When a valuation is being developed in a currency ("the valuation currency") that differs from the currency used in the cash flow projections ("the functional currency"), the valuer should use one of the following two currency translation methods:

1. Discount the cash flows in the functional currency using a discount rate appropriate for that functional currency. Convert the present value of the cash flows to the valuation currency at the spot rate on the valuation date.
2. Use a currency exchange forward curve to translate the functional currency projections into valuation currency projections and discount the projections using a discount rate appropriate for the valuation currency. When a reliable currency exchange forward curve is not available (for example, due to lack of liquidity in the relevant currency exchange markets), it may not be possible to use this method.

### 5.1.3 Cost Approach

The cost approach may be used as the primary approach when there is either no evidence of transaction prices for similar property or no identifiable actual or notional income stream that would accrue to the owner of the relevant interest.

Broadly, there are ***three cost approach methods***:

a) replacement cost method: a method that indicates value by calculating the cost of a similar asset offering equivalent utility,
b) reproduction cost method: a method under the cost that indicates value by calculating the cost to recreating a replica of an asset, and
c) summation method: a method that calculates the value of an asset by the addition of the separate values of its component parts.

Cost approach is generally applied to the valuation of property through the **depreciated replacement cost method**.

### 5.1.3.1 Replacement Cost Method

Replacement cost is the cost that is relevant to determining the price that a participant would pay as it is based on replicating the utility of the asset, not the exact physical properties of the asset.

Usually replacement cost is adjusted for physical deterioration and all relevant forms of obsolescence. After such adjustments, this can be referred to as depreciated replacement cost.

***The key steps in the replacement cost method are***:

I. calculate all of the costs that would be incurred by a typical participant seeking to create or obtain an asset providing equivalent utility,
II. determine whether there is any depreciation related to physical, functional and external obsolescence associated with the subject asset, and
III. deduct total depreciation from the total costs to arrive at a value for the subject asset.

The replacement cost is generally that of a modern equivalent asset, which is one that provides similar function and equivalent utility to the asset being valued, but which is of a current design and constructed or made using current cost-effective materials and techniques

**Cost Considerations**

The cost approach should capture all of the costs that would be incurred by a typical participant. The cost elements may differ depending on the type of asset and should include the direct and indirect costs that would be required to replace/ recreate the asset as of the valuation date.

The replacement cost must reflect all incidental costs, as appropriate, such as the value of the land, infrastructure, design fees, finance costs and developer profit that would be incurred by a participant in creating an equivalent asset.

Some common items to consider include, but are not limited to:

**Direct costs:**

a. materials, and
b. labour

**Indirect costs:**

a. transport costs
b. installation costs
c. professional fees (design, permit, architectural, legal, etc)
d. other fees (commissions, etc)
e. overheads
f. taxes
g. finance costs (eg, interest on debt financing), and
h. profit margin/to the creator of the asset (eg, return to investors).

**Depreciation/Obsolescence**

Depreciation adjustments are normally considered for the following types of obsolescence, which may be further divided into sub-categories when making adjustments:

a) physical obsolescence: any loss of utility due to the physical deterioration of the asset or its components resulting from its age and usage,
b) functional obsolescence: any loss of utility resulting from inefficiencies in the subject asset compared with its replacement such as its design, specification or technology being outdated,
c) external or economic obsolescence: any loss of utility caused by economic or locational factors external to the asset. This type of obsolescence can be temporary or permanent.

Depreciation/obsolescence should consider the physical and economic lives of the asset:

a) The physical life is how long the asset could be used before it would be worn out or beyond economic repair, assuming routine maintenance but disregarding any potential for refurbishment or reconstruction,
b) The economic life is how long it is anticipated that the asset could generate financial returns or provide a non-financial benefit in its current use. It will be influenced by the degree of functional or economic obsolescence to which the asset is exposed.

Physical obsolescence can be measured in two different ways:

a) curable physical obsolescence, ie, the cost to fix/cure the obsolescence, or
b) incurable physical obsolescence which considers the asset's age, expected total and remaining life where the adjustment for physical obsolescence is equivalent to the

proportion of the expected total life consumed. Total expected life may be expressed in any reasonable way, including expected life in years, mileage, units produced, etc.

There are two forms of functional obsolescence:

a) excess capital cost, which can be caused by changes in design, materials of construction, technology or manufacturing techniques resulting in the availability of modern equivalent assets with lower capital costs than the subject asset, and
b) excess operating cost, which can be caused by improvements in design or excess capacity resulting in the availability of modern equivalent assets with lower operating costs than the subject asset.

Economic obsolescence may arise when external factors affect an individual asset or all the assets employed in a business and should be deducted after physical deterioration and functional obsolescence. For real estate, examples of economic obsolescence include but are not limited to:

(a) adverse changes to demand for the products or services produced by the asset,
(b) oversupply in the market for the asset,
(c) a disruption or loss of a supply of labour or raw material,
(d) the asset being used by a business that cannot afford to pay a market rent for the assets and still generate a market rate of return, and
(e) adverse changes in the environmental, social and governance characteristics of the subject asset.

## 5.2 Valuation of Plant and Equipment

Fair value of plant and equipment may have to be calculated depending on the method of measurement (revaluation model of IAS 16 or fair value model of IAS 40) of the asset or where the transaction involves sale/ purchase of such an asset. Reference should be made to IVS 300, when performing valuation of plant and equipment.

When valuing plant and equipment, consideration must be given to the degree to which the asset is attached to, or integrated with, other assets; as it impacts on the value. For example:

a) assets may be permanently attached to the land and could not be removed without substantial demolition of either the asset or any surrounding structure or building,
b) an individual machine may be part of an integrated production line where its functionality is dependent upon other assets,
c) an asset may be considered to be classified as a component of the real property (eg, a Heating, Ventilation and Air Conditioning System (HVAC)).

In such cases, it will be necessary to clearly define what is to be included or excluded from the valuation. Any special assumptions relating to the availability of any complementary assets must also be stated.

Where the plant and equipment connected with the supply or provision of services to a building are often integrated within the building and, once installed, are often difficult to separate from it; these items will normally form part of the property/ building and therefore the requirements of valuation of Properties must also be considered, where appropriate.

- Examples include assets with the primary function of supplying electricity, gas, heating, cooling or ventilation to a building and equipment such as elevators. If the purpose of the valuation requires these items to be valued separately, the scope of work must include a statement to the effect that the value of these items would normally be included in the value of property and may not be separately realisable.

One of the three principal valuation approaches described in IVS 103 Valuation Approaches or IFRS 13 Fair value measurement may all be applied to the valuation of Plant and Equipment depending on the nature of the assets, the information available, and the facts and circumstances surrounding the valuation.

### 5.2.1 Market Approach

For classes of plant and equipment that are homogenous, eg, cranes, construction equipment, motor vehicles (light and heavy) and earthmoving equipment, the market approach is commonly used as there may be sufficient data of recent sales of similar assets.

However, many types of plant and equipment are specialized and in these instances care must be exercised in offering valuation using a market approach when available market data is poor or non-existent. In such circumstances it may be appropriate to adopt either the income approach or the cost approach to the valuation .

When using the market approach, types of evidence will include;

a) actual sales of identical assets,
b) actual sales of similar assets,
c) asking prices for identical assets,
d) asking prices for similar assets.

Actual sales must take preference over asking prices and evidence available just prior to the valuation date should be preferred to that further from the valuation date.

Depending upon the asset(s) being valued, market evidence may be considered in a variety of ways including:

a) piecemeal (ie, individual asset basis),
b) production line (ie, a group of assets together forming an operating unit),
c) whole of plant/facility (ie, a production facility producing X units per day),
d) portfolio (ie, a group of assets operating across a region).

Highest and best use considerations should always be a primary consideration for the valuer when considering the above types of evidence. The reliability of the evidence should be weighted according to its source. Depending upon the asset class considered as part of the valuation, evidence may be considered at a local, national or international level.

The market approach for actual sales of identical assets includes all forms of depreciation and obsolescence relating to an asset and no adjustment will be required.

When considering actual sales or asking prices of similar assets (and asking prices for identical assets), various adjustments may need to be considered to bring the evidence in line with the subject asset, and may include but not limited to adjustments for:

a) technical factors (size, capacity, rating, units of production, specification, etc),
b) deterioration and obsolescence factors (condition, intensity of use, age, maintenance, overhaul status, operating costs),
c) market-related factors (location, currency, quantities, asking price versus actual sales, environmental/licensing/compliance status, etc),
d) time or basis of value factors (date of sale versus valuation date, market sale versus liquidation sale, installed as-is/where-is versus removed, etc).

In making adjustments to bring the evidence in line with the subject asset, the valuer may use various methods including:

a) direct adjustment (ie, a currency or amount adjustment),
b) indirect adjustment (ie, to adjust the evidence by a percentage).

Professional judgement must be used to ensure that the evidence being considered is appropriate having consideration to the nature of the valuation being performed.

### 5.2.2 Income Approach

The income approach to the valuation of plant and equipment can be used where specific cash flows can be identified for the asset or a group of complementary assets, eg, where a group of assets forming a process plant is operating to produce a marketable product/service or generating income from a lease.
The income approach for an asset or group of complementary assets may be used where the main driver of value is largely driven by its income producing ability and afforded significant weight under the following circumstances such as:

a) the asset or group of complementary assets have a high barrier to entry for market participants,
b) there is significant time involved to create an asset or group of complementary assets of equal utility, whether by purchase or construction,
c) there are potential legal or regulatory hurdles to create an asset or group of complementary assets of equal utility,
d) a purchaser would be willing to pay a significant premium for the ability to use the asset or group of complementary assets immediately, due to favourable market economics and/or more immediate cashflow certainty,
e) there is undue inconvenience, risk or other factors involved in obtaining an asset or group of complementary assets of equal utility, whether by purchase or construction.

When an income approach is used to value plant and equipment, the valuation must consider the cash flows expected to be generated over the explicit forecast period of the asset(s) as well as the value of the asset(s) at the end of the explicit forecast period, often referred to as terminal value.
***The key steps in the DCF method are***:

a) choose the most appropriate type of cash flow for the nature of the subject asset and the valuation (ie, pre-tax or post-tax, total cash flows or cash flows to equity, real or nominal, etc),
b) determine the most appropriate **explicit period**, if any, over which the cash flow will be forecast,
c) prepare cash flow forecasts for that period,
d) determine whether a **terminal value** is appropriate for the subject asset at the end of the explicit forecast period (if any) and then determine the appropriate terminal value for the nature of the asset,
e) determine the appropriate **discount rate**, and
f) apply the discount rate to the forecasted future cash flow, including the terminal value, if any.

When a valuation is being developed in a currency ("the valuation currency") that differs from the currency used in the cash flow projections ("the functional currency"), the valuer should use one of the following two currency translation methods:

1. Discount the cash flows in the functional currency using a discount rate appropriate for that functional currency. Convert the present value of the cash flows to the valuation currency at the spot rate on the valuation date.

2. Use a currency exchange forward curve to translate the functional currency projections into valuation currency projections and discount the projections using a discount rate appropriate for the valuation currency. When a reliable currency exchange forward curve is not available (for example, due to lack of liquidity in the relevant currency exchange markets), it may not be possible to use this method.

### 5.2.3 Cost Approach

The cost approach is commonly adopted for valuing plant and equipment, particularly in the case of individual assets that are specialized or special-use facilities. The first step is to estimate the cost to a market participant of replacing the subject asset by reference to the lower of either reproduction or replacement cost.

The replacement cost is the cost of obtaining an alternative asset of equivalent utility; this can either be a modern equivalent providing the same functionality or the cost of reproducing an exact replica of the subject asset.

#### 5.2.3.1 Replacement Cost Method

Generally, replacement cost is the cost that is relevant to determining the price that a participant would pay as it is based on replicating the utility of the asset, not the exact physical properties of the asset.

Usually replacement cost is adjusted for physical deterioration and all relevant forms of obsolescence. After such adjustments, this can be referred to as depreciated replacement cost.

***The key steps in the replacement cost method are***:

a) calculate all of the costs that would be incurred by a typical participant seeking to create or obtain an asset providing equivalent utility,
b) determine whether there is any depreciation related to physical, functional and external obsolescence associated with the subject asset, and
c) deduct total depreciation from the total costs to arrive at a value for the subject asset.

Details on cost considerations and depreciation adjustments have been provided under Replacement cost method in Property valuation section.

The replacement cost is generally that of a modern equivalent asset, which is one that provides similar function and equivalent utility to the asset being valued, but which is of a current design and constructed or made using current cost-effective materials and techniques.

#### 5.2.3.2 Reproduction Cost Method

Reproduction cost is appropriate in circumstances such as the following:

a) the cost of a modern equivalent asset is greater than the cost of recreating a replica of the subject asset, or
b) the utility offered by the subject asset could only be provided by a replica rather than a modern equivalent.

***The key steps in the reproduction cost method are***:

a) calculate all of the costs that would be incurred by a typical participant seeking to create an exact replica of the subject asset,
b) determine whether there is any depreciation related to physical, functional and external obsolescence associated with the subject asset, and
c) deduct total depreciation from the total costs to arrive at a value for the subject asset.

Details on cost considerations and depreciation adjustments have been provided under Replacement cost method in Property valuation section.

#### 5.2.3.3 Cost-to-Capacity Method

Under the cost-to-capacity method, the replacement cost of an asset with an actual or required capacity can be determined by reference to the cost of a similar asset with a different capacity.

The cost-to-capacity method is generally used in one of two ways:

a) to estimate the replacement cost for an asset or assets with one capacity where the replacement costs of an asset or assets with a different capacity are known (such as when the capacity of two subject assets could be replaced by a single asset with a known cost, or
b) to estimate the replacement cost for a modern equivalent asset with capacity that matches foreseeable demand where the subject asset has excess capacity (as a means of measuring the penalty for the lack of utility to be applied as part of an economic obsolescence adjustment).

This method could be used as a primary method for determining replacement cost on a top-down basis, or could be used as a check method to the replacement cost determined on a bottom-up basis. However, the existence of an exact comparison plant with the same designed capacity that resides within the same geographical area would always take preference over a cost-to-capacity method.

It is noted that the relationship between cost and capacity is often not linear, so some form of exponential adjustment may also be required. However, the valuer should exercise caution in performing this adjustment when large differences in capacity are being used as evidence relative to the subject asset as this may not lead to credible outcomes.

## 6. Disclosures

IFRS 13 requires a number of disclosures designed to provide users of financial statements with additional transparency regarding:

- Extent to which fair value is used to measure assets and liabilities
- Valuation techniques, inputs and assumptions used in measuring fair value
- Effect of Level 3 fair value measurements on profit or loss (or other comprehensive income)

| Reference | Disclosures |
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| IFRS13 p91 | 1. Disclose information that helps users of its financial statements assess both of the following: |
| | (a) for assets and liabilities that are measured at fair value on a recurring or non-recurring basis in the statement of financial position after initial recognition, the valuation techniques and inputs used to develop those measurements; and |
| | (b) for recurring fair value measurements using significant unobservable inputs (Level 3), the effect of the measurements on profit or loss or other comprehensive income for the period. |
| IFRS13 p92 (a) - (d) | To meet the objective in IFRS 13 para 91, consider all the following: |
| | (a) the level of detail necessary to satisfy the disclosure requirements; |
| | (b) how much emphasis to place on each of the various requirements; |
| | (c) how much aggregation or disaggregation to undertake; and |
| | (d) whether users of financial statements need additional information to evaluate the quantitative information disclosed. |
| | 2. If the disclosures provided in accordance with this IFRS and other IFRSs are insufficient to meet the objectives in IFRS 13 para 91, disclose additional information |

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| IFRS13 p 93(a)- (i) | 3. To meet the objectives in IFRS 13 para 91, disclose, at a minimum, the following information for each class of asset (see IFRS 13 para 94 for information on determining appropriate classes of assets and liabilities) measured at fair value (including measurements based on fair value within the scope of this IFRS) in the statement of financial position after initial recognition: |
| | a) for recurring and non-recurring fair value measurements, the fair value measurement at the end of the reporting period, and for non-recurring fair value measurements, the reasons for the measurement; |
| | b) for recurring and non-recurring fair value measurements, the level of the fair value hierarchy within which the fair value measurements are categorised in their entirety (Level 1, 2 or 3); |
| | c) for assets and liabilities held at the end of the reporting |
| | (d) for recurring and non-recurring fair value measurements categorised within Level 2 and Level 3 of the fair value hierarchy, a description of the valuation technique(s) and inputs used in the fair value measurement. If there has been a change in valuation technique, disclose that change and the reason(s) for making it. For fair value measurements categorised within Level 3 of the fair value hierarchy, provide quantitative information about the significant unobservable inputs used in the fair value measurement; |
| | An entity is not required to create quantitative information to comply with this disclosure requirement if quantitative unobservable inputs are not developed by the entity when measuring fair value. However, when providing this disclosure, an entity cannot ignore quantitative unobservable inputs that are significant to the fair value measurement and are reasonably available to the entity. |
| | (e) for recurring fair value measurements categorised within Level 3 of the fair value hierarchy, a reconciliation from the opening to the closing balances, disclosing separately changes during the period attributable to the following: |
| | I. total gains or losses for the period recognised in profit or loss, and the line item(s) in profit or loss in which those gains or losses are recognised; |

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| | II. total gains or losses for the period recognised in other comprehensive income, and the line item(s) in other comprehensive income in which those gains or losses are recognised; |
| | III.purchases, sales, issues and settlements (each of those types of changes disclosed separately); |
| | Iv. and the amounts of any transfers into or out of Level 3 of the fair value hierarchy, the reasons for those transfers and the entity's policy for determining when transfers between levels are deemed to have occurred (see IFRS 13 para 95). Transfers into Level 3 are disclosed and discussed separately from transfers out of Level 3; |
| | (f) for recurring fair value measurements categorized within Level 3 of the fair value hierarchy, the amount of the total gains or losses for the period in (e)(i) included in profit or loss that is attributable to the change in unrealised gains or losses relating to those assets and liabilities held at the end of the reporting period, and the line item(s) in profit or loss in which those unrealised gains or losses are recognised; |
| | (g) for recurring and non-recurring fair value measurements categorised within Level 3 of the fair value hierarchy, a description of the valuation processes used by the entity. If income approach is used, frequency and methods of calibration, back testing and other testing procedures of pricing models. [IFRS IE65(b)]; |
| | (h) for recurring fair value measurements categorised within Level 3 of the fair value hierarchy: |
| | (i) for all such measurements, a narrative description of the sensitivity of the fair value measurement to changes in unobservable inputs if a change in those inputs to a different amount might result in a significantly higher or lower fair value measurement. If there are interrelationships between those inputs and other observable inputs used in the fair value measurement, provide a description of those interrelationships and of how they might magnify or mitigate the effect of changes in the unobservable inputs on the fair value measurement. To comply with that disclosure requirement, the narrative description of the sensitivity to changes in |

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| | unobservable inputs includes, at a minimum, the unobservable inputs disclosed when complying with (d); and |
| | (ii) for financial assets and financial liabilities, if changing one or more of the unobservable inputs to reflect reasonably possible alternative assumptions would change fair value significantly, state that fact and disclose the effect of those changes. Disclose how the effect of a change to reflect a reasonably possible alternative assumption was calculated. For that purpose, significance is judged with respect to profit or loss, and total assets or total liabilities – or, when changes in fair value are recognised in other comprehensive income, total equity; and |
| | (iii) for recurring and non-recurring fair value measurements, if the highest and best use of a non-financial asset differs from its current use, disclose that fact and why the non- financial asset is being used in a manner that differs from its highest and best use. |
| IFRS13 p94(a),(b) | 4. Determine appropriate classes of assets and liabilities on the basis of the following: |
| | a) the nature, characteristics and risks of the asset; and |
| | b) the level of the fair value hierarchy within which the fair value measurement is categorised. |
| | · The number of classes may need to be greater for fair value measurements categorised within Level 3 of the fair value hierarchy because those measurements have a greater degree of uncertainty and subjectivity. |
| | · Determining the appropriate classes of assets and liabilities for which disclosures about fair value measurements shall be provided requires judgement. A class of assets and liabilities will often require greater disaggregation than the line items presented in the statement of financial position. |

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| | · Provide information sufficient to permit reconciliation to the line items presented in the statement of financial position. If another IFRS specifies the class for an asset, an entity may use that class in providing the disclosures required in IFRS 13 if that class meets the requirements in IFRS 13 para 94. |
| IFRS13 p95 (a)-(c) | 5 Disclose and consistently follow the entity's policy for determining when transfers between levels of the fair value hierarchy are deemed to have occurred in accordance with IFRS 13 para 93(c) and (e)(iv). The policy about the timing of recognising transfers is the same for transfers into the levels as for transfers out of the levels. Examples of policies for determining the timing of transfers include the following: |
| | (a) the date of the event or change in circumstances that caused the transfer; |
| | (b) the beginning of the reporting period; and the end of the reporting period. |
| IFRS13 p96 | 6. If an entity makes an accounting policy decision to use the exception in IFRS 13 para 48 (exemption where an entity manages a group of financial assets and liabilities on the basis of its net exposure to market or credit risk), disclose that fact. |
| IFRS13 p97 | 7. For each class of asset not measured at fair value in the statement of financial position but for which fair value is disclosed, disclose the information required by IFRS 13 para 93(b)-(d) and (i). |
| | However, an entity is not required to provide the quantitative disclosures about significant unobservable inputs used in fair value measurements categorised within Level 3 of the fair value hierarchy required by IFRS 13 para 93(d). For such assets and liabilities, an entity does not need to provide the other disclosures required by this IFRS. |
| IFRS13 p99 | 8. Present the quantitative disclosures required by this IFRS in a tabular format unless another format is more appropriate. |

## 7. Defined Terms

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| **active market** | A market in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis. |
| **cost approach** | A valuation technique that reflects the amount that would be required currently to replace the service capacity of an asset (often referred to as current replacement cost). |
| **discount rate** | A rate of Return used to convert Economic Income into present value. |
| **entry price** | The price paid to acquire an asset or received to assume a liability in an exchange transaction. |
| **exit price** | The price that would be received to sell an asset or paid to transfer a liability. |
| **expected cash flow** | The probability-weighted average (ie mean of the distribution) of possible future cash flows. |

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| **fair value** | The price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. |
| **highest and best use** | The use of a non-financial asset by market participants that would maximise the value of the asset or the group of assets and liabilities (eg a business) within which the asset would be used. |
| **income approach** | Valuation techniques that convert future amounts (eg cash flows or income and expenses) to a single current (ie discounted) amount. The fair value measurement is determined on the basis of the value indicated by current market expectations about those future amounts. |
| **Inputs** | The assumptions that market participants would use when pricing the asset or liability, including assumptions about risk, such as the following:<br>1. the risk inherent in a particular valuation technique used to measure fair value (such as a pricing model); and<br>2. the risk inherent in the inputs to the valuation technique.<br>Inputs may be observable or unobservable. |
| **Level 1 inputs** | Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at the measurement date. |
| **Level 2 inputs** | Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. |
| **Level 3 inputs** | Unobservable inputs for the asset or liability. |
| **market approach** | A valuation technique that uses prices and other relevant information generated by market transactions involving |

identical or comparable (ie similar) assets, liabilities or a group of assets and liabilities, such as a business.

**market-corroborated inputs** — Inputs that are derived principally from or corroborated by observable market data by correlation or other means.

**market participant** — Buyers and sellers in the principal (or most advantageous) market for the asset or liability that have all of the following characteristics:

1. They are independent of each other, ie they are not related parties as defined in IAS 24, although the price in a related party transaction may be used as an input to a fair value measurement if the entity has evidence that the transaction was entered into at market terms.
2. They are knowledgeable, having a reasonable understanding about the asset or liability and the transaction using all available information, including information that might be obtained through due diligence efforts that are usual and customary.
3. They are able to enter into a transaction for the asset or liability.
4. They are willing to enter into a transaction for the asset or liability, ie they are motivated but not forced or otherwise compelled to do so.

**most advantageous market** — The market that maximises the amount that would be received to sell the asset or minimises the amount that would be paid to transfer the liability, after taking into account transaction costs and transport costs.

**non-performance risk** — The risk that an entity will not fulfil an obligation. Non-performance risk includes, but may not be limited to, the entity's own credit risk.

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| **observable inputs** | Inputs that are developed using market data, such as publicly available information about actual events or transactions, and that reflect the assumptions that market participants would use when pricing the asset or liability. |
| **orderly transaction** | A transaction that assumes exposure to the market for a period before the measurement date to allow for marketing activities that are usual and customary for transactions involving such assets or liabilities; it is not a forced transaction (eg a forced liquidation or distress sale). |
| **principal market** | The market with the greatest volume and level of activity for the asset or liability. |
| **risk premium** | Compensation sought by risk-averse market participants for bearing the uncertainty inherent in the cash flows of an asset or a liability. Also referred to as a 'risk adjustment'. |
| **terminal value** | An estimate of the value of Economic Income of a business beyond the discrete forecast period in the Discounted Economic Income Method. Also known as residual value or continuing value. |
| **transaction costs** | The costs to sell an asset or transfer a liability in the principal (or most advantageous) market for the asset or liability that are directly attributable to the disposal of the asset or the transfer of the liability and meet both of the following criteria:<br>1. They result directly from and are essential to that transaction.<br>2. They would not have been incurred by the entity had the decision to sell the asset or transfer the liability not been made (similar to costs to sell, as defined in IFRS 5). |

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| **transport costs** | The costs that would be incurred to transport an asset from its current location to its principal (or most advantageous) market. |
| **unit of account** | The level at which an asset or a liability is aggregated or disaggregated in an IFRS for recognition purposes. |
| **unobservable inputs** | Inputs for which market data are not available and that are developed using the best information available about the assumptions that market participants would use when pricing the asset or liability. |