EUROPEAN PLANT, MACHINERY & EQUIPMENT VALUATION STANDARDS

1ST EDITION – 2022

TEGOVA

The European Group
of Valuers' Associations

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EVS-PME 2022 is effective from 1 November 2022.

PREFACE

It is a euphemism to call this Book 'timely'. It's a perfect conjunction of right time, right place, right industrial and geopolitical context.

When TEGOVA decided to develop the standards in the spring of 2020, the motivation was the high demand from European practitioners who wanted standards tailored to the European manufacturing context and to the general principles of valuation in TEGOVA's European Valuation Standards. To that extent, it was the same as for the first ever European Business Valuation Standards, launched that year: filling a gap and not having to rely on whatever non-European norms and training were out there.

The European Plant, Machinery & Equipment Valuation Standards Board was already at work when the world changed, with the hydra of climate, pandemic and war and the sickening realisation that Europeans had gravely compromised their prosperity, health, safety and security – and raised their carbon footprint – by extending their supply lines to far away authoritarian or rogue regimes.

To the surprise of many sceptics, the European Union rose to the challenge with a massive and comprehensive legislative agenda for the repatriation, regeneration and greening of European industry and even more surprisingly, with a common EU budget to back it up.

Good and timely regulation has a way of kick-starting change even before it hits the statutes, and it's happening now. This puts an absolute duty on the valuation profession to undergo its own transformation and learn to put a value on the components of the industrial transformation as it happens.

So it is that EVS-PME 2022 is at once steeped in the tradition and culture of all Blue Books – it has the same format and enunciates the same central valuation principles – and yet is also very different, driven by the nature of PME and because it is the child of economic and political forces that had not yet erupted during the gestation and development of EVS 2020 and EVS-BV 2020.

With this third pillar, TEGOVA's valuation standardisation work now covers the entire European real estate, business and industrial economy with significant synergies between the three Blue Books facilitating interaction between fields of valuation.

Krzysztof Grzesik REV FRICS
Chairman of the Board of TEGOVA

INTRODUCTION

Valuation of Plant, Machinery & Equipment (PME) has a wide field of application. Valuations are required for a variety of purposes, including allocation of purchase price, bankruptcy, condemnation, dissolutions of marriage, partnerships, and corporations, financing, insurance, leasing, management considerations, mergers and acquisitions, partnership formation and dissolution, transfer of ownership, various types of taxation and tax planning, and utility rate making. Each valuation purpose requires that an appropriate level, type, or definition of value be selected. The client defines the intended use of the valuation, *but it is the valuer's responsibility* to select or accept the proper definition of value associated with the intended use of the valuation.

PME may depreciate unevenly over the useful life of the asset, are highly reliant on the specific industry, are usually movable and relocatable all over the world, have buyers and sellers with varied motives, face dismantling, assembling and commissioning costs, take time to market, and buying and selling conditions may vary significantly depending on whether such assets are permanently attached to real property or are individual assets.

These features make the valuation of PME a challenging endeavour, requiring understanding of key technical characteristics, experience of the specific market, research and the use of market evidence, objectivity, an appreciation of the appropriate assumptions and sound judgement skills.

Items of PME are tangible assets used in the production or supply of goods or services, for rental by others or for administrative purposes and are expected to be used over a period of time. PME comprise a broad variety of assets, from stand-alone machines to complete production lines or factories.

The usual broad categories assigned to PME are:

- Production and manufacturing equipment
- Transportation vehicles
- Handling equipment
- Auxiliary equipment
- Laboratory and test equipment
- Office furniture, accessories and equipment
- IT equipment
- Production plants/units.

PME differentiates from real estate in ways that can affect both the valuation approaches and the valuation report, the most important difference being mobility. Another characteristic specific to PME is rapid depreciation, caused by a useful life shorter than that of real estate, technical progress, or fluctuating demand for business products.

Classification as PME – when not defined by law – is based on the professional judgment of the valuer and her/his understanding of the purpose and main technical characteristics of the subject asset.

The identification process of PME includes a broad understanding of the production/manufacturing process and of the role of the subject asset(s) in this process, followed by documentation of the relevant individual characteristics of the asset(s).

The three basic valuation approaches (market, cost and income) are the same for real estate and PME valuation, but vary significantly in their implementation.

Concepts such as 'fixed assets' and 'in situ'/'ex situ' values, scrap value and the three types of obsolescence (physical, functional and economic) and many more particular to PME are defined, standardised and delivered to the public, in order to set a common language for valuation practice in the European Union, the European Economic Area, candidate EU Member States and EU-associated and Neighbourhood countries.

These Standards also serve to help the many practicing valuers throughout Europe who are asked to assess the value of both real estate and PME for lending purposes, financial reporting, and business purposes, helping bridge both fields of practice to deliver quality valuations to the highest standard.

These Standards, like all Blue Books, are in lock step with the EU regulatory framework. Environmental protection, energy conservation, health and safety in particular are becoming drivers for the depreciation of assets; valuers need uniform guidance in dealing with such issues.

It is hoped that this Blue Book will foster convergence in PME valuation across Europe, providing common ground and best practice regarding methodology, reporting and valuation approaches to a fast-mutating industrial landscape.

Konstantinos P. Pallis MEng DEA REV
Chairman of the European Plant, Machinery & Equipment Valuation Standards Board

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I.
European Plant, Machinery & Equipment Valuation Standards and Guidance Notes

I.A. European Plant, Machinery & Equipment Valuation Standards

Introduction

EVS-PME 1 Market Value and Bases of Value Other than Market Value

EVS-PME 2 The Valuation Process, Macro and Micro Identification, Collection of Data

EVS-PME 3 The Valuation Approaches and Methods

EVS-PME 4 Reporting the Valuation

EVS-PME 5 Plant, Machinery & Equipment Valuation and Energy Efficiency

EVS-PME 1 Market Value and Bases of Value Other than Market Value

1. Introduction
2. Scope
3. Basis of Value
4. Definitions of Market Value and Commentary
5. Bases of Value Other than Market Value
6. Documentation

1. Introduction

1.1. EVS-PME 1 considers Market Value and other Bases of Value in the context of Plant, Machniery & Equipment (PME) valuation including valuation of majority or minority interests and specific ownership rights.

1.2. Market Value is a key concept in establishing an informed expectation as to the price of something. The nature of the market in which that value is determined will differ according to the subject of the transaction while market conditions will vary with the changing balance of supply and demand, changing knowledge, fashion, rules, expectations, credit conditions, hopes of profit and other circumstances.

1.3. "Value" does not mean the actual sum that may prove to be paid in a given transaction between specific parties. At an individual level, the value of an asset such as PME to a person will reflect its usefulness to her/him when judged against the person's resources and opportunities. In the context of a market with competing parties, it is rather an estimate of the amount that could reasonably be expected to be paid, the most probable price in market conditions at the date of valuation. While the PME in question may have different values for different individuals who may be in the market, its Market Value is the estimate of the value in the present market on assumptions that are deliberately neutral to achieve a standard basis of assessment for both buyers and sellers.

1.4. The ultimate test for Market Value, however determined, is whether parties in the market place could really be expected in practice to pay a price at the level of the value that has been assessed. That emphasises the importance of soundly analysing good quality comparable evidence where it can be obtained. Any valuation arrived at with a purely theoretical approach must face this final test. This is also applicable to valuations of PME, given the usual individual nature of the assets and the markets concerned, especially at times of flux.

1.5. Although the majority of professional valuations will be on the basis of Market Value, there are circumstances in which alternative bases of value may be required or more appropriate. It is essential that both the valuer and the users of valuations clearly understand the distinction between Market Value and other bases of value, together with the effects that differences between these concepts may create in the valuer's approach to the valuation and in the resulting reported value.

2. Scope

This Standard defines, explains and distinguishes Market Value and bases of value other than Market Value.

3. Basis of Value

3.1. **Definition** — A statement of the fundamental assumptions for undertaking a valuation for a defined purpose.

3.2. **Commentary** — A basis of value as a statement should be distinguished from the methods or techniques used to implement a chosen basis. Established terms and methods used in the valuation should be defined in the Valuation Report.

In the event that none of the bases in EVS-PME are suitable for the completion of an instruction, a clear and transparent definition of the basis used must be expressly stated, and the valuer must explain the reason for deviating from a recognised basis. If the resultant valuation does not reflect a sum that would equate to a valuation prepared on the basis of Market Value, this must be stated in the Valuation Report along with any assumptions or special assumptions used.

4. Definition of Market Value and Commentary

4.1. Definition of Market Value

4.1.1. "Market Value" means:

> *"The estimated amount for which the plant, machinery and equipment should exchange on the date of valuation between a willing buyer and a willing seller in an arm's-length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without being under compulsion."*

4.1.2. ***Market Rent*** — The market for PME is one in which such assets are not only bought and sold but also leased. Market Value is appropriate for valuing the ownership of PME while Market Rent is appropriate for the value that may be expected to be paid as rent for PME items.

> ***Market Rent*** – *"The estimated amount for which the plant, machinery and equipment should be rented on the date of valuation between a willing lessor and a willing lessee on the terms of the actual or assumed rental agreement in an arm's-length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without being under compulsion."*

4.1.3. Unless specifically required by legislation, obliged by the terms of a contract or instructed by a client, valuers are to use Market Value (or, as appropriate, Market Rent) as the basis of value rather than the alternative bases reviewed in section 5.

4.2. Commentary of Market Value

4.2.1. General

4.2.1.1. The advantage of this standard definition of Market Value is that it clearly sets out the key concepts involved, namely:

- the result;
- the PME valued;
- the transaction;
- the date of valuation;
- the defining characteristics of the hypothetical parties as willing and in an arm's-length transaction;
- the necessary marketing;
- the consideration of the market by the parties;

4.2.1.2. This commentary takes each phrase of the definition in turn and explores its meaning in seeking the Market Value of PME.

4.2.2. The result

4.2.2.1. *"The estimated amount ..."* — This refers to a price expressed in terms of money (normally in the local currency), excluding local or national applied taxes and payable for the PME in an arm's-length transaction. Market Value is measured as the most probable price reasonably obtainable in the market at the date of valuation on the assumptions of the Market Value definition. It is the best price reasonably obtainable by the seller and the most advantageous price reasonably obtainable by the buyer.

4.2.2.2. This estimate specifically excludes an estimated price inflated or deflated by any special terms or circumstances such as financing which are not typical, sale and leaseback arrangements, special considerations or concessions granted by anyone associated with the sale, or any elements of Special Value.

4.2.2.3. Market Rent is measured as the most probable rent reasonably obtainable in the market at the date of valuation on the assumptions of the Market Rent definition. It is the best rent reasonably obtainable by the lessor and the most advantageous rent reasonably obtainable by the intending lessee.

4.2.2.4. Special Value is considered with related issues in section 5 — Valuation Bases Other Than Market Value.

4.2.3. The plant, machinery and equipment being valued

4.2.3.1. *"... the plant, machinery and equipment ..."* — is to be analysed with its legal, physical, economic and other attributes.

4.2.3.2. When considering a Market Rent, as defined at 4.1.2, the terms of the actual or proposed rental agreement, subject to any further relevant statutory provisions, affect the rental value of the asset. If the determination of the Market Rent is made before a rental agreement is in place, the valuer must state the material terms of the rental agreement as assumptions, typically following conventional practice for that type of asset in its specific market. The valuer should ordinarily assume that the terms of the rental agreement would not require a premium, be restrictive or contain clauses that would not suit average market participants. If any of those points arise they will require an adjustment to the Market Rent.

4.2.3.3. Valuers must take due regard where the purchase price of any PME includes items of real property, incentives for the transaction or other matters.

4.2.3.4. The concept of ***'highest and best use' (HABU)*** is integral to Market Value and is the use of PME that is physically possible, reasonably probable, legal or likely to become so, and that results in the highest value of the PME at the date of valuation. Therefore, data should be considered at the highest level of trade, that is the end user or consumer level, where appropriate.

4.2.3.4.1. **'Physically possible'** – There can be a reasonably probable and legal use which offers the highest value for the PME, but is inoperable. Example: the PME is located in a leasehold property where the remaining term of the lease expires before the useful life of the PME and the future cost of relocation would reasonably be anticipated.

4.2.3.4.2. **'Reasonably probable'** – Disregarding specialist uses that might occur to a single bidder. It also allows consideration of uses thought likely to become possible, as for example, where existing infrastructure constraints or other physical limitations are currently in place but are likely to be eased in the future. Example: the relaxing or lifting of import or export restrictions.

4.2.3.4.3. **'Legal or likely to become so'** – Potential buyers perceive that legislation is likely to change to render a currently illegal use legal or a licensing regime is considered likely to become more or less stringent.

4.2.3.4.4. **'The highest value'** – It will reflect an appraisal of the probability that the market places on the highest value use being achieved, the costs likely to be incurred and, where relevant, the return on investment likely to be earned in doing so, the time scale and any other associated factors in bringing it about. A valuation taking into account a *"likely"* or *"reasonably probable"* use will only reflect an element of the uplift in value that is expected to result once such use is fully permitted or where relevant, other constraints have been lifted.

4.2.3.5. In most cases valuers will quickly ascertain that HABU is the same as existing use. Sometimes they may identify a more valuable use but conclude that the costs of such change of use would be too great and therefore HABU would still equal value in existing use at the date of valuation.

4.2.4. The transaction

4.2.4.1. ***"... should exchange ..."*** - It is an estimated amount rather than a predetermined or actual sale price. It is the price at which the market expects a transaction to be completed on the date of valuation and that meets all the other elements of the Market Value definition.

4.2.4.2. For a Market Rent, it is an estimated amount rather than a predetermined or actual rent. It is the rent at which the market expects to be paid for the rental if taken on the date of valuation and that meets all the other elements of the Market Rent definition. The actual rent would anyway be expected to be different if there were a capital cost such as a premium associated with taking the rental agreement.

4.2.4.3. The use of "should" conveys that sense of reasonable expectation. The valuer must not make unrealistic assumptions about market conditions or assume a level of Market Value above that which is reasonably obtainable.

4.2.4.4. In considering the Market Rent for PME, it would be conventional to assess it on the basis that no premium was also being paid in respect of lease by any party so that it is simply the rental agreement Value that is being determined. Where a premium, positive or negative, is expected under the terms of the lease, that should be clearly stated to avoid all ambiguity.

4.2.5. The date of valuation

4.2.5.1. ***"... on the date of valuation ..."*** — This requires that the estimated Market Value or Market Rent be time-specific to a given date; a value is a judgment as at a particular point in time. This is normally the date on which the hypothetical sale is deemed to take place and is usually, therefore, different from the date on which the valuation is actually prepared. As markets and market conditions may change, the estimated value may be incorrect or inappropriate at another time. The valuation amount will reflect the actual market state and circumstances at the required date of valuation, not at a past or future date. The date of valuation and the date of the Valuation Report may differ, but the latter cannot precede the former. The definition also assumes simultaneous binding agreement of terms and completion of the contract for sale without any variation in price that might otherwise be made in a Market Value transaction at the date of valuation.

4.2.5.2. Market Value is quite expressly not an assessment of value over the longer term but only at the time of the hypothetical transaction.

4.2.5.3. The phrase "date of valuation" (and also "valuation date") is used to refer to the date at which the valuation is determined (and for which the evidence supporting it is to be relevant) rather than the, usually later, date when the valuation is prepared and considered, with the Valuation Report then being completed for the client. The completion of the Valuation Report will never be earlier than the date of valuation, as it would then be contemplating circumstances that have not happened and for which important evidence

may yet be found. The report should record both the date of valuation and the date on which the report was completed.

4.2.6. The parties – hypothetical, willing and at arm's-length

4.2.6.1. *"... between a willing buyer ..."* - This assumes a hypothetical buyer, not the actual purchaser. Such person is motivated, but not compelled, to buy. This person is neither over-eager to buy nor determined to do so at any price.

4.2.6.2. The same provisions apply to Market Rent, presuming a hypothetical would-be renter who is willing to take the rental agreement of the PME, but not at any price.

4.2.6.3. This willing buyer or would-be renter is also one who would undertake the transaction in accordance with the realities of the current market and with current market expectations, rather than on an imaginary or hypothetical market, which cannot be demonstrated or anticipated to exist. The buyer would not pay a higher price than that which the market requires. The present owner (or, as appropriate, lessee) of the PME is included among those who constitute the market.

4.2.6.4. Equally, the motivated buyer or renter cannot be presumed to be reluctant or unwilling. He or she is attending to this as a practical business person.

4.2.6.5. *"... and a willing seller ..."* - Again, this is a hypothetical seller, rather than the actual owner and is to be assumed to be neither an over-eager nor a forced seller who is prepared to sell at any price, nor one prepared to hold out for a price not considered reasonable in the current market. The willing seller is motivated to sell the PME at market terms for the best price obtainable in the market after proper marketing, whatever that price might be. The factual circumstances of the actual owner are not part of this consideration because the 'willing seller' is a hypothetical owner. The PME are assumed to be on the market.

4.2.6.6. For Market Rent, the renter is a hypothetical one, not the actual owner. He or she is willing to rent the PME, but is neither compelled to rent it out nor to hold out for a price not considered reasonable in the current market.

4.2.6.7. Thus, while the PME is to be valued as it is in the real world, the assumed buyer and seller (or lessor and lessee) are hypothetical parties, albeit acting under current market conditions. The requirement that they both be willing to make the transaction creates the tension between them in which Market Value (or Market Rent) can be assessed.

4.2.6.8. Market Value and Market Rent are thus independent of and uninfluenced by the objectives of the client instructing the valuation.

4.2.6.9. ***"... in an arm's-length transaction ..."*** — A transaction in which the parties act independently of each other is one between parties who do not have a particular or special relationship (as might be the case, for example, with parent and subsidiary companies, lessor and lessee or family members) which may make the price level uncharacteristic of the market or inflated by any element of special value. For the purposes of Market Value and Market Rent the transaction is presumed to be between unrelated parties, each acting independently.

4.2.7. The marketing

4.2.7.1. ***"... after proper marketing ..."*** – The PME would be exposed to the market in the most appropriate manner to effect its disposal at the best price reasonably achievable in accordance with the Market Value definition. The length of exposure may vary with market conditions, but must be sufficient to allow the PME to be brought to the attention of an adequate number of potential purchasers. The marketing period is assumed to have been before the date of valuation.

4.2.8. The parties' consideration of the matter

4.2.8.1. ***"... wherein the parties had each acted knowledgeably ..."*** — This presumes that both the willing buyer and willing seller are reasonably well informed about the nature, condition and characteristics of the PME, its actual and potential uses, and the state of the market at the date of valuation. The same assumption applies to the willing lessor and the willing lessee for Market Rent.

4.2.8.2. The parties will thus appraise what might reasonably be foreseen at that date. In particular, the hypothetical buyer may be better informed for this assessment than some or all of the real bidders. This involves knowledge not just of the PME, but also of the market and therefore the evidence (including such comparables and other relevant market information as may be available) on which to judge the value of the PME.

4.2.8.3. ***"... prudently ..."*** - Each party is presumed to act in their own self-interest with that knowledge, and prudently to seek the best price for their respective positions in the transaction. Prudence is assessed by referring to the state of the market at the date of valuation, not with the benefit of hindsight at some later date. It is not necessarily imprudent for a seller to sell

PME in a market with falling prices which are lower than previous market levels. In such cases, as for other transactions in markets with changing prices, the prudent person will act in accordance with the best market information available at the time.

4.2.8.4. ***"... and without being under compulsion ..."*** – This establishes that each party is motivated to undertake the transaction, but is neither forced nor coerced to complete it. Each freely enters into and completes the transaction.

4.2.9. Assumptions

4.2.9.1. Valuers make assumptions where they assume (or are instructed to assume) something on a matter of fact which they do not or cannot know or reasonably ascertain.

4.2.9.2. The valuation instruction may require the valuer to make assumptions, for example, the time allowed for marketing in the context of a forced sale valuation. The valuer may have to make certain assumptions in order to complete the valuation effectively, often in the absence of particular information. In either case those assumptions should be clearly stated.

4.2.9.3. The valuer must undertake inspections and investigations to the extent necessary to produce a professional valuation for the purpose instructed. Where the information provided or available is limited or restricted, the valuer may need to make assumptions to enable an opinion of value to be reported in the absence of full data or knowledge. Assumptions may relate to facts, conditions or situations affecting the valuation which, in the absence of full information, are those considered most likely to be correct. For matters such as, for example, the environmental status and/or the maintenance status or conditions of use that may be beyond the valuer's ability to check independently, the assumption may be accompanied by a recommendation that the client have the facts established by those with the appropriate specialist skills.

4.2.9.4. The following is an indicative, non-exhaustive, list of items that may be reported as matters where assumptions have been made in arriving at an opinion of value:

- If detailed information on ownership rights and identification of the PME is not available, valuers would have to assume the position they consider most likely, also stating that they accept no responsibility or liability for the true interpretation of the legal documents conveying the ownership rights and identification characteristics, setting out any encumbrances, restrictions or liabilities that may affect the value of the PME;
- The extent of the inspection should be clearly set out in the report, consistent with the nature of the instruction and the type of PME (partial inspection, sampling, desktop valuation without inspection). It may be necessary to make the assumption that, while any obvious defects have been noted, other defects may exist which could require a more detailed survey or the appointment of specific experts. That might be followed by a comment that the opinion of value stated is based on the condition as reported or derived from specific documents asserting the technical and physical condition of the assets and so, any additional defects that exist may require the valuation conclusion to be amended;
- Depending on the type of PME, attachment to or integration with other assets may require a distinct valuation assumption (availability of any complementary assets, assets attached to the land - which may require significant demolition costs upon removal, operation of machinery dependant on specific software or an individual machine which only works as part of a production line);
- Assumptions will be needed regarding the hypothetical selling conditions of the assets:
  - "in situ", wherein the assets are sold in place forming a complete (or incomplete) production line or facility; "in situ" assumption should also include a specification related to the use of the PME, as part of a business operating under going concern or a business that is closed. The in situ value of PME reflects the intrinsically higher value of the assets considering the benefits to the buyer of not having to source, transport and install an asset.
  - "ex situ" wherein the assets are sold separately and are transferred to the buyer's venue; "ex situ" assumption requires additional consideration on dismantling, transportation and potential re-assembling costs in case of complex PME.
- The valuer may, on valuations of PME used in a business under going concern, under the "in situ" assumption, need to assume that all utility services provided are operational and sufficient for the intended use.

4.2.10. Special assumptions, including alternative use value and forced sale value

4.2.10.1. In distinction to an assumption the valuer has to make to undertake the task, the valuer may make a special assumption when assuming, usually on instruction, a fact or circumstance that is different from those that are verifiable at the date of valuation. The result will be a Market Value on that special assumption.

4.2.10.2. This must be stated in the Valuation Report so as to inform the client as to the valuation in those different circumstances. Examples of this include where the valuer is instructed to make special assumptions as to the value of the PME:

- Were it used in a going concern business when in fact the PME is not currently used;
- Were it sold as individual items removed from their current location (uninstalled) when in fact the PME is used in a going concern business.
- Assuming lease-free possession of PME, when the PME is leased;
- Valuing on the basis of an assumed manufacturing/production capacity which differs from the actual performance of the PME;

4.2.10.3. Two particular examples are considered below:

- Alternative Use Value;
- Forced Sale Value.

4.2.10.4. Alternative use value

4.2.10.4.1. *Definition* — The value of the PME under a use other than the present one.

4.2.10.4.2. *Commentary* — While Market Value identifies the best available value for an asset however used, some valuations may be required only to assume the present use; for example, a business is being assessed as a going concern. If it is material to consider alternative uses of the PME which may not involve continuing the present business, then that would be its alternative use value, a Market Value. That value would not reflect any costs of ceasing the business.

4.2.10.5. Forced sale value

4.2.10.5.1. *Definition* — A sum that could be obtained for the asset where, for whatever reason, the seller is under constraint that requires the dis-

posal of the asset under conditions that do not conform with the definition of Market Value.

4.2.10.5.2. ***Commentary*** — Forced sale value is a Market Value on a special assumption as to the conditions for marketing. The need for a valuation may arise where the seller is under compulsion to sell, is desperate to sell or a strict time limit is otherwise imposed. This might obviously arise where the period in which the PME is to be sold is too short to allow the proper marketing needed to be confident of the best price achieved. More generally, potential buyers may be aware that the seller is under constraint and so moderate their offers from what they might otherwise have offered. The nature of these specific constraints determines the situation in which the hypothetical transfer takes place — without those constraints, it would be considered Market Value.

4.2.10.5.3. ***Forced sale value is not a basis of valuation***. Once all the relevant constraints are identified it may be seen as a Market Value assessment on the special assumption of a stated but limited period for marketing. Thus, the valuer should not undertake a valuation on a forced sale basis but rather on a Market Value basis on stated specific special assumptions relevant to the case in hand.

4.2.10.5.4. The valuer needs to know and state the time allowed and the relevant constraints on the seller. As the value will reflect those very specific circumstances of the assumptions imposed, they should be stated in the terms of engagement and in the Valuation Report. The result will not be a Market Value as it is not based on a hypothetical willing seller but a seller under constraint.

4.2.10.5.5. The forced sale value is determined by application of a reduction in the form of a forced sale discount to the observable market price of the PME. To determine the Forced Sale Value of PME which do not have a liquid market, the valuer shall consider observable prices on markets where similar assets are traded, with discounts for illiquidity reflected as appropriate.

4.2.10.5.6. The Market Value in situ of PME often includes other items associated with the equipment, such as fixtures, foundations, power lines, piping connecting the PME, etc. When estimating the forced sale value ex situ, the valuer must exclude these items, whereas they must be included in an in situ forced sale scenario.

4.2.10.5.7. Usually the forced sale value is usually lower than Market Value because assets must be sold quickly, but is greater than scrap value.

4.3. Transaction costs and taxes

4.3.1. Market Value is to be the estimated value of PME and so excludes the additional costs that may be associated with sale or purchase as well as any taxation on the transaction. These factors may influence the value but are not part of it. If they need to be recognised, this should be reported as a sum in addition to the Market Value.

4.3.2. In particular, Market Value will be the value before any taxes which may apply to any real transaction in the PME being valued. The fact of transaction taxes or Value Added Tax as they may affect some or all potential parties will be part of the wider framework of the market and so, along with all other factors, influence value, but the specific taxation due on a transaction is over and above its Market Value.

5. Bases of Value Other than Market Value

5.1. Fair Value

5.1.1. Definitions

The term Fair Value is used in two particular but distinct contexts, giving it differing applications:

5.1.1.1. ***A general definition*** — Fair Value may generally be used as a basis of valuation for PME as between specific, identified participants in an actual or potential transaction, rather than assuming the wider market place of possible purchasers. As such, it may often result in a different value to the Market Value of the PME subject to valuation. For this purpose it is defined as:

"The price that would be received to sell plant, machinery and equipment in an orderly transaction between identified willing market participants possessing full knowledge of all the relevant facts, making their decision in accordance with their respective objectives."

The same concept can be applied to the determination of a Fair Rent between two specific, identified parties. In this context Fair Rent is defined as:

"The rental fee that would be received on the letting of plant, machinery and equipment in an orderly rental transaction between identified willing market

participants possessing full knowledge of all the relevant facts, making their decision in accordance with their respective objectives."

When the Fair Rent is reported, the valuer should state the assumptions adopted as regards the main terms of the agreement between the respective parties, as these may have an impact on the level of the rent.

In some jurisdictions the expression *"fair rent"* may have other meanings, determined by legislation or regulation.

5.1.1.2. ***For accounting purposes*** — Fair Value is specifically adopted as a term under International Financial Reporting Standards (IFRS) for which, albeit with slightly less detailed assumptions than the full definition of Market Value, it may often give the same result as Market Value. For this purpose, it is defined as:

"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."

(IFRS 13, par.1)

The Fair Value of a non-financial asset like PME takes into account a market participant's ability to generate economic benefits by using the asset in its highest and best use (IFRS 13:27), that is, the most valuable use of the non-financial asset that is physically possible, legally permissible and financially feasible at the date of valuation. In this non-financial context, Fair Value may differ from a valuation prepared in accordance with the definition of Market Value (see EVS-PME 1.4 for Market Value).

5.1.2. Commentary — Fair Value for financial reporting

5.1.2.1. In respect of financial reporting under IFRS 13, Fair Value is a required basis of valuation, defined as in 5.1.1.2 above. While the definition differs from that of Market Value, being less detailed in its assumptions about prior exposure to the market, the value reported will frequently be indistinguishable from Market Value. However, there may be cases, particularly involving future development potential, where the two values are not the same.

5.1.2.2. It should be noted that, since the publication of IFRS 13, it is now clear that Fair Value is intended to be an estimate of the sale price (or *"exit price"*) that could be achieved. Fair Value must be estimated from the point of view of participants in the market. Any special value to the existing owner is to be disregarded if participants in the market would not be expected to reflect that extra value.

5.1.2.3. Fair Value will generally be determined on the basis of the non-financial asset's highest and best use as defined by IFRS 13, that is, the most valuable use of the asset that is physically possible, legally permissible and financially feasible at the date of valuation. This is a different definition from the EVS-PME definition of HABU.

5.2. Special value

5.2.1. *Definition* - Special value is an opinion of value that incorporates consideration of characteristics that have a particular value to a special purchaser.

5.2.1.1. A special purchaser is an individual for whom the asset has a higher value than for other market participants.

5.2.2. Commentary

5.2.2.1. Where particular qualities or characteristics of certain PME have a value for one acquiring party that is higher than Market Value, that party may be described as a special purchaser and any figures reported that equate to a sum representing that purchaser's opinion of value would represent a special value. For example, a press forming machine or older construction that can use a big selection of existing dies may have higher value for a company than a newer one which will require redesign/adaptation of the existing dies.

5.3. Synergistic value

5.3.1. *Definition* - Synergistic value is created when the total value of several assets (or of several legal interests in the same asset) combined is greater than the value of the sum of their parts.

5.3.2. Commentary

5.3.2.1. Terms of engagement and Valuation Reports should clearly specify where such value is required or will be provided and Market Value may also be reported, so as to identify the differential between the two bases.

5.3.2.2. This might often be found where the acquisition of PME and related property, often a neighbouring one, unlocks extra value for the purchaser. It may be relevant to transactions between lessor and lessee. However, where a group of assets including PME offers the same synergistic value

opportunities to several potential bidders (by offering any of them a greater scale of operation) then this value should be considered to be the Market Value of the PME.

5.4. Investment value

5.4.1. *Definition* - The value of an asset or group of assets calculated on the basis of specific investment criteria.

5.4.1.1. Whilst every prospective buyer will individually calculate the investment value of an asset or a group of assets for the purposes of establishing a price at which to bid, the value so calculated may equal the Market Value, but may also be higher or lower than the Market Value.

5.4.2. Commentary

5.4.2.1. This subjective concept relates a specific asset or group of assets to a specific investor, group of investors, or entity with identifiable investment objectives and/or criteria. As valuations prepared on this basis determine what an individual buyer may be prepared to bid, they are not a measure of the overall judgment of the market on the subject PME. Thus, they would not be expected to be consistent with or equivalent to valuations prepared on any other basis, including Market Value. Such valuations are to determine the value of certain PME items for a specific individual investor with her/his own actual concerns, rather than a hypothetical party.

5.4.2.2. It is important to be able to establish a way to determine the value that the PME to be acquired has for specific investors.

5.4.2.3. From a quantitative perspective, the investor's assumptions about the asset's profitability and potential for capital gain, combined with the expected useful life and the specific requirements on investment return, will be key for determining the investment value of an asset.

5.4.2.4. This basis of value is used to assess the investment value of certain PME for a known individual investor. This process is to be distinguished from the determination of Market Value: whereas Market Value is the best price that would be reasonably expected in the market, taking account of all the various types of likely bidders, investment value is the maximum price that a known individual bidder would offer, according to her/his specific investment requirements.

5.4.2.5. Information to be gathered — In order to assess investment value, the valuer will need:

- Any specific characteristics of the client's business that might have an influence on the future cash flows generated by the subject asset or group of assets representing PME;
- The client's investment, purchase or lease criteria (such as a business plan or target rate of return or the hold period in correlation with the expected useful life).

5.5. Insurable value

5.5.1. *Definition* - Insurable value is the cost of replacing the damaged asset(s) with materials of similar kind and quality with or without any deduction for depreciation, depending on the insurance policy adopted.

5.5.1.1. Reinstatement value is the cost necessary to replace, repair, or rebuild the insured PME to a condition substantially the same as, but not better or more extensive than, its condition when new.

5.5.1.2. Indemnity value is the cost necessary to replace, repair or rebuild the insured PME to a condition substantially the same as, but not better or more extensive than, its condition at the time when the damage occurred, taking into consideration age, condition, and remaining useful life.

5.5.2. Commentary

5.5.2.1. The insurable value should include, inter alia, any appropriate additional costs including fees for engineers and service providers, planning permissions, licenses, approvals, possible removal of debris following a loss and commissioning of equipment.

5.5.2.2. Except if instructed otherwise, real estate housing the equipment along with all installations serving its operation should be exempted (as they are usually covered by another insurance).

5.6. Scrap value

5.6.1. *Definition* - Scrap value is the value of an asset when it is no longer usable and is disposed of for the materials it contains.

5.6.2. Commentary

5.6.2.1. Scrap value can be given as **net scrap value**, after deduction of relevant disposal costs, or **gross scrap value**, without deduction of the disposal costs. The latter can vary significantly depending on the final disposal location, the works associated with the disposal process, the permits and authorisations needed, the transportation methods and associated costs, the sanitisation processes that may be needed, etc.

5.6.2.2. The scrap value can be negative if the cost of disposing of the PME is higher than the value of its materials on the scrap market.

5.6.2.3. Prices of scrap are determined by supply and demand for the materials and are usually publicly quoted.

5.7. Liquidation value

5.7.1. *Definition* - Liquidation value is the estimated amount that creditors or equity holders could reasonably expect to receive in the event of liquidation of the company's PME, when sold piecemeal or in whole.

5.7.2. Commentary

5.7.2.1. Liquidation value applies when either the valuation is undertaken in a company's liquidation scenario, or the highest and best use analysis performed by the valuer clearly indicates that the liquidation value of the PME is higher than the value ensuing from a valuation on a continued use value basis.

5.7.2.2. The estimation of liquidation value shall be net of liquidation costs, such as the fees charged by any third-party liquidation service hired to handle the sale.

5.7.2.3. There are two scenarios for the liquidation value concept, which will result in different valuation figures:

- **Liquidation value on an orderly sale basis:** As orderly sale allows for appropriate marketing time, the value of the PME should be equal to its Market Value;
- **Liquidation value on a forced sale basis:** When determining the liquidation value of the PME on a forced sale basis, the valuer estimates the amount for which the PME would be sold at an auction. As an auction has a short time frame, the seller will end up accepting less compensation for the PME offered for sale than it would on an orderly sale basis, so the value of the PME should be less than its Market Value. This is usually called *forced sale value*. (see para. 4.2.10.5.)

5.7.2.4. The need for a valuation on a forced sale basis usually arises when the seller is under compulsion to sell, is desperate to sell or a strict time limit is otherwise imposed.

5.7.2.5. Under the forced sale basis, the valuer shall apply a reduction in the form of a forced sale discount to the observable market price of the PME. To determine the liquidation value of PME which do not have a liquid market, the valuer shall consider observable prices on markets where similar assets are traded, with discounts for illiquidity reflected as appropriate.

5.7.2.6. The liquidation value can be further sub-categorised regarding the means of selling the assets:

"in situ", wherein the PME are sold in place forming a complete (or incomplete) production line. In such cases the real estate housing the equipment is usually sold together with the PME, but is not included in the PME's "in situ" liquidation value.

"ex situ", wherein the assets are sold separately and are transferred to the buyer's venue. In such case, the "ex situ" liquidation value needs to take account of the dismantling, transportation, installation and commissioning costs associated with the relocation of the PME.

5.7.2.7. The Market Value in situ of PME often includes other items associated with the equipment, such as fixtures, foundations, power lines, piping connecting the PME, etc. When assessing the liquidation value ex situ, the valuer must exclude these items, whereas they must be included in an in situ liquidation scenario.

5.7.2.8. The liquidation value differs from Market Value in terms of the time period assumed for the sale. In Liquidation, the seller is under pressure to sell, whereas in normal selling conditions, sufficient time for marketing is assumed.

5.7.2.9. Liquidation value is usually lower than Market Value because assets must be sold quickly, but is greater than scrap value.

5.8. Continued use value

5.8.1. **Definition** - Continued use value of PME is the value under the assumption that the PME contributes to the ongoing activity of the company by being in operation and usually by generating cash flow.

5.8.2. Commentary

5.8.2.1. The value of continued use is attributed to the asset in full operation, installed in the planned location, observing the appropriate maintenance procedures, the current legislation and the factors that influence the expected life cycle, with a normal depreciation resulting from use and age.

5.8.2.2. Continued use value assumes that the PME is installed and in operation for the specific purpose for which it was designed and is not expected to be sold separately.

5.8.2.3. The cost approach may be used in calculating this value considering the useful life of the PME, its age and residual value.

5.8.2.4. Continued use value can be used for valuation of an exclusive production process by use of unique PME when there are no market comparables.

5.9. Idle-in-place

5.9.1. PME which remains located at the business premise but which is part of a discontinued business operation is considered idle property. Idle property may remain in place, or be stored in a separate location from normal business operations. It may be impractical to move the item due to size, weight, cost or other restrictions which prevent removing the item from normal business operations. When the property cannot be moved it is considered Idle-in-Place.

5.9.2. Idle PME does not include property that has been placed out of service on a temporary basis. Further, it does not include property which is used on a stand-by basis, or infrequent use.

5.9.3. PME that has been deemed Idle-in-place or Idle is a commodity and should be valued based on the concept of value-in-exchange as opposed to value-in-use. Idle property is not fully installed. When the PME is re-sold, the cost of transportation, and all re-installation costs bring the PME to value-in-use.

6. Documentation

6.1. In accordance with EVS-PME 4, a professional valuation should be properly recorded in writing in a way that is transparent and clear to the client and to any user of the Valuation Report who might reasonably seek to rely on it.

6.2. The definition of Market Value or of other bases of value used should be recorded in both the terms of engagement and the Valuation Report.

EVS-PME 2 The Valuation Process

1. Introduction
2. Scope
3. Terms of Engagement
4. Liaison with Client's Advisers, Auditors and Others
5. Commentary
6. Supporting the Valuation
7. Macro and Micro Identification
8. Collection of Data

1. Introduction

A valuation must be professionally prepared with the PME valued and all available evidence considered so that the result can be sustained under challenge.

2. Scope

This Standard considers the procedural steps followed in preparing the Valuation Report.

3. Terms of Engagement

3.1. Terms of engagement are the specific terms of the contract between the valuer and the client. These terms are submitted to the client or prospective client once verbal or written instructions are received to provide a valuation service. Specific terms are prepared for each instruction, clearly and accurately reflecting the nature and purpose of the valuation and the extent of investigation to be undertaken to justify the subsequent opinion of value reported.

3.2. Detailed terms of engagement must be agreed in writing before the valuation is undertaken.

3.3. Terms of engagement as agreed may require subsequent amendment, and any variations must be recorded in writing to avoid misunderstanding and consequential dispute.

3.4. Terms of engagement must be in line with client requirements, recent legislation, requirements of the valuer's professional association and the latest edition of EVS-PME.

3.5. Failure to issue written terms will result in non-compliance with EVS-PME and the requirements of TEGOVA's European Plant, Machinery & Equipment Valuers' Code of Conduct. This may also result in an inadequate defence to any legal action relating to fees, negligence or performance.

3.6. Where valuations of a similar nature, such as valuations for lending purposes, are regularly provided to the same client and the valuer has previously provided terms of engagement, the valuer must confirm in writing that these terms continue to apply unless otherwise agreed with the client.

3.7. The minimum terms to be submitted and agreed are as follows:

- The client's identity and any other intended users
- The purpose of the valuation
- The PME being valued
- The ownership
- The basis or bases of value
- A specific date of valuation
- Declaration that no conflict of interest exists
- Declaration of independence
- The identity and status of the valuer
- The scope and extent of investigations
- The extent to which a duty of care will be provided
- Consistency with EVS-PME
- The fee to be charged
- Basic disclaimer

3.8. Other terms that may be considered:

- Assumptions, special assumptions and departures from EVS-PME
- Reliance placed on information provided by the client
- Any restriction placed on publication
- Timetable for work
- Respect of the requirements of hygiene and safety rules at work (Ex: potentially hazardous environments)
- Photographic and patent registration confidentiality term
- Respect of the security rules for intrusion

4. Liaison with Client's Advisers, Auditors and Others

4.1. The valuer may need to liaise with the client's other advisers to secure necessary information. Where the valuation is required for inclusion in financial statements, it will be important to liaise closely with the auditors to ensure that the work undertaken is what is required, and to ensure consistency and the use of appropriate bases of value.

4.2. The professional judgement of the valuer will determine whether he/she relies on information provided or disclosed. Terms of engagement agreed must explicitly state what, if any, reliance is placed on information provided by the client, the client's representatives or third parties.

5. Commentary

5.1. Valuers have a responsibility to demonstrate that they are competent, qualified and not subject to conflicts of interest or have declared, and taken steps to remedy, any real or apparent deficiency so that they may carry out the proposed assignment.

5.2. Conflicts or legal disputes may occur many years after the original valuation instructions have been completed. The historic context and reasoning behind any specific terms and conditions may then be difficult to recall unless they were recorded in writing at the time. Such a record will also show if the valuation has been used for purposes other than that for which it was prepared or was disclosed to unauthorised persons.

5.3. Apart from the benefits to the valuer of a clear and concise record which has been prepared and agreed in advance of the assignment, it also ensures that the client and the client's professional advisers know what to expect and are able to judge whether what they receive is what they wanted and expected.

5.4. **Sub-contracted valuations** — Prior approval must be obtained from the client where work is sub-contracted to other, specialist, valuers or where substantial third-party professional assistance is necessary. This approval must be recorded in writing from the client and disclosed in the terms of engagement.

5.5. **Valuations passed to a third party** — There is a risk that valuations prepared for one purpose may be passed to a third party and used for another unrelated purpose. The terms of engagement must therefore exclude liability of the valuer toward third parties and must specify the restricted nature of the valuation which is for the sole purpose of the client.

5.6. **Valuations which do not comply with EVS-PME** — Where a valuer is asked to carry out a valuation on a basis that is inconsistent with, or in contravention of, these Standards, the valuer must advise the client at the beginning of the assignment that the valuation will be qualified to reflect the departure from EVS-PME.

5.7. **Valuations carried out with limited information or where special assumptions are necessary** — A situation may arise where there is limited information, inadequate inspection opportunities, or restricted time available to the valuer. For example, in some cases the valuation may be required for the internal purposes of the management, in others the valuation may be required in relation to a takeover or merger where time is of the essence. In such cases, the valuer must ensure that the terms of engagement agreed confirm that the valuation will be for the client's use only and that it will not be published.

5.7.1. In the event that departures, limited information or special assumptions are recognised and defined during the valuation process, it will be necessary to confirm these in writing with the client.

5.8. It is essential that the terms of engagement state clearly that the Valuation Report, and any publication based on it, will set out in clear terms the instructions relating to the valuation, the purpose and context of the valuation, the extent to which enquiries have been restricted, the assumptions that have been made, the dependence that has been placed on the accuracy of the sources of information used and the extent of non-compliance with these Standards.

5.9. Exceptionally, it may be appropriate and expedient to issue valuations containing appropriate qualifications in instances where the limited circumstances set out below apply:

- The valuer has already previously inspected the subject PME and is familiar with it and with the market; or
- The valuer has received sufficient detailed supplementary information from management and/or internal valuers to the undertaking, to make up for the deficiency in the valuer's own enquiries.

5.10. Comments on terms of engagement

Terms	Comment
The purpose of the valuation	The valuer must declare that the valuation only relates to the specific purpose stated.
The PME being valued	The PME type and general identification information must be stated, along with the current location of the PME. The following must be considered: ▸ Where identification/ registration numbers for the PME are not available, secondary references, such as accounting inventory numbers/ IDs for the PME may be required, especially when valuing a large number of assets. ▸ Where PME is permanently attached to a real estate property, specify what PME is to be valued as a part of the real estate property. ▸ Where PME being valued are subject to a rental agreement, it is possible that improvements or additions such as capital expenditure undertaken by the renter will be disregarded upon renewal or review of a rental agreement. This may be relevant when valuing complex machinery such as a production line, as it may have an impact on value.

Terms	Comment
The ownership	If more than one legal interest exists, specify which is being valued.
The basis or bases of value	The basis or bases of value that will be reported must be specified. A basis of value recognised in EVS-PME should be used. This may be determined by the client, the professional body, legislation or regulation.
A specific date of valuation	The date of valuation must be a specific date, as agreed with the client and stated in the engagement letter.
Declaration that no potential conflict of interest exists. Declaration of any previous involvement with the entity or the parties involved	The requirements of the valuers in terms of professional objectivity mean that they must be aware of anything that could be perceived as a conflict of interest. In their initial enquiries, valuers must ask the client to identify any other interested or connected parties so as to establish whether there is a possible conflict of interest for the valuer, the valuer's partners, co-directors or close family. If such a conflict exists, then it must be disclosed in writing to the client who may then choose whether or not to confirm the appointment. If the valuer is confirmed by the client, the conflict of interest must be clearly stated in the Report. There may be circumstances under which the valuer, despite the client's wishes, will still decline to accept the instructions.
The identity and status of the valuer	It must be stated that the valuer is acting in an external and independent capacity. Compliance with the valuer's relevant code of conduct must be confirmed. The qualifications and designations of the valuer must be set out.

Terms	Comment
Assumptions, special assumptions, limitations and departures	All assumptions, special assumptions and limitations required by the client in preparing the valuation must be specified. Reference must be made to any departures from EVS-PME, setting out the reasoning and justification for departure.
The scope and extent of investigations	The scope and extent of the investigations must be clearly set out. The extent of the inspection (internal and external) must be stated.
Reliance placed on information provided by the client	If the client has supplied information relating to the PME or if the valuer is advised by the client to obtain information from a specified third party, then the terms must state that the valuer will rely upon this information and will not seek to verify its accuracy. The terms of engagement will also state that the valuer does not accept liability where the client has withheld information or given incorrect information.
Any restriction placed on publication	If any restrictions regarding publication, reproduction, public reference or circulation of the Valuation Report are agreed, they must be stated.
The extent to which a duty of care will be provided	The specific identity of the parties to whom a duty of care is owed should be set out. It may be appropriate to specify that no responsibility or duty of care will be offered to any other parties.
Consistency with European Plant, Machinery & Equipment Valuation Standards	Where the valuation has been rendered consistent with EVS-PME, this must be stated, using the full title 'European Plant, Machinery & Equipment Valuation Standards'.

Terms	Comment
The fee to be charged	All relevant costs and charges to be borne by the client must be specified. If expenses are to be charged, the basis of that charge must be included. Figures quoted must state where they are exclusive of VAT or other taxes. Where the client is not registered for VAT (such as a private individual) the total fee including VAT must be stated. Where fees are determined by third parties or prescribed by statute, the actual amount to be charged must be provided. The fee for valuation shall not be contingent on the outcome of the valuation.
Basic disclaimer	
Timetable for work	

6. Supporting the Valuation

6.1. A professional valuation relies on the valuer appraising the PME in its context, researching and verifying all matters with a bearing on the value of the PME. The quality of the valuation will, in part, rely on the quality of the information used to prepare it and so the valuer will need to verify any sources. Market conditions relevant to the subject PME must also be reviewed as these form part of the basis on which decisions may be made. Data retained following the submission of a valuation must be sufficient to enable verification that the analysis and evaluation undertaken in the approach, or approaches, to providing the opinion of value reported were sufficient for the type and scale of valuation.

6.2. Plant, machinery and equipment inspection — As part of obtaining personal knowledge of the PME, the report-signing valuer must make her/his own visual inspection of the PME. This will include the site of the PME, the PME in use/operational (if possible) and the environment in which the PME is used/operated, to record all matters which appear relevant to the value of the PME.

6.2.1. The Valuation Report must contain the following inspection information:

- Date of inspection;
- Information to be received and examined: list of documents and other information originating from third parties e.g. identification/registration information, ownership documents, information on physical characteristics, technical description and condition, operating, maintenance and repair costs of the PME, rental agreements, etc., including origin of data and supporting evidence;
- Confirmation that the inspection was made by the valuer and the extent of the inspections carried out must be stated. If the inspection has been less complete than usually required for this type of valuation, this must be stated;
- The extent of the PME and related site that it was possible to inspect, e.g. limitations during inspection, sampling inspection, etc.

6.2.2. The nature of the on-site inspection will depend on the type of PME and legislation, custom and practice, but the valuer must record the main characteristics of the PME, including technical and physical condition and presence of any auxiliary facility that affects the value.

6.2.3. The nature and scale of the inspection(s) will depend on the purpose of the valuation agreed with the client. There may be circumstances, such as the provision of a portfolio valuation, where it is appropriate to restrict the inspection(s), for example, to the main items of PME only or a desktop valuation. If an inspection has not been made, or it was not carried out in a manner enabling the gathering of all necessary information, this fact and the reason for the restriction must be recorded in the Valuation Report, as factors which could significantly affect the value of the PME may not have been identified.

6.2.4. Typically, inspection is performed in the presence of and in cooperation with the client or client representative. Identification of PME will be performed based on information provided by the client. The valuer will not assume the responsibility for obtaining information necessary for the identification of PME.

6.2.5. Limited identification techniques include partial inspection, sampling or desktop examination and their use should be documented in the valuation report.

6.2.6. Partial inspection refers to the impossibility to conduct a full inspection of the PME subject to valuation (e.g. in the case of complex production lines or plants).

6.2.7. Sampling inspection is usually based on the use of statistical methods and based on homogeneous samples.

6.2.8. In a **desktop valuation,** the subject PME is valued without inspection. In this case, the client will provide in writing all the information necessary for such valuation.

6.3. Consideration must be given to identifying relevant financial, legal and regulatory constraints regarding the PME, part of which may be directly connected to the specific industry.

6.4. Having inspected the PME, valuers must seek out and consider available market information, including comparables and cost-related information, and analyse them comprehensively on a common basis as to evidence of prices, costs and/or yields.

6.5. Valuations for secured lending purposes require an objective assessment of PME-specific risk factors of the economic life linked to the proposed loan facility.

6.6. Figures reported must be supported, not just stated. The valuation is the culmination of valuers' investigations and research that demonstrates their skill in bringing together data from various sources, using that information efficiently and providing a considered opinion.

6.7. The contents of a Valuation Report will be determined by the purpose and agreed Terms. EVS-PME 3 deals with Valuation Reporting.

6.8. Where the valuer is aware of market uncertainty, volatility or other issues putting the value at risk, these should be considered and reported in the assessment.

7. Macro and Micro Identification

7.1. Macroidentification

7.1.1. Macroidentification is a procedure used by the valuer to obtain a reasonable understanding of the setting in which the PME is operated. This procedure targets the entire production process by detecting major components contributing to the capacity of the plant, understanding the production flow and the products manufactured.

7.1.2. The data for macroidentification of PME may include:

- Target industry specifics
- Status of safety and environment regulations
- Commissioning date and date of subsequent expansions of the production line/ entire plant, according to case
- Location of the PME
- Products manufactured and their association with the process description and plant layout
- By-products, residual products and their association with current and potential uses
- Plant design capacity and actual capacity
- Plant obsolescence and inefficiency
- Historical operational data
- Energy consumption
- Necessary operating staff
- Maintenance programmes and costs
- Historical and actual physical and technical condition of the plant
- Remaining useful life of the plant
- Other considerations: centralised/controlled operation of the plant, related intangibles or accessories, pollution management, any unfavourable factors with impact on the valuation conclusion, etc.

7.1.3. As not all of these data apply to all valuations of PME, the valuer must exercise professional judgment regarding the information necessary in order to situate the PME in its operating environment and properly determine the capacity of the PME within the entire ensemble, according to case.

7.2. Microidentification

7.2.1. Microidentification is a procedure used by the valuer to obtain a reasonable understanding of the individual characteristics of the PME.

7.2.2. PME is usually identified by manufacturer or trademark, model name or code and serial number. Occasionally, identification information is not available or is incomprehensible. In such instances, alternative identification can be derived from accounting register data, such as inventory numbers.

7.2.3. Microidentification must also include the main technical characteristics, capacity, age and dimensions (if relevant) and the location of the PME.

7.2.4. The data for microidentification of PME may include:

- Manufacturer/trademark
- Model type/code – any reference of the manufacturer in relation to the model
- The serial number can offer additional information on model, capacity, manufacturing year
- Capacity and main functional characteristics
- Certificates of legal and regulatory compliance (Ex: Machinery Directive, CE Marking);
- Dimensions – length, width, height, diameter – and weight
- Commissioning date and age – derived from serial number, acquisition documents, maintenance records and accounting records, etc.
- Technical condition – derived from maintenance records and physical inspection
- Maintenance and operating costs/ energy consumption
- Installation costs (in the case of in-situ valuations)
- Decommissioning and dismantling costs (in the case of ex-situ valuations)

7.2.5. Microidentification is necessary to identify any technological type of accessories or intangible assets related to the PME (e.g. software, technical documentation, production registers, patents, licenses, intellectual property rights, etc.) which are covered by the valuation process.

7.2.6. Microidentification should reflect the extent to which the respective PME is attached to other assets (e.g. plant incorporated into buildings or structures and which cannot be moved without substantially affecting the building) or embedded into them (e.g. integrated into a production line). In such circumstances it will be essential to clearly delimit the subject of the valuation.

7.2.7. Separate valuation of PME intended to supply utilities or other types of services to a real estate property should comprise an assumption related to the fact that such PME is included in the real estate value (incorporated into the buildings) and is unlikely to be sold separately.

8. Collection of Data

8.1. Commentary

8.1.1. The quantity and type of data collected should be correlated with the valuation approach and assumptions.

8.1.2. Data required to assess the value of PME must include:

- Data related to macroidentification
- Data related to microidentification
- Data regarding the maintenance practices to which the equipment is submitted
- Data regarding the energy efficiency of the equipment
- Environmental compliance (noise, pollution)
- Data regarding regular inspections, in cases where they are mandatory
- Specific market information
- Data on comparable assets
- Data collected from the inspection

8.1.3. Market information includes social, technological, economic, administrative or environmental data and information which can influence the value of the PME and may indicate certain forms of depreciation.

8.1.4. Data on comparable assets can include, inter alia, information on comparable PME transactions or asking prices, information about equivalent new PME, depreciation, revenues, costs, capitalisation and discount rates.

8.1.5. The Valuation Report shall include references to the information sources.

EVS-PME 3 The Valuation Approaches and Methods

1. Introduction
2. Purposes of Valuation
3. Scope
4. Valuation Approaches
5. General Observations
6. The Market Approach
7. The Cost Approach
8. The Income Approach
9. Value Conclusion

1. Introduction

1.1. Methodology is a system of methods used in a particular area of study or activity.

1.2. In valuation of PME, the term methodology is used to describe the process by which a valuer undertakes the valuation. Thus, for a given valuation, methodology includes the selection by the valuer of the approach or approaches to be applied, the choice of method(s) and the use of models or techniques in order to interpret the valuation inputs and reach conclusions based on them.

1.3. There is a hierarchy of definitions; Approaches, Methods and Models. An approach is the first level in a hierarchy of definitions. The three recognised approaches are Market, Cost and Income. All of these are based on the underlying economic principles of price formation and the choice of approach will vary depending on the purpose, the nature and the available data for the valuation. Each of these principal valuation approaches includes different detailed methods of application and within these methods, there are different models. Some models are quantitative in nature, others more qualitative but all are techniques that allocate value to the component characteristics of PME.

1.4. EVS-PME does not impose any specific valuation methodology, as (unless there is applicable regulation) they are a matter for the professional judgement of the valuer in each case, according to the nature of the PME and the context and purpose of the valuation. In addition, methodology can be expected to evolve in the future as a result of many influences, including market behaviour and advances in calculation and analytical tools/methods — it would be inappropriate to attempt to restrict evolution by insisting on valuers retaining certain of today's recognised methods/models.

1.5. However, valuation methodology is implicit in valuation standards. Standardised valuation methods facilitate transparency and comprehension by readers of Valuation Reports; up-to-date valuation standards in turn reinforce good practice and accuracy of valuations.

2. Purposes of Valuation

The valuer should know the purpose of the valuation in order to clearly define the scope of work. The purposes for which the valuation of PME is required include:

- Sale or purchase of the PME
- Lending purposes
- Financial reporting, purchase price allocation
- Valuations for legal purposes
- Lease purposes
- Insurance purposes
- Liquidation/insolvency procedures
- Taxation

3. Scope

This section refers to Europe-wide accepted valuation approaches and methods for the valuation of any kind of PME for any purpose.

4. Valuation Approaches

4.1. In order to perform a valuation founded on the relevant basis of value, one or more valuation approaches shall be used.

4.2. Although there are certain differences in application and greater differences in nomenclature, there are, in fact, only three basic approaches for valuing PME: the market, cost and income approaches.

4.3. Within the three basic approaches of valuation, there are a number of valuation methods that are used, depending on the particular market. These methods will be used for one or more of the three basic approaches, as appropriate for the valuation based on the kind of asset, the available data, the purpose of the valuation, the nature of the client, the local legal framework, etc.

4.4. In the **Market Approach**, the valuation is produced by comparing the PME with the evidence obtained from market transactions or offers that fulfil the criteria for the relevant basis of value and asset type. The market approach is generally used when sufficient market data are available. However, many types of PME are highly specialised and no market evidence is available, imposing application of the cost approach or the income approach.

4.5. The **Cost Approach** provides an indication of value based on the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction. It will often be necessary to make an allowance for physical, functional and economic obsolescence of the PME compared with a modern equivalent, yielding the depreciated replacement cost of the PME. The cost approach is frequently applied for PME, principally for valuation of individual assets that are specialised.

4.6. The **Income Approach** in the valuation of PME is based on capitalising or discounting the estimated future income to be derived from the asset(s). However, cash flows may be partially attributable to intangible assets, so separation of the cash flow element of PME is very complex. Application of the income approach is not typical for the valuation of many individual PME items.

4.7. Selection of the valuation approach depends on the type of PME, the valuation purpose, the valuation assumptions and the quality and quantity of the data available.

5. General Observations

5.1. It is necessary to analyse the market and the market evidence in detail before deciding which method or methods should be used to carry out the valuation. The examination, investigation and analysis of the available market evidence is one of the most important steps in the valuation process.

5.2. The valuer will investigate the type of market evidence available, and this will depend on, for example: the nature of the local market; the type of PME to be valued and its condition; the condition of the asset; the specific industry. Market evidence may include comparable transactions, offers, data on lease fee, capitalisation rates, costs etc. This process enables the valuer to determine which market information is the most relevant and to give due weight to each piece of relevant evidence.

5.3. The type of asset to be valued is the second important factor, for on this, the decision will largely rest as to the valuation method to be adopted. While market-based comparison of transaction values may be natural for many types of individual assets, lack of an active market will prompt application of cost or income approaches.

Applications

6. The Market Approach

6.1. The market approach assumes that the informed purchaser would pay no more for an asset than the cost of acquiring a comparable asset with the same utility.

6.2. The market approach assesses Market Value through an analysis of prices obtained from sales and asking prices of PME similar to the subject of valuation and the adjustments to take account of differences between the comparable PME and the subject of valuation. This means that the valuer may have to make several different adjustments to the values obtained from the transactions and/or asking prices in respect of the comparable PME.

6.3. One of the first steps in the market approach is the proper identification of the subject PME. The approach is most reliable when there is an active market and verifiable information.

6.4. The basic procedure for the market approach:

- **A.** Gather data of sales and asking prices of identical or similar assets. Identify the relevant comparable data.
- **B.** Determine the elements of comparability.
- **C.** Determine the appropriate unit of comparison. Identify the units of comparison that are used by participants in the relevant market.
- **D.** Perform a consistent comparative analysis of qualitative and quantitative similarities and differences between the subject asset and the comparables.
- **E.** Analyse and adjust the data. Make necessary adjustments, if any, to reflect differences between the subject asset and the comparable assets.
- **F.** Use the adjusted data to assess the value of the asset.

6.5. When asking prices are used in the market approach, an adjustment factor should be applied based on the market conditions in order to reflect the potential sales bargain.

6.6. Valuers will need to judge what they deem to be an acceptable number of comparable transactions.

6.7. Elements of comparability:

A. The main comparative elements which are linked to the PME itself:

- Chronological and effective age
- The manufacturer, model and type
- The capacity, working space, weight and dimensions
- Usage indicators (km, working hours)
- Additional equipment, tools and accessories

B. The main comparative elements linked to the legal/regulatory framework, inter alia:

- Emission standards
- Occupational health and safety features (motion sensors, moving/rotation part protectors, safety cage, mandatory inspections and certificates (for example cars, lifting equipment))

C. The main comparative elements linked to the nature of the transaction:

- The type and time of the sale (sale/advertising/auction)
- The motive for the sale
- The quality and quantity of the PME
- The location of sale
- The agreed or asking price

6.8. Judgments have to be made about the relative merits of the subject PME and the comparable assets, so that adjustments for differences can be made to the price of each comparable asset to estimate a value of the subject asset. The more dissimilar the assets identified for comparison are to the subject asset, the less reliable the value resulting from the comparative method.

6.9. The basic methods of comparative analysis:

A. Direct match

B. Comparable match

C. Percentage of cost

6.9.1. **Direct match**. This method establishes value based on a direct match of the subject asset to an identical or highly comparable asset and in this way the valuer is able to determine the most accurate value.

6.9.2. **Comparable match**. This method is based upon deriving the value of the subject asset by comparing it with similar (but not identical) assets, on the basis of one or more technical and technological characteristics (productivity, capacity, dimensions, weight, etc.) adjusted to the characteristics of the subject PME.

6.9.3. **Percentage of cost**. The method uses a ratio between the selling price and the current cost of a new asset at the time of sale. The value of the subject asset can be determined by establishing this relation, and applying the ratios extracted. This method is used when there is a large quantity of comparable market data, because by using statistical tools, valuers define partial functions of the comparable elements and establish the proportion applied to the subject PME. This way, the valuer can establish functions / relationships for comparables such as:

- Age – market price – the price of the new assets
- Capacity – market price – price of the new assets
- Condition – market price – price of the new assets, etc.

6.10. There may be significant differences between the comparables and the subject PME. The market approach should only be considered when there are assets with characteristics that are reasonably comparable to the subject asset, although it may sometimes be necessary to accept as comparable, assets that are not ideal in this respect. This is because some evidence is better than no evidence at all. However, in such a situation it may be desirable to apply a different valuation approach either instead of the comparable approach or as a check to it.

6.11. In many cases, the analysis of comparable evidence and determination of Market Value are based on the valuer's individual expertise, knowledge and experience. The valuer should be aware that any analytical tool employed is only as reliable as the accuracy and quality of the data gathered. Also, the value of an asset cannot be derived solely on the basis of mathematical or statistical models. All valuation models whether heuristic or quantitative are simply tools that help valuers determine the value of the subject assets.

6.12. Even in circumstances where the comparative approach is not used, market inputs should be used in the application of other approaches.

7. The Cost Approach

7.1. The cost approach provides an indication of value based on the economic principle that a buyer will pay no more for PME than the cost to obtain PME of equal utility, whether by purchase or by construction. It will often be necessary to make an allowance for obsolescence of the PME compared with an equivalent new one.

7.2. The cost approach is commonly adopted for:

- Specialised PME or special-use facilities
- Estimating the replacement value of PME that are very seldom, if ever, sold or let on the market
- PME with no active market or that are unique, thus eliminating the possibility of a market approach
- PME that are not directly income-generating, thus eliminating the possibility of an income approach
- Estimating the value of a partially completed plant installation.

7.3. A fundamental problem of the cost approach is that cost does not necessarily equal value.

7.4. The cost approach is summarised as follows:

- Determine current cost new.
- Determine the residual value.
- Determine the useful and applied life.
- Calculate value through Straight Line Method or Exponential Method.
- Determine and define value.

7.5. Cost approach steps

7.5.1. The first step of the cost approach is to determine the current cost new of reproducing or replacing the subject PME by reference to the lower of either reproduction or replacement cost.

7.5.2. The second step is to adjust the current cost new to reflect the impact on value of physical deterioration and functional and economic obsolescence.

7.5.3. The final step is to estimate the residual value, i.e. the value of the PME, if any, at the end of its useful life.

7.6. The result of those three operations will give an indication of Market Value.

7.7. **The current cost new** (replacement or reproduction cost) is generally the proper starting point for developing an opinion of value using the cost approach. *Replacement cost* is the current cost of a similar new asset having the nearest equivalent utility to the asset being valued (modern equivalent), whereas *reproduction cost* is the current cost of reproducing a new replica of the asset being valued using the same, or closely similar, materials.

7.8. The cost incurred in the acquisition or manufacturing of PME may be appropriate for use as the current cost new of an asset under certain circumstances, but the valuer should consider the following:

- If the PME is new, this cost might be the relevant figure to adopt in assessing the current cost new. In adopting this figure, the valuer would need to be satisfied that there was no excessive expenditure, or feature of the design that is not relevant to the economic purpose of the asset.
- If the PME is not new, and was not acquired recently, these costs may not be relevant, or may need to be adjusted for inflation/indexation to an equivalent as at the valuation date, due to changes in market prices, inflation/deflation or other factors.
- Care must be taken when adopting a particular market participant's own costings, as they may not represent what typical market participants might have paid.
- The valuer must also consider the possibility that the entity's costs incurred may not be historical in nature due to prior purchase accounting or the purchase of used PME.
- The valuer must consider all significant costs that have been included and whether those costs contribute to the value of the asset.
- Any costs, discounts or rebates that would not be incurred by, or available to, typical market participants should be excluded.

7.9. There are several **methods of determining the current cost new** of PME.

The major ones are:

- The detail method
- Trending
- Cost-to-capacity
- Other engineering methods

7.10. **The detail method** (also known as the 'summation method'), requires that a current cost new be assigned to each individual component of an asset. The PME is itemised or "detailed" so that the sum of all the components reflects the cost new of the whole. All typical direct and indirect costs should be included.

7.10.1. **Direct costs** are those directly incurred in the purchase and installation of an asset, or group of assets into functional use, such as:

- Direct material costs, including the item of PME itself
- Direct labour costs for installation
- Transport, freight and handling
- Rigging and moving
- Electrical
- Piping
- Foundations

7.10.2. **Indirect costs** are those expenditures that normally may be necessary for the installation of an asset but typically are not directly attributable to the purchase and installation of PME and are not usually included in the vendor invoice, such as:

- Engineering, and other professional fees
- Administrative, accounting, consulting, and legal fees
- Temporary insurance during installation
- Licenses and permits
- Security costs during installation
- Temporary enclosures
- Debugging and run-in costs
- Finance costs (e.g. interest on debt financing)
- Profit margin/entrepreneurial profit to the creator of the asset

7.11. **The trending method** is a method of estimating an asset's reproduction cost 'as new' in which an index or trend factor is applied to the asset's historical cost to convert the known cost into an indication of current cost.

7.11.1. **Historical cost** is the cost of an asset when it was first placed into service by its first owner and was bought as new.

7.12. **The cost-to-capacity method** is generally used to estimate the replacement cost for an asset with one capacity where the replacement costs of an asset with a different capacity are known.

7.12.1. The valuer should not use the cost-to-capacity formula to scale up a unit beyond what is reasonable. When there are large differences in capacity, significant error can occur.

7.13. **Other engineering methods**: There are several other methods available to assist in estimating the current cost new such as, inter alia: Lang factor method, Hand factor method, Chilton method, Peters-Timmerhaus ratio factors method, Compartmentalisation method, Miller method, Turnover ratios method, Investment cost per unit of capacity method etc., applied on a case-by-case basis.

7.14. **Deterioration and obsolescence**: In the context of a cost approach depreciation, the valuer ascertains the size of the value gap between the modern equivalent replacement and the existing asset.

7.15. **Depreciation** is a PME's loss of value due to any cause in relation to its current cost new.

7.16. Depreciation under the cost approach differs from depreciation accounting practice. Accounting depreciation represents cost recovery for financial reporting; valuation depreciation represents the actual loss in value to PME.

7.17. The value of the PME is affected by some or all three main types of depreciation:

- Physical deterioration
- Functional obsolescence
- Economic/external obsolescence

7.18. Physical deterioration

7.18.1. In the cost approach, the PME is valued in its existing condition.

7.18.2. Physical deterioration is loss in value associated with the passage of time and use (combination of use, effect of aging process, structural defects, operational wear and tear, corrosion / erosion, UV degradation and any type of hazardous environmental exposure of the asset, etc.).

7.18.3. Physical deterioration is estimated as a percentage: a new asset has 0% physical deterioration, while an asset that is completely exhausted has 100% physical deterioration.

7.18.4. Most types of PME physically deteriorate with use and, depending on the type of asset and use, the rate of depreciation may be materially different.

7.18.5. The main factors to consider for physical deterioration are:

- Material resistance specifications
- Planned operating time versus actual operating time
- Maintenance required versus maintenance performed
- Environmental exposure
- Chronological age

7.18.6. When trying to estimate only physical deterioration, valuers should avoid incidentally including functional or economic obsolescence. The best procedure is to rely on the age, use and maintenance of the PME.

7.18.7. There are three basic methods of measuring physical deterioration: 1) Formula ratio; 2) Direct amount measurement and 3) Observation

7.18.8. The **Formula ratio method** includes two techniques:

1. **Ratio: use/total use**, for estimating physical deterioration by analysis based on PME use.
2. **Ratio: age/life**, for estimating physical deterioration by analysis based on opinion of useful life and remaining useful life of PME.

7.18.8.1. **Effective age** is the apparent age of PME in comparison with new PME of like kind; that is, the age indicated by the current condition of the PME. In estimating effective age, the valuer considers the effect that overhauls,

rebuilds, and above-average or below-average maintenance may have had on the PME's current condition.

7.18.9. Economic, physical, useful, applied and remaining useful life of PME:

- Economic life is the anticipated length of time during which the PME 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. Economic life is the period in which the PME can provide economic benefits to the owner, generally shorter than the physical life.
- Physical life is the anticipated length of time during which the equipment could be used before being worn out or beyond cost-effective repair, assuming routine maintenance but disregarding any potential for future refurbishment or reconstruction.
- Useful life is the time frame in which the PME is expected to effectively operate as designed and specified by the manufacturer.
- Applied life is the length of time passed, measured in any appropriate unit (e.g. years, months, days, hours etc.), since the commissioning of the PME.
- Remaining useful life of PME is defined as the useful life of the asset minus its age, expressed in the same units of the PME's useful life, and taking into account any completed refurbishments or other factors that have increased or decreased its operating life.

7.18.10. The ultimate test for physical deterioration is consideration of the anticipated useful life of the PME, having regard to its constituent parts and the rate at which they will deteriorate.

7.18.11. When considering a component approach to lifespan, care should be exercised with any averaging procedure as, if a component is scheduled to fail after a given lifespan, giving the component an apparently longer lifespan by averaging with other components of a longer lifespan will be inappropriate. It may be that some adjustment is required, but any fundamental component part of a structure which affects economic viability usually needs to be considered in the light of the component with the shortest predicted lifespan.

7.18.12. For economic life, consideration beyond the current user or client is required in order to judge how long any industry or service provider would make use of it, not just the individual client. It is the remaining economic life at the date of valuation that is relevant. Further planned refurbishments should not be taken into account at the date of valuation.

7.18.13. The remaining economic, useful and physical life is the time in which the PME will still contribute to the total value of the business and is a matter of professional judgment.

7.18.14. **Direct amount measurement** (the second basic method of measuring physical deterioration);

- This concept involves measurement of the physical deterioration expressed in monetary terms. It is applicable when specific components have deteriorated and can economically be cured. When using this concept, the valuer should strive to segregate the curable elements from the incurable elements.
- Deterioration is curable when it is economically feasible to remedy it, if the resulting increase in utility and value is greater than the expenditure or cost to cure.
- Deterioration is incurable when it is not economically feasible to remedy it, if the resulting increase in utility and value is less than the expenditure or cost to cure.

7.18.15. **Observation method**: (the third basic method of measuring physical deterioration): Determination of the current condition of equipment and comparing it to the new equipment. This method is based on the valuer's personal experience and examination of similar equipment. The procedure involves observing the visible elements of wear and tear and converting those observations into a personal opinion. On the basis of the facts, the valuer must develop an opinion of physical deterioration, often stated in the form of a percentage, to deduct from current cost new.

7.18.16. In the presence of sufficient data, this method should only be used on a complementary basis, not as the basic method.

7.18.17. **Commentary**

7.18.17.1. Manufacturers usually specify the proper maintenance to be applied to the PME over its lifetime. Knowledge and assessment of the PME's maintenance status is therefore required to calculate depreciation caused by physical deterioration.

7.18.17.2. Most assets physically deteriorate faster when used, and with rates of deterioration that vary according to the type of asset and use. When operating time is within a timeframe specified by the manufacturer, the deterioration should be in line with the asset's chronological aging.

7.18.17.3. If the cost of repairing, refurbishing or re-fitting the PME to render it fit for modern use exceeds the cost of a modern replacement, then it has a scrap or salvage value, or no value.

7.18.17.4. Physical deterioration may be greatly accelerated when the subject PME is exposed to adverse environmental and/or operating conditions if the PME was not designed to operate optimally under such conditions.

7.19. Functional obsolescence

7.19.1. Functional obsolescence of PME is loss in value associated with reduced efficiency and utility of the asset.

7.19.2. ***Functional obsolescence*** is a term used to describe obsolescence originating from any kind of functional deficiency of the PME. Functional deficiency may be a consequence of the adopted design of the PME, applied materials and manufacturing process, applied technology, equipment performance (capacity, speed, weight, etc.), lack or excess of operational functions, damage caused by use or breakdown, etc. Functional obsolescence is divided into two basic categories:

- Operational obsolescence is a loss in value resulting from differences in utility/operability between market equivalent or standard in a certain area of PME, and the subject PME.
- Technological obsolescence is a loss in value between new and subject PME resulting from material, design and technological differences.

7.19.3. The main causes of functional obsolescence are:

- Introduction of new technologies improving efficiency, functionality or quality of the product or the environmental performance of the PME
- Rapid changes of user requirements for the generated product
- Availability and cost of labour
- Discontinuity of manufacturer support (spare parts, consumables, software, etc.)
- Changes in legislation that favour efficiency, environmental footprint and health and safety

7.19.4. Depreciation caused by functional obsolescence is the reduction in value due to reduced utility or desirability of all or part of the PME, because industry or modern use requirements have changed over time. This could apply to all types of PME.

7.19.5. Functional obsolescence is measured by the following techniques:

- Capitalising the excess operating costs over the subject PME's expected remaining useful life
- Reducing the cost by the amount of capital costs related to the excess capacity

- Estimating the amount of capital costs required to cure the functional deficiency or structural/capacity inadequacy

7.19.6. Even new PME can be functionally obsolescent, when design, material, main technological process etc., is not appropriate or is inadequate for the PME's intended purpose.

7.19.7. If new technology has rendered existing technology obsolete, PME may have residual value or no value. However, care is required here, because often this obsolescence is cost-driven where automation has overtaken manual labour. Labour costs vary worldwide, and so-called "old" or obsolete industry is sometimes exported to other parts of the world where it can still function economically, using lower labour rates, in which case the value write-down will not be total.

7.19.8. Commentary

7.19.8.1. The introduction of new technologies usually has a direct effect on the value of PME. PME can even become obsolete before it is released.

7.19.8.2. In specialised manufacturing processes, it is likely that historic specification no longer fulfils the modern requirement of that industry and may also cease to efficiently deliver its original design function. The PME might no longer be fit for purpose at all, or in other cases may still be used but at a lower than optimum efficiency.

7.19.8.3. The depreciation adopted by the valuer needs to reflect the cost of bringing the original PME asset into line with a modern replacement or, if not possible, reflect the consequence of a continued operation at lower efficiency. If the asset is no longer fit for purpose, its value may have scrap or salvage value, or no value.

7.19.8.4. Changes in user requirements for a product should be met by appropriately adapted production processes. Failing to do so may render the product unwanted, and negatively affect the PME's value.

7.20. Economic/external obsolescence

7.20.1. Economic/external obsolescence is loss in value due to influences outside the PME. It is the type of obsolescence that is not inherent to the PME, but rather to factors associated with the wider economic environment.

7.20.2. Economic/external obsolescence may arise when external factors affect individual PME or all PME employed in an industrial area or sector and should be deducted after physical deterioration and functional obsolescence.

7.20.3. The main causes of economic/external obsolescence are:

- General decline of a market segment that the asset or the product of the asset corresponds to
- Strategic decisions of governments that may favour specific markets and/or disrupt the balance of international trade
- Application or withdrawal of tariffs and quotas (including anti-dumping)
- Changes in legislation that favour specific markets and products

7.20.4. Examples of economic/external obsolescence include:

- Adverse changes to demand for the products or services produced by the PME
- A disruption or loss of a supply of labour or raw material
- Adverse changes to energy/environmental legislation affecting production or the product itself

7.20.5. The valuer will need to take a broad view of the industry and economy in which the PME operate including the general sentiment towards a particular use, whether it is stable, declining or growing. Some aspects requiring a valuer's adjustment might be:

- Physical capacity versus requirements
- Labour availability versus requirements
- Raw material availability versus requirements
- Energy availability versus requirements
- Working capital availability versus requirements
- Potential legislative energy emissions/environmental controls

7.20.6. In order to gauge the overall demand in the wider economy for whatever the PME is contributing to, valuers must take into account demand fluctuations which are likely to be cyclical, so they will need some knowledge as to where that industry might be in the current cycle.

7.20.7. Economic/external obsolescence may be quantified using several different techniques. The appropriate technique is dependent on data availability and the type of PME being valued. The main techniques are:

- **Inutility** (Cost-to-capacity concept): whenever due to economic/external factors the operating level of PME is significantly lower than its rated or design capacity, obsolescence is measured as a ratio between actual and design capacity.
- **Market approach**: is used to assess economic/external obsolescence with reference to transactions of comparables of similar type as the subject PME used in the same industry sector and suffering the same/similar degree of physical and functional depreciation.
- **Income approach**: the extent of obsolescence is estimated as the percentage difference between the replacement cost new and the value calculated by the income approach for the hypothetical replacement of the subject PME.
- **Analysis of industry returns**: consists of comparing the returns on invested capital in the industry the subject PME operates in with the returns on investment capital in general or in all industries.

7.20.8. If demand for a product or service has collapsed globally or within the trading radius and is not expected to resume, there may be no demand for the PME and it may potentially have residual (scrap or salvage value) or nil value.

7.20.9. Commentary

7.20.9.1. Economic/external obsolescence occurs where a market for an output has declined, altered or disappeared and there is surplus capacity. For example, when the construction sector declines, demand for concrete, steel and aggregates also decline, with negative impact on the relevant industries and the equipment they use.

7.20.9.2. Application or withdrawal of tariffs and quotas might render PME assets totally obsolete.

7.20.9.3. Some types of PME are less susceptible to economic/external obsolescence due to their more generic nature enabling their use in various markets and industry segments. Specialised equipment that is exclusively used in a single market or industry segment is more susceptible to this kind of obsolescence.

7.21. Residual value

- The residual value is the estimated value of PME at the end of its useful life.
- For PME, residual value is the net scrap or salvage value.

7.22. Valuation assumptions

7.22.1. Measuring deterioration and obsolescence is a difficult task involving many assumptions by the valuer which need to be accurately recorded in the valuation report.

7.22.2. The valuer will need to establish with the client how the PME is used and will continue to be used. With more specialised PME, valuers will need to place greater reliance on information provided by the client or other professional advisers. When such information is lacking, it must be compensated by appropriate assumptions.

7.23. *Refurbishment and Overhaul*: Most assets may undergo refurbishment or overhaul extending their economic (physical and functional) life beyond the original design life. The valuer will need to take into consideration such refurbishment or overhaul, assessing the useful life of the PME. Purely age-related scales of depreciation are unlikely to be very accurate.

8. The Income Approach

8.1. The income approach is based on the 'time value of money' concept: an amount of money received today is worth more than an amount of money to be received in the future, because money received today can be invested and earn interest. Present value represents the value today of something that will be received in the future.

8.2. The income approach serves for the valuation of PME where its value is determined by capitalising or discounting the estimated future income to be derived from the PME, whether this income is rent, an operating lease or a capital lease or income generated by a business profiting from the use of PME.

8.2.1. Thus, the legal interest valued is the ownership right over the PME that gives the owner the ability to use the PME for the creation of an income stream.

8.3. The income approach is based on PME's capacity to generate net income and converting it to its present value. In the valuation of PME based on operating profits (such as the valuation of process plants), the valuer will often work on the basis of earnings before interest, tax, depreciation and amortisation (EBITDA).

8.4. All data and assumptions must be market-derived. As an example, market-derived data are based on the prevailing rental rates in the marketplace for the same or similar PME. The actual contract rent may be higher or lower than market rent. Contract rent is the amount agreed upon at the time the rental/lease agreement was executed.

8.5. All methods based on the income approach will be grounded in the interaction of the following elements:

- Current and expected future net income;
- The timing of future events that can be expected to affect the net income;
- The way in which potential buyers would account for this interaction of money flows over time.

8.6. The income approach is appropriate for the valuation of those PME categories which permit the clear identification of a net income stream attributable solely to the PME. For example:

1. PME that are rented and create a rental income for the owner:
    - Transportation equipment
    - Construction machinery (excavators, bulldozers, ready mix batching plants etc.).
    - Vessels and yachts
2. PME that create an identifiable net income through their operation for the owner
    - Renewable energy installations (photovoltaic stations, wind turbines, biothermal installations)
    - Simple production lines, such as a steel processing centre, a printing facility, self-standing PME such as plastic forming machine, a lathe, a milling machine, etc.
3. Process plants, where:
    - PME pays the largest part in value of this specialised property
    - PME can be easily dismantled and moved to another location
    - PME forms part of process systems intended for one or more technological processes, but at the same time can operate as separate technological units.

8.7. The income approach usually comprises:

- Determination of the expected net future income (cash inflows)
- Determination of the expenses over time necessary for achieving the expected future income (cash outflows)
- Subtraction of the annual operating expenses from the expected future income
- Derivation of the discount rate or capitalisation rate
- Determination of the present value of the annual net cash flows
- Estimation of the terminal value of the PME
- Estimation of the value of the PME

8.8. Two methods are typically used to value PME by the income approach:

1. **The direct capitalisation (DC) method** measures value by dividing a single period net income by a capitalisation rate. The method simply capitalises a single period net income or cash flow over the remaining useful life. It assumes that there will be no variation in the capitalisation rate and no termination of the income stream. It is a single-period model.
2. **The discounted cash flow (DCF) method** measures value based on the expected future cash flows discounted to present value. The DCF method is most frequently developed on a debt-free, net cash flow basis. The method results in the value of PME associated with a going concern. It is a multiple-period model.

8.9. The PME should usually be distinguished from the business that may be using it. When the value of the PME is derived from the operating business of a manufacturing or process plant, care must be taken to exclude any cash inflows or outflows not associated with the operations of PME being valued, such as interest income or expense, insurance claim payments, or PME replacements, as well as cash inflows or outflows related to intangible and contributory assets such as software, assembled work force, working capital and goodwill.

8.10. Direct capitalisation method

8.10.1. If at the date of valuation, the income generated by the PME is perpetual, direct capitalisation is applied based on the formula: capital value equals net operating income divided by the capitalisation rate.

8.10.2. When using the direct capitalisation method, two main steps are required:

1. Projecting the net income
2. Deriving the capitalisation rate

8.10.3. The direct capitalisation method can be used if the single-year income applied is indicative of the annual income for the remaining life of the asset and the capitalisation rate reflects the recapture period of the asset.

8.10.4. Though in comparison with the discounted cash flow method direct capitalisation involves fewer assumptions, it requires strong reasoning because:

1. The useful life expectancy of PME is relatively short.
2. The income generated by PME tends to vary over the remaining useful life, often following a descending trend.

8.10.5. The direct capitalisation method can be useful for calculating the depreciation due to functional or economic factors. For example, if the subject machine can only run a few hours per day, but a modern replacement can run for more hours per day, the loss in revenue from the non-production hours can be capitalised and the estimated amount subtracted from the replacement cost. Whether the obsolescence was functional or economic will depend on whether the forces reducing the production hours were internal or external.

8.10.6. When applying the direct capitalisation method, it is important to capitalise income generated solely by the PME, not the income of the business that owns the PME.

8.11. The direct capitalisation method can be used for valuation of such equipment as vehicles, machine tools, agricultural machinery, construction and mining machinery, etc. This is because such equipment is usually rentable and appropriate comparables can be found on the machine rental market.

8.12. Capitalisation rate

8.12.1. Developing an appropriate capitalisation rate is a critical step in the direct capitalisation process, as the future income-generating capacity of PME is typically short-lived compared to real estate. Therefore, the capitalisation rate shall contain provisions both for return on the investment (discount rate) and capital recovery (return of the investment). In effect the capitalisation rate equates to the discount rate minus long term growth.

8.12.2. When choosing the rate to be adopted, the valuer must take account of:

- The risks associated with the income-generating capacity of PME, captured within the capitalisation rate
- The expected remaining useful life of PME

8.12.3. Even when the direct capitalisation method is applied, consideration should be given to the salvage or scrap value, if any, when the PME has reached the end of its useful life. An analysis of resale values of used equipment can be helpful in determining salvage value.

8.12.4. The capitalisation rates or income multipliers sometimes can be extracted from comparable sales. Such market-derived capitalisation rates or income multipliers can provide reliable estimates of value if they are derived from comparable sales with the same potential for future income.

8.12.5. The most common direct capitalisation multiplier used for PME valuation is the **gross income multiplier**, derived by:

1. Extracting from comparable PME sales
2. Comparing the comparable PME attributes (physical, functional, and financial) to the subject PME
3. Adjusting the comparable PME multipliers in order to obtain an appropriate multiplier

8.12.6. When either calculating value or extracting multipliers, the valuer should ensure that the income (however estimated) is calculated on the same basis.

8.13. Discounted cash flow

8.13.1. For full plant valuation, the discounted cash flow (DCF) method results in the business enterprise value of an operating business, which includes the values of the working capital, the tangible assets (real property, machinery and equipment), and intangible assets. A value for machinery and equipment is calculated by making the appropriate deductions from the business enterprise value.

8.13.2. The discounted cash flow method is based on present value calculations of expected net income or cash flow projected over a specific calculation period. The expected net income also includes a terminal value which is normally calculated and discounted at the end of a notional holding period. Consequently, a time horizon, projected cash flow and terminal value have to be determined. To calculate present value, the estimated income or cash flow has to be discounted and a discount rate has to be determined.

8.13.3. Key steps in applying the DCF method:

- Choose the type of cash flow relevant to the nature of the PME and the purpose of valuation.
- Determine the time horizon for the cash flow projections.

- Estimate all cash in-flows and out-flows for each year over a determined period of time (DCF period).
- Calculate the terminal value for the PME at the end of the projected cash flow period (if any).
- Choose the discount rate in the light of the general level of risk inherent to the model.
- Discount the projected cash flows to their present value, including the projected terminal value (if any).

8.14. Cash flow considerations

8.14.1. The cash flow must correspond to the nature of the PME and purpose of valuation. Therefore, the following factors must be considered:

- Only those cash in-flows and out-flows specific to the operation of the PME as a stand-alone item are appropriate.
- The projected cash flow can be explicit (reflecting future growth) or implicit (excluding future growth expectations), pre-tax or post-tax, before or after debt items, depending on various factors, such as the nature of the PME, the purpose of valuation, selected basis of value, available data, etc.
- Normally, cash flow is stated in the currency of the income.
- The discount rate must be consistent with the future cash flow estimates, i.e. it must be based on the same assumptions in terms of timing, inflation, costs, financing and taxes. The discount rate chosen should not reflect risks for which the future cash flow estimates have been adjusted.

8.15. The hold period

8.15.1. Cash flows are estimated over a certain period during which the hypothetical buyer will own the PME before finally selling it. There is no particular rule as to how long the hold period should be. The selection criteria will depend upon the purpose of the valuation, the nature of the PME, the information available and the required bases of value:

- In general, the hold period should be sufficient for PME to achieve a stabilised level of net income, after which the terminal / residual value has to be determined.
- For PME with a short useful life, it is more likely to be both possible and relevant to project cash flow over its entire remaining useful life.
- For PME in cyclical processes, the hold period should, as a minimum, cover an entire process cycle.

8.16. Cash flow forecasts

8.16.1. Income and operating cost information can be obtained from either primary or secondary sources. Primary sources are regulatory bodies, PME manufacturers, PME owners and managers, etc. Secondary sources are published information.

8.16.2. When relying on published information, valuers must be critical towards it and must ensure that it is properly quoted and sourced.

8.16.3. Usually, the cash flow forecast will not include taxes, loan/debt servicing and accounting depreciation.

8.16.4. Cash inflows (income) usually include cash received from:

- The sale of goods and/or services produced by the PME. These are directly connected to the forecasted production capacity
- Benefits ensuing from regulation (e.g. sale of green certificates, gate fees etc.)
- The sale or rent of PME

8.16.5. Cash outflows (expenses) usually include costs for:

- Energy consumed by PME operation
- Raw materials or semi-finished products needed for production
- Salaries and fees paid for PME operation
- Regular maintenance and any planned refurbishment of the PME
- Insurance of the PME
- Regulatory commitments, penalties or fees (e.g. purchase of green certificates, waste management, environmental rehabilitation of the operating site, etc.)
- Payments for patents, rights, licenses etc.
- Rent paid for the required real estate or complementary assets (if any)
- Administration and sales (if appropriate)

8.17. Terminal value

8.17.1. Terminal value is the value as PME at the end of its useful life after the hold period. This value is included in the income stream of the PME over the hold period and discounted to the present value.

8.17.2. For PME, the most used methods for calculating a terminal value are:

1. Market approach/exit value. This method can be performed in several ways, but the ultimate goal is to calculate the value of the asset at the end of the determined cash flow forecast. Common ways to calculate the terminal value under this method include application of a market evidence-based capitalisation factor or a market multiple. In an explicit DCF valuers should also consider the expected market conditions at the end of the forecast period and make adjustments accordingly.
2. Direct capitalisation
3. Cost approach
4. Net scrap or salvage value. The terminal value of some assets may have little or no relationship to the preceding cash flow. In such cases, the terminal value is typically calculated as the scrap value of the asset, minus costs to dispose of the asset. In circumstances where the costs exceed the scrap value, the terminal value is negative and referred to as a disposal cost or an asset retirement obligation.

8.18. Discount rate

8.18.1. All in-flows and out-flows in the cash flow model, including the terminal value, are discounted by the application of an appropriate discount rate. The discount rate is intended to reflect the hypothetical buyer's assessment of the risk inherent in the subject PME.

8.18.2. Ideally, the valuer would have evidence of discount rates from recent transactions, but such information is often scarce.

8.18.3. When transactional evidence is not available, the discount rate can be calculated using:

- Capital asset pricing model
- Weighted average cost of capital
- Build-up method

8.18.4. In developing a discount rate, a valuer should consider:

- The type of PME being valued
- Comparable market data
- The age of the PME versus its useful life
- The required bases of value
- The degree of certainty of the expected net income

8.18.5. When estimating an Investment Value for a particular investor, individual rates reflecting the needs of the specific investor are used.

8.19. Commentary

8.19.1. The discount rate should be consistent with the cash (or profit) flows estimated in the model, i.e., it must be based on the same assumptions in terms of timing, inflation, income growth/decline expectations, costs, financing and taxes. The discount rate chosen should not reflect risks for which the future cash flow estimates have been adjusted. For example in an explicit DCF, income growth is already reflected in the cash flow.

8.19.2. When adjusting the cash flow forecast, the valuer must provide the rationale for the adjustments and document their nature and amount.

8.19.3. In developing the discount rate, valuers must consider the chances of achieving the forecast cash flow and whether the forecast cash flow assumptions are consistent with the discount rate.

9. Value Conclusion

9.1. The value conclusion must be consistent with:

- The terms of engagement
- The subject of valuation
- Specific market conditions
- All relevant information available at the valuation date

9.2. In some countries, it is normal practice, or even a legal obligation for some valuation purposes in some instances (e.g. terms of engagement, statutory requirements), to value PME using two or more different methods, which may therefore give several different resulting values. The valuer must then consider the various results and make a professional judgement as to the value to report. In contrast, in other countries the valuer is expected to use just one method.

EVS-PME 4 Reporting the Valuation

1. Introduction
2. Scope
3. The Valuation Report – Definition
4. The Valuation Report
5. Valuation Review

1. Introduction

The valuation, as determined by the valuer, must be clearly and effectively conveyed to the client. The Valuation Report will be the document on which the client will rely in taking decisions. It must therefore be exact, transparent and understandable to the client.

2. Scope

This Standard deals with the Valuation Report in which the valuer informs the client of the value determined.

3. Valuation Report – Definition

The Valuation Report is a document detailing the scope, key assumptions, valuation methods, and conclusions of an assignment, providing a professional opinion of value supported by a recognised basis or bases of valuation within the framework of European Plant, Machinery & Equipment Valuation Standards.

4. The Valuation Report

4.1. General

4.1.1. A Valuation Report must be in writing, prepared and presented in a reliable and comprehensible manner for the users and clients. This is appropriate for a report providing a Market Value and also for reports concerning all other bases of valuation, as it gives certainty between valuer and client.

4.1.2. The Valuation Report must record:

- The instructions for the assignment
- The basis and purpose of the valuation
- The addressee of the Report
- Details of comparables and/or other information used and the results of the analysis that led to the opinion of value.

4.1.3. It must also explain the analytical processes undertaken in carrying out the valuation and present the supporting information.

4.1.4. The Valuation Report must provide a clear and unequivocal opinion as to value, as at the date of valuation with sufficient detail to ensure that all matters agreed with the client in the terms of engagement and all other key areas are covered and that there is no misunderstanding of the real situation of the PME and the intended use.

4.1.5. The Report must not be ambiguous, must not mislead the reader in any way nor create a false impression. It needs to be written in terms which a person with no knowledge of the PME or of valuations can understand.

4.1.6. Decisions may be made, and finances committed or withdrawn on the strength of the valuation. The valuer's opinions about the merits or weaknesses of the subject PME must be well founded and expressed in a reasoned and objective way that will enable the reader to understand the conclusions reached.

4.1.7. Where the valuer has been instructed to undertake a valuation despite an actual or potential conflict of interest, that conflict and its acceptance by the parties must be recorded.

4.2. Content of the Valuation Report

4.2.1. The content, length and detail of the Report will be a matter for the valuer's discretion but must meet the specific profile and needs of the client as well as the specific instructions from the client to the valuer and have regard to the purpose of the valuation and the use that the client proposes to make of the valuation.

4.2.2. The form and content of the Report should therefore be agreed with the client at the start of the instruction and confirmed in writing in the terms of engagement.

4.2.3. Where the market for the PME being valued is affected by unusual uncertainty and this is relevant to the valuation, the valuer must proceed with caution, comment on the issue to the client and make appropriate statements in the Report.

4.2.4. Valuations are prepared with reference to a specific date of valuation. As such, the value may not be the same the day after that date. In certain circumstances, the valuer may wish to state a period after which the valuation should no longer be relied on. This may be particularly important in times when values are volatile. This may be specified by national legislation or by the requirements of the contract.

4.2.5. All Valuation Reports must include a statement that the Qualified Valuer responsible for the valuation to the client has conformed to the requirements of these European Plant, Machinery & Equipment Valuation Standards.

4.2.6. The Valuation Report shall cover the items, not necessarily presented in the same way or order:

(see Annex page 97)

5. Valuation Review

5.1. A valuation review is an assessment of another valuer's report, not a revaluation.

5.2. It takes the form of a Valuation Review Report

5.3. Sometimes the valuation review can be required as an attachment to the original Valuation Report.

5.4. The review objectives are to:

- Provide an assessment of the compliance of the valuation work under review with European Plant, Machinery & Equipment Valuation Standards;
- Examine the documents relied on and assess their proper and accurate use;
- Identify any mistakes and their impact on the conclusions.

5.5. Apart from the elements needed to achieve the review objectives, the Valuation Review Report shall state at least:

- The identity of the client and other intended users;
- The intended purpose of the review, and intended use of the review results;
- The professional independence requirements based on which the reviewing valuer shall express an unbiased opinion with no influence from any third party;
- Whether or not discussions with the original valuer have taken place;
- The assumptions and special assumptions in the valuation review.

5.6. The scope of the review work must be clearly stated, in a manner that must not be misleading to either the contracting parties or any third party having legitimate access to the contract that covers the scope of work.

5.7. The reviewing valuer must be:

- A qualified valuer;
- Independent from the valuer who originally performed the valuation;
- In possession of all the facts and information relevant to the PME on the date of valuation on which the first valuer relied. If the reviewing valuer does not have this information, or has it only partially, this must be clearly stated.

ANNEX
CONTENT OF THE VALUATION REPORT

A. BASIC ELEMENTS OF THE INSTRUCTION

A.1. The asset

1. **The asset** – Name or brief description of the asset.
2. Address where the asset is located (if applicable).
3. Identification on a map (if applicable, i.e. plant).

A.2. The client

4. Identification of instructing client (name, details).
5. How the client instructed the valuer and any modification since the date of instruction.
6. **Third party reliance** – Where it has been agreed that certain identified third parties will be able to rely on the Report, those third parties must be identified.
7. **Limitations on the Report/confidentiality clause** – The valuer must state any limitations on the use of the Report as well as any limitations relating to its publication.

A.3. The valuer

8. **Identification of the valuer** – When the valuation instruction is given to a company, the individual valuer conducting the report must be identified.
9. The qualifications of the valuer.
10. The status of the independent valuer (external or internal).
11. Confirmation that the valuer has the experience and market knowledge necessary to value the asset.

12. **Confirmation that there are no conflicts of interest** — Where conflicts exist, the Report must state that these were brought to the client's attention and both parties have accepted to undertake the valuation considering the conflicts non-critical for valuation objectivity.

13. **Use of specialist valuers or advisers** — Where the signing valuer has used the services of third-party specialists, they must be identified and the client's agreement to their use recorded.

A.4. The scope of work

14. The purpose of the valuation (loan and other banking use, sale/purchase, taxation, upgrading, financial reporting, etc.).

15. Basis of value instructed including full relevant EVS-PME definition (e.g. Market Value) and reference to the law or regulation that defines the basis of the valuation.

16. The legal interest in the property being valued (freehold/outright ownership, leasing or other, ownership percentage, etc.).

17. If a special assumption is being made, the valuer must clearly state in the conclusion of the Valuation Report alongside the opinion of value that the latter has been derived under that special assumption.

18. Investigations carried out.

A.5. The available information

19. **Information received and examined** — List of documents and other information originating from third parties and / or the customer e.g. various permits, asset registries, maintenance records etc., including origin of data and supporting evidence (attached as annexes).

20. Source of measurement data and measurement standards used.

21. Valuers must state any important assumptions made as regards documents or information not made available to them, or about information they were not able to verify.

22. Reliance on information obtained from the client and from third parties must be recorded.

A.6. The inspection

23. The scope of the inspection to be carried out. Purely visual with no coverage of hidden defects, unless otherwise instructed.

24. Date of inspection.

25. Confirmation that the inspection was made by the valuer or by a suitably qualified person under the valuer's responsibility. In all cases, responsibility for the inspection falls to the valuer.

26. The name and qualifications of the person who physically inspected the asset and the extent of the inspections carried out must be stated. If the inspection has been less complete than usually required for this type of valuation (ex. no verification of functional status), this must be stated.

B. DESCRIPTION

B.1. Microidentification

27. Description shall include (where applicable): manufacturer, model / type, serial number, year of construction, nominal output/capacity, power consumption, type of energy supply, environmental / safety regulations compliance, accessories or supplementary / auxiliary equipment included.

28. Details about the condition of the asset, including reference to its maintenance status, as depicted in maintenance registries, major upgrades applied, etc.

29. Details about the working environment and condition of the assets, affecting their overall status.

30. Valuer's opinion of the market characteristics that tend to influence asset value.

B.2. Macroidentification

31. Location analysis: description of production lines in the plant; description of the processes used (a flow chart is sometimes useful); reference to actual and nominal production capacity, working shifts, etc.

32. Description of permitting status of the plant and compliance with regulatory framework.

33. Comment on the physical characteristics as to quality, date of construction, technological status, overall maintenance status, etc.

34. Review of the condition of the production centre to which the asset belongs.

B.3. The legal situation

35. **Ownership** — Including comment on any covenants, third party rights over the asset, restrictions or obligations that could have an effect on value.

36. **Leases** — Information on the main lease terms, the amounts of current rents and any provisions for them to vary during the remaining life of the lease.

37. **Permitting issues** — Information about the current permits in place, expiry dates, renewal status, compliance issues, environmental issues, operational health and safety (OHS) issues.

38. Judgment of the impact of the legal situation on the value.

C. VALUATION

C.1. The methodology

39. **Methodology** — Description of valuation approaches that were considered; which approaches and which methods have been used.

40. **Key assumptions** — It is recommended that the choice of these key inputs be explained with reference to the comparables listed.

C.2. The selection criteria for relevant market data

41. The criteria chosen for selections of comparables (market(s) used, size, type, etc.) must be clearly stated and consistent with the asset's characteristics.

42. Information of transactions in respect of comparable assets (redacted as appropriate for confidentiality and privacy) and other market data (ex. asking prices) must be clearly set out together with the source of such information and the criteria chosen for selections of comparables.

C.3. The analysis of the market data

43. Description of each comparable (photographs may be included as annexes, chosen as appropriate in terms of confidentiality and privacy).

44. **Adjustments to the values of comparable assets with accompanying commentary** — The valuer must provide appropriate comment reflecting the logic and reasoning for the adjustments provided.

C.4. Valuation

45. Analytical calculation supporting the opinion of value.

D. CONCLUSION

46. The reported value must be clearly and unambiguously stated, together with confirmation that sufficient investigation has been undertaken to justify the opinion of value reported.

47. Final conclusion on value.

48. Date of valuation.

49. A clear statement as to whether transaction costs such as VAT, fees, etc. are or are not included in the reported value.

50. **Currency** — The reported value must clearly indicate the currency that has been used for the valuation. If the value is reported in a currency other than the currency of the country in which the asset is situated, the report must state the conversion rate used.

51. Statement of compliance with the General Data Protection Regulation (GDPR).

52. Statement of compliance with EVS-PME.

53. Basic disclaimer.

54. The Valuation Report must be signed and dated by the valuer.

55. Annex with copies of the documents used as supporting evidence (see 19) plus photographic documentation of the asset.

EVS-PME 5 Plant, Machinery & Equipment Valuation and Energy Efficiency

A legal obligation to comply with legislation requiring a higher level of energy efficiency / emissions reduction by a fixed date creates an unavoidable major cost that impacts many PME classes so that by that date the owner will have to either upgrade the PME or replace it.

Valuers must be aware of any such legal deadlines and when they appear, must estimate the cost of the upgrade or replacement needed to meet the required new level of energy efficiency / emissions reduction or future requirements that are sufficiently close to coming into force and consider the extent to which these costs affect the Market Value at the date of valuation.

1. Introduction
2. Scope
3. European Plant, Machinery & Equipment Valuation Standard 5 — PME Valuation and Energy Efficiency
4. Commentary

1. Introduction

1.1. Containing climate warming has become the top short, medium and long-term priority of the European Union. All relevant EU policy without exception — energy efficiency,renewables, environment, transport, internal market, competition, state aid, economic and monetary policy, economic governance, taxation, digitalisation, agriculture, fisheries, regional policy, research and innovation, accession negotiations, neighbourhood policy, foreign trade, foreign affairs, foreign development, Covid-19 recovery funding and the EU budget (the 2021-2027 Multiannual Financial Framework) — must be designed or redesigned to contribute to the reduction of carbon emissions and to carbon capture.

1.2. The European Climate Law sets new EU targets of at least 55% reduction in greenhouse gas (GHG) emissions by 2030 and net carbon neutrality by 2050 ('net' meaning reduction in carbon emissions combined with carbon capture).

1.3. Under the Proposal for a Directive amending Directive (EU) 2018/2001 (the Renewable Energy Directive):

"Member States shall ensure that industrial products that are labelled or claimed to be produced with renewable energy and renewable fuels of non-biological origin shall indicate the percentage of renewable energy used or renewable fuels of non-biological origin used in the raw material acquisition and pre-processing, manufacturing and distribution stage, calculated on the basis of the methodologies laid down in Recommendation 2013/179/EU or, alternatively, ISO 14067:2018.';" ***(Article 22a(2))***

This requirement will provide the valuer with a key to gauging the true degree of decarbonisation of the industrial process and hence the extent of any value premium.

1.4. The Emissions Trading System (ETS) puts a price on carbon and lowers the cap on emissions from certain economic sectors every year. It brought down emissions from power generation and energy-intensive industries by 48.2% between 2005 and 2021.

1.4.1. The latest version lowers the overall emission cap even further and increases its annual rate of reduction.

1.4.2. As the noose gets tighter, there will be an ever-greater value premium for plant, machinery and equipment that can function fuel-efficiently – and discounts for those that can't. The valuer will need to identify and compute these.

1.5. Proposed stronger CO_2 emissions standards for cars and vans will accelerate the transition to zero-emission mobility by requiring average emissions of new cars to come down by 55% from 2030 and 100% from 2035 compared to 2021 levels.

1.5.1. As a result, all new cars registered as of 2035 will be zero-emission.

1.5.2. The valuation of car plant and automotive accessories production processes will need to be completely reviewed and recalibrated in the light of these deadlines.

1.6. The proposed Sustainable Air Transport Regulation will oblige fuel suppliers to blend increasing levels of sustainable aviation fuels (SAF) in jet fuel taken on-board at EU airports, including synthetic low carbon fuels, known as e-fuels.

1.6.1. SAF volume share will rise from 2% in 2025 to 63% in 2050.

1.6.2. This will impact valuation reports both for aviation fuel manufacturing processes and for the manufacture of aircraft capable of assimilating such fuels.

1.7. The proposed Regulation on the use of renewable and low-carbon fuels in maritime transport will stimulate the uptake of sustainable maritime fuels and zero-emission technologies by setting a maximum limit on the greenhouse gas content of energy used by ships calling at European ports.

1.7.1. The greenhouse gas intensity limit of energy used on-board rises from -2% in 2025 to -75% in 2050.

1.7.2. There are additional zero-emission requirements for energy used at berth.

1.8. Valuers must make themselves aware of the final legislation and assess the impact on the PME's Market Value.

2. Scope

This Standard covers the obligations impacting Market Value stemming from EU law and national transposition aimed at meeting the European Green Deal / Fit for 55 targets.

3. European Plant, Machinery & Equipment Valuation Standard 5 — PME Valuation and Energy Efficiency

3.1. A legal obligation to comply with legislation requiring a higher level of energy efficiency / emissions reduction by a fixed date creates an unavoidable major cost that impacts many PME classes so that by that date the owner will have to either upgrade the PME or replace it.

3.2. Valuers must be aware of any such legal deadlines and when they appear, must estimate the cost of the upgrade or replacement needed to meet the required new level of energy efficiency / emissions reduction or future requirements that are sufficiently close to coming into force and consider the extent to which these costs affect the Market Value at the date of valuation.

4. Commentary

4.1. The sectors affected by the Green Deal package amount to such a vast portion of the industrial economy with so many interlinkages between different industries, that it is expected that the entire industrial landscape will be transformed.

4.2. Valuers dispose of all necessary tools (see EVS-PME 3) for assessing the impact of legal obligations on specific PME considering factors such as:

- PME lifecycle changes due to legislation
- Obsolescence caused by legislation
- Cost of using non-conforming PME
- Permitting restrictions
- Alternative uses in other jurisdictions outside EU
- Market trends for the specific PME class within the EU or in other jurisdictions

I.B. EUROPEAN PLANT, MACHINERY & EQUIPMENT VALUATION GUIDANCE NOTES

EVS-PME GN 1 Market Approach

EVS-PME GN 2 Cost Approach

EVS-PME GN 3 Income Approach

EVS-PME GN 4 Useful Life of Plant, Machinery & Equipment

EVS-PME GN 5 Functional Obsolescence in PME Valuation

EVS-PME GN 6 Distinguishing between Plant Building and Productive Machinery and Equipment

EVS-PME GN 7 Inventory Valuation

EVS-PME GN 8 Issues Regarding Insurable Value, Scrap Value and Salvage Value

EVS-PME GN 9 Recycling Renewables

EVS-PME GN 1 Market Approach

1. Introduction
2. Direct Match Method
3. Comparable Match Method
4. Other Methods

1. Introduction

The valuer uses the market approach to indicate value by analysing recent sales or asking prices of PME that are similar to the subject PME. If the comparables are not exactly like the PME being valued, their sales price or asking price is adjusted to the characteristics of the PME being valued.

2. Direct Match Method

This method is applied when the subject PME and comparable PME are identical and the typical elements of comparability include differences in condition, age and/or a measurable usage indicator (kms, working hours etc). Under this method, the PME manufacturer, model and type as well as the capacity, working space, weight and dimensions are assumed to be identical.

The method is applied in two steps:

1. Calculation of adjusted values of series of comparables

$$AVi = Pi \times AdjF(A)i \times AdjF(C)i \times AdjF(M)i$$

2. Calculation of the value of the subject PME either as:

Average of the adjusted values of comparables

$$V = \frac{AV_1 + AV_2 + AV_3 + ... + AV_n}{i}$$

or

Weighted average of the adjusted values of comparables

$$V = \frac{w_1 \times AV_1 + w_2 \times AV_2 + w_3 \times AV_3 + \ldots w_n \times AV_n}{w_1 + w_2 + w_3 + \ldots w_n}$$

Abbreviations

V = Value of the subject PME

AV = Adjusted Value per comparable

i = Number of comparables

P = Price – selling or asking price (with proper adjustments)

AdjF = Adjustment factor that expresses a factor of deviation related to a specific comparability element between the subject and the comparable PME

AdjF(A) is the appropriate factor for Age

AdjF(C) is the appropriate factor for Condition

AdjF(M) is the appropriate factor for a measurable usage indicator

w = weight factors

Commentary

- If no sales prices are available, then reliable and properly adjusted asking prices might be used instead.
- In the direct match method, the adjustment factors mostly refer to physical and functional depreciation differences and thus can be calculated following the relevant principles.
- The use of weighting factors is based on criteria related with the nature of the comparables. Higher weighting factors are given to more reliable comparables and vice versa.

3. Comparative Match Method

This method should only be applied if there are not enough data to support the direct match method. This method is applied by comparing similar (but not identical) PME where the comparables are adjusted to the characteristics of the subject PME using several elements of comparability (productivity, capacity, dimensions, weight, brand name, product range, etc.). Any element of comparability may be included as long as it has an impact on value and the information is clear, complete and reliable. Calculation of adjustment factors in this method requires deep knowledge and judgement, considering qualitative and quantitative factors, and its application may not be generically formulated.

4. Other Methods

The methods and formulae described in this guidance note are indicative and serve as generic guidelines for the market approach. Other methods that are approved and applied by local authorities, are acceptable.

EVS-PME GN 2 Cost Approach

1. Introduction
2. Straight Line Method
3. Exponential Method
4. Determine and Define Value
5. Other Methods

1. Introduction

1.1. The cost approach is based on the economic principle that a buyer will pay no more for PME than the cost to obtain PME of equal utility whether by purchase or by construction.

1.2. The cost approach is usually summarised as follows:

- Determine current cost new
- Determine the residual value
- Determine the useful and applied life
- Calculate value through straight line method or exponential method
- Determine and define value

2. Straight Line Method

Abbreviations

V = Value

CCN = Current Cost New

RV = Residual Value

UL = Useful Life

AL = Applied Life

FO = Functional obsolescence (if any additional)

EO = Economic obsolescence (if any)

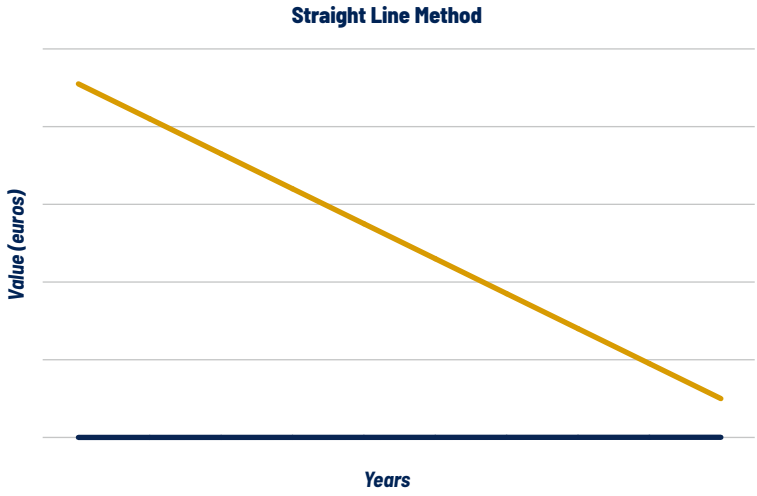
Straight Line Method

This method considers constant yearly depreciation until the PME reaches residual value at the end of its useful life.

$$V=\left[(CCN-RV)-AL\times\left(\frac{CCN-RV}{UL}\right)\right]\times FO\times EO+RV$$

Commentary

- Useful life and applied life may be expressed by number of units of the PME activity (kms, hours, pages printed, etc.) when appropriate according to the nature of the PME.
- Useful life and applied life must always be expressed in the same units.
- Applied life should always be less than the useful life. When applied life is equal to useful life, then the PME has only that residual value of the PME.
- When determining the useful life of PME, a part of functional obsolescence is always included. Additional functional obsolescence is only applied when factors outside the initial design specification of the PME affecting the subject are determined.



3. Exponential Method

Exponential Method

This method considers the decreasing yearly depreciation of the PME until it reaches the residual value at the end of useful life.

Abbreviations

V = Value

CCN = Current Cost New

RV = Residual Value

UL = Useful Life

AL = Applied Life

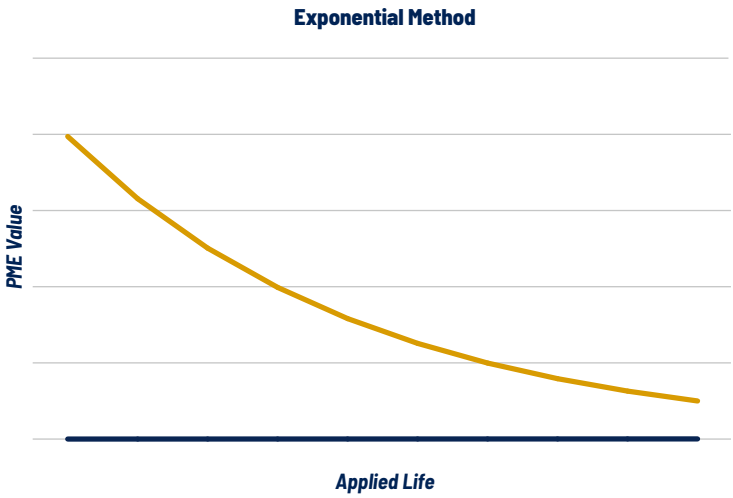
FO = Functional obsolescence (if any additional)

EO = Economic obsolescence (if any)

$$V = (CCN - RV) \times \left(1 - \frac{1}{UL}\right)^{AL} x\, FO \times EO + RV$$

Commentary

- Useful life and applied life may be replaced by number of units of the PME activity (kms, hours, pages printed, etc.) when appropriate according to the nature of the PME.
- Useful life and applied life must always be applied with the same units.
- When determining the useful life of PME, a part of functional obsolescence is always included. Additional functional obsolescence is only applied when factors outside the initial design specification of the PME affecting the subject are determined.



4. Determining and Defining Value

The value calculated must be reconciled with the requisite basis of value. In some cases, the value calculated as above will lead directly to Market Value while in other cases such as calculation of insurance value, liquidation value etc., some further adjustments may be required.

5. Other Methods

The methods and formulae described in this guidance note are indicative and serve as generic guidelines for the cost approach. Other methods that are approved and applied by local authorities are acceptable.

EVS-PME GN 3 Income Approach

1. Introduction
2. Direct Capitalisation Method
3. Discount Cash Flow (DCF) Method

1. Introduction

1.1. In general terms, the income approach is a form of investment analysis. It is based on an asset's capacity to generate net benefits over time (i.e. usually monetary benefits) and the conversion of these benefits into a present value.

1.2. The income approach assumes the PME value estimate by converting the income generated by the asset into a value if:

1. the PME units under valuation are available for rental;
2. the PME units either individually or in combination are used for production of a sellable product or service and are thus generating an identifiable income flow.

2. Direct Capitalisation Method

2.1. Direct capitalisation involves perpetual capitalisation of the first year's income from the subject PME. This method does not reflect any potential future variation in income unless an adjustment is made to the discount rate to reflect this.

2.2. Direct capitalisation method applied to real estate or business usually values an asset as perpetuity i.e. an infinite stream of cash flow. The general formula for the direct capitalisation method is:

$$NPV = \frac{NOI}{R_o}$$

Where:

NPV – Net Present Value

R_o – overall capitalisation rate

NOI – net operating income

2.3. Since the future income-generating capacity of PME is typically short-lived compared to real estate or business, the capitalisation rate applied shall contain provisions both for return on the investment (discount rate) and capital recovery (return

of the investment over the useful life). Thus, the capitalisation rate for PME is derived as follows:

$$R_o = \frac{i}{(1-(1+i)^{-(RUL)})}$$

Where:

R_o – overall capitalisation rate

i – discount rate

RUL – remaining useful life

2.4. The discount rate can be calculated using:

- Capital asset pricing model
- Weighted average cost of capital
- Rates/yields observed in the market
- Build-up method

2.5. When estimating an investment value for a particular investor, individual rates reflecting the needs of the specific investor are used.

2.5.1. Consequently:

$$NPV = \frac{NOI}{\frac{i}{(1-(1+i)^{-RUL})}}$$

Where:

NPV – Net Present Value of PME

NOI – net operating income

i – discount rate

RUL – remaining useful life (years)

2.6. If at the end of useful life PME appears to have a terminal value in the form of net scrap or salvage value, this terminal value shall be added to the result obtained by the above formula:

$$NPV = \frac{NOI}{\frac{i}{(1-(1+i)^{-RUL})}} + \frac{TV}{(1+i)^{RUL}}$$

Where:

NPV – Net Present Value of PME

NOI – net operating income

i – discount rate

RUL – remaining useful life, years

TV – terminal value at the end of useful life

3. Discounted Cash Flow (DCF) Method

3.1. This method measures the direct economic benefits derived from ownership, in the form of future cash inflows and outflows attributed to the asset, stated at their present value.

3.2. General DCF formula:

$$NPV = \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \ldots + \frac{CF_n}{(1+i)^n} = \sum_{n=1}^{t} \frac{CF_n}{(1+i)^n}$$

Where

NPV – Net Present Value of the future cash flows

CF – cash flow in the period

i = discount rate

n = time periods, 1 to infinity

3.3. Since often the explicit cash flow forecast period is shorter than entire PME useful life, and the PME is expected to continue beyond the explicit forecast period, valuers must estimate the terminal value at the end of that period. The terminal value is then discounted back to the valuation date, usually using the same discount rate as applied to the exit forecast cash flow.

3.4. Thus, the DCF formula applied for PME valuation is the following:

$$NPV = \sum_{n=1}^{t} \frac{CF_n}{(1+i)^n} + \frac{TV_t}{(1+i)^t}$$

Where:

NPV – Net Present Value of the future cash flows

CF – cash flow in the period

i - discount rate

n - time periods, 1 to terminal year t

TVt– terminal value at the end of explicit forecast period

3.5. For valuations of PME, the most commonly used methods for calculating a terminal value are:

- Market approach/exit value
- Direct capitalisation
- Cost approach
- Net scrap or salvage value

EVS-PME GN 4 Useful Life of Plant, Machinery & Equipment

1. Commentary
2. PME Life Cycle Analysis (LCA)
3. PME Replacement Analysis

1. Commentary

1.1. Useful life is usually measured in years, months, days or even hours depending on the type of PME.

1.2. Some PME assets have a specific useful life that results from actual operating time or some form of operational impact and not idle time. In that case the useful life of the asset is mainly based on use, not the passage of time. Measurable operational effects may include distance travelled, pages printed, operational hours, etc.

1.3. Under any valuation approach, a valuer must decide what the likely remaining useful life is, having taken into account the three types of likely depreciation.

1.4. It is the remaining useful life at the date of valuation that is relevant. Further planned refurbishments should not be taken into account at the date of valuation.

1.5. There may be guidance on the useful life of certain PME assets or constituent parts obtainable from industry specialists. These data sources should be explained and detailed in the Valuation Report.

1.6. When considering a component approach to useful life, care should be exercised with any averaging procedure as, if a component is scheduled to fail after a given useful life, giving the component an apparently longer useful life by averaging with other components of a longer useful life might be inappropriate. It may be that some adjustment is required, but any fundamental component part of a structure which affects economic viability usually needs to be considered in the light of the component with the shortest predicted useful life.

1.7. Lifetime guidance for accounting purposes tends to adopt a fixed approach that does not apply to most PME assets. Each asset might have unique specifications for its expected useful life specified by the manufacturer.

1.8. Factors that are considered in determining the useful life of a PME asset:

- ***Expected use of the asset*** - The use is evaluated by reference to the expected production capacity of the asset Ex: Usage regimes (kilometre hours / machine average load, etc);

- ***Expected normal wear*** - Depending on operational factors such as the number of shifts during which the asset will be used, the repair and maintenance programme and the care and maintenance of the asset while idle. Example: Wear in relation to the expected use;
- ***Functional and/or economic obsolescence*** - Resulting from changes or improvements in production, or from a change in market demand for the service or product derived from the asset. Example: computer or operating system.
- ***Legal or similar limits on the use of the asset*** – For example, equipment that depends on regular inspections.

1.9. Reference framework of useful life

1.9.1. When collating the PME documentation, the valuer should try to obtain the useful life established by the manufacturer. When this is not available, it can be estimated, but valuers must justify their choice.

1.9.2. Useful life can be shortened or extended according to the type of use and maintenance regime.

1.9.3. Reference values must be confirmed by the technical documentation if the valuer has access to it.

1.9.4. A non-exhaustive table of broadly estimated useful lives for equipment families that may vary in accordance with design specifications is presented in annex to this guidance note.

2. PME Life Cycle Analysis (LCA)

2.1. Every PME asset goes through very distinctive life cycle phases affecting its value (monetary or in use) from its design to the end of its life.

2.2. The process of assessing and documenting PME impact – on users, the environment, the economy etc. – is usually known as Life Cycle Analysis (LCA).

2.3. LCA is a complex process involving the examination of PME's impact on, inter alia:

- Environment
- Energy efficiency

- Natural resources
- Planning and zoning
- Health & safety
- Location-specific regulatory compliance
- Economic performance of the user

2.4. The usual life cycle of PME includes three phases:

1. Investment phase (material extraction, design & manufacturing, transport & installation)
2. Operation & maintenance (usually its useful life)
3. Decommissioning (end-of-life disposal)

2.5. The valuer must be familiar with LCA in order to be able to assess either the replacement cost or the end-of-life value of a PME asset or even the replacement timing for the PME under examination.

3. PME Replacement Analysis

3.1. The determination of the time that is justified to replace a PME asset is a process involving the assessment of when it is no longer economically feasible to operate and maintain /repair. Costs associated with owning and operating the PME include: depreciation, inflation, investment, maintenance, repair, downtime and functional and economic obsolescence.

3.2. Replacement Analysis Methods in use:

1. Intuitive Method

This method depends largely on professional judgment. It is often used when PME is replaced because it is time for a major overhaul or at the beginning of a new equipment-intensive task. Availability of funds, production schedule, availability of replacements and maintenance issues are decisive factors.

2. Minimum Cost Method

This method focuses on minimising PME cost regarding operating and maintenance costs and depreciation. The replacement decision is taken when the

estimated yearly cost of the current PME exceeds the minimum average annual cumulative cost of the replacement.

It is based on comparing alternative solutions, more than the intuitive method's professional judgement.

3. Maximum Profit Method

This method is based on maximising PME profit. The economic life of PME is defined by the year in which the average annual cumulative profit is maximised. The replacement takes place when the next year's estimated annual profit generated by the use of the PME falls below the average annual cumulative profit that would be generated by the proposed replacement.

It works well if the profits associated with a given PME asset can be isolated and clearly defined. If this is not possible, the minimum cost method can be used as an alternative.

4. Payback Period Method

The payback period is the time required for the return of the original investment for the acquisition of a PME asset, by generated profit. This method provides a time-based comparison tool, i.e., comparing how long it takes to recover the investment in each possible replacement PME asset. The capital recovery is calculated using the net savings – after tax, disregarding financing costs. It is often used when it is hard to forecast PME-generated cash flow due to market instability, inherent uncertainty and technological change as it is limited to the payback period.

ANNEX

NON-EXHAUSTIVE TABLE OF BROADLY ESTIMATED USEFUL LIVES FOR EQUIPMENT FAMILIES THAT MAY VARY IN ACCORDANCE WITH DESIGN SPECIFICATIONS

Useful life age group	Description
Very Long (25 or more years)	Components that are very resistant to the effects of the passage of time and use. Their technology is well established without any expected progress in the next decades. If well maintained, their useful life can go on for over 25 years and in some cases over 40.
Long (20 - 25 years)	Components that are resistant to the effects of the passage of time and use. Their technology is established and slow technological progress is usually expected within the next decades. If well maintained and updated as required, their useful life is usually 20 to 25 years. At that point it is usually considered best to replace them.
Medium (15 - 20 years)	Components that are resistant to the effects of the passage of time and use but also include automations and/or some sensitive mechanics that physically deteriorate more quickly. Their technology is subject to slow but stable technological progress during their lifetime. If they are well maintained and have any available automations replaced or updated as required, their useful life is usually 15 to 20 years. At that point it is usually considered best to replace them.
Short (10 - 15 years)	Mainly components that are vulnerable to the effects of the passage of time, including automations and/or some sensitive mechanics such as electronics that physically deteriorate quickly. Their technology is subject to change since technological progress is certain during their lifetime. If well maintained, with any available automations replaced or updated as required, their useful life is usually 10 to 15 years. At that point it is usually required to replace them.

Useful life age group	Description
Very Short (5 - 10 years)	PME of this age group consist mainly of automations and/or sensitive mechanics such as electronics that physically deteriorate quickly. Their technology is subject to dynamic change since technological progress is certain and frequent during their lifetime. If well maintained, and with any available automations replaced or updated as required, their useful life is usually 5 to 10 years. At that point it is usually required to replace them.
Minimal (1 - 5 years)	Consist exclusively of automations and/or sensitive mechanics such as electronics and IT equipment that physically deteriorate quickly. Their technology is subject to radical change since technological progress is certain and quick during their lifetime. Sometimes these PME are made obsolete during the year of their release. They are only subject to basic maintenance, as they are directly replaced as a whole before any form of extended maintenance, repair or major update would be required. Their useful life is usually 1 to 5 years and they are always considered obsolete at that point.

EVS-PME GN 5 Functional Obsolescence in Plant, Machinery & Equipment Valuation

1. Introduction
2. Types of Functional Obsolescence
3. The Extent of the Functional Obsolescence of PME
4. The Main Elements of the Functional Obsolescence of PME

1. Introduction

When valuers use the cost approach in valuation of plant, machinery and equipment, they need to analyse physical deterioration and external obsolescence and determine whether there is functional obsolescence. If so, the valuer must determine such value and apply it in the valuation process. This guidance note gives an overview of the main factors determining the functional obsolescence of PME, and of the approaches based on which the extent of this obsolescence can be determined.

2. Types of Functional Obsolescence

Functional obsolescence is a term used to describe obsolescence originating from any kind of functional deficiency of the PME. Functional deficiency may be a consequence of the adopted design of the PME, applied materials and manufacturing process, applied technology, equipment performance (capacity, speed, weight, etc.), lack or excess of operational functions, damage caused by use or breakdown, etc.

Functional obsolescence is divided into two basic categories:

- Operational obsolescence is a loss in value resulting from differences in utility/operability between market equivalent or standard in a certain area of PME, and the subject PME.
- Technological obsolescence is a loss in value between new and subject PME resulting from material, design and technological differences.

Functional obsolescence represents a form of PME depreciation that is manifest, not visibly, as in physical deterioration, but rather in the efficiency of the PME in relatively invisible ways. Functional obsolescence is manifested in different ways, among which the following two are of key importance:

A. ***The increased or relatively higher costs*** that occur during PME operation in comparison to present-day PME
B. ***Excessive capital cost*** that results from a difference between the reproduction costs of the analysed PME and the costs of replacing the present-day PME with PME of equal utility

The basis for functional obsolescence is that the "correct amount" is better than "not enough" or "too much". In accordance with capability, utility and quality of PME, there are two types of functional obsolescence:

- ***Inadequacies*** (or deficiency, imperfection, shortage, defect, etc.) are basically the lack of capabilities, utilities or quality that other PME on the market have.
- ***Superadequacies*** are capabilities, utilities or quality, that exceed what is typical for the PME in the market, and do not contribute to the Market Value by an amount equal to their cost.

For both types of functional obsolescence, hypothetical solutions can be:

- ***Curable (or reparability)*** – The functional obsolescence can be fixed or repaired in an economically viable way. The investment for 'cure' is lower than the benefit from the increase in Market Value.
- ***Incurable (or irreparability)*** – The functional obsolescence cannot be corrected at all or cannot be corrected in an economically viable way.

It is important for the valuer to know whether the functional obsolescence is curable or incurable. If it is curable, rational investors will make the investment, because eliminating the observed deficiencies gives them an economic or other benefit. Conversely, incurable functional obsolescence requires analysis not only of the value of functional obsolescence, but also of possible consequential limitations on further use of such PME which, if confirmed, may give a scrap or salvage value, rather than Market Value.

3. The Extent of the Functional Obsolescence of PME

The obsolescence adopted by the valuer needs to reflect the cost of bringing the original PME into line with a modern equivalent of equal utility or, if not possible, reflect the consequence of a continued operation at lower efficiency.

Functional obsolescence can only be identified after it has already occurred. The longer the estimated duration of functional obsolescence, the greater the feasibility of a cure or, in other words, the longer the functional obsolescence exists, the smaller the effects of its cure.

The analysis of functional obsolescence is based on economic principles, viewed from the point of a rational investor. If the PME can repair or improve in an economically viable manner, then the amount of such investment represents the functional obsolescence. Otherwise, if it is not possible to make repairs, improvements, or corrections to the elements causing functional obsolescence, or it is not possible to do so in an economically viable manner, then the cost or loss incurred due to

perceived deficiencies is the amount of functional obsolescence. The stated cost or loss lasts for a period equal to the remaining economic or useful life of the PME.

Identification and calculation of functional obsolescence encompass several steps:

1. Determining the comparative elements of the subject PME. The comparative elements are the main technical and economic factors for a particular type of PME. It is necessary to determine the technological processes for which the PME is intended, the main technical characteristics and modes of operation, applied design of PME, etc.
2. Determining the market equivalent of the subject PME, i.e., determining the values (or range of values) of previously defined comparative elements. Identification includes analysis of internal and external factors:
   - **A.** Internal factors refer to the subject PME, but in the condition when new.
   - **B.** External factors refer to the same (successor model) or similar type of equipment (equipment of the same utility, but from other manufacturers) which at the time of valuation is the standard on the market.
3. By comparing the market equivalent and the subject of valuation, the existence of the functional obsolescence is determined:
   - **A.** Does the latest model of the subject PME or defined market equivalent constitute an improvement in the design, manufacturing, performance etc.?
   - **B.** Is there any significant deviation between the subject PME and the market equivalent, in terms of operational, labour, maintenance costs or other defined comparative elements?
   - **C.** Are there any defects or damage to the subject PME limiting its functionality in accordance with the main design characteristics?
   - **D.** Does the equipment associated with the subject plant or machinery, necessary for its operation, limit its functionality and performance characteristics?
   - **E.** Are there any external physical or technological limitations that may affect the subject PME, causing it to work with limited capabilities?

4. If it is determined that there is functional obsolescence, it is necessary to calculate its value. The value will depend on whether the functional obsolescence is curable or incurable, or a mixture, the main question being, can the subject PME be corrected, repaired or improved, that is, hypothetically, can it be brought to the level of the market equivalent?

   A. The extent of curable functional obsolescence represents the amount of investment (total cost) for cure of PME. This is determined by:

      - Defining the scope and type of hypothetical work (correction, reparation, maintenance, improvement, etc.) required to cure;
      - Calculating the total cost of realisation of the previously defined works;
      - Confirming whether functional obsolescence is curable or not. In this case, the valuer compares the calculated total cost and Market Value of the subject PME in the state after cure.

   B. The extent of incurable functional obsolescence represents the loss incurred due to perceived deficiencies, calculating:

      - ***The time during which the functional obsolescence occurs.*** This time represents a future use of the subject PME, requiring adoption of remaining useful life or remaining economic life.
      - ***The costs incurred as a result of incurable functional obsolescence.*** These costs can be constant or variable in the future, and depend on the type of functional obsolescence, the time of future use of the PME, the volume of production, operational, labour and maintenance costs, etc.
      - ***The extent of the functional obsolescence.*** This is calculated under the income approach, by using previously adopted remaining time of use and calculated costs.

4. The Main Elements of the Functional Obsolescence of PME

There are four main categories:

A. Design and manufacturing of PME

- Performance characteristics (capacity, speeds, strokes, etc.)
- Weight and overall dimensions
- The quality of the built-in material
- Space and surface on the layout
- Number of technological operations
- Necessary accompanying equipment and device

B. Use and operation costs of PME

- Utilisation of raw materials
- Operating supplies and chemicals
- Energy and utility consumption (current, water, compressed air, etc.)
- The amount of waste generated
- Generation of manufacturing scrap
- Quantity and type of waste and wastewater
- Environmental impact

C. Labour costs and PME

- Required number of workers
- Required labour qualifications and skills
- Work with hazardous substances
- Required health and safety procedures
- Work complexity

D. Maintenance costs of PME

- Frequency of necessary maintenance
- Complexity of maintenance
- Consumption of maintenance materials
- Duration of individual service
- Maintenance workforce qualifications

Example of identification of curable and incurable functional obsolescence

Subject of valuation: *"The line for the production of plastic parts has a nominal capacity of 100 pcs./h. However, due to damage to the compressor, which operates at reduced capacity, the line achieves a capacity of 80 pcs./h. The price of the new compressor is 3.000 €. The share of compressor value in the value of the subject production line is about 4%. No damage or other irregularities were noticed on the subject line. The modern line of the same manufacturer, in its standard offer has a capacity of 100 pcs./h, with similar technical characteristics, but requires 2 workers less for operation. The useful life of the subject line is 18 years, and it can be concluded that the remaining useful life is 8 years. There is sufficient demand in the market for the subject plastic parts, so the subject line can operate at full capacity"*.

Table 1. Example of identification of curable and incurable functional obsolescence

Facts	Valuer conclusion	Functional obsolescence	The extent of functional obsolescence
"The line for the production of plastic parts has a nominal capacity of 100 pcs./h. However, due to damage to the compressor, which operates at reduced capacity, the line achieves a capacity of 80 pcs./h. *The price of the new compressor is 3.000 €. The share of compressor value in the value of the subject production line is about 4%."*	Since the compressor represents only a part of the value of the line (4%), all necessary conditions are met for the hypothetical replacement of the compressor so that the production line could be operational at full capacity.	Curable	The extent of the functional obsolescence is equal to the purchase cost of the compressor (3.000 €), plus cost of transportation, assembly and commissioning.
"Modern line of the same manufacturer, in its standard offer has a capacity of 100 pcs./h, with similar technical characteristics, but requires 2 workers less for operation. *The useful life of the subject line is 18 years, and it can be concluded that the remaining useful life is 8 years."*	Since the new production line works need 2 workers less, the existence of functional obsolescence can be observed. The observed functional impairment cannot be corrected by additional investment, and because of that it will remain during the further operation of the subject line.	Incurable	The extent of the functional obsolescence is equal to the amount derived from the income calculation. The income calculation is obtained from the cost of the additional 2 workers and the remaining useful life of 8 years.

Facts	Valuer conclusion	Functional obsolescence	The extent of functional obsolescence
"No damage or other irregularities were noticed on the subject line."	There is no additional functional obsolescence due to equipment damage.	None	0%

After the individual elements of the functional obsolescence have been identified, they should be expressed in one value and as a percentage, in order to be applied in the value analysis using a cost approach.

EVS-PME GN 6 Distinguishing between Plant Building and Productive Machinery and Equipment

1. Introduction
2. Definitions
3. Fixed Versus Non-fixed Assets
4. Commentary

1. Introduction

1.1. The valuation of PME is a complex process as it covers a wide spectrum of industries, each having PME with its own inherent characteristics.

1.2. Amongst the valuation issues to be considered is the specific utility of the asset, its contribution to the production of goods and / or services for which it was designed and deployed and its potential to contribute to the profitability of the business, after considering the market situation and/or level of maintenance.

2. Definitions

2.1. **Plant** is a combination of buildings or structures together with the relevant infrastructure and **machinery** and **equipment** all together serving a specific production plan.

2.2. **Machinery** is a group of machines or the parts of a machine that make it work. A machine is an apparatus made up of an identified number of parts that harmoniously operate together to perform the task for which it was designed. The machine uses a primary (solar, wind, geothermal, etc.) or secondary (e.g. electricity, heat) source of defined energy.

2.3. **Equipment** is a tool or set of tools for performing a particular task.

3. Fixed Versus Non-fixed Assets

3.1. Sometimes the purpose of the valuation obliges the valuer to distinguish between machinery and equipment that are permanently installed in the building (fixed) and machinery and equipment that can be removed without structural damage to the building or without disrupting the production process.

3.2. Machinery and equipment feature specific traits that differentiate them from the real property and can affect both the valuation approaches and the value reporting, the most important being mobility. Machinery and equipment can be movable or 'fixed'.

3.3. Machinery and equipment are characterised as "fixed" in the following cases:

1. A machine, group of machines or production line attached by any means to structural elements of the building such as floors, walls, ceilings, etc., regardless of the construction materials (concrete, metal frames, brickwork, etc.) in a stable and permanent way (e.g. foundation, fitting points integrated in the structural elements, welding, etc.).
2. A group of machines or production line not attached to the building, but interconnected and in a single production operation.

3.4. Machinery and equipment which do not meet the above criteria are characterised as non-fixed.

3.5. Non-exhaustive list of machinery and equipment characterised as non-fixed:

- Machine tools of various types
- Equipment for electrical industry
- Equipment for carpentry, metalwork and mechanical workshops
- Equipment for the metallurgical industry
- Equipment for the foundry industry
- Equipment for the chemical industry
- Sound reproduction equipment
- Laboratory equipment, instruments and precision devices
- Hospital equipment
- Printing equipment
- Thermal and electric motors
- Compressors
- Scales
- Computers
- Refrigeration plants
- HVAC plants
- Equipment for the textile industry
- HORECA equipment
- Laundry equipment and dyeing equipment
- Agricultural machinery, implements and vehicles
- Construction machinery, implements and vehicles
- Vessels of all types

- Mining equipment
- Railway vehicles
- Ground transportation vehicles of all types
- Aircraft and helicopters
- Military vehicles
- Fire fighting equipment

4. Commentary

4.1. It is up to the valuer to identify the extent to which the respective machinery and equipment are attached to other assets (e.g. incorporated into buildings or structures and which cannot be moved without substantially affecting the respective building, structure or plant) or embedded into them (e.g. the machinery and equipment may be part of an integrated production line). In such cases it will be necessary to clearly define what is to be included in, or excluded from, the valuation.

4.2. The machinery and equipment that serve the building's operation and are not related to a specific production process housed in the building are usually valued with the building (e.g. electrical and mechanical installations, lifts, cranes, etc.).

4.3. The machinery and equipment that are closely related with the specific activity housed in the building are valued separately, as they are related with the activity (production PME).

4.4. If the PME are fixed or integrated with other assets, then any assumptions or special assumptions regarding the availability of any required complementary assets must be stated.

4.5. The assumptions and special assumptions describing the conditions and circumstances in which the PME are marketed shall be specified, e.g.:

- PME are valued as a whole, as they are installed in situ and are part of the business considered as a going concern.
- PME are valued as a whole, as they are installed in situ, but based on the assumption that the business is closed.
- PME are valued as individual items that will be removed from their current location (dismantled / ex situ).

4.6. As in general non-fixed machinery and equipment may be purchased on the open market, they should be valued as separate items on the ex situ assumption, unless the valuer is instructed otherwise by the client.

EVS-PME GN 7 Inventory Valuation

1. Introduction
2. Scope
3. Inventory Valuation Process

1. Introduction

Inventories usually include movable assets that may be valued by applying approaches and techniques of PME valuation. Thus, this guidance note builds on the definitions and commentary on the Valuation Approaches and Methods in EVS-PME 3 and EVS-PME GN 1-3.

2. Scope

2.1. EU Accounting Rule 9 defines Inventories as assets:

A. In the form of materials or supplies to be consumed in the production process

B. In the form of materials or supplies to be consumed or distributed in the rendering of services

C. Held for sale or distribution in the ordinary course of operations or

D. In the process of production for sale or distribution

2.2. EVS-PME considers as inventory the commodities, raw materials, merchandise and goods that are not PME. Examples include:

- Materials that may be used in production processing
- Stored energy resources
- Products that are stored for future sales due to current low demand
- Spare parts for plant and equipment

2.3. The valuation of inventory for financial reporting is regulated by the International Financial Reporting Standards. Therefore, this guidance note concentrates on valuations that require Market Value as the basis of value. Valuation purposes may include, inter alia:

- Sale or purchase of the inventory
- Leasing of the inventory
- Inventory acting as collateral for financing purposes

2.4. Inventory valuations of going concern companies must be based on a recent inventory list prepared and certified by the company and referred to in the terms of engagement.

3. Inventory Valuation Process

3.1. Inventories usually consist of sets of large quantities of homogeneous assets, or assets that can be grouped according to their similarities, thus it is reasonable to apply a portfolio valuation approach. For valuation purposes, a portfolio is defined as a collection of assets owned by a person or entity and which are to be valued as a whole.

3.2. The valuation of a number of assets as a portfolio is undertaken in the same way as the valuation of an individual asset with instruction and engagement, inspection, research, analysis, forming an opinion as to value, and reporting.

3.3. Though the full scale of the portfolio has to be defined and recorded, of practical necessity, the closer inspection may only cover a fraction or representative samples of inventories. That requires care in selecting the sample involved so that it is representative of the portfolio as whole, as well as care in the professional use of any statistical techniques employed in this task.

3.4. The key task for the valuer during inspection is to distinguish the inventories to be treated as marketable goods possessing Market Value from those which are outdated or expired and no longer have a useful life. Though applying Scrap Value or Salvage Value to the latter may be appropriate, in some cases they have no value or negative value.

3.5. Those inventories that are interchangeable with other goods of the same type, such as raw materials used as inputs in the production of other goods or services, are usually valued using the market approach.

3.6. Some types of inventories such as unfinished goods, can be valued according to the income approach, based on the actual or expected selling prices of finished goods, and the direct and indirect expenses that would be expected to be incurred in the completion of production and selling of the finished goods. Consideration should also be given to the degree of risk due to the time required to complete and sell the readymade products.

3.7. Inventories may include furniture, electronic equipment and any other general household items. They are generally reported at their Market Value. Market Value of used household items is usually much lower than the price when new, and for this reason, the valuation should be based on the market approach and on a direct

match of the subject item to identical or highly comparable items sold or exposed in the second-hand market. Valuations of household items must be based on the inventory list certified by the client, supported with photographs, proof of purchase or other ownership evidence, if available.

EVS-PME GN 8 Issues Regarding Insurable Value, Scrap Value and Salvage Value

1. Introduction
2. Insurable Value
3. Scrap Value and Salvage Value

1. Introduction

1.1. Valuation of PME covers a broad variety of assets, from stand-alone machines to complete production lines or factories.

1.2. Further to this comes the purpose of valuation that dictates the proper basis of value of the asset being valued, as Market Value is not always the appropriate basis of value, hence the importance of other values such as insurable value, scrap value and liquidation value, that valuers must use in their work as per client instructions.

1.3. This Guidance Note builds on the definitions and commentary on insurable value and scrap value in EVS-PME 1.

2. Insurable Value

2.1. The insurable value is calculated by the valuer after inspecting the insured PME, collection of its data / specifications and contact with suppliers in order to obtain the current cost of new PME of the same specifications at the time of valuation. Any further deductions can be made based on the insurance policy adopted by the customer.

2.2. The usual insurance policies encountered in PME are:

- ***New for old***: the cost of replacing the damaged asset with a new one of equal quality.
- ***Old for old***: the cost of replacing the damaged asset with a new one minus accrued depreciation or with a used one of equal quality at the same (depreciated) cost level.

2.3. The insurance premium for 'new for old' insurance policies is generally higher than for 'old for old' ones, but with 'new for old', the insured party obtains a higher cover of the costs of repairing the damage.

2.4. The insurable value in 'old for old' insurance policies depreciates over time, creating a need for periodic adjustment in order to adjust the insurance premium accordingly.

2.5. Insurance companies usually cover PME for the following risks:

- Fire
- Explosion
- Storm
- Lightning
- Flooding
- Earthquake
- Industrial accidents
- Transportation accidents
- Malicious damage
- Theft
- Riot
- Terrorist acts

2.6. Often reference is made to the **Total Insurable Value (TIV)** which can be defined as the value of insurance covering the full replacement cost of the covered PME as well as the business' income loss in the event that the insured risk materialises.

2.6.1. Total insurable value is calculated by adding the value of property, equipment, inventory, tools, etc. at each location and combining it with income on a (usually) yearly basis to use it for assessing the loss during the time needed to resume operations after a loss.

2.6.2. The assessment of TIV usually requires the collaboration of several experts.

2.7. When the sum insured is less than the insurable value, the insurer merely compensates the part of the loss that corresponds to the proportion that the sum insured has to the insurable value. This is an under-insurance condition.

2.8. When the sum insured is more than the insurable value, there is an over-insurance condition which may tempt the insured party to make a false claim in order to profit from a loss. In such cases the insurer may seek to avoid paying the compensation.

3. Scrap Value and Salvage Value

3.1. **Scrap value** is the value of an asset when it is no longer usable and is disposed of for the materials it contains. Its assessment requires knowledge of both domestic and international scrap markets, and of the way the Market Value of scrap materials is expressed for the subject PME (for example, price per weight or price per unit).

3.2. In assessing the scrap value, it is also necessary to establish the cost of dismantling, cutting and transporting the material to the final disposition location. In many cases the cost of depolluting the equipment, before it is processed for final disposition as scrap material, may have to be factored in.

3.3. The valuer must therefore be familiar with the relevant legal framework of the jurisdictions of both the origin and the processing of the scrap material.

3.4. The EU legal framework and policies on sustainability, recycling of materials and disposition of various products at the end of their useful life set the basis for the development of an EU scrap materials market also affecting the international scrap markets (see also Part IV).

3.5. Scrap value is often combined with salvage value for calculating end-of-life value of PME.

3.6. **Salvage value** is the value of an asset or of its constituent parts, when it is disposed of as a whole or as separate components for an alternative (sometimes inferior) use or for spare parts.

3.7. In several cases, the terminal value of an asset is the sum of scrap value for some of its parts and the salvage value of the rest. In such cases the salvage value may represent a positive income for the owner while the scrap value may represent a negative income as scraping of the material may be done at a cost.

3.8. Under the income method, the assessment of scrap and/or salvage value is sometimes an indispensable part of the process in order to bring it to present value in the cash flow model as the last income of the period under examination.

EVS-PME GN 9 Recycling Renewables

1. Introduction
2. EU Regulatory Framework
3. Current Technological Status
4. Future Challenges and Prospects
5. Conclusions

1. Introduction

1.1. This GN serves to raise awareness of the recycling of renewable energy PME. The issue is still largely unresolved and will affect the life cycle of a wide variety of PME and their associated value.

1.2. The European Green Deal package sets ambitious goals that are expected to drive the EU economy, but also the world, to an increasing pace of production of renewable energy consuming equipment to satisfy their transportation, heating / cooling and productive needs.

1.3. Renewable energy production itself imposes the manufacturing of large quantities of Photovoltaic (PV) panels, wind turbines and batteries for energy storage.

1.4. All this equipment, although cleaner than fossil fuel predecessors, raises a problem for the near future, when much of it will reach the end of its life cycle.

2. EU Regulatory Framework

2.1. **The Waste Framework Directive** provides a waste hierarchy:

- **A.** Prevention
- **B.** Preparing for re-use
- **C.** Recycling
- **D.** Other recovery, e.g. energy recovery; and
- **E.** Disposal

2.1.1. It also obliges member states to ensure that waste undergoes preparation for re-use, recycling or other recovery operations and to promote preparation for re-use activities and begin the process leading to minimum standards for sorting and recycling that require a permit.

2.2. **The Waste Electrical and Electronic Equipment (WEEE) Directive** provides for re-use, recovery and recycling of this waste stream and begins the process leading to the development of state-of-the-art standards.

2.3. The European Commission's imminent **Circular Electronics Initiative** is to include:

- Regulatory measures for electronics and information and communications technology (ICT) including mobile phones, tablets and laptops under the Ecodesign Directive so that devices are designed for energy efficiency and durability, repairability, upgradability, maintenance, reuse and recycling;
- Focus on electronics and ICT as a priority sector for implementing the ***'right to repair'***, including a ***right to update obsolete software***;
- Regulatory measures on chargers for mobile phones and similar devices, including the introduction of a common charger, improving the durability of charging cables, and incentives to decouple the purchase of chargers from the purchase of new devices;
- Improving the collection and treatment of waste electrical and electronic equipment including by exploring options for an ***EU-wide take back scheme*** to return or sell back old mobile phones, tablets and chargers;
- Review of EU rules on restrictions of hazardous substances in electrical and electronic equipment and provison of guidance to improve coherence with relevant legislation, including REACH and Ecodesign.

2.4. On 10 December 2020 the European Commission proposed a **new regulatory framework for batteries**:

- Rules on recycled content and measures to improve the collection and recycling rates of all batteries and ensure the recovery of valuable materials;
- Addressing ***non-rechargeable batteries*** with a view to progressively phasing out their use where alternatives exist;
- Sustainability and transparency requirements for batteries taking account of, for instance, the carbon footprint of battery manufacturing, ethical sourcing of raw materials and security of supply, and ***facilitating reuse, repurposing and recycling***.

2.5. However, currently there is no harmonised classification of PV panels at EU level (hazardous, non-hazardous waste).

3. Current Technological Status

3.1. The basic categories of renewables waste can be distinguished as follows:

- Batteries
- Photovoltaic
- Wind turbine blades
- Electrical and Electronic Equipment

3.2. Current technology, especially regarding the first three categories, is not very recycling-friendly. In other words, recovering valuable and scarce material (or critical raw materials (CRM)) still seems impractical, as devices are not designed and produced to enable dismantling. In addition, the miniaturisation, complex material mixtures and low concentration of CRM in products make effort more difficult.

3.3. The technologies needed for processing these wastes are not mature yet. Nevertheless, scientists, manufacturers and waste handlers are developing ways and methods to effectively recover valuable materials, often mixed with less valuable ones.

3.4. In brief, the technological status for recovering materials from the above categories at time of writing is as follows:

- **Batteries**
  - Lead acid batteries: thermo-chemical process to obtain lead, high temperature metallurgy
  - Li – ion batteries: high temperature metallurgy, low temperature extraction, hydrothermal cathode refreshing. Recovery of Co and Li
- **Photovoltaics**
  - Pyrolysis to recover silicon followed by acid/electrolysis process to recover copper and silver. Thermal and chemical process to separate silicon cells
- **Wind turbine blades**
  - Pyrolysis to recover fibers, mechanical degradation and use with adhesives in order to produce construction panels

- **Electrical and Electronic Equipment**
  - Recovery of rare earth elements from fluorescent powder treatment and Nd-magnet treatment
  - Recovery of Au, Ag and Pb from PCB treatment

3.5. The current technological status along with economic and legal obstacles makes the recycling of CRM an uncommon practice.

3.6. The financial aspect of recycling and recovery of CRM is currently troubled by very high capital costs involved in developing recycling processes coupled with low and volatile prices of CRM minerals. Furthermore, it is a challenge to achieve high quality secondary materials suitable for use in the production of new products.

3.7. The legal aspect of recycling is covered by the WEEE Directive, the Battery Directive and partially by the End-of-Life Vehicles (ELV) Directive. These directives do not have specific requirements for recovery of CRMs, but the proposal for a Sustainable Batteries Regulation currently under discussion does.

4. Future Challenges and Prospects

4.1. CRM used in green economy PME must be recycled and reused to meet European Green Deal goals and plans to make the Union less dependent on third countries for such materials.

4.2. Furthermore, the recycling process must be economically viable and environmentally friendly so as not to undermine the benefits of renewable energy production and exploitation.

4.3. Technologies for achieving these goals either exist (ex. lithium, cobalt extraction from Li – ion batteries) or are under development (PV treatment).

4.4. As large quantities of renewable energy PME are reaching their end of life while the EU regulatory framework promotes economically viable recycling activity, a new financial environment affecting the life cycle of a wide variety of PME and their values is emerging.

4.5. The EU-funded CEWASTE project identified the criteria that various types of equipment must fulfil to be characterised as Key CRM Equipment (KCE), i.e., those devices from which the recycling of CRMs could be feasible. To qualify as KCE, the products have to match both of the following criteria:

- The product, or at least one component contained within it, (key CRM component, KCC) contains relevant concentrations and amounts of CRMs which can be isolated in pre-treatment.
- The final treatment, i.e. the recycling of the CRMs from the above products, must be technically feasible. This is the case if a processing technology has achieved a technology readiness level (TRL) of at least 7, so that an adequate industrial scale final treatment is possible either currently or in the near future. *1HORIZON 2020 – Work Programme 2014-2015, General Annexes*

4.5.1. Technology readiness levels

- Collectors and pre-treatment operators must be able to provide the input which the end treatment process requires for the recycling of the CRMs.
- Collection and treatment targeting the recycling of the CRMs from the KCE is either commercially feasible already or could be achieved by additional financing within a reasonable cost-benefit ratio. An example is the additional financing ensuing from extended producer responsibility under the WEEE Directive, which enabled the sound treatment and disposal of many types of e-waste the recycling of which was economically not feasible before.

4.6. It is up to EU policy makers to create the appropriate economic conditions for increasing resource supply security in the Union by recycling of CRMs. Developments are expected soon.

4.7. Valuers must be aware of these developments when assessing PME values as the life cycle of many PME will be greatly affected in various ways, such as:

- Raw materials pricing, as recycled CRMs start entering the market
- Affecting the design and production costs (recycling-friendly design)
- Promoting reuse or alternative use, thus extending PME useful life
- Evolution of residual value at the end of PME life through the development of recycling industry streams
- The increase of reuse or alternative use, extending PME useful life

5. Conclusions

- The European Green Deal's ambitious goals are about to change the operational and financial environment of many PME associated with the renewable energy industry.
- Recycling / recovery technologies are to a large extent maturing and will be ready to enter production soon.
- The regulatory framework's development is increasing the financial viability of these activities.
- The values of affected PME will be influenced by these developments in terms of functional obsolescence, useful life duration and other life cycle parameters.

II.
EUROPEAN PLANT, MACHINERY & EQUIPMENT VALUATION INFORMATION PAPERS

European Plant, Machinery & Equipment Valuation Information Papers – Table

EVS-PME IP 1 PME Maintenance – How It Affects Value and How the Valuer Can Verify It

EVS-PME IP 2 Equipping Valuers for EU Carbon Reduction Regulation

EVS-PME IP 3 PME Servicing Energy Efficiency in Buildings

EVS-PME IP 4 Real Estate Valuation and PME Valuation – Valuing the Energy Efficient Transformation of the European Building Stock

EVS-PME IP 1 PME Maintenance – How It Affects Value and How the Valuer Can Verify It

1. Introduction
2. Useful Life
3. Maintenance
4. Conclusions

1. Introduction

Plant, Machinery and Equipment has various aims, functionalities, work types, operational contexts and safety requirements that have a direct impact on its expected useful life.

2. Useful Life

The useful life of PME depends on its use, wear and tear, and technological or economic obsolescence and legal constraints such as environmental regulation.

One possible definition of useful life could be the ***period, as specified by the manufacturer, over which the equipment remains fully functional, provided that the maintenance plan is observed***.

In other words, the operating regime and the maintenance undergone by PME are linked to its state of repair. Useful life may vary when operating regimes and pre-defined maintenance practices change.

3. Maintenance

Maintenance is a set of actions designed to maintain PME in, or restore it to, a particular condition, or aimed at ensuring that a particular service can be delivered.

Maintenance is one of the elements that define physical deterioration, together with age and operating regime. There are various depreciation methods that take these variables into account, enabling determination of value.

PME is usually subject to defined maintenance practices; in some cases, these are mandatory. Maintenance processes are logged, enabling the creation of maintenance records and indicators that will provide the valuer with valid information and guarantees as to its condition.

3.1. Maintenance principles

There are various different PME maintenance principles; different approaches are taken over time in line with technological change. There are various maintenance standards due to the highly specific nature of PME: for example, maintenance standards relating strictly to lifts, escalators, aviation, or land-based transport.

Maintenance processes are applied depending on their ultimate objective i.e., whether or not the PME needs more rigorous maintenance given its operating requirements.

Thus, PME maintenance may be divided between planned and unplanned maintenance:

3.1.1. Planned

Planned, i.e., scheduled within a given time frame:

- ***Preventive*** maintenance aims to prevent and avoid breakdowns from happening;
- ***Systematic*** maintenance is performed regularly according to units of time, such as hours or kilometres and performance.

3.1.2. Unplanned

- ***Corrective*** maintenance occurs after a breakdown is detected.
- ***Condition-based*** maintenance looks at the actual condition of the equipment. For example, in aviation and railway transport, monitoring systems relay the condition of systems and sub-systems in 'real time', predicting failures and communicating the condition to Centralised Technical Management (CTM) systems.

3.2. Maintenance indicators

All maintenance approaches have what are known as ***'maintenance indicators'***. Maintenance indicators help to quantify the degree of maintenance to which the equipment was subject, its response, and its current condition in terms of reliability and availability. It is also possible to gain information on maintenance implementation (the plan), and whether or not it is behind schedule. These indicators, which must be included in PME maintenance logs, will provide the valuer with a clear idea of how its condition has evolved, incorporated into its useful life.

Maintenance indicators also help the valuer by providing supporting justifications to be communicated to the client, as well as the options chosen in classifying the condition of the PME, and the respective determination of value.

Some indicators are specified below.

$$\textit{Monthly availability rate \%} = \frac{\textit{Time in service}}{\textit{Mission Time (1)}}$$

$$MTBF\,(Mean\ Time\ Between\ Failures) = \frac{Time\ in\ service}{Number\ of\ breakdowns}\ (2)$$

$$\lambda\,(breakdown\ rate) = \frac{1}{MTBF}$$

$$MTTR\,(Mean\ Time\ to\ Repair) = \frac{Total\ down\ time\ due\ to\ breakdown}{Number\ of\ breakdowns}\ (2)$$

(1) The theoretical availability of the PME

(2) The numerator and denominator must have the same unit of time.

3.3. RAMS

Other notable aspects indirectly related to PME maintenance and PME useful life include RAMS (Reliability, Availability, Maintainability, Safety) analysis, mandatory accreditations (regular inspections), standards, legislation, and the Machinery Directive.

RAMS analysis has recently emerged in the form of a document drawn up before a particular PME is supplied. It aims to assess its reliability, availability, maintainability, and safety at different phases of each life cycle. Initially developed as a design verification tool, it is now a kind of analysis applied to setting out requirements during the design stage, during regular service, and at the end of its useful life and final disposal.

A RAMS analysis aims to guarantee that the PME runs correctly, that it will function well in the future, and that it can be maintained correctly within an acceptable time frame and budget, causing no damage to users and the environment should there be any operational irregularities. This analysis provides all parties (supplier,

designer, client, owner, inspector, controller, valuer) with reassurance in the form of a comprehensive contractual agreement with the manufacturer/supplier regarding the quality of PME procured.

Figure 1 shows the relationship between the cost of preventive maintenance for PME and the costs resulting from failures. The higher the investment in preventive maintenance, the lower the costs incurred by failures and vice versa. The optimal point corresponds to the equilibrium between the two curves.

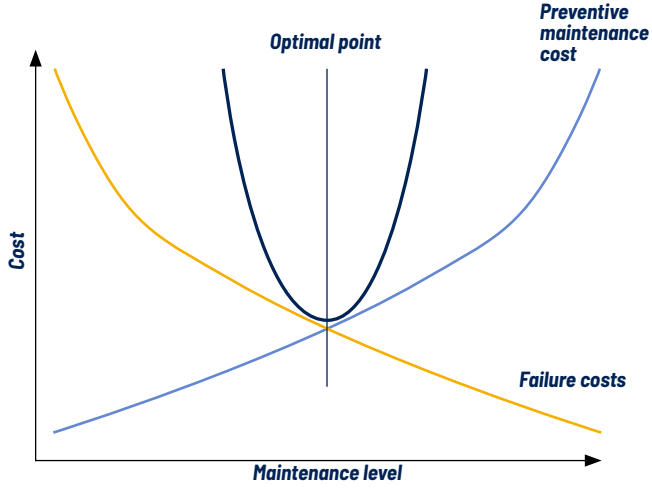


Figure 1 - Diagram illustrating the relationship between maintenance costs and levels

This document will justify the valuer's options, providing all the PME design data as relates to Reliability, Availability, Maintainability, and Safety.

4. Conclusions

To summarise: The valuer must assess the maintenance that the PME undergoes in order to obtain the following information:

- Description of maintenance practices to which the PME is subject
- Degree of compliance with the maintenance plan
- Maintenance indicators:
    - Reliability
    - Availability

- Mean Time Between Failures – MTBF
- Mean Time to Repair – MTTR
- Other

In addition, the valuer must check compliance with mandatory standards and legislation, as well as with the Machinery Directive and RAMS analysis, if applicable.

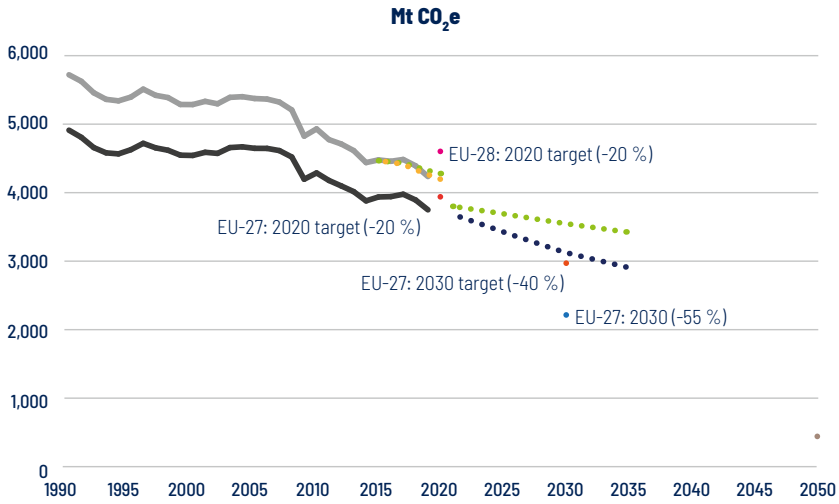
All these data will help the valuer to document the actual condition of the PME under valuation serving as the basis of the Valuation Report.

EVS-PME IP 2 Equipping Valuers for EU Carbon Reduction Regulation

1. Introduction
2. EU Emissions Trading System
3. The Renewable Energy Directive
4. Effects on Transportation
5. Impacts on PME Life Cycle
6. Impact on PME Valuations

1. Introduction

The European Green Deal legislative package has arrived and radical changes are expected for almost all economic activities within the next years. Some of the main elements of the package include clean energy, sustainable industry and sustainable mobility. Energy, industry and transport together still account for some of the highest GHG emissions amongst the various economic activities in the EU. PME valuation covers energy production plants, industrial facilities, and means of transportation, extending to the manufacture of cars, boats, trains and aircraft as well as the production of their fuels. When the Green Deal proposals become law, PME valuation reports will have to take account of their impact.



Greenhouse gas emission targets, trends, and Member States MMR (Monitoring Mechanism Regulation) projections in the EU, 1990-2050

Source: European Environment Information and Observation Network (Eionet) - April 2021

2. EU Emissions Trading System

The existing EU Emissions Trading System (ETS) puts a price on carbon and lowers the cap on emissions from certain economic sectors every year. It has brought down emissions from power generation and energy-intensive industries by 48.2% in the past 16 years. The proposed ETS will lower the overall emission cap even further and increase its annual rate of reduction. As the noose gets tighter, there will be an ever-greater value premium for plant, machinery and equipment that can function fuel-efficiently – and discounts for those that can't – that the valuer will need to identify and compute.

3. The Renewable Energy Directive

The Proposal amending the Renewable Energy Directive includes in its article 22a: ***"Member States shall ensure that industrial products that are labelled or claimed to be produced with renewable energy and renewable fuels of non-biological origin shall indicate the percentage of renewable energy used or renewable fuels of non-biological origin used in the raw material acquisition and pre-processing, manufacturing and distribution stage, calculated on the basis of the methodologies laid down in Recommendation 2013/179/EU or, alternatively, ISO 14067:2018.';"***.

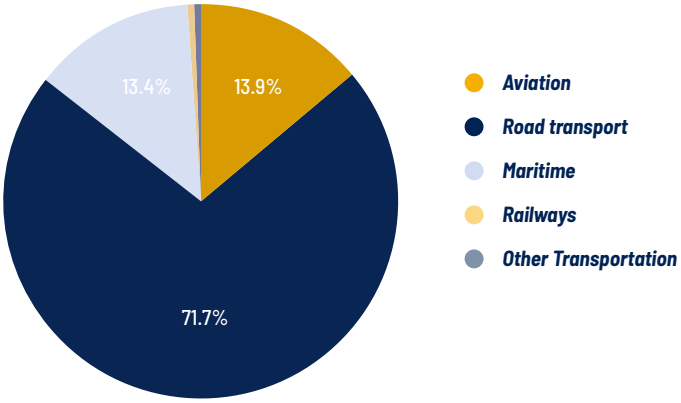
This requirement will provide the valuer with a tool to evaluate the decarbonisation of several industrial processes and hence the extent of any value premium for PME.

4. Effects on Transportation

The new regulation is strengthening CO_2 emissions standards for the whole automotive industry, accelerating the transition to zero-emission mobility by requiring average emissions of new passenger cars to come down by 55% from 2030 and 100% from 2035 compared to 2021 levels. As a result, all new cars registered as of 2035 will be zero-emission. Meanwhile the Euro 7 emission rules proposal is expected soon and will accelerate the shift to sustainable and smart mobility, preparing the ground for the zero-emission future. The valuation of any PME connected to the automotive industry (vehicles, automotive manufacturing plants, accessories manufacturing, etc.) will need to be completely reviewed and recalibrated in the light of these deadlines.

Concerning aircraft, the new sustainable air transport regulation will oblige fuel suppliers to blend increasing levels of sustainable aviation fuels (SAF) in jet fuel taken on-board at EU airports, including synthetic low carbon fuels, known as e-fuels. SAF volume share is to rise from 2% in 2025 to 63% in 2050. This will impact valuation reports both for aviation fuel manufacturing processes and for the manufacture of aircraft capable of assimilating such fuels.

Regulation of the use of renewable and low-carbon fuels in maritime transport will stimulate the uptake of sustainable maritime fuels and zero-emission technologies by setting a maximum limit on the greenhouse gas content of energy used by ships calling at European ports. The greenhouse gas intensity limit of energy used on-board rises from -2% in 2025 to -75% in 2050. There are additional zero-emission requirements of energy used at berth.



Share of transport greenhouse gas emissions
Source: European Environment Information and Observation Network (Eionet) - December 2019

5. Impact on PME Life Cycle

In an attempt to quantify the impact on PME Life Cycle, a non-exhaustive list is presented with examples of PME Groups and the relevant negative impact ensuing from the European Green Deal:

Low Impact	Medium Impact	High Impact
Electronic & IT equipment	Packaging	Oil refining plants
Medical equipment	Agricultural equipment	Cement plants
Automation / Robotics	HVAC	Plastics manufacturing
Reprographic machines	Pharmaceutical manufacturing	Transport equipment
Carpentry equipment	Steelworks	Mining equipment

6. Impact on PME Valuations

While those efforts initially seem to be targeted at specific groups of PME or industrial sectors, they amount to such a vast portion of the industrial economy with so many interlinkages between 'different' industries, that the European Commission's plan will create a broader market for sustainable low-carbon technologies and alternative fuels. Since most industrial processes currently depend on technologies that emit greenhouse gases, a transformation of the entire industrial landscape is expected. Valuers will need to be conscious of the impact of these broader externalities on any kind of PME valuation.

EVS-PME provides valuers with the tools to capture the way this transformation of the entire industrial sector is going to affect PME valuations.

Some examples of predictable impacts on valuation methodologies:

Market approach

- The green transition will create new markets for clean technologies and products.
- Established markets might shrink or disappear.

Cost approach

- New technologies will now be required for several production processes resulting in functional / technological obsolescence for current PME.
- Costs for disposal may rise due to new requirements affecting the Residual Value of many PME.

Income approach

- Period of income will frequently be limited by regulation-mandated retirement of some technologies.
- Improving energy efficiency is going to require frequent green investments with midterm payback periods, increasing the complexity of regular cashflows.
- Supply of clean resources may be more expensive initially. While renewable electricity can replace fossil fuels in many applications, the more expensive hydrogen may play an important role in industrial activities such as steel production, where fossil fuels are used as an energy source and as a reactant.

Ultimately, all PME are expected to be affected to a greater or lesser degree. At present, we can only assume and predict some of the effects of the new regulation. Valuers will need to be aware of developments and adapt their practice accordingly.

EVS-PME IP 3 PME Servicing Energy Efficiency in Buildings

1. Introduction
2. Minimal Requirements for Buildings
3. Buildings Application Areas
4. Energy Class of Buildings
5. Carbon Footprint
6. Typology of Buildings
7. Brief Description of Technical Building Systems

1. Introduction

Buildings have an immense potential to contribute to the fight against climate change through efficiency gains, simultaneously ensuring the reduction of consumption and emissions and increasing the standards of safety and comfort of users.

This IP aims to address the subject of PME serving the energy efficiency of buildings and to support valuers in understanding how these variables can influence the energy performance of buildings.

The European Union is committed to achieving climate neutrality and to this end has developed methodologies and actions for a sustainable, competitive and decarbonised energy system by 2050.

The central piece of legislation for buildings is Directive 2010/31/EU on the energy performance of buildings (EPBD), currently under revision.

2. Minimal Requirements for Buildings

The EPBD imposes minimum requirements on new buildings and buildings undergoing renovation. Requirements are applicable considering the external envelope of the building and its technical systems that aim to promote ambient thermal comfort, adequate thermal behaviour, efficiency and durability of technical systems, good energy management and the use of renewable energy sources.

Minimum requirements are also imposed for the installation of infrastructure and charging points for electric vehicles in buildings.

3. Buildings Application Areas

The Directive sets out conditions for new buildings and existing buildings undergoing renovation. New buildings must be nearly zero energy buildings (NZEB). In order to ensure this condition, the applicable requirements focus essentially on:

3.1. Building envelope

The occurrence of pathologies should be minimised, and thermal energy needs should be limited while maintaining comfortable indoor conditions.

3.2. Technical systems

The technical systems should focus essentially on:

- General energy performance
- Adequate dimensioning and adjustment
- Correct installation
- Adequate control

3.3. Building's components

The components of new buildings subject to compliance with the requirements are:

3.3.1. Residential buildings

- Opaque envelope
- Glazed envelope
- Ventilation systems
- Air conditioning systems
- Hot water preparation systems
- Electrical energy production systems
- Lifting systems
- Electric vehicle charging infrastructures

3.3.2. Commercial and services buildings

- Opaque envelope
- Glazed envelope
- Ventilation systems
- Air conditioning systems
- Hot water preparation systems
- Fixed lighting systems
- Electrical energy production systems
- Building Automation and Control Systems (BACS)
- Lifting systems
- Electric vehicle charging infrastructures

4. Energy Class of Buildings

The energy performance of buildings is represented by their energy class, determined by their energy indicators, and are defined in Directive 2010/31/EU, partially transcribed below.

Directive 2010/31/EU Annex I - Common general framework for the calculation of energy performance of buildings states:

'1. The energy performance of a building shall be determined on the basis of calculated or actual energy use and shall reflect typical energy use for:

- space heating;
- space cooling;
- domestic hot water;
- ventilation;
- built-in lighting; and
- other technical building systems.

The energy performance of a building shall be expressed by a numeric **indicator of primary energy use in kWh/(m^2.y)** for the purpose of both energy performance certification and compliance with minimum energy performance requirements. The methodology applied for the determination of the energy performance of a building shall be transparent and open to innovation.

Member States shall describe their national calculation methodology following the national annexes of the overarching standards, namely ISO 52000-1, 52003-1, 52010-1, 52016-1, and 52018-1, developed under mandate M/480 given to the European Committee for Standardisation (CEN). This provision shall not constitute a legal codification of those standards.';

'2. The energy needs for space heating, space cooling, domestic hot water, ventilation, lighting and other technical building systems shall be calculated in order to optimise health, indoor air quality and comfort levels defined by Member States at national or regional level.

The calculation of primary energy shall be based on primary energy factors or weighting factors per energy carrier, which may be based on national, regional or local annual, and possibly also seasonal or monthly, weighted averages or on more specific information made available for individual district system.

Primary energy factors or weighting factors shall be defined by Member States. In the application of those factors to the calculation of energy performance, Member

States shall ensure that the optimal energy performance of the building envelope is pursued.

In the calculation of the primary energy factors for the purpose of calculating the energy performance of buildings, Member States may take into account renewable energy sources supplied through the energy carrier and renewable energy sources that are generated and used on-site, provided that it applies on a non-discriminatory basis.';

'2a. For the purpose of expressing the energy performance of a building, Member States may define additional numeric indicators of:

- total primary energy use;
- non-renewable primary energy use;
- renewable primary energy use;
- greenhouse gas emission produced in $kgCO_2eq/(m^2.y)$. *(NDLR Carbon Footprint)*

'ANNEX IA

COMMON GENERAL FRAMEWORK FOR RATING THE SMART READINESS OF BUILDINGS

1. The Commission shall establish the definition of the smart readiness indicator and a methodology by which it is to be calculated, in order to assess the capabilities of a building or building unit to adapt its operation to the needs of the occupant and of the grid and to improve its energy efficiency and overall performance.

To illustrate the calculation of the building energy class, there follow examples from the Portuguese transposition of the EPBD energy certification system, managed by ADENE.

4.1. Energy class of residential buildings

In residential buildings, the energy class is determined according to the energy class ratio (*RNt*), which results from the ratio between the nominal primary energy demand foreseen[1] for the building and the reference[2] nominal energy demand for the same building, according to the equation below.

1 *The forecasted nominal primary energy needs consider design or actual conditions.*

2 *The reference nominal primary energy needs are based on the same building, with the same use profiles, but with reference solutions defined in the legislation.*

$$RNt = \frac{Ntc}{Nt}$$

RNt - Energy class ratio in residential buildings;

Ntc - Annual nominal primary energy demand [kWhEP/(m^2.year)];

Nt - Reference annual nominal primary energy demand [kWhEP/(m^2.year)].

The energy class is obtained by matching the value of *RNt* with the ranges shown in the table below.

The result of the energy class ratio in residential buildings, *RNt* below 1 meaning that the building presents an energy efficiency that can be from B- to A+, as shown in the Table below.

Energy class	*RNt*
A+	$RNt \leq 0{,}25$
A	$0{,}25 < RNt \leq 0{,}50$
B	$0{,}50 < RNt \leq 0{,}75$
B -	$0{,}75 < RNt \leq 1{,}00$
C	$1{,}00 < RNt \leq 1{,}50$
D	$1{,}50 < RNt \leq 2{,}00$
E	$2{,}00 < RNt \leq 2{,}50$
F	$RNt > 2{,}50$

4.2. Energy class of commercial and services buildings

In commercial and services buildings, the energy class is determined as a function of the energy class ratio (*RIEE*), which results from the ratio between the predicted

S^3 -type energy efficiency indicators, taking into account the contribution of renewable energy sources, and the reference, as shown in the equation below.

$$RIEE = \frac{EEpr,S - IEEpr,S}{IEEref,S}$$

RIEE - Energy class ratio in commercial and services buildings;

EEpr,S - Predicted energy efficiency indicator of type S [kWhEP/(m^2.year)];

IEEpr,S - Predicted renewable energy efficiency indicator [kWhEP/(m^2.year)];

IEEref,S - Type S reference energy efficiency indicator [kWhEP/(m^2.year)].

The energy class is obtained by matching the value of *RIEE* with the ranges shown in the Table below.

The result of the trade and services energy class ratio, *RIEE* below 1 meaning that the building presents an energy efficiency that can be from B- to A+, as shown in the Table below

Energy class	R_{IEE}
A+	$R_{IEE} \leq 0,25$
A	$0,25 < R_{IEE} \leq 0,50$
B	$0,50 < R_{IEE} \leq 0,75$
B -	$0,75 < R_{IEE} \leq 1,00$
C	$1,00 < R_{IEE} \leq 1,50$
D	$1,50 < R_{IEE} \leq 2,00$
E	$2,00 < R_{IEE} \leq 2,50$
F	$R_{IEE} > 2,50$

3 *The Energy Efficiency Indicator of type S represents the primary energy consumption that is taken into account for the calculation of the energy classification of the building.*

5. Carbon Footprint

Carbon footprint

Carbon footprint is a concept used to quantify the impact of an activity, a person or a country on climate change and is measured in Tons of CO_2 equivalent.

Carbon footprint is an environmental indicator that measures greenhouse gas emissions including compounds such as methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and, above all, the most abundant and largest contributor to global warming: carbon dioxide (CO_2).

A carbon dioxide equivalent or CO_2 equivalent, abbreviated as CO_2-eq is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

Global warming potential"or"GWP"means the climatic warming potential of a greenhouse gas relative to that of carbon dioxide ("CO_2"), calculated as the ratio of the warming potentials of one kilogram of greenhouse gas to one kilogram of CO_2.

"Tonnes of CO_2 equivalent" refers to the amount of greenhouse gas corresponding to the result of multiplying the mass of greenhouse gas in metric tonnes by the respective GWP.

Taking the example of nitrous oxide (N2O), which has a GWP of 298[4] corresponds to a CO_2 tonne equivalent value of 298.

6. Typology of Buildings

The technical systems are an integral part of a building, essential to its operation. Each building has individualised configurations of its technical systems and they are directly associated with the functionalities intended for the use to be given to each building, but also to existing standards and legislation for the different subsystems of its technical systems. For example, an HVAC system has a certain configuration that varies according to the use of the building, depending on whether it is a residence, hospital facility, hotel unit or an office.

4 *REGULATION (EU) No 517/2014 on fluorinated greenhouse gases.*

Each building can have one or several types of use. For example, a building that combines the areas of parking, housing, retail and services.

The energy efficiency of buildings is determined by legal minimum energy performance requirements regarding their envelope and technical systems, and also by their typical use.

7. Brief Description of Technical Building Systems

7.1. Ventilation

Ventilation in buildings can be carried out by means of systems:

- Natural ventilation
- Mechanical
- Mixed or hybrid

'Natural ventilation system' is understood as the system composed by components, namely, openings, interior air passages and ducts, which ensure, on average, the renewal of air exclusively promoted by the effects of temperature difference and wind action, without any mechanical system.

'Ventilation using mechanical means' is based on the use of systems and equipment that promote the renewal of indoor air by extraction and/or insufflation of air.

'Mixed ventilation systems' are a combination of natural and mechanical ventilation systems, subject to user or automatic control.

Evaluating the energy performance of buildings requires consideration of the various variables that limit the design of these systems, for example:

- Characteristics of the envelope that have an impact on air infiltration and pollutant removal efficiency
- Minimum flow rates of new air in accordance with legislation
- Characteristics of the components of the natural ventilation system, namely openings and ducts
- Energy consumption of ventilation equipment and its energy efficiency
- Possibility of using Free-Cooling, through the opening of windows and control of ventilation systems
- Possibility of using Heat Recovery systems, by recovering the energy contained in the stale air extracted from the inside of the building

7.2. Air conditioning and water heating systems

The air conditioning and water heating systems present a great variety of solutions.

Some buildings rely on receiving energy from the district heating and cooling network for air conditioning and heating domestic hot water fed from independent thermal power plants. In other cases, the buildings incorporate the air conditioning and heating systems themselves, being integrated into them.

7.2.1. Air conditioning

The types of air conditioning systems present many solutions that are adapted to the size of the building, the type of use and function.

The equipment can also be classified by type of operation. For example, in the case of some air conditioning installations, equipment supported by refrigerating systems is used.

The refrigeration system is characterised by the circulation of a fluid (refrigerant gas) in a closed system, achieved through expansion carried out in the expansion valve and subsequent compression achieved in the compressor. The exchange of energy is carried out in the existing coils in the system (condenser and evaporator). The condenser is also known as the Outside Unit and the evaporator as the Inside Unit.

Refrigeration systems which only cool the cooling medium to be cooled are called cooling only and those which heat and cool the medium to be cooled and heated are called Heat Pump or Reversible. In this case the system performs a cycle inversion operation through the cycle inverter valve reversing the flow direction in the evaporator and the condenser.

Refrigeration systems can also be defined by the design solution options:

- Direct expansion: Refrigerating systems in which the outdoor unit is the condenser and the indoor unit is the evaporator, presenting the following typology:
    - Split: consisting of two modules, the condensing module and the evaporating module. Splits can be mono-split (only one indoor unit) or multi-split (with more than one indoor unit);
    - Compact: System composed of a single unit incorporating the evaporator and the condenser.

- Indirect Expansion or Hydronic System: In this case the refrigerating system will heat or cool water which will be distributed by terminal units placed in the spaces to be air conditioned, i.e., the exchange of energy is not directly carried out by the refrigerant to the space to be treated, but indirectly through treated water. The cold/hot water generating unit is called a Chiller in the case of producing only cold water and a Heat Pump in the case of producing hot/cold water. These systems present the following typology:
    - Water-Water System: a Chiller/Heat Pump with the condenser cooled by water;
    - Air-to-Water System: a Chiller/Heat Pump with air cooled condenser.

7.2.2. Water heating

Exclusively in heating, systems using boilers can be used. Boilers are devices which burn fuel to generate energy for space heating and domestic hot water. The fluid to be heated is water. They can use various energy sources such as diesel, gas and biomass.

Other heating systems can rely on electric heating (electric resistances or oil) as is the case of water heaters and electric radiators, the most commonly used solutions in the domestic sector.

Currently the systems described above for heating are being replaced by heat pump type refrigerating systems designed exclusively for heating.

7.2.3. Efficiency of the systems

One of the solutions with the highest energy efficiency is heat pumps. Their energy efficiency is measured by dividing the cooling / heating capacity by the total nominal absorbed electrical power consumption.

If, for example, the same room is heated using two different solutions: an electrical resistance heater and an alternative heat pump unit, the difference will be in the energy efficiency of each solution, i.e.:

- The energy efficiency of the electric resistance is 1, that is, the heating thermal energy produced is equal to the nominal electrical energy absorbed by the equipment;

- The energy efficiency of the heat pump is 3[5], that is, the thermal energy produced corresponds to 3 times the nominal electrical energy absorbed by the equipment.

For the purpose of evaluating the energy performance of buildings, the fixed air conditioning and hot water preparation (DH) systems should be characterised with respect to their performance and energy efficiency. The calculation of the final energy associated with the heating, cooling and hot water functions should be done using the nominal efficiency of the production equipment, and in the case of heat pump systems, seasonal efficiencies should also be considered when available.

7.2.4. Typology of equipment

The table below shows the most commonly used systems and equipment for air conditioning and water heating, classified by type of system, function and examples.

System typology	Function	Examples of equipment
Direct Expansion Systems (Refrigeration Systems)	Ambient Heating / Cooling	Split: Consisting of an outdoor unit and an indoor unit
		Multisplit: Consisting of one outdoor unit and several indoor units
		VRF - Variable refrigerant flow - Consists of one outdoor unit and several indoor units
		Rooftop - Compact unit for connection to airconditioning distribution networks

5 *The energy efficiency value is indicative and may vary depending on the equipment manufacturer.*

System typology	Function	Examples of equipment
Indirect Expansion Systems (Refrigeration Systems)	Ambient Heating / Cooling	Chiller: Cold water production unit
		Heat pump: Cold / hot water production unit
		Fan coils: Climate control terminal units (placed in the spaces to be air-conditioned)
		AHU: Air handling unit for connection to air conditioning distribution networks
		Total Fresh Air AHU: Handling unit for connection to air-conditioned air distribution networks
		HRU (Heat Recovery Units): Recovery of the energy contained in the exhausted air from inside the building)
Heating systems	Ambient Heating	Heat pump: Hot water production unit
		Underfloor heating: Systems powered by the heat pump unit for floor heating
		Radiators: Terminal heating units fed from the heat pump unit (placed in the spaces to be heated)
Heating systems	Pool water heating	Heat pump: Hot water production unit

System typology	Function	Examples of equipment
Heating systems	Domestic hot water and ambient heating	Boiler: Fuel-burning system
		Underfloor heating: Systems powered by the boiler for heating the floors
		Radiators: Terminal heating units fed from the boiler (placed in the spaces to be air conditioned)
Heating systems	Domestic hot water	Electric water heater

7.2.5. HVAC and water heating equipment using alternative energies

Passive systems for heating and/or cooling are systems that use alternative energies, e.g.:

- Solar thermal collectors for heating and DHW (domestic hot water). Solar collectors consist of
  - Solar panel
  - Hot water accumulation tank
  - Pumping system
  - Pipes and accessories

  The operation of these systems is based on solar radiation which, when incident on the solar collector, heats the solar fluid which will heat the water inside the tank. In these systems there is normally support from conventional heating systems such as boilers and more recently heat pumps.
- Geothermal energy systems: Heat pumps for heating, cooling and domestic hot water (DHW) using geothermal energy. The geothermal energy system consists of capturing the free energy existing in the ground, benefiting from a constant temperature of approximately 16ºC all year round.
- Aerothermal energy systems: Heat pumps for heating, cooling and DHW using aerothermal energy. Aerothermal energy is a renewable energy that takes advantage of the thermal energy in the air and transfers it inside the house to provide heating, cooling and domestic hot water, depending on the comfort needs of the home.

7.3. Electricity generation systems

7.3.1. Photovoltaic systems

Photovoltaic systems absorb radiation and convert it into electrical energy, producing a direct current (DC), being converted into alternating current (AC) through a piece of equipment called an inverter. After conversion, all energy can be used locally or injected into the public grid. The direct current, generated by the photovoltaic modules, is led to the inverter with the help of solar cables, and is distributed (in AC) through the building's electrical distribution network or directly into the network connection.

If there is a solar energy surplus which is not consumed directly, instead of being injected into the network, it can be stored for later consumption in solar batteries.

7.3.2. Wind power systems

These systems transform wind energy into useful energy obtained in a renewable and clean way, as it does not produce pollutants. Wind energy is transformed into electrical energy by means of a wind turbine (or aerogenerator), which includes propellers that move with the speed of the wind. To determine the contribution of the wind systems to be considered, it is necessary to characterise the wind turbine power curve and the wind speed distribution by classes for the site in question.

7.4. Biomass energy

Biomass energy (or bioenergy) is derived from recently living organic materials known as biomass. It is a form of renewable energy usually applied to produce electricity, heat, transportation fuels and other products. Biomass energy is very versatile and has the potential to increase the flexibility of electricity generation and enhance the reliability of the electric grid, since the processes for electricity and/or heat generation are similar to those applied with fossil fuels. Any building or industrial facility may benefit from installing combined power and heat systems based on biomass that meet both electricity and thermal needs of the building. In some cases, industries may produce biomass as a byproduct and in that scenario, even higher levels of energy and production cost efficiency are achieved.

7.5. Building automation and control systems (BACS)

BACS are systems for the automation and control of buildings rationalising their energy consumption. They encompass all the equipment, software and

engineering services that contribute to the economic, safe and energy-efficient operation of the technical building systems.

Automation systems should ensure continuous and comparative monitoring, recording and analysis of energy consumption and energy efficiency of buildings, in order to obtain information about their actual or potential energy performance, as well as communication and interaction between all technical systems, regardless of their differences.

The BACS should monitor the building's technical systems, with its efficiency class being defined by the number of functions covered by them including, for example, the control of the following systems:

A. Heating

B. Cooling

C. Domestic hot water

D. Ventilation

E. Lighting

F. Solar protection devices

G. Management systems

7.6. Fixed lighting systems

Fixed lighting systems, including indoor and outdoor, in commercial and service buildings, where applicable, are subject to compliance with minimum requirements on illuminance and power density.

The characterisation of the lighting systems shall take into account their components, in particular luminaires, lamps and, where applicable, ballasts, transformers or drivers, and control systems by occupancy or availability of natural light.

Automated lighting control systems

Lighting control systems have a major impact on energy saving in commercial and residential buildings.

Control and dimming systems are installed for network operation for the purpose of centralised lighting management with the following control functions:

- Switching by motion detection or occupancy (presence detection)
- Switching according to the level of daylight (daylight switching)
- Dimming according to the potential use of natural light (daylight control)

- Time control
- Control, parameterisation and monitoring of all lighting equipment in the network

There are new functionalities enabling the user to adapt the lighting of a location to the activity being carried out at a particular moment.

7.7. Lift, escalator and moving walks installations

In commercial and service buildings, the lift, escalator and moving walks systems are characterised on the basis of EN ISO 25745-2 and EN ISO 25745-3 concerning the energy performance of lifts, escalators and moving walks.

The energy consumption associated with lift systems is estimated based on the energy consumption during the manoeuvre, considering pause and standby periods.

Regeneration of energy in lifts and escalators

Lifts

The regeneration of energy in lifts is the process that consists of using the braking energy of the lift to transform it into electrical energy. The energy generated is then used in equipment in the same building that is consuming energy at that moment.

All electric traction lifts composed of cabin, machine and counterweight only make an effort, at most, equivalent to half a cabin load.

This is because the weight of the counterweight is equivalent to the sum of the weight of the car and the half carrying load, which causes the lift, whether it is going down with a full car or going up with an empty car, to produce energy.

By integrating the lift's power control system with a Variable Frequency Drive (VFD) and connecting it to an energy regenerator, it is possible to recover energy that would otherwise be wasted and transform it for use in the grid.

At the moment the lift is, for example, going up empty, the VF is receiving energy from the motor and sending it to the regenerator. This in turn, through sensors and specific software, works this energy to transform it into reusable energy for the building.

This energy can be used by other lifts or by other equipment which, at that moment, is consuming energy. On average, between 15 and 17% of the total energy consumed by the lift is used.

Escalators and moving walks

The energy regeneration system can also be installed in escalators and moving walks, but only has an effect on the escalator or moving walk when it is going down, as an escalator or moving walk going up only consumes energy, it does not produce it.

7.8. Electric vehicle charging infrastructure

The electric vehicle works by charging a battery that stores energy, to be used by the vehicle's engine.

The range of the electric vehicle depends on the capacity of the batteries, the power of the engine, the route taken and the driving style. The charging time depends on the storage capacity of the battery and the power provided by the charging point.

Charging can be carried out at charging points not integrated in the electric mobility network, such as private garages. This group includes charging using a normal electric socket, respecting technical and safety rules.

There are three types of charging points:

- Standard Charging Point: an infrastructure that allows electric vehicle batteries to be charged. Normal recharging points have built-in sockets to which the user connects a charging cable and have charging powers between 3.7 kW and 22 kW.
- Rapid Charging Point: an infrastructure that enables the rapid charging of electric vehicle batteries. These units have their own cables to connect to the vehicle. Depending on the type of battery and electric vehicle, charging equivalent to 100 kilometres of autonomy takes around 20 minutes.
- Reversible Charging Point: a developing technology that uses the car battery as storage for energy for the building.

EVS-PME IP 4 Real Estate Valuation and PME Valuation – Valuing the Energy Efficient Transformation of the European Building Stock

1. Introduction
2. Technical Building Systems
3. Conclusions

1. Introduction

The revision of the Energy Performance of Buildings Directive (EPBD) currently in progress will bring significant regulatory pressure accelerating the decarbonisation of buildings, in the first instance with the upgrading of the worst-performing building stock.

Technical building systems are an integral and key part of the Directive. The European Commission's Proposal for a recast of the Directive (***COM(2021) 802 final 15.12.2021***) contains a new provision that:

> "Member States shall ensure that the requirements they set for technical building systems reach at least the latest cost-optimal levels."
>
> ***(Article 11(1), subparagraph 4)***

The same Article underscores the overarching, transversal importance of technical building systems to the building's energy efficiency and to the goals of the Directive:

> "Member States shall ensure that, when a technical building system is installed, the overall energy performance of the altered part, and where relevant, of the complete altered system, is assessed. The results shall be documented and passed on to the building owner, so that they remain available and can be used for the verification of compliance with the minimum requirements laid down pursuant to paragraph 1 and the issue of energy performance certificates."
>
> ***(Article 11(4))***

Property valuation is one of the pillars of climate change mitigation and adaptation and needs to rapidly deploy the skills necessary to support the EPBD strategies in order to achieve a totally decarbonised building stock by 2050.

2. Technical Building Systems

> "Technical building system' means technical equipment for space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, on-site renewable energy, electricity generation and storage, or a combination thereof, including those systems using energy from renewable sources, of a building or building unit;"
>
> ***Article 2(6)***

Technical building systems are consubstantial to a complete and meaningful determination of the building's value. They have to be analysed, not only with regard to their condition and useful life, but also in terms of fulfilment of the national requirements ensuing from transposition of the EPBD including their contribution to determining the hierarchical, alphabetical grade or class on the building's energy performance certificate.

Property valuation must foresee the risk posed by technical systems for each kind of building. Technical systems are subject to safety, energy efficiency and environmental legislation and standards which are liable to periodic review. In addition, **the EPBD is placing limits on the use of equipment which had complied until now with specific legislation and standards**.

Valuers will need to identify the areas where equipment will have to be upgraded as well as areas where it will be possible to retain technical installations able to comply with legislation as long as they are well maintained.

For example, the valuer could identify equipment in a technical building system serving for heating and cooling the building which could be non-compliant with the EPBD or could prejudice the building's energy certification grade and would therefore need to be replaced, while not implying replacement of the whole system.

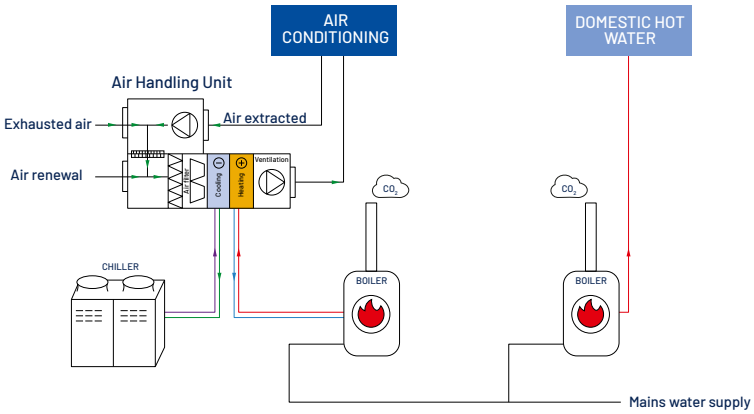
2.1. Example of technical building systems improvements

Take the example of dedicated heating, ventilation and air conditioning (HVAC) systems. Their size depends on the function of each building, and they are made up of various individual pieces of equipment which, as a whole, provide the building with treated air, offering stable conditions in terms of comfort and quality of indoor air, along with domestic hot water. These systems can keep pace with buildings' useful life because, although their components have a shorter useful life, scheduled replacement is possible without jeopardising the viability of the technical system of which they form part.

Consequently, it will also be possible to introduce the adaptations required by the EPBD and its recast, without having to replace buildings' HVAC systems completely.

The image below illustrates an existing HVAC system for a building.

Example: Technical building systems for heating and cooling



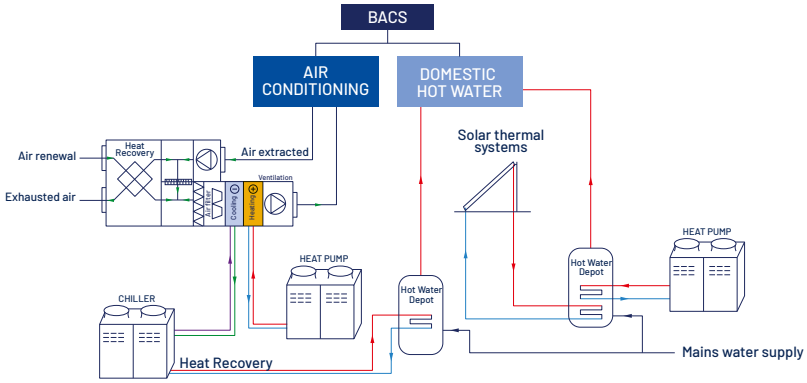
The system comprises:

- Air handling unit (AHU) responsible for ventilation and heating and for cooling the treated air entering the building
- Unit to cool the air – chiller
- Unit to heat the air – boiler
- Domestic hot water – produced by another boiler

The technical system is the subject of scheduled maintenance and complies with current legislation, but the building has a low EPC rating. The goal is to increase its energy efficiency significantly and ensure that all its equipment has zero direct GHG emissions, i.e., does not generate any on-site carbon emissions.

Various solutions could be adopted, as shown in the image below. These may or may not be fully implemented, depending on their contribution wholly or individually to the building's overall energy performance.

Some strategies for improving the building energy certification grade, applied to the Example



Examples include the following improvements (amongst others):

1. Installation of a chiller with heat recovery, so that some of the thermal energy given off by the equipment can be recovered and diverted to heat domestic water
2. Replacement of the boiler used to heat the air with a heat pump unit offering much greater energy efficiency and generating zero direct emissions
3. Installation of a heat recovery module in the AHU unit, making it possible to recover some of the thermal energy contained in the air extracted from the building and transfer it to the renewed air to be introduced to the building
4. Installation of a solar thermal system to heat domestic water
5. Replacement of the boiler used for domestic hot water with a high temperature heat pump
6. Installation of a building automation and control system (BACS) for technical management of the HVAC system, as well as other technical building systems

All the illustrated improvements contribute to greater energy efficiency of the HVAC system, helping to make use of the thermal energy which would be given off, reducing heating needs for air conditioning and domestic hot water and, finally, contributing towards a decrease in the building's electricity consumption and elimination of fossil fuel sources.

2.2. Key technical building systems elements that valuers must assess

Technical building systems are designed to provide various technical solutions tailored to the specific use of each building, the type of system required and

available energy sources, guided by the applicable mandatory standards and legislation governing their design, construction materials and energy efficiency and the safety of persons and property.

Heating and cooling systems, Building Automation and Control Systems (BACS), built-in lighting systems, energy regeneration in lifts, escalators and travelators, electric vehicle charging infrastructure and on-site electricity generation systems are amongst the technical building systems with the highest impact on the building's energy performance.

2.2.1. Heat pumps

Systems using fossil fuel-based energy sources include those supplying ambient heating and domestic hot water such as boilers, but the current EPBD recast provides that, as of 2027, Member States may no longer subsidise fossil fuel boilers. Alternative solutions with zero direct GHG emissions exist, such as heat pumps.

A heat pump is characterised by a refrigeration system that promotes circulation of a fluid (refrigerant gas) in a closed system, which changes status and condition to provide energy exchange through the system's coils. Coils make up the condensation unit usually placed on the outside and the evaporation unit normally placed inside which will heat or cool the space to be treated. Where the fluid is water, the evaporator will be placed inside the tank to be treated.

The refrigerant gases currently used in refrigeration systems are subject to legislation which imposes minimum standards of use in terms of atmospheric heating potential (AHP), along with maintenance standards for fluorinated gas systems covering both procedures and the accreditation of maintenance companies. The gases currently used in these systems have no influence on depletion of the ozone layer and have medium-to-low global warming potential (GWP). Under pressure from the legal requirement to seek environmentally friendly solutions, the industry has been developing gases with ever lower GWP without compromising the systems' energy efficiency and has been developing alternatives to replace them with other natural gases having nearly zero environmental impact.

Heat pumps are highly energy efficient. Taking the example of heating, the energy efficiency of any given heating system depends on the relationship between the quantity of thermal energy supplied and the quantity available to operate it. Considering electrical resistance [heating], energy efficiency is '1', i.e., the heating power produced is equal to the nominal power absorbed by the equipment. In the case of a heat pump with energy efficiency of '3', this means that the thermal energy it produces corresponds to 3 times its nominal absorbed power.

Apart from ambient heating and domestic hot water, heat pump systems can also provide power for ambient cooling, offering a complete solution which can be

incorporated in a thermal power plant serving one or more buildings or as an individual system serving a unit or part of a building.

These systems can produce thermal energy in combination with passive systems (which use alternative energy sources), as in the case of thermal solar collectors for heating water, aerothermal systems which make use of existing thermal energy in the air and geothermal systems which capture the energy in the soil, benefiting from a constant temperature of around 16°C year-round.

2.2.2. Building automation and control systems (BACS)

> "7.'building automation and control system' means a system comprising all products, software and engineering services that can support energy efficient, economical and safe operation of technical building systems through automatic controls and by facilitating the manual management of those technical building systems;"
>
> *Article 2(7) EPBD (unchanged in the Recast)*

BACS ensure technical management of all the equipment in the building, in terms of its operation, energy rationalisation and the safety of persons and property. The systems found in buildings are controlled and monitored electronically by means of the BACS communications interfaces which communicate directly with the equipment's controllers through bus communication lines with user-friendly navigation.

BACS enable continuous, comparative monitoring, recording and analysis of energy consumption and efficiency, providing information on the building's actual or potential energy performance, as well as communication and interaction between all the technical systems. This includes active and passive air conditioning, domestic hot water, ventilation, smart lighting and mechanical access (lifts, escalators and moving walks) systems.

2.2.3. Electric vehicle charging infrastructure

This is another of the strategies of the EPBD, which, in conjunction with revision of the Deployment of Alternative Fuels Infrastructure Regulation, sets down minimum requirements for buildings' infrastructure for sustainable mobility so as to accommodate the increasing use of electric vehicles (also regulated by other European Green Deal legislation: no more manufacture of internal combustion cars as of 2035).

The charging infrastructure could be standard, simply using normal electrical sockets, or rapid, using chargers with specific rapid charging sockets. Bidirectional or reversible chargers are available on the market, and these can charge the batteries of electrical vehicles or be used to supply power to the building.

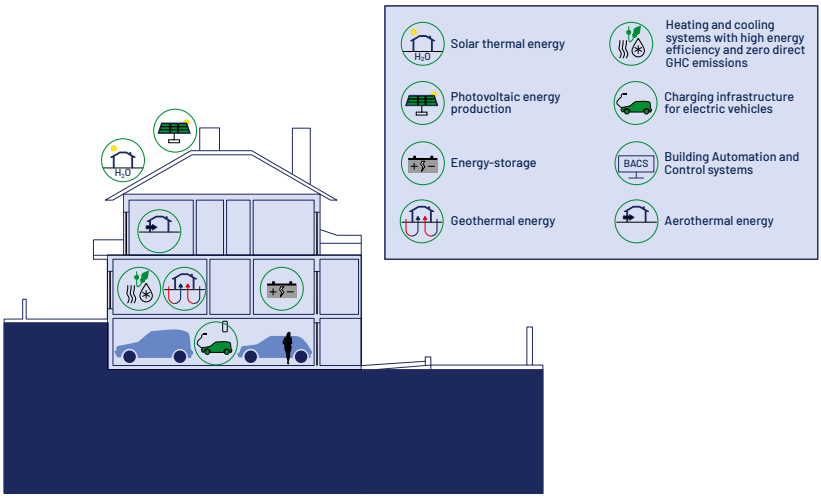
2.2.4. On-site electricity generation systems in buildings

On-site electricity generation systems in buildings, such as photovoltaic systems, must also be considered in the light of the EPBD. Including the European Commission Proposal of 18 May 2022 extending the EPBD Recast Proposal of 15 December 2021 to include rooftop solar installation for the entire building stock except public and commercial smaller than 205 m^2 and existing residential. Their operation is based on absorption of solar radiation and its conversion into direct current (DC) electricity which is then converted into alternating current (AC) electricity by means of an inverter. After conversion, all the power may be used locally or injected into the public grid. Currently, the technology has been fully developed by electricity distribution companies, who offer various on-site electricity generation system solutions, integrated within the grids of the buildings and associated with smart energy meters.

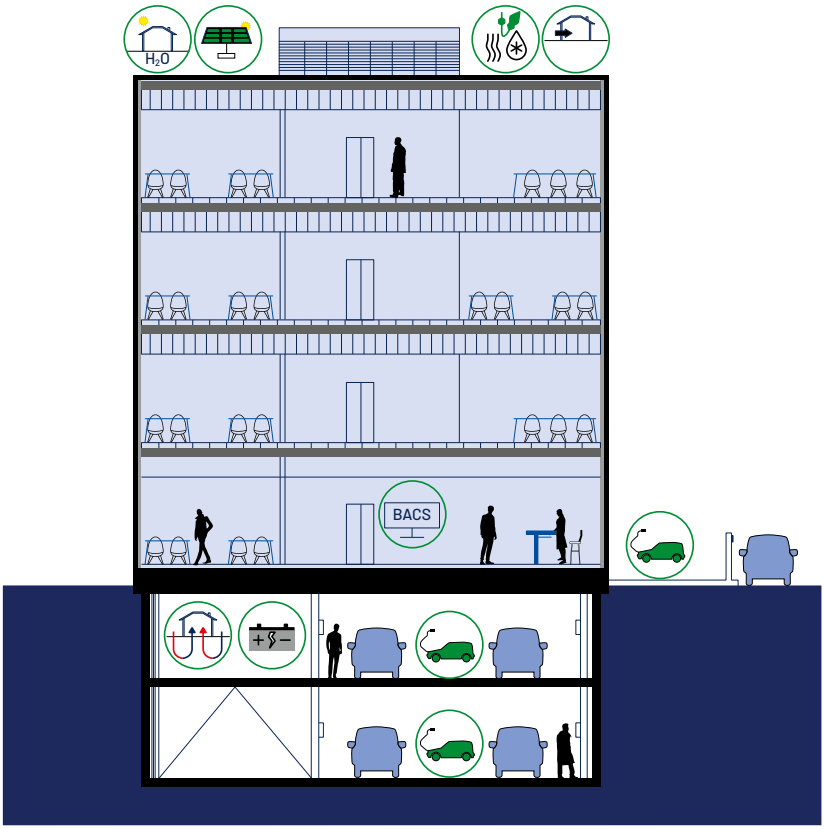
2.3. Building renovations - main measures involving their technical systems

In building renovations, the main measures involving their technical systems must focus as a priority on those directly influencing the building's energy performance, such as heating and cooling appliances, on-site electricity generation systems and electric vehicle charging infrastructure. In the case of commercial and service buildings, BACS should also be considered.

2.3.1. Example of measures in residential buildings



2.3.2. Example of measures in commercial and service buildings



3. Conclusions

It is not the goal of property valuation to implement the rehabilitation plan for technical systems, nor to determine buildings' energy performance in accordance with an alteration of one of their technical systems, but it should identify and analyse systems, their condition and maintenance, and the target equipment to be prioritised in rehabilitation work in line with the latest EPBD-compliant national regulation so as to inform property clients of the new variables impacting the property's valuation. In particular, technical systems will have a direct influence on the building's energy performance classification, a key component in the property valuation.

Depending on the size of the building and the importance of its technical installations, collaboration between property valuers and PME valuers can contribute strongly to its valuation, with a view to minimising the risk of error in the overall determination of value and attaining excellence, fulfilling the objectives of the EPBD.

Rehabilitation of the European building stock is under way and requires all operators in the sector to come together to achieve the objectives set for decarbonisation by 2050.

Property valuation reports should include an analysis of technical building systems, identifying cases where their sustainable rehabilitation is likely to be necessary, with a view to enhancement of their energy performance and compliance with the EPBD-enhanced national regulation.

An alliance between property valuation and plant, machinery and equipment valuation is essential, in justified cases, to keep up with current and future requirements and also provide the market with support and confidence.

III.
European Plant, Machinery and Equipment Valuers' Code of Conduct

Valuers in TEGOVA member associations must adhere, as a matter of personal responsibility, to this Code which is founded on:

- The principles of professional behaviour; and
- The expectation of clients that a valuation will be prepared professionally by a qualified valuer.

Valuers are to uphold and demonstrate professional standards in their work and so safeguard the trust placed in them by clients to whom a duty of care is owed, by regulatory authorities and, more generally, by society.

This TEGOVA Code embeds the values of:

- Fairness;
- A proper professional respect for others and for standards;
- Responsibility and trustworthiness.

Such professional standards extend beyond the requirements of law (which bear on all persons) and require a duty of care to the client and respect for others, acting to the best of the valuer's ability without discriminating against individuals in respect of their nationality, ancestry, race or social origin, colour, religion, belief or political opinion, marital status, gender, gender expression or sexual orientation, age or disability.

A breach of this Code may give rise to disciplinary action by the relevant member association. and possible loss of the valuer's status as a Recognised European Plant, Machinery & Equipment Valuer (REV-PME).

The Code

A. The valuer must act with honesty, integrity and diligence at all times with a duty of care to the client and otherwise with attention, competence and respect for all parties.

B. The valuer must exercise professional judgement objectively and independently in undertaking work and, as relevant, honour the duties of a professional to a court, tribunal or equivalent forum.

C. The valuer must maintain a level of professional knowledge and technical skill that is at least that required by the professional valuation body of which the valuer is a member, keeping up to date with professional matters and relevant current developments so as to be competent in professional practice.

D. The valuer must accept the client's commission only if he/she has the professional skills, knowledge and competence appropriate to the task undertaken. The valuation work must meet the requirements of a professional service. Professional service determines that the skill, knowledge and competence of the valuer must be appropriate to the type and scale of valuation, with any factor which could compromise an objective assessment being disclosed.

E. The valuer must be transparent and accountable to clients in undertaking professional work for them.

F. The valuer must avoid all conflicts of interest and must inform the client in writing when one arises and before issuing the Valuation Report.

G. The valuer must not disclose privileged or confidential information.

H. The valuer must have or be subject to a procedure for handling complaints that may be made concerning professional conduct and must advise clients in writing of its existence.

Where a valuation must be signed in the name of a valuation company rather than by a named individual valuer, this Code applies to the company and also to any individual employed by the company to undertake valuation work.

IV.
European Union Legislation and Plant, Machinery & Equipment Valuation

1. General Introduction
2. PME Valuations Imposed by EU Legislation
3. EU Legislation as Part of the PME Valuation Matrix
4. PME Valuation and Taxation
5. Schedule of EU Legislation

Disclaimer – The present text is prepared as a brief overview of EU legislation as it may apply to, or be relevant for, PME valuation. It offers signposts for, not guidance on, what are often complex technical subjects. Most of the legislation under review has been made by Directives. This means that Member States will generally have used their own legislation to implement it. Likewise, many provisions of Regulations may be incorporated and/or supplemented in national legislation. It is thus likely that there will be local features of significance as well as interactions with other domestic law.

The text is intended to offer assistance to valuers in their professional capacity - not in any other role, including the ownership of PME - and is based on an understanding of the law as at 1 May 2022. Where an issue is relevant to a valuation, the valuer is advised to seek further specific information or advice on appropriate points.

1. General Introduction

1.1. **European Union (EU) legislation and PME valuation** – EU legislation has an increasingly important impact on the use, management, associated costs, development opportunities and value of property. Indeed, whereas Article 345 of the Treaty on the Functioning of the European Union (TFEU) states that ***"[t]he Treaties shall in no way prejudice the rules in Member States governing the system of property ownership"***, EU legislation does have an impact on property.

1.2. EU legislation may of course directly apply to PME or activities closely associated with its ownership, occupation or use. This is for instance the case when EU legislation defines the purpose of a PME valuation and/or sets out the criteria for such valuation. But the impact of EU legislation on PME and PME valuation can also be indirect, where EU legislation applies to certain activities or sectors, creating opportunities or imposing limitations according to the use of PME for these activities or in these sectors. Likewise, EU legislation on value added tax (VAT) can be a significant factor in PME transactions and, thus, impact the PME valuation. Moreover, EU legislation directly touches upon the valuers' activities.

1.3. Accordingly, for a valuer to act in accordance with EVS-PME, it is necessary to have at least a basic understanding of the applicable EU legislation and to be able to assess the impact of legal obligations on PME and/or PME valuation.

1.4. **PME valuations imposed by EU legislation** – In some cases, EU legislation makes specific provisions for property valuation. Thus, from a relatively early stage EU legislation on company accounting bore on the valuation of property for the financial accounts of relevant companies. This has been developed for credit

institutions, insurance institutions and investment funds. Likewise, independent expert valuations can be imposed for Transfer Pricing or State aid purposes.

1.5. EU legislation as part of the PME valuation matrix – A professional valuation relies on the valuer appraising the PME in its context, researching and verifying all matters with a bearing on the value of the PME. The valuation of PME can only reflect the actual market as it exists on the valuation date with its balance of supply and demand, hopes and concerns and the information the market considers relevant. Legislation and policy relevant to PME are part of that matrix.

1.6. This is also reflected in EVS-PME 1 where it is stated that the PME is to be analysed with its legal, physical, economic and other attributes. Indeed, to determine the Market Value of PME, the valuer must take due regard to the use of PME that is physically possible, reasonably probable, legal or likely to become so, and that results in the highest value of the PME. Accordingly, consideration must be given to establishing relevant legal and regulatory constraints regarding the PME, part of which may be directly connected to a specific sector or industry.

1.7. The importance of legislation for a reliable PME valuation is also attested throughout the valuation process as set out in EVS-PME 2. For instance, by means of a so-called ***"macro-identification"*** the valuer must obtain a reasonable understanding of the setting in which the PME is operated. This implies, amongst others, the collection of data on safety, health and environment regulations. In addition, the valuer must also obtain a reasonable understanding of the individual characteristics of the PME. The data that are to be collected in the context of this ***"micro-identification"*** may include certificates of legal and regulatory compliance.

1.8. An exact understanding of the applicable legislation is particularly important if the PME is valued under the Cost Approach where functional, technological and/or economic obsolescence will to a large extent determine the value of PME. Typical drivers for such obsolescence are indeed changes in legislation affecting PME (e.g. changes that favour efficiency, environmental footprint or health and safety).

1.9. Throughout the past decades, the EU has been very active in setting minimum standards for the production and commercialisation of a wide range of goods.

1.10. Many sectors of the EU market are currently subject to harmonised rules that protect consumers, public health, and environment. These harmonised rules preclude the adoption of possibly divergent national rules and ensure the free circulation of products within the EU. They provide a clear and predictable legal

framework. If manufacturers follow these rules, their products can be sold freely in the market. In the majority of sectors (e.g. electronic and electric equipment, machinery, lifts and medical devices), EU legislation is limited to essential health, safety, and environmental protection requirements. To demonstrate compliance with these requirements, manufacturers may voluntarily use standards or other technical specifications. In other sectors (e.g. automotive and chemicals), EU legislation provides detailed requirements obliging certain types of products to have the same technical specifications or to respect certain labelling obligations.

1.11. Some sectors are nonetheless still governed by national provisions. These non-harmonised sectors are not subject to common EU rules and may come under national rules of the Member States. The principle of free movement of goods ensures however that these rules do not create unjustified barriers to trade. The main provisions governing the free movement of goods (including PME) are:

- Article 34 TFEU, which relates to intra-EU imports and prohibits ***"quantitative restrictions and all measures having equivalent effect"***;
- Article 35 TFEU, which relates to exports from one Member State to another and similarly prohibits ***"quantitative restrictions and all measures having equivalent effect"***; and
- Article 36 TFEU, which provides for derogations to the internal market freedoms of Articles 34 and 35 TFEU that are justified ***"on grounds of public morality, public policy or public security; the protection of health and life of humans, animals or plants; the protection of national treasures possessing artistic, historic or archaeological value; or the protection of industrial and commercial property"***.

1.12. These provisions are also at the basis of the principle of mutual recognition as defined by the Court of Justice of the European Union (CJEU). According to this principle, Member States cannot prohibit the sale on their territory of goods which are lawfully marketed in another Member State, even where those goods have been produced in accordance with different technical rules. This principle is however not absolute. Member States may indeed restrict the marketing of goods that have been lawfully marketed in another Member State, where such restrictions are justified on the grounds set out in Article 36 TFEU or on the basis of other overriding reasons of public interest, recognised by the case-law of the CJEU, and where those restrictions are proportionate to the aim pursued.

1.13. In recent years, the EU has also adopted a wide array of instruments in relation to health, safety, energy and the environment. These measures are not limited to certain sectors but have an impact on the entire industrial landscape. For instance, the ambition of the EU in driving environmental policy and climate action

has led to the adoption of various instruments on various matters, such as resource protection, water, pollution and biodiversity. The focus on measures to fight climate change is also reflected in the energy policy. Much of this affects PME and PME valuation. In particular, PME may in this context not only pose problems of energy consumption and inefficiency to be tackled but also offer solutions in terms of climate change mitigation and renewable energy.

1.14. **PME valuations and VAT** – PME valuations may also be impacted by the EU framework on VAT. Indeed, whereas Market Value represents the estimated value of PME and so excludes any taxation on the transaction, the VAT regime may affect some or all potential interested parties. As such, VAT is an integral part of the market and may thus, along with all other factors, influence value.

1.15. **Valuation services under EU legislation** – EU legislation not only affects PME and PME valuations, it also impacts the provision of valuation services as such.

1.16. For instance, the freedom of establishment (Articles 49 TFEU) and the freedom to provide services (Article 56 TFEU) preclude any national measure which, albeit applicable without discrimination on grounds of nationality, negatively affects the access to the market for service providers or undertakings from other Member States and thereby hinders trade within the EU. Accordingly, Member States cannot restrict the provision of valuation services on their territory. This also means that a valuer that is established and/or qualified in one Member State is in principle entitled to also provide valuation services in another Member State.

1.17. Valuers must of course also respect EU competition rules. In particular, Article 101 TFEU prohibits agreements between undertakings which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market. Typical examples of such agreements concern the fixing of prices or the partitioning of markets.

1.18. Another important field of law that directly impacts valuers is that of privacy and data protection. In this context, the Valuation Report must contain a statement of compliance with the General Data Protection Regulation (GDPR).

1.19. **Nature and impact of EU legislation** – EU legislation comes in many forms. The main legal instruments however are Regulations and Directives.

1.20. A Regulation is a binding legislative act. It must be applied in its entirety across the EU. Examples of Regulations that are relevant for PME valuation are the Capital Requirements Regulation 575/2013 and the Energy Governance Regulation 2018/1999 that are further discussed in the following sections.

1.21. Most of the EU legislation under review in the following sections has been made by Directives. A Directive is a legislative act that sets out a goal that all EU Member States must achieve. However, it is up to the individual Member States to devise their own laws on how to reach these goals. The effect of a Directive will, thus, depend on how it is drafted. For instance, the CJEU has ruled that where a Directive prescribes an outcome, such as a particular quality of bathing water, that outcome has to be achieved. In such a case, it is not sufficient to take all practical steps. Conversely, when a more general 'framework' Directive does not specify outcomes so precisely, the compliance with that Directive and its assessment may turn more on the approach the Member States have taken. In ***Marleasing*** (C-106/89), the CJEU has however underlined that national legislation must, as far as possible, be interpreted ***"in the light of the wording and the purpose of the directive in order to achieve the result pursued by the latter"***.

1.22. In view of these elements, much of this common framework is not directly evident to many who are active in their local marketplaces. However, although much EU legislation is applied through domestic measures, that does not detract from the EU's key role as the source of much that affects the valuation of PME.

1.23. This key role is also likely to increase given the vast amount of Proposals that are currently under debate and may become final law in the years to come. For instance, in the context of the European Green Deal, the European Commission has announced several legislative and policy actions which will have high impact for PME, such as a possible extension of the EU Emissions Trading System to buildings, a new EU Strategy on Adaptation to Climate Change or the introduction of an EU model for separate waste collection. Moreover, whereas these initiatives will only become binding once formally adopted, they should already be included in the context of PME valuation since future changes in legislation that favour specific markets and products may actually impact current Market Value.

1.24. **EU legislation and the EVS-PME** – There follows a brief description of the main policy areas and instruments that, directly or indirectly, have an impact on PME and/or PME valuation. Considering the broad range of EU legislation that has grown and seems likely to develop substantially, this text can of course not provide an exhaustive overview, but outlines the most significant areas.

2. PME Valuations Imposed by EU Legislation

2.1. General Overview

2.1.1. EU legislation may encompass specific provisions concerning PME valuation.

2.1.2. PME valuation is a component of EU rules on statutory needs or company accounts. Specific rules have also been developed for credit institutions, insurance institutions and investment funds. Likewise, independent expert valuations can be imposed for Transfer Pricing or State aid purposes.

2.2. PME Valuation for Statutory Needs under EU Company Law

2.2.1. **Limited liability companies** – The statutory requirements towards limited liability companies are set by Directive 2017/1132, which codifies and replaces a series of previous directives on certain aspects of European company law, such as: disclosure of information on companies in business registers, capital maintenance, divisions of companies, mergers within one country and cross-border mergers. This Directive has been amended by Directive 2019/2121 (laying down new rules on cross-border conversions and divisions and amending rules on cross border mergers) and by Directive 2019/1151 (covering the use of digital tools and processes in company law).

2.2.2. Title I of Directive 2017/1132 lays down a number of general provisions on the establishment and functioning of limited liability companies. This also includes a set of detailed rules on capital maintenance and alteration.

2.2.3. In particular, the Directive requires the issuance of a report by one or more experts on any consideration other than in cash before the company is incorporated or is authorised to commence business (Article 49).

2.2.4. Such reports require the involvement of ***"experts"*** defined as (Article 49(1)):

- Independent of the company;
- Appointed or approved by an administrative or judicial authority;
- Either natural persons or legal persons and companies and firms under the laws of each Member State.

2.2.5. The experts' report shall (Article 49(2) and (3)):

- Contain at least a description of each of the assets comprising the consideration as well as of the methods of valuation used;
- State whether the values arrived at by the application of those methods correspond at least to the number and nominal value or, where there is no nominal value, to the accountable part and, where appropriate, to the premium on the shares to be issued for them;
- Be published in the manner laid down by the laws of each Member State.

2.2.6. **European company (SE)** – The Council has adopted the two legislative instruments necessary for the establishment of a European company, namely Regulation 2157/2001 on the Statute for a European company and Directive 2001/86/EC supplementing the Statute with regard to the involvement of employees in the European company. This enables a company to be set up within the territory of the EU in the form of a public limited liability company, known by the Latin name "Societas Europaea" (SE).

2.2.7. Regulation 2157/2001 requires the opinion of an independent expert in following procedures of formation and winding up of an SE:

- To certify that the company has net assets at least equivalent to its capital plus those reserves which must not be distributed under the law or the Statutes in case of conversion of an existing public limited liability company into an SE (expert to be appointed by a judicial or administrative authority in the Member State to which the company being converted into an SE is subject) (Article 37(6));
- To certify that the company has assets at least equivalent to its capital in case an SE is going to be converted into a public limited liability company (expert to be appointed by a judicial or administrative authority in the Member State to which the SE being converted into a public limited liability company is subject) (Article 66(5)).

2.2.8. **European Cooperative Society (SCE)** – Regulation 1435/2003 on the Statute for a European Cooperative Society (SCE) puts in place a legal statute for the SCE. It enables a cooperative to be established by persons resident in different Member States or by legal entities established under the laws of different Member States. These SCEs can operate throughout the Union with a single legal personality, set of rules and structure.

2.2.9. The law applicable to public limited liability companies in the Member State where the SCE has its registered office, concerning the appointment of experts and

the valuation of any consideration other than cash (such as PME), shall apply by analogy to the SCE (Article 4(6)).

2.2.10. Article 23 of the Regulation moreover provides that a detailed written report explaining and justifying the terms of the merger, from a legal and economic point of view, shall also indicate any special valuation difficulties.

Legislation

Council Regulation (EC) No 2157/2001 of 8 October 2001 on the Statute for a European company (SE)

Council Directive 2001/86/EC of 8 October 2001 supplementing the Statute for a European company with regard to the involvement of employees

Council Regulation (EC) No 1435/2003 of 22 July 2003 on the Statute for a European Cooperative Society (SCE)

Directive (EU) 2017/1132 of the European Parliament and of the Council of 14 June 2017 relating to certain aspects of company law

Directive (EU) 2019/1151 of the European Parliament and of the Council of 20 June 2019 amending Directive (EU) 2017/1132 as regards the use of digital tools and processes in company law

Directive (EU) 2019/2121 of the European Parliament and of the Council of 27 November 2019 amending Directive (EU) 2017/1132 as regards cross-border conversions, mergers and divisions

2.3. PME Valuation for Company Accounts

2.3.1. **Statutory audits and auditors** – Companies have to prepare financial statements and provide a true and fair view of their financial position. The EU has introduced rules to ensure consistent and comparable financial reporting.

2.3.2. Directive 2014/56/EU amending Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts sets out the framework for statutory audits and the audit profession. A statutory audit is a legally required review of financial records. Statutory audits may only be carried out by statutory auditors or audit firms approved by the Member States' competent authorities. Member States must keep a public register of these. Statutory auditors and audit firms should be independent when carrying out statutory audits and avoid conflict of interests. Adequate internal organisation of statutory auditors and audit firms should help to prevent any threats to their independence.

2.3.3. **Listed companies** – Regulations 1606/2002 and 1126/2008 provide that, with a view to harmonising the financial information and ensuring a high degree of transparency and comparability of financial statements, consolidated accounts of listed companies must be prepared in conformity with international accounting standards (IAS). In particular, IAS 16 outlines the accounting treatment for most types of property, plant and equipment (except where other standards require different accounting treatments). The main issues of IAS 16 are the recognition of assets, the determination of their carrying amounts and the recognition of depreciation charges and impairment losses. IAS also include the International Financial Reporting Standards (IFRS) which provide standards on fair value measurement (IFRS 13).

2.3.4. Regulation 537/2014 indicates specific requirements for statutory audits of listed companies with a view to ensuring that the audits of those entities are of adequate quality and are carried out by statutory auditors and audit firms subject to stringent requirements (enhancing the integrity, independence, objectivity, responsibility, transparency and reliability of statutory auditors and audit firms carrying out statutory audits of public interest entities).

2.3.5. The European Commission has also issued a Recommendation on external quality assurance for statutory auditors and audit firms auditing public interest entities with a view to providing guidance to quality assurance systems for statutory auditors and audit firms performing audits in such entities.

2.3.6. **Limited liability companies** – In the Accounting Directive 2013/34/EU, the European Commission introduced new requirements for the annual financial statements of limited liability companies. This Directive ensures the clarity and comparability of financial statements and allows for exemptions or simplifications in financial reporting obligations for micro-undertakings and SMEs. The Accounting Directive has been modified by Directive 2021/2101.

2.3.7. The main requirements are the following:

- To ensure the disclosure of comparable and equivalent information, recognition and measurement principles should include the going concern, the prudence, and the accrual bases (Recital 16);
- The principle of materiality should govern recognition, measurement, presentation, disclosure and consolidation in financial statements (Recital 17);
- Items recognised in annual financial statements should be measured on the basis of the principle of purchase price or production cost (Recital 18);

- As systems of fair value accounting provide information that can be of more relevance to the users of financial statements than purchase price or production cost-based information, Member States should be allowed to permit or require fair value accounting for assets other than financial instruments (Recital 19);
- Estimates should be based on a prudent judgement of the management of the undertaking and calculated on an objective basis, supplemented by experience of similar transactions and, in some cases, reports from independent experts (Recital 22).

2.3.8. According to Article 6(1)(i) of the Accounting Directive, items recognised in the financial statements (including tangible assets such as PME) should, as a general rule, be measured in accordance with the principle of purchase price or production cost. However, Member States may permit or require the measurement of specified categories of assets (other than financial instruments) at amounts determined by reference to fair value (Article 8(1)(b)). Following Article 8(9) of the Directive, Member States may permit or require that where assets other than financial instruments are measured at fair value, a change in the value be included in the profit and loss account.

2.3.9. **Financial institutions and insurance undertakings** – Directive 2003/51/EC amended Directives 78/660/EEC, 83/349/EEC, 86/635/EEC and 91/674/EEC on the annual and consolidated accounts of certain types of companies, banks and other financial institutions and insurance undertakings. This Directive refers to the ***"fair value"*** as a general basis of valuation.

2.3.10. Directive 91/674/EEC as amended by Directive 2003/51/EC and Directive 2006/46/EC specifies that current value shall mean "Market Value" (Article 48(1)) in the case of investments other than land and buildings.

2.3.11. Regulation 537/2014 sets out specific requirements for statutory audits of banks and insurance undertakings with a view to ensuring that the audits of those entities are of adequate quality and are carried out by statutory auditors and audit firms subject to stringent requirements (enhancing the integrity, independence, objectivity, responsibility, transparency and reliability of statutory auditors and audit firms carrying out statutory audits of public interest entities).

Legislation

Council Directive 91/674/EEC of 19 December 1991 on the annual accounts and consolidated accounts of insurance undertakings

Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards

Directive 2003/51/EC of the European Parliament and of the Council of 18 June 2003 amending Directives 78/660/EEC, 83/349/EEC, 86/635/EEC and 91/674/EEC on the annual and consolidated accounts of certain types of companies, banks and other financial institutions and insurance undertakings

Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC

Commission Recommendation of 6 May 2008 on external quality assurance for statutory auditors and audit firms auditing public interest entities

Commission Regulation (EC) No 1126/2008 of 3 November 2008 adopting certain international accounting standards in accordance with Regulation (EC) No 1606/2002 of the European Parliament and of the Council

Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC

Regulation (EU) No 537/2014 of the European Parliament and of the Council of 16 April 2014 on specific requirements regarding statutory audit of public-interest entities and repealing Commission Decision 2005/909/EC

Directive 2014/56/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts

Directive (EU) 2021/2101 of the European Parliament and of the Council of 24 November 2021 amending Directive 2013/34/EU as regards disclosure of income tax information by certain undertakings and branches

2.4. PME Valuation for Credit Institutions

2.4.1. **Banking capital requirements and regulation** – The Basel Accords seek to impose a prudent framework and to set out a basis for calculating the amount of capital that a lending institution should hold against its liabilities. Those agreements were developed in response to the 2008 financial crisis. In order to calculate the capital that a credit institution is required to hold, the regulators apply a ratio to the value of the available assets depending on the class of the assets.

2.4.2. The EU has addressed this issue in successive legislation on capital requirements. In 2013, the Capital Requirements Directive (CRD) IV package entered into force, comprising Directive 2013/36/EU and Regulation 575/2013. This package provides a regulatory framework for credit institutions and their operation. For instance, Article 229(3) of the Capital Requirements Regulation 575/203 explains that physical collateral other than immovable property (e.g. PME) must be valued at ***"Market Value"***, i.e. ***"the estimated amount for which the property would exchange on the date of valuation between a willing buyer and a willing seller in an arm's-length transaction"***.

2.4.3. On 27 October 2021, the European Commission adopted a review Proposal of the CRD IV package in order to ensure that banks become more resilient to potential future economic shocks. The Proposal aims to strengthen resilience to economic shocks, to contribute to the green transition by requiring banks to assess environmental, social and governance risks and to ensure sound management of banks and better protection of financial stability. The Proposal is currently being discussed by the Council.

2.4.4. The Proposal for a Regulation amending Regulation 575/2013 inserts a provision on ***"specialised lending exposures"*** specifying a series of risk weights where the purpose of a specialised lending exposure is to finance the acquisition of physical assets, including ships, aircraft, satellites, railcars, and fleets, and the income to be generated by those assets comes in the form of cash flows generated by the specific physical assets that have been financed and pledged or assigned to the lender by one or several third parties (object finance exposures) or a project for the development or acquisition of large, complex and expensive installations, including power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure, and the income to be generated by the project is the money generated by the contracts for the output of the installation obtained from one or several parties which are not under management control of the sponsor (project finance exposures).

2.4.5. Specifically as regards PME valuation, Article 318(3)(a) of the same Proposal indicates that the costs of general maintenance of contracts on property, plant or equipment shall be excluded from the gross loss computation.

2.4.6. The provisions for the regulation of banking, including those concerning the Basel requirements, are further developed and standardised by the European Banking Authority (EBA) in the Single Rulebook. This document provides a set of harmonised prudential rules which institutions throughout the EU must respect. The EBA is also mandated to produce a number of Binding Technical Standards (BTS) for the implementation of the CRD IV package which, once adopted by the European Commission, are legally binding and directly applicable as national law in Member States (unless otherwise agreed). Furthermore, the EBA is coordinating a Q&A process in which it answers questions on the practical application or implementation of the CRD IV package and on other legislation falling within the EBA's remit.

2.4.7. Further guidance on the valuation of immovable and movable property is provided in Section 7 of the EBA guidelines of 29 May 2020 on loan origination and monitoring. These guidelines apply to any valuation, monitoring and revaluation of immovable property and movable property collateral conducted after 30 June 2021.

2.4.8. As one of the reactions to the 2008 financial crisis, banks have had to screen the quality of their assets. In June 2018, the ECB updated its manual for Asset Quality Review which contains the methodology for assessing the valuations of bank assets from a prudential perspective. As regards the valuation of real estate, this manual reconfirms the leading role of the European Valuation Standards: ***"Real estate should be valued in line with European Standards EVS-2012 (Blue Book) and other international standards such as the Royal Institute of Chartered Surveyors (RICS) guidelines, with EVS-2012 taking precedence in the event of any conflict (for the avoidance of doubt, this should be considered to apply throughout the document)."***

Legislation

Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012

Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC

ECB Manual of June 2018 for Asset Quality Review

EBA Guidelines of 29 may 2020 on loan origination and monitoring

Proposal of 27 October 2021 for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 as regards requirements for credit risk, credit valuation adjustment risk, operational risk, market risk and the output floor

EBA Single Rulebook

2.5. PME Valuation for Insurance and Reinsurance Institutions

2.5.1. **Solvency II and Omnibus II** – The insurance and reinsurance sector is now governed by the Solvency II regime established by the Solvency II Directive 2009/138/EC. This framework Directive requires the Solvency Capital Requirement of each insurance and reinsurance institution to be calculated at least once a year. It also provides specific rules for the valuation of assets and liabilities, including technical provisions for the business of (re)insurance.

2.5.2. According to Article 75(1) of the Solvency II Directive, Member States must ensure that, unless otherwise stated, insurance and reinsurance institutions value their assets ***"at the amount for which they could be exchanged between knowledgeable willing parties in an arm's length transaction"***.

2.5.3. Recital 46 of the Directive states that ***"valuation standards for supervisory purposes should be compatible with international accounting developments, to the extent possible, to limit the administrative burden [...]"***.

2.5.4. The Omnibus II Directive 2014/51/EU and Solvency II Delegated Regulation 2015/35 amended the Solvency II regime in a number of ways. For instance, Article 9(3) of Regulation 2015/35 provides that, where necessary, Article 75 of the Solvency II Directive prevails over international accounting standards. In addition, Article 2 of the Regulation provides that valuations ***"shall be based on the expertise of persons with relevant knowledge, experience and understanding of the risks inherent in the insurance or reinsurance business"*** and that valuers have to provide certain qualification proofs.

2.5.5. The key assumptions underlying the valuation of assets and liabilities of insurance and reinsurance undertakings, as well as approaches to be applied for different classes of assets and liabilities are explained in Chapter II of Regulation 2015/35, stating that insurance and reinsurance undertakings:

- Shall value assets and liabilities based on the assumption that the undertaking will pursue its business as a going concern;

- Shall value assets and liabilities in accordance with international accounting standards;
- Shall value individual assets and individual liabilities separately;
- Shall take into account the characteristics of the asset or liability where market participants would take those characteristics into account when pricing the asset or liability at the valuation date, including the condition and location of the asset or liability and restrictions, if any, on the sale or use of the asset;
- As the default valuation method, shall value assets and liabilities using quoted market prices in active markets for the same assets or liabilities;
- Where the use of quoted market prices in active markets for the same assets or liabilities is not possible, shall value assets and liabilities using quoted market prices in active markets for similar assets and liabilities with adjustments to reflect differences;
- Use of quoted market prices shall be based on the criteria for active markets, as defined in international accounting standards;
- When using alternative valuation methods, as little as possible rely on undertaking-specific inputs and make maximum use of relevant market inputs.

2.5.6. **EIOPA Guidelines** – Article 2(22) of the Omnibus II Directive provides that the European Insurance and Occupational Pensions Authority (EIOPA) can lay down technical standards on matters such as valuation. On 14 September 2015, the EIOPA issued Guidelines on recognition and valuation of assets and liabilities other than technical provisions intending to facilitate convergence of professional practice across Member States and to support undertakings in recognising and valuing assets and liabilities. Guideline 3 regarding investment property and other properties provides that *"[f]or the purposes of Article 10 of Delegated Regulation (EU) 2015/35 when valuing investment property and other properties, undertakings should select the method in accordance with Article 10(7) thereof that provides the most representative estimate of the amount for which the assets could be exchanged between knowledgeable willing parties in an arm's length transaction. In accordance with Article 10(6) of that regulation these methods should be based on the following: a) current prices in an active market for properties of a different nature, condition or location, or subject to different lease or other contractual terms, adjusted to reflect those differences; b) recent prices of similar properties on less active markets, with adjustments to reflect any changes in economic conditions since the date of the transactions that occurred at those prices; c) discounted cash flow projections based on reliable estimates of future cash flows, supported by the terms of any existing lease and other contracts and, when possible, by external evidence such as current Market Rents for similar properties in the same location and condition and using discount rates that reflect current market assessments of the uncertainty in the amount and timing of the cash flows."*

Legislation

Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)

Directive 2014/51/EU of the European Parliament and of the Council of 16 April 2014 amending Directives 2003/71/EC and 2009/138/EC and Regulations (EC) No 1060/2009, (EU) No 1094/2010 and (EU) No 1095/2010 in respect of the powers of the European Supervisory Authority (European Insurance and Occupational Pensions Authority) and the European Supervisory Authority (European Securities and Markets Authority)

Commission Delegated Regulation (EU) 2015/35 of 10 October 2014 supplementing Directive 2009/138/EC of the European Parliament and of the Council on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)

EIOPA Guidelines of 14 September 2015 on recognition and valuation of assets and liabilities other than technical provisions (EIOPA-BoS-15/113)

2.6. PME Valuation for Investment Funds

2.6.1. **General** – Investment funds are financial products collecting investors' money, and investing the pooled capital through a portfolio of financial instruments. The most common investment funds in Europe are undertakings for collective investment in transferable securities (UCITS) which are sold to retail investors. They are regulated by UCITS Directive 2009/65/EC as amended by Directive 2014/91/EU. Funds that are not regulated at EU level by the UCITS Directive, including real estate funds, hedge funds and private equity funds, are alternative investment funds. They are designed for professional investors and are regulated by AIFM Directive 2011/61/EU.

2.6.2. **Valuation for UCITS** – The rules for the valuation of assets and for the calculation of the sale or issue price and the repurchase or redemption price of the units of a UCITS shall be laid down in the national law, in the fund rules or in the instruments of incorporation of the investment company (Article 85 of the UCITS Directive). In case of merger of UCITS, a depositary or an independent auditor approved in accordance with Directive 2006/43/EC should draw up a report on behalf of all the UCITS involved (Article 42 of the UCITS Directive). This report should validate the criteria adopted for valuation of the assets and, where applicable, the liabilities, the calculation method of the exchange ratio set out in the common draft terms of merger as well as the actual exchange ratio and, where applicable, the cash payment per unit.

2.6.3. **Valuation for alternative investment funds** – Supplemented by the Commission Delegated Regulation 231/2013, the AIFM Directive lays down rules for the valuation of assets and the calculation of the net asset value per unit or share of alternative investment funds:

- The process for valuation of assets and calculation of the net asset value should be functionally independent from the portfolio management and the remuneration policy of the AIFM and other measures should ensure the prevention of conflicts of interest and of undue influence on the employees (Recital 29);
- The valuation procedures shall ensure that the assets are valued and the net asset value per unit or share is calculated at least once a year (Article 19(3));
- Subject to certain conditions and qualifications, AIFMs should be able to appoint an external valuer to perform the valuation function (Article 19(5)).

2.6.4. On 25 November 2021, the European Commission published a Proposal for a new AIFM Directive introducing important changes such as additional reporting requirements, an increased role for European Securities and Markets Authority (ESMA) in oversight of delegation activities, new liquidity management tools for open-ended funds and modifications to fees disclosure.

2.6.5. **Report of the European Court of Auditors** – Pursuant to Article 287(4), second subparagraph, TFEU, the European Court of Auditors (ECA) published, on 21 February 2022, a Report on EU actions regarding regulation of investment funds. The ECA concluded that the EU has not achieved the desired outcomes of a single market for investment funds since the consistency and effectiveness of fund supervision and investor protection is insufficient. The ECA recommended therefore an update of the legal framework, more effective convergence work, better investor protection and a streamlined reporting framework. The Report also noted that ***"a significant minority of NCAs, including those of some of the main UCITS domiciles, were of the opinion that retail investors in UCITS funds are still not sufficiently protected against the risks of [...] incorrect valuation of assets (26%)"***.

Legislation

Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC

Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS)

Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010

Commission Delegated Regulation (EU) No 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision

Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions

Proposal of 25 November 2021 for a Directive of the European Parliament and of the Council amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds

ECA Special report 04/2022 of 21 February 2022 on Investment funds

2.7. PME Valuation for Transfer Pricing

2.7.1. **General** – In a world of increasingly integrated national economies, rapidly progressing technology and growing transportation and communication, the role of Multinational Enterprises (MNEs) has become ever more important.

2.7.2. As a result of this trend, intra-group transactions have multiplied which, in turn, have brought attention to the prices charged for 'controlled' transactions between various parts of the same corporate group. These transfer prices are not inherently market prices that apply in 'uncontrolled' transactions between unrelated parties. As a matter of fact, since MNEs obviously have a financial incentive to allocate as little profit as possible to jurisdictions where those profits are subject to higher taxation, this could lead to artificial transfer prices which should not be accepted as a basis for calculating taxable income.

2.7.3. The European Commission defines transfer pricing as ***"the terms and conditions surrounding transactions within a multi-national company. It concerns the prices charged between associated enterprises established in different countries for their inter-company transactions, i.e. transfer of goods and services"***. These prices do not reflect an independent market price as they are set by non-independent

associates withing an MNE. Transfer pricing became a major tax compliance issue as it raises the worry that MNEs may set transfer prices to reduce taxable profits in their jurisdiction.

2.7.4. **OECD Guidelines** – Transfer pricing legislation in the EU is not harmonised. The current situation as regards application of the transfer pricing rules is such that all Member States have adopted or are following the non-binding Transfer Pricing Guidelines of the Organisation for Economic Co-operation and Development (OECD). Those Guidelines were updated in January 2022.

2.7.5. In its decision of 21 October 2010 on State aid SA.38374 implemented by the Netherlands, the European Commission extensively referred to the OECD Guidelines because it believes ***"those guidelines are an existing manual in the area of transfer pricing that are the result of expert discussions in the context of the OECD and elaborate on techniques aimed to address common challenges of the application of the arm's length principle to concrete situations"***. This has been confirmed by the General Court in ***Netherlands v Commission*** (T-760/15 and T-636/16), finding that the Guidelines ***"reflect the international consensus achieved with regard to transfer pricing"***.

Legislation

OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations of 20 January 2022

2.8. PME Valuation for State Aid Rules

2.8.1. **General** – With the promotion of the internal market, the EU has sought to regulate the extent to which public authorities can use subsidies as a protectionist tool, distorting the free operation of that market. The State aid rules have been a major part of this policy, providing a legal framework in which actions in Member States can be regulated, approved or forbidden.

2.8.2. In this context, Article 107(1) TFEU provides the following:

"Save as otherwise provided in the Treaties, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market".

2.8.3. Accordingly, the TFEU sets out four cumulative conditions for a measure to be qualified as State aid. In particular, the measure must (i) give an economic advantage, (ii) be financed by the State or through State resources, (iii) selectively favor certain undertakings or the production of certain goods and (iv) distort competition and affect trade between Member States.

2.8.4. In 2016 the European Commission issued the Notice on the notion of State aid that gives general guidance on all aspects of the definition of State aid.

2.8.5. **Valuation and the existence of State aid** – Economic transactions carried out by public bodies do not confer an advantage, and therefore do not constitute State aid, if they are carried out in line with normal market conditions. To assess whether a range of economic transactions carried out by public bodies takes place under normal market conditions, the European Commission and the CJEU developed the market economy operator (MEO) test. The purpose of this test is to assess whether the public bodies acted as a market operator would have done in a similar situation. If this is not the case, the beneficiary undertaking has received an economic advantage which it would not have obtained under normal market conditions, placing it in a more favourable position compared to that of its competitors.

2.8.6. **Valuation and the compatibility of State aid** – In some cases, the valuation of assets may also be important in order to declare State aid compatible with the internal market. For instance, reference can be made to the Communication on the treatment of impaired assets in the Community banking sector that sets out criteria for the compatibility of asset relief measures. In this context, the European Commission points out that a correct and consistent approach to the valuation of eligible assets is important to prevent undue distortions of competition and to avoid subsidy races between Member States. In addition, it is underlined that the valuation must be based on internationally recognised standards and benchmarks and that, when assessing the valuation methods put forward by Member States, the European Commission will consult panels of valuation experts.

Legislation

Article 107(1) of the Treaty on the Functioning of the European Union

Communication from the Commission of 26 March 2009 on the treatment of impaired assets in the Community banking sector

Commission Notice of 19 July 2016 on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union

3. EU Legislation as Part of the PME Valuation Matrix

3.1. General Overview

3.1.1. To determine the value of PME, the valuer must have due regard to the use of PME that is physically possible, reasonably probable, legal or likely to become so. Accordingly, legislation is part of the PME valuation matrix.

3.1.2. In recent years, the EU has adopted a wide array of instruments in relation to health and safety, climate, environment and energy. These measures are not limited to certain sectors but have an impact on the entire industrial landscape. Much of this affects PME and PME valuation. PME may in this context not only pose problems linked to energy consumption and inefficiency, but also offer solutions in terms of climate change mitigation.

3.2. Health and Safety

3.2.1. General

3.2.1.1. EU legislation on health and safety can impose large costs on PME owners which may have an important impact on PME valuation.

3.2.1.2. For a valuer, it is therefore of crucial importance to have at least a basic understanding of the applicable EU health and safety legislation and to understand its potential impact in any particular situation.

3.2.2. General Product Safety Directive 2001/95/EC

3.2.2.1. **Objective** – The General Product Safety Directive 2001/95/EC establishes a general safety requirement for any product placed on the market, or otherwise supplied or made available to consumers, intended for consumers, or likely to be used by consumers under reasonably foreseeable conditions even if not intended for them. The purpose of this Directive is to ensure that products placed on the market are safe.

3.2.2.2. **Scope of application** – The Directive applies to ***"any product - including in the context of providing a service - which is intended for consumers or likely, under reasonably foreseeable conditions, to be used by consumers even if not intended for them, and is supplied or made available, whether for consideration or not, in the course of a commercial activity, and whether new, used or reconditioned"*** (Article 2(a)). However, each of its provisions

only applies ***"in so far as there are no specific provisions with the same objective in rules of Community law governing the safety of the products concerned"*** (Article 1).

3.2.2.3. General safety requirement – A product shall be deemed safe, as far as the aspects covered by the relevant national legislation are concerned, when, in the absence of specific Community provisions governing the safety of the product in question, it conforms to the specific rules of national law of the Member State in whose territory the product is marketed and laying down the health and safety requirements which the product must satisfy in order to be marketed (Article 3(2)).

3.2.2.4. Revision – On 30 June 2021, the European Commission adopted a Proposal for a Regulation on General Product Safety. This Proposal seeks to address the challenges of product safety of emerging technologies, including use of artificial intelligence and connected devices, and to establish clear obligations for online marketplaces. In addition, the proposed revision of the General Product Safety Directive also focuses on ensuring a better enforcement of the framework and improving the recall of dangerous products in the hands of consumers.

Legislation

Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety

Proposal of 30 June 2021 for a Regulation of the European Parliament and of the Council on general product safety, amending Regulation (EU) No 1025/2012 of the European Parliament and of the Council, and repealing Council Directive 87/357/EEC and Directive 2001/95/EC of the European Parliament and of the Council

3.2.3. Machinery Directive 2006/42/EC

3.2.3.1. **Objective** – One of the main pieces of legislation governing the harmonisation of essential health and safety requirements for machinery at EU level is the Machinery Directive 2006/42/EC. It was amended by Directive 2009/127/EC with regard to machinery for pesticide application and by Regulation (EU) No 167/2013 on the approval and market surveillance of agricultural and forestry vehicles. The Directive lays down health and safety requirements in relation to design and manufacture in order to improve the safety of machinery placed on the market and therefore guarantee a high level of protection for EU workers and citizens.

3.2.3.2. **Scope of application** – The Machinery Directive only applies to the products listed in Article 1(1)(a) to (f) that are to be placed on the EU market for the first time. Article 1(2) of the Directive provides a list of products that are excluded from its scope of application, such as safety components, motor vehicles and electrical and electronic products. Machinery is broadly defined by Article 2(a) of the Directive.

3.2.3.3. **Essential health and safety requirements** – The Machinery Directive promotes harmonisation through a combination of mandatory health and safety requirements and voluntary harmonised standards identified in its Annex I. For instance, point 1.1.2.(a) of Annex I states that machinery must be designed and constructed so that it is fitted for its function, and can be operated, adjusted and maintained without putting persons at risk when these operations are carried out under the conditions foreseen but also taking into account any reasonably foreseeable misuse thereof.

3.2.3.4. **Information and warnings on the machinery** – The Machinery Directive also provides that information and warnings on the machinery should preferably be provided in the form of readily understandable symbols or pictograms. In this context, it is explained that all machinery must be marked visibly, legibly and indelibly with the following particulars:

- The business name and full address of the manufacturer and, where applicable, his authorised representative;
- Designation of the machinery;
- The CE Marking;
- Designation of series or type;
- Serial number, if any;
- The year of construction, that is the year in which the manufacturing process is completed.

3.2.3.5. **Revision** – The Machinery Directive is currently under review. The evaluation of the Directive showed that ***"it is relatively flexible to technological developments in the digital era [...] but that some of its provisions require better legal clarity and improved coherence with other legislation"***. On 21 April 2021, the European Commission therefore adopted a Proposal for a Regulation on machinery products in order to modernise the framework. The Proposal seeks namely to clarify the respective obligations of the manufacturers, importers and distributors.

Legislation

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC

Directive 2009/127/EC of the European Parliament and of the Council of 21 October 2009 amending Directive 2006/42/EC with regard to machinery for pesticide application

Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles

Proposal of 21 April 2021 for a Regulation of the European Parliament and of the Council on machinery products

3.2.4. Specific Sectoral EU Legislation

3.2.4.1. **Lifts** – The Lifts Directive 2014/33/EU permits the free circulation of lifts and safety components for lifts within the internal EU market and ensures a high level of safety for lift users and maintenance staff.

3.2.4.2. This harmonised EU legislation governs the design, manufacture, and installation of lifts. It applies to most goods and passenger lifts but some products are not covered (e.g. construction site hoists, escalators and mechanical walkways where the Machinery Directive applies and cableways installations where the Cableways Regulation applies). It is mainly relevant for lift installers and components manufacturers but also has important implications for the owners and users of lifts.

3.2.4.3. Annex I of the Lifts Directive indicates that ***"where the relevant risk exists and is not dealt with in this Annex, the essential health and safety requirements of Annex I to Directive 2006/42/EC of the [Machinery Directive] apply. The essential health and safety requirements of point 1.1.2 of Annex I to [the Machinery Directive] apply in any event"***.

3.2.4.4. The European standardisation organisations have produced harmonised standards for the Lifts Directive. A reference to those standards is enclosed in the Commission Implementing Decision (EU) 2021/76.

3.2.4.5. **Cableway installations** – The Cableways Regulation (EU) 2016/424 applies to cableway installations designed to transport persons used in particular in high-altitude tourist resorts, in urban transport facilities or in sports facilities. It allows for the free movement of safety components and subsys-

tems of cableway installations in the EU internal market while maintaining a uniform and high level of safety. Safety is of prime importance and has to be guaranteed in all operating conditions.

3.2.4.6. The European standardisation organisations have produced harmonised standards for the Cableways Regulation. A reference to those standards is enclosed in the Commission Implementing Decision (EU) 2019/1923.

3.2.4.7. **Medical devices** – Regulation 2017/745 on medical devices aims to ensure the smooth functioning of the internal market as regards medical devices, taking as a base a high level of protection of health for patients and users, and taking into account the small- and medium-sized enterprises that are active in this sector. At the same time, this Regulation sets high standards of quality and safety for medical devices in order to meet common safety concerns as regards such products.

3.2.4.8. This Regulation lays down rules concerning the placing on the market, making available on the market or putting into service of medical devices for human use and accessories for such devices in the Union. In this context, it is provided that a device must meet the general safety and performance requirements set out in Annex I of the Regulation.

3.2.4.9. In addition, it should be underlined that Article 1(12) of the Regulation provides that ***"devices that are also machinery within the meaning of point (a) of the second paragraph of Article 2 of [the Machinery Directive] shall, where a hazard relevant under that Directive exists, also meet the essential health and safety requirements set out in Annex I to that Directive to the extent to which those requirements are more specific than the general safety and performance requirements set out in Chapter II of Annex I to this Regulation"***.

3.2.4.10. The European standardisation organisations have produced harmonised standards for Regulation 2017/745. A reference to those standards is enclosed in the Commission Implementing Decision (EU) 2021/1182.

3.2.4.11. During the pandemic of COVID-19, the European Commission issued a Recommendation (EU) 2020/403 which helped increase the availability of medical devices in the short term, benefiting healthcare workers and other first-line responders. In 2021, the European Commission adopted a Recommendation (EU) 2021/1433 on conformity assessment and market surveillance procedures in order to avoid the risk of creating distortions in the supply of essential medical devices.

3.2.4.12. **Personal protective equipment (PPE)** – Regulation 2016/425/EU lays down requirements for the design and manufacture of PPE which is to be made available on the market, in order to ensure protection of the health and safety of users and establish rules on the free movement of PPE. Article 3(1)(a) of the Regulation defines PPE as ***"equipment designed and manufactured to be worn or held by a person for protection against one or more risks to that person's health or safety"***.

3.2.4.13. **Equipment for use in explosive atmosphere (ATEX)** – The ATEX Directive 2014/34/EU covers equipment and protective systems intended for use in potentially explosive atmospheres. Equipment may be electrical and/or mechanical. The Directive defines the essential health and safety requirements and conformity assessment procedures to be applied before products are placed on the market. It may apply in addition to other directives such as the Low Voltage and Machinery Directives. European harmonised standards for Directive 2014/34/EU are produced by the European standardisation organisations.

3.2.4.14. **Electrical and electronic equipment** – The Low Voltage Directive 2014/35/EU applies to a wide range of electrical equipment for both consumer and professional usage, designed for use with a voltage rating of between 50 and 1000 volts for alternating current and between 75 and 1500 volts for direct current. It ensures that health and safety requirements are the same for products placed on the EU market.

3.2.4.15. The Electromagnetic Compatibility (EMC) Directive 2014/30/EU ensures that electrical and electronic equipment does not generate, or is not affected by, electromagnetic disturbance. The main objectives of the Directive are to regulate the compatibility of equipment regarding EMC:

- Equipment (apparatus and fixed installations) needs to comply with EMC requirements when it is placed on the market and/or taken into service (Article 4 of the EMC Directive);
- Application of good engineering practice is required for fixed installations, with the possibility that competent authorities of EU countries may impose measures in instances of non-compliance (Article 19 of the EMC Directive).

3.2.4.16. Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment aims to contribute to the protection of human health and the environment by laying rules on the restriction of the use of hazardous substances in electrical and electronic equipment. The legislation requires certain hazardous substances to be

substituted by safer alternatives. In March 2020, the European Commission adopted, under the European Green Deal, a Communication announcing that it will present a Circular Electronics Initiative which will include the review of the rules on restrictions of hazardous substances in electrical and electronic equipment.

3.2.4.17. **Radio equipment** – The Radio Equipment Directive 2014/53/EU establishes a regulatory framework for placing radio equipment on the market. It ensures a single market for radio equipment by setting essential requirements for safety and health, electromagnetic compatibility, and the efficient use of the radio spectrum. It also provides the basis for further regulation governing some additional aspects. These include technical features for the protection of privacy, personal data and against fraud. Furthermore, additional aspects cover interoperability, access to emergency services and compliance regarding the combination of radio equipment and software.

3.2.4.18. **Pressure equipment and vessels** – Directives 2014/68/EU and 2014/29/EU regulate stationary pressure equipment and simple pressure vessels. In particular, the Directives apply to the design, manufacture and conformity assessment of stationary pressure equipment and simple pressure vessels aiming to guarantee free movement of these products while ensuring a high level of safety.

3.2.4.19. **Motor vehicles, trailers, systems and components** – The General Safety Regulation 2019/2144/EU sets mandatory motor vehicle safety features in order to ensure the safety of vehicle occupants and vulnerable road users. In this context, the Regulation establishes requirements for the type-approval of vehicles, and of systems, components and separate technical units designed and constructed for vehicles, with regard to their general characteristics and safety.

3.2.4.20. **Registration, evaluation, authorization and restriction of chemicals (REACH)** – The REACH Regulation 1907/2006 aims ***"to ensure a high level of protection of human health and the environment, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the internal market while enhancing competitiveness and innovation"*** (Article 1).

3.2.4.21. It places responsibility on industry to manage the risks from chemicals and to provide safety information on the substances. In particular, manufacturers and importers are required to gather information on the properties of their chemical substances, which will allow their safe handling, and to

register the information in a central database in the European Chemicals Agency (ECHA) (Articles 5 and following).

3.2.4.22. The Regulation also calls for the progressive substitution of the most dangerous chemicals, the so-called ***"substances of very high concern"***, when suitable alternatives have been identified (Article 55).

3.2.4.23. REACH impacts a wide range of companies across many sectors, even those who may not think of themselves as being involved with chemicals. Most companies use chemicals, sometimes even without realising it, therefore companies need to check their obligations if they handle any chemicals in their professional activity. Companies, even simple users, might have some responsibilities under REACH.

Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Directive 2014/29/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of simple pressure vessels

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

Directive 2014/33/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to lifts and safety components for lifts

Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres

Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC

Directive 2014/68/EU of the European Parliament and of the Council of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment

Regulation (EU) 2016/424 of the European Parliament and of the Council of 9 March 2016 on cableway installations and repealing Directive 2000/9/EC

Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC

Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC

Commission Implementing Decision (EU) 2019/1923 of 18 November 2019 on the harmonised standards for cableway installations drafted in support of Regulation (EU) 2016/424 of the European Parliament and of the Council

Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No 78/2009, (EC) No 79/2009 and (EC) No 661/2009 of the European Parliament and of the Council and Commission Regulations (EC) No 631/2009, (EU) No 406/2010, (EU) No 672/2010, (EU) No 1003/2010, (EU) No 1005/2010, (EU) No 1008/2010, (EU) No 1009/2010, (EU) No 19/2011, (EU) No 109/2011, (EU) No 458/2011, (EU) No 65/2012, (EU) No 130/2012, (EU) No 347/2012, (EU) No 351/2012, (EU) No 1230/2012 and (EU) 2015/166

Commission Recommendation (EU) 2020/403 of 13 March 2020 on conformity assessment and market surveillance procedures within the context of the COVID-19 threat

Commission Implementing Decision (EU) 2021/76 of 26 January 2021 on harmonised standards for lifts and safety components for lifts drafted in support of Directive 2014/33/EU of the European Parliament and of the Council

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 11 March 2020, A new Circular Economy Action Plan for a cleaner and more competitive Europe, COM/2020/98

Commission Implementing Decision (EU) 2021/1182 of 16 July 2021 on the harmonised standards for medical devices drafted in support of Regulation (EU) 2017/745 of the European Parliament and of the Council

Commission Recommendation (EU) 2021/1433 of 1 September 2021 on conformity assessment and market surveillance procedures within the context of the COVID-19 threat

3.2.5. Control of Hazards Involving Dangerous Substances

3.2.5.1. The Seveso III Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances lays down several rules on land-use planning in the vicinity of sites of hazardous activity.

3.2.5.2. The Directive is applicable to all locations where dangerous substances are present in one or more installations (Articles 2(1) and 3(1)). The dangerous substances are listed in Annex I of the Directive and include, amongst others, flammable and explosive substances, petroleum products, alternative fuels and ammonium nitrate.

3.2.5.3. Pursuant to Article 13 of this Directive, Member States are required to adopt land-use policies and/or other relevant policies which include the objectives of preventing major accidents and limiting the consequences of such accidents for human health and the environment. These policies must take account of the need (i) to maintain appropriate safety distances between locations where dangerous substances are present and residential areas, buildings and areas of public use, recreational areas, and, as far as possible, major transport routes and (ii) to protect areas of particular natural sensitivity or interests in the vicinity of these hazardous locations. Moreover, Member States must carry out controls on new developments in the vicinity of existing hazardous locations and on the siting of new hazardous locations.

3.2.5.4. It is obvious that these policies and controls may restrict the use of major industrial sites and can thus affect the value of their PME. They may also require valuations for compensation or mitigation.

Legislation

Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC

3.2.6. EU Legislation Enforcement and Standards

3.2.6.1. **Market surveillance and compliance of products** – Regulation 2019/1020/EU aims to improve the functioning of the internal market by strengthening the market surveillance of products covered by the Union harmonisation legislation, with a view to ensuring that only compliant products that fulfil requirements providing a high level of protection of public interests, such as health and safety in general, health and safety in the workplace, the protection of consumers, the protection of the environment and public security and any other public interests protected by that legislation, are made available on the Union market.

3.2.6.2. **European harmonized standards** – Regulation (EU) No 1025/2012 on European standardisation provides a legal basis to use European standards for products and services, identify ICT technical specifications, and finance the European standardisation process. It also sets transparency requirements for the European standardisation organisations and the national standardisation bodies.

Legislation

Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation, amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council

Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011

3.3. Climate and Environment

3.3.1. General

3.3.1.1. **Valuation and environmental regulation** – Environmental EU regulation can impose large costs on PME owners, making it important to understand the potential for its impact in any particular situation and its consequence for PME valuations. The valuation of PME is closely linked to the compliance with EU environmental rules and standards.

3.3.1.2. **Growth of EU environmental legislation** – The EU has over the past decades put in place a broad range of environmental legislation. At first, this was driven by concerns to ensure a safe environment, stimulated by incidents such as the exposure in 1976 of the population of Seveso and neighbouring settlements near Milan to dioxins following an incident at a chemical manufacturing plant. Nowadays, EU environmental policy is mainly extending on the basis that many issues see both causes and effects extending beyond the reach of individual countries.

3.3.1.3. **Environment in the TFEU** - The EU's role in environmental policy is now also confirmed in Article 191(2) TFEU stating that **"Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay"**.

3.3.1.4. In addition, Article 11 TFEU states that **"environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development"**. The effect is that environmental protection is now an integral part of the framework of EU legislation and that, alongside the precautionary and the polluter pays principles, sustainable development has been affirmed as a core principle.

3.3.1.5. However, it should be noted that environmental protection is not (yet) considered to be an overriding objective. Indeed, the CJEU explained in ***Austria v Commission*** (T-356/15) that ***"although protection of the environment must be integrated into the definition and implementation of EU policies, particularly those which have the aim of establishing the internal market, it does not constitute, per se, one of the components of that internal market, defined as an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured"***. Accordingly,

the CJEU found that State aid for the promotion of nuclear energy cannot be called into question by its possible effects on the implementation of the principle of protection of the environment, the precautionary principle and the polluter pays principle.

3.3.1.6. **Environment Action Programme (EAP)** – The EU not only agrees specific legislation but also frames general environmental policies. In 2022 the European Parliament and the Council adopted the eighth Environment Action Programme (EAP) that sets the principles guiding EU environment policy until 2030. The EAP sets out six priority objectives for 2030 and the conditions needed to achieve these:

- Achieving the 2030 greenhouse gas emission reduction target and climate neutrality by 2050;
- Enhancing adaptive capacity strengthening resilience and reducing vulnerability to climate change;
- Advancing towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy;
- Pursuing a zero-pollution ambition, including for air, water and soil and protecting the health and well-being of Europeans;
- Protecting, preserving and restoring biodiversity, and enhancing natural capital;
- Reducing environmental and climate pressures related to production and consumption (particularly in the areas of energy, industry, buildings and infrastructure, mobility, tourism, international trade and the food system).

3.3.1.7. **European Green Deal** – The European Green Deal of December 2019 outlines several initiatives relating to the EU's environmental policies. In particular, the Green Deal announces several legislative and policy actions which will have high impact on PME, such as:

- A possible extension of the EU Emissions Trading System to new sectors (see the Proposal for a Directive amending Directive 2003/87/EC introducing a separate emissions trading system to cover emissions from fuels used in road transport);
- A new EU Strategy on Adaptation to Climate Change;
- A EU model for separate waste collection;
- A circular economy action plan.

3.3.1.8. **Fit for 55** – As part of the European Green Deal, the European Commission also adopted a package of legislative Proposals named "Fit for 55". This package aims to strengthen the EU's position as a global climate leader by making the EU's climate, energy, land use, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. According to the European Commission, this package aims to fundamentally transform our economy and society for a fair, green and prosperous future.

3.3.2. Environmental Assessments

3.3.2.1. **EU spatial planning** – In general, the EU has intervened relatively little in spatial planning policy. The most far-reaching intervention in spatial planning is through Directives 2011/92/EU and 2001/42/EC requiring environmental assessments prior to obtaining authorisation for carrying out certain environmental developments. The aim of these Directives is to integrate environmental considerations into the preparation of projects, plans and programmes to reduce their environmental impact.

3.3.2.2. **Environmental impact assessments (EIA) for projects** – The Environmental Impact Assessment Directive 2011/92/EU provides that projects which are likely to have effects on the environment must in principal be made subject to a development consent and an EAI prior to that consent. In general, the projects concerned relate to interventions in the natural surroundings and landscape which, by virtue of their nature, size or location, are likely to have significant effects on the environment.

3.3.2.3. Annex I of the Directive contains a list of projects which must always be subject to consent and a prior EIA whereas Annex II concerns a list of projects for which Member States must decide on a case-by-case basis whether they must be made subject thereto based on the effects they might have on the environment (Articles 2(1) and 4(1) and (2)). When Member States carry out a case-by-case examination, they should take into account the criteria set out in Annex III of the Directive (Article 4(3)).

3.3.2.4. In order to carry out an EIA, the developer must provide information on the environmental impact of the project for which it requests an authorisation (Article 5). Subsequently, the developer must inform and consult the competent authorities and the public (Articles 6 and 7). The competent authority decides whether it grants authorisation for the project taking into consideration the results of the EIA and the consultations, and communicates its decision to the public (Articles 8 and 9). This decision can be challenged by the public (Article 11).

3.3.2.5. Projects that are subject to an EIA may not be developed without prior EIA. If a project has nevertheless been developed, the lack of an EIA cannot be remedied with a retrospective authorisation and Member States must revoke or suspend consent already granted (***Inter-Environnement Wallonie*** (C-41/11)). It is however possible to regularise projects developed without an EIA by conducting a new EIA if the following conditions are fulfilled (Comune di Castelbellino (C-117/17)):

- The regularisation does not provide the parties concerned with an opportunity to circumvent EU law or to dispense with applying it;
- The EIA is not conducted solely in respect of the project's future environmental impact, but also takes into account its environmental impact from the time of its completion.

3.3.2.6. Environmental assessments (EA) for plans and programmes – Directive 2001/42/EC introduces the obligation of conducting an EA with respect to plans and programmes which are likely to have significant environmental effects. According to the case-law of the CJEU, plans and programmes may relate to ***"any measure which establishes a significant body of criteria and detailed rules for the grant and implementation of one or more projects"*** (see, for instance, ***Associazione Verdi Ambiente e Società - Aps Onlus*** (C-305/18) and Thybaut (C-160/17)).

3.3.2.7. Pursuant to Article 2(a) of the Directive, an EA must be prepared if the plans and programmes in question satisfy two conditions:

- They are subject to preparation and/or adoption by an authority, or are prepared by an authority for adoption through a legislative procedure;
- They are required by legislative, regulatory or administrative provisions.

3.3.2.8. The plans and programmes concerned include those which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use and which set the framework for future development consent of projects listed in Annexes I and II of Directive 2011/92/EU (Article 3(2)(a)). An EA is also mandatory for plans and programmes which are subject to an assessment pursuant to Articles 6 and 7 of the Habitats Directive 92/43/EEC (Article 3(2)(b)). In addition, Member States must decide on a case-by-case basis whether an EA should also be carried out for other plans or programmes which are likely to have significant environmental effects (Article 3(4)).

Legislation

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment

3.3.3. Water

3.3.3.1. **Water Framework Directive** – The Water Framework Directive 2000/60/EC establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which (i) prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems, (ii) promotes sustainable water use based on a long-term protection of available water resources and (iii) aims at enhanced protection and improvement of the aquatic environment (Article 1).

3.3.3.2. This Directive requires Member States to identify the individual river basins on their territory, which are in fact the areas covering one or more river catchments (Article 3). For each river basin district, Member States must establish a ***"river basin management plan"*** entailing a detailed account of how the objectives set forth in the Directive will be attained (Articles 4, 11 and 13). These objectives and the accompanying measures differ depending on whether the water constitutes surface water or ground water (Article 4). In addition, the Directive provides additional objectives for ***"protected areas"*** designated by the Member States, such as bathing areas and areas with water used for the abstraction of drinking water (Articles 4, 6, 7 and 11 and Annex IV).

3.3.3.3. The Water Framework Directive is supplemented with several Directives aiming at preventing or reducing water pollution, each covering a specific topic. For instance, Directive 2006/118 tackles the pollution of groundwater, whereas Directives 98/83/EC and 2020/2184 provide measures for the protection of drinking water. The discharge of urban waste water and industrial waste water is regulated by Directive 91/271/EEC. Directive 91/676/EEC aims at preventing and reducing water pollution arising from nitrates

from agricultural sources and, in this context, obliges Member States to designate ***"nitrate vulnerable zones"*** within which certain agricultural practices are to be imposed and certain waters are to be monitored. Finally, Directive 2008/105/EC imposes standards for surface water and requires Member States to set up an inventory of emissions, discharges and losses of all substances listed in that Directive.

3.3.3.4. **Floods Directive** – The Floods Directive 2007/60/EC establishes a framework for the assessment and management of flood risks.

3.3.3.5. On the basis of this Directive, Member States are obliged to carry out an assessment for each river basin, prepare flood hazard maps and flood risk maps and set out flood management plans. Flood hazard maps not only have to indicate where floods are probable but also whether they are a low, medium or high probability (Article 6(3)). For each scenario, the flood extent, the water depths or water level and the flow velocity or the relevant water flow should be mentioned (Article 6(4)). Flood risk maps have to mention the indicative number of inhabitants and the type of economic activity of the area potentially affected (Article 6(5)).

3.3.3.6. The identification of a site as prone to flooding will have important consequences for its PME valuation, and this due to both the practical fact of any actual flooding and the impact of that identification on the availability or cost of insurance. In some cases, the value of PME can also be impacted by flood control measures that require certain land to be flooded to protect other property by managing water flow.

3.3.3.7. **European Green Deal** – The protection of the environment, the seas and the oceans is a priority of the Green Deal, as they are a source of natural and economic wealth for Europe.

3.3.3.8. In order to pursue this preservation, the EU is committed to:

- Protect the biodiversity and ecosystems;
- Reduce air, water and soil pollution;
- Move towards a circular economy;
- Improve waste management;
- Ensure the sustainability of the blue economy and fisheries sectors.

3.3.3.9. As part of the European Green Deal, the European Commission adopted in 2021 the EU Action Plan "Towards Zero Pollution for Air, Water and Soil". This plan ties together all relevant EU policies to tackle and prevent pollution and foresees reviews of relevant EU legislation to identify remaining

gaps in EU legislation. Key 2030 targets are therefore set to reduce pollution at source, such as improving water quality by reducing waste, plastic litter at sea and microplastics released into the environment. In addition, the plan details a range of actions, namely:

- Reviewing the standards for the quality of water, including in EU rivers and seas;
- Reviewing the majority of EU waste laws to adapt them to the clean and circular economy principles;
- Fostering zero pollution from production and consumption.

Legislation

Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment

Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources

Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration

Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks

Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/ EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption

Communication of 12 May 2021 from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil", COM/2021/400

3.3.4. Pollution

3.3.4.1. **EU Clean Air Policy** – As part of its Clean Air Policy, the EU has adopted several Directives protecting air quality, especially by preventing and limiting air pollution from various classes of industrial and other plants (see Directives 2015/2193, 2010/75/EU, 2009/126/EC, 2008/50/EC, 2004/107/EC and 94/63/EC). These Directives set maximum or target values for the emission of certain pollutant substances and require the Member States to carry out controls on the air pollution.

3.3.4.2. The main instrument regulating pollutant emissions from industrial installations is the Industrial Emissions Directive 2010/75/EU. It lays down the obligation to require a permit for operating certain industrial activities giving rise to pollution above a certain threshold and the conditions under which such permits may be granted. Pursuant to this Directive, the Commission also adopts references for national authorities to set permit conditions. For instance, Commission Implementing Decision (EU) 2017/1442 provides the reference for setting permit conditions for large combustion plants.

3.3.4.3. As part of the Green Deal, the European Commission announced a revision of the Industrial Emissions Directive in order to reach the EU's zero pollution ambition. In the EU Action Plan "Towards Zero Pollution for Air, Water and Soil" the European Commission sets the objective to improve air quality to reduce the number of premature deaths caused by air pollution by 55% and to reduce by 25% the EU ecosystems where air pollution threatens biodiversity. In addition, the plan details a range of actions, such as aligning the air quality standards more closely to the latest recommendations of the World Health Organisation.

3.3.4.4. On 5 April 2022, the European Commission adopted a Proposal for a Directive amending the Industrial Emissions Directive with, amongst others, the aim to:

- Extend the Directive's coverage to include other activities such as mining, large-scale battery production and cattle farming;
- Strengthen the requirements attached to permit conditions;

- Tighten the rules applying to breaches;
- Create an innovation centre for industrial transformation and emissions (INCITE), which would collect and analyse information on innovative techniques;
- Impose on operators of installations covered by the Industrial Emissions Directive the obligation to include transformation plans in their environmental management systems by 30 June 2030. This transformation plan shall contain information on how the installation will transform itself during the 2030-2050 period in order to contribute to the emergence of a sustainable, clean, circular and climate neutral economy by 2050.

3.3.4.5. **Road transport** – Regulations 2019/631 and 2019/1242 set CO_2 emission performance standards for newly registered cars and light commercial vehicles and newly registered heavy-duty vehicles.

3.3.4.6. In line with the Green Deal and the "Fit for 55" package, the European Commission has adopted a Proposal modifying Regulation 2019/631 by setting new CO_2 emissions targets for cars and light commercial vehicles in order to contribute to achieving climate neutrality by 2050.

3.3.4.7. **Shipping and aviation** – International shipping and aviation are a large and growing source of greenhouse gas emissions. On 14 July 2021, the European Commission adopted a Proposal for a Directive aiming to revise the EU emissions trading system aviation rules.

3.3.4.8. The Proposal for an Alternative Fuels Infrastructure Regulation requires that ships and aircraft have access to clean electricity supply in major ports and airports. The ReFuelEU Aviation Initiative will oblige fuel suppliers to blend increasing levels of sustainable aviation fuels in jet fuel taken on-board at EU airports. Similarly, the FuelEU Maritime Initiative will stimulate the uptake of sustainable maritime fuels and zero-emission technologies by setting a maximum limit on the greenhouse gas content of energy used by ships calling at European ports.

3.3.4.9. **Non-road mobile machinery emissions** – Regulation (EU) 2016/1628 on requirements for gaseous and particulate pollutant emission limits for internal combustion engines defines pollutant emission limits for a wide variety of machinery, used off the road, of different power ranges and applications, with the aim of gradually reducing emissions and phasing out equipment with the most polluting engines. It applies to:

- Small gardening and handheld equipment (lawn mowers, chainsaws, etc.);
- Construction machinery (excavators, loaders, bulldozers, etc.);
- Agricultural and farming machinery (harvesters, cultivators, etc.);
- Railcars, locomotives and inland waterway vessels.

3.3.4.10. Regulation (EU) 2020/1040 was adopted to prolong certain transitional provisions of Regulation 2016/1628 in order to address the impact of the COVID-19 crisis on non-road mobile machinery manufacturers.

3.3.4.11. **Noise emission by outdoor equipment** – The European Commission has identified noise as one of the most pressing problems in urban areas across Europe and stressed the need to take action on various sources of noise, as part of its environmental action plan in 1993. The subsequent 'future noise policy' sets out steps for the development of a directive to specifically regulate noise created by outdoor equipment.

3.3.4.12. The Outdoor Noise Directive (OND) 2000/14/EC regulates the noise emissions into the environment by outdoor equipment. It names some 57 types of equipment. The main type is outdoor machinery, such as equipment used on construction sites or in parks and gardens.

Legislation

European Parliament and Council Directive 94/63/EC of 20 December 1994 on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations

Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors

Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air

Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Directive 2009/126/EC of the European Parliament and of the Council of 21 October 2009 on Stage II petrol vapour recovery during refuelling of motor vehicles at service stations

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants

Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, amending Regulations (EU) No 1024/2012 and (EU) No 167/2013, and amending and repealing Directive 97/68/EC

Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants

Regulation (EU) 2019/631 of the European Parliament and of the Council of 17 April 2019 setting CO_2 emission performance standards for new passenger cars and for new light commercial vehicles, and repealing Regulations (EC) No 443/2009 and (EU) No 510/2011

Regulation (EU) 2019/1242 of the European Parliament and of the Council of 20 June 2019 setting CO_2 emission performance standards for new heavy-duty vehicles and amending Regulations (EC) No 595/2009 and (EU) 2018/956 of the European Parliament and of the Council and Council Directive 96/53/EC

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Regulation (EU) 2020/1040 of the European Parliament and of the Council of 15 July 2020 amending Regulation (EU) 2016/1628 as regards its transitional provisions in order to address the impact of the COVID-19 crisis

Communication of 12 May 2021 from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil", COM/2021/400

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2019/631 as regards strengthening the CO_2 emission performance standards for new passenger cars and new light commercial vehicles in line with the Union's increased climate ambition, COM/2021/556

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC as regards aviation's contribution to the Union's economy-wide emission reduction target and appropriately implementing a global market-based measure, COM/2021/552

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council, COM/2021/559

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council on ensuring a level playing field for sustainable air transport, COM/2021/561

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC, COM/2021/562

Proposal of 5 April 2022 for a Directive of the European Parliament and of the Council amending Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) and Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste, COM/2022/156

3.3.5. Liability for Environmental Damage and Waste

3.3.5.1. **Environmental Liability Directive** – The Environmental Liability Directive 2004/35/EC lays down a framework for environmental liability based on the polluter pays principle. The basic rule is that operators of certain activities causing damage to the environment must take the necessary preventive or remedial action and bear all the related costs.

3.3.5.2. Article 2(1) of the Environmental Liability Directive Directive provides a broad definition of ***"environmental damage"***. Apart from ***"damage to protected species and natural habitats"*** and ***"water damage"***, it also includes ***"land damage"*** which is defined as ***"any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms"***.

3.3.5.3. The Directive distinguishes two situations where the liability regime applies. First, a person may be held liable for environmental damage caused by any of the activities listed in Annex III of the Directive and for any imminent threat of such damage (Article 3(1)(a)). These activities include, amongst others, waste management activities, the discharge of pollutants into the air, inland surface water and groundwater, any deliberate release

into the environment of genetically modified organisms, water abstraction and impoundment of water and several activities with respect to dangerous substances or goods. Second, the liability regime applies to damage to protected species and natural habitats, or its imminent threat, caused by any activities outside Annex III, provided the operator is negligent or at fault (Article 3(1)(b)).

3.3.5.4. In March 2021, the European Commission adopted Guidelines that further clarify the scope of the notion ***"environmental damage"***. Following an evaluation carried out by the European Commission in 2016, it has been found that the Directive's implementation was hampered by significant lack of uniform application of its concepts, in particular related to environmental damage. The Guidelines indicate that environmental damage needs to be understood ***"in relation to those who may be legally liable for it under the Directive, the circumstances in which and the conditions under which their liability may arise, and the kinds of action that liability will require them to take"*** (point 10), meaning the operators in respect of the occupational activities coming within the scope of the Directive, mainly described in Annex III of the Directive. The liability of operators covered by Annex III is strict, since no fault is required. Only a causal link is sufficient in order for an operator to be held liable.

3.3.5.5. The European Commission announced, in the EU Action plan "Towards Zero Pollution for Air, Water and Soil", its will to ensure a stricter implementation and enforcement of EU pollution-prevention laws by, amongst other, evaluating the Environmental Liability Directive.

3.3.5.6. **Waste Framework Directive** – The Waste Framework Directive 2008/98/EC establishes a legal framework to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste. In particular, the Directive lays down a set of detailed measures for the prevention, recovery and disposal of waste without endangering human health and without using processes or methods which would harm the environment.

3.3.5.7. ***"Waste"*** is defined by the Directive as ***"any substance or object which the holder discards or intends or is required to discard"*** (Article 3(1)).

3.3.5.8. Article 8 of the Directive provides that Member States may take legislative or non-legislative measures to ensure that any person who professionally develops, manufactures, processes, treats, sells or imports products has extended producer responsibility. The ***"extended producer responsibility scheme"*** is defined by Article 3(21) as ***"a set of measures taken by Member States to ensure that producers of products bear financial responsibility or***

financial and organisational responsibility for the management of the waste stage of a product's life cycle".

3.3.5.9. Moreover, Article 29 of the Directive provides that Member States shall establish waste prevention programmes setting out prevention measures applicable to businesses. The aim of such measures is to break the link between economic growth and the environmental impacts associated with the generation of waste. Annex IV of the Directive lists a number of measures that can affect (i) the framework conditions related to the generation of waste, (ii) the design, production and distribution phase of a product and (iii) the consumption and use phase.

3.3.5.10. The European Green Deal includes a commitment to adopt ***"new legislation, including targets and measures for tackling over-packaging and waste generation"***. As part of the Green Deal, the EU Action Plan "Towards Zero Pollution for Air, Water and Soil" ties together all relevant EU policies to tackle and prevent pollution and foresees reviews of relevant EU legislation to identify remaining gaps in EU legislation. Key 2030 targets are therefore set to reduce pollution at source, such as significantly reducing waste generation and residual municipal waste. The plan details a range of actions, namely reviewing the majority of EU waste laws to adapt them to the clean and circular economy principles.

3.3.5.11. **Waste from Electrical and Electronic Equipment (WEEE)** – The WEEE Directive 2012/19/EU aims to contribute to protecting the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste from electrical and electronic equipment. In particular, Article 4 of the Directive requires Member States to encourage cooperation between producers and recyclers and measures to promote the design and production of electrical and electronic equipment, notably in view of facilitating re-use, dismantling and recovery of WEEE, its components and materials.

Legislation

Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Commission Notice Guidelines of 7 April 2021 providing a common understanding of the term 'environmental damage' as defined in Article 2 of Directive 2004/35/EC of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage, 2021/C 118/01

Communication of 12 May 2021 from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil", COM/2021/400

3.4. Energy

3.4.1. **General** – The EU energy policy framework has direct and indirect effects on the valuation of PME. It is therefore interesting for valuers to consider the commercial issues arising from this framework when appraising movable property. It should also be noted that PME may in this context not only pose problems of energy consumption and inefficiency to be tackled, but also offer solutions in terms of climate change mitigation and renewable energy.

3.4.2. **Energy policy framework** – In line with Article 194(1) TFEU, the EU policy on energy inter alia aims to promote energy efficiency and energy saving and the development of new and renewable forms of energy.

3.4.3. **Current EU targets** – The EU framework sets two main targets with regards to energy. First, pursuant to Article 3(1) of the Renewable Energy Directive 2018/2001, the share of energy from renewable sources in the Union's gross final consumption of energy in 2030 should be at least 32%. Second, Article 1(1) of the Energy Efficiency Directive 2018/2002 establishes a headline EU energy efficiency target for 2030 of at least 32.5% compared to projections.

3.4.4. **European Green Deal & review of the current EU targets** – The European Climate Law Regulation (EU) 2021/1119 enshrines carbon neutrality by 2050 and a new EU 2030 climate target of at least 55% reduction of greenhouse gas emissions compared to 1990.

3.4.5. As part of the European Green Deal, the European Commission has also adopted a package consisting of various legislative Proposals.

3.4.6. The "Fit for 55" legislative package includes, amongst others, a revision of the Renewable Energy Directive. This Proposal raises the target for the share of renewables in the EU energy mix to 40% by 2030. An important tool for meeting this target is increased electrification in the transport sector.

3.4.7. In parallel, the European Commission adopted a Proposal to update the Energy Efficiency Directive. The aim of the Proposal is to raise the target for reducing primary and final energy consumption by 2030. In this context, the European Commission underlines that ***"[w]hile the energy savings potential remains large in all sectors, there is a particular challenge related to transport, as it is responsible for 30% of final energy consumption [...] Another important sector to which increasing attention is being paid is the information and communications technology (ICT) sector, which is responsible for 5-9% of the world's total electricity use and more than 2% of all emissions"***. The Proposal strengthens the requirements for some businesses. For example, the largest energy using companies will need to implement energy management systems in the future. The European Commission explains that those companies are likely to be more effective at ensuring that more cost saving energy saving investments will be made while probably having a lower overall cost burden on the company.

3.4.8. **System for greenhouse gas emission allowance trading** – In order to meet the European Green Deal's ambitions, the European Commission proposed in July 2021 to amend the Emissions Trading System Directive 2003/87/EC in order to set the Directive coherently in line with the cost-effective emission reductions of buildings and road transport stemming from a combination of carbon pricing and strengthening the existing regulatory framework for these sectors.

3.4.9. **Social climate fund** – In July 2021, the European Commission published its Proposal for a Regulation establishing a Social Climate Fund, as part of the revision of the EU emissions trading system under the "Fit for 55" legislative package. This fund aims to address the social and distributional impact of the new emissions trading system for buildings and road transport and provide dedicated funding to Member States in order to help citizens finance investments in energy efficiency, heating and cooling systems and cleaner mobility. Over the period 2025 to 2032, it will allocate a total of € 72.2 billion.

3.4.10. **Ecodesign for energy related products** – The Ecodesign Directive 2009/125/EC establishes a framework for the setting of Community ecodesign requirements for energy-related products. An energy-related product is defined as any good that has an impact on energy consumption during use which is placed on the market and/or put into service. In March 2022, the European Commission published a Proposal for a Regulation establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC.

The European Commission has however indicated that, awaiting the adoption of this new Regulation, it will ensure that work under the existing Ecodesign Directive continues, including via adoption of a new Ecodesign and Energy Labelling Working Plan for the period 2022-2024, addressing new energy-related products and updating and increasing the ambition of those already regulated.

3.4.11. **The EU's long-term strategy** – On 28 November 2018, the European Commission published a European strategic long-term vision for a climate neutral economy. This Communication highlights the findings of the October 2018 Special Report on the impact of global warming of 1.5°C of the Intergovernmental Panel on Climate Change (IPCC) that disastrous and irreversible impacts will take place as soon as the planet warms by more than 1.5°C above pre-industrial levels and that the only way to stay below 1.5°C is for the world to be at net-zero CO_2 emissions by 2050.

3.4.12. According to the European Commission, the Union's current trajectory is not sufficient to reach this goal and to confirm the Union's global leadership in the transition towards a net-zero-greenhouse gas emissions economy.

3.4.13. The Communication identified seven **"main strategic building blocks"** to reach a net-zero greenhouse gas emissions economy by 2050. In particular, the European Commission underlines the importance of taking further action on (i) energy efficiency, (ii) the deployment of renewables and the use of electricity to fully decarbonise Europe's energy supply, (iii) clean mobility, (iv) the circular economy, (v) smart network infrastructure and inter-connections, (vi) bio-economy and forestation and (vii) carbon capture and storage.

3.4.14. **National energy and climate plans** – One of the key instruments for achieving the EU's energy targets is the Energy Governance Regulation 2018/1999, as amended by the European Climate Law Regulation (EU) 2021/1119. This Regulation organises a form of perpetual, rolling oversight by the European Commission of Member State progress on all fronts, via the obligation on Member States to produce integrated national energy and climate plans (NECPs), updates of these plans, progress reports on the plans and updates, and separate long-term strategies. The long-term strategies have to specifically cover national measures taken as part of:

- Energy efficiency
- Renewables
- Greenhouse gas emissions reductions
- Interconnections
- Research and innovation

3.4.15. Member States will need to update their NECPs by 30 June 2024 in a final form in order to reflect the EU's increased ambitions.

Legislation

Article 194(1) of the Treaty on the Functioning of the European Union

Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC

Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products

Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council

Communication of 28 November 2018 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, COM/2018/773

Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources

Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas

emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757, COM/2021/551

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, COM/2021/557

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council on energy efficiency (recast), COM/2021/558

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council establishing a Social Climate Fund, COM/2021/0206

Proposal of 30 March 2022 for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC, COM/2022/142

4. PME Valuation and Taxation

4.1. Value Added Tax (VAT)

4.1.1. General Overview

4.1.1.1. **VAT Directive** –The current EU legislation on VAT is laid down in the VAT Directive 2006/112/EC. The VAT Directive provides a common framework regarding the way VAT is to be applied in the Member States (Articles 31 to 92), the standard rates (Articles 93 to 129(a)) and the exemptions (Articles 131 to 166) and deductions (Articles 167 to 192).

4.1.1.2. **Taxable persons and transactions** – In principle, VAT is applied to all transactions carried out in the EU for consideration (payment) by a taxable person, i.e. any individual or body that supplies taxable goods and/or services in the course of business (Articles 12 and 13). Taxable transactions include supplies of goods or services within a Member State, intra-EU acquisitions of goods (goods supplied and dispatched or transported by a business in one Member State to a business in another) and imports of goods into the EU (Articles 14 to 30).

4.1.1.3. **Supply of goods** – The supply of goods is defined as the transfer of the right to dispose of tangible property as owner (Article 14).

4.1.1.4. **Reduced rates and exemptions** – Annex III of the VAT Directive provides a list of supplies of goods and services to which the reduced rates and the exemption with deductibility of VAT referred to in Article 98 of the Directive may be applied. The list includes the supply of goods and services of a kind normally intended for use in agricultural production but excluding capital goods such as machinery or buildings; and, until 1 January 2032, supply of chemical pesticides and chemical fertilisers.

4.1.1.5. **Interpretation of VAT rules and concepts** – The rules and notions in the Directive constitute independent concepts of EU law which are to be interpreted solely under EU law (see, for instance, ***Sequeira Mesquita*** (C-278/18)), unless when stipulated otherwise in the Directive. When it is unclear how certain VAT rules should be applied, national courts may refer questions to the CJEU for a preliminary ruling on how the rules should be applied. Exemptions provided for in the Directive must be interpreted strictly (see, for instance, ***Leichenich*** (C-532/11)).

4.1.1.6. **Impact on PME valuation** – VAT can be a significant factor in PME transactions. With the significant VAT rates applicable in many Member States, failing to recognise the impact of VAT could prejudice the PME valuation. This is especially the case in markets where some buyers are not able to fully recover the VAT. The valuer should therefore understand or, if necessary, seek instruction on the VAT status of the PME being valued. In particular, it will be important to know whether the PME is exempt or whether the exemption has been waived and, if it is subject to tax, what VAT rate applies to the PME transaction at issue.

4.1.2. The Supply of Land and Buildings

4.1.2.1. **New buildings and building land** – In line with Article 12(1) of the VAT Directive, the supply, before first occupation, of a building or parts of a building and of the land on which the building stands and the supply of building land are subject to VAT. Member States may apply criteria other than that of first occupation, such as the period elapsing between the date of completion of the building and the date of first supply, provided that this period does not exceed five years.

4.1.2.2. **Existing buildings and other types of land** – The supply of existing buildings or parts thereof, land on which a building stands and land which has not been built on is exempted from VAT (Article 135(1)(j) and (k)). However,

Member States may allow taxpayers to opt for VAT on these transactions (Article 137(1)(b) and (c)). If the taxpayer opts for this, VAT will be chargeable on the supply of property but the taxpayer can recover the VAT on its inputs. The CJEU clarified that, for the purposes of this VAT exemption waiver, buildings and the land on which they stand cannot be dissociated from each other (see ***Breitsohl*** (C-400/98)). Therefore, a taxable person who supplies both buildings and the land on which they stand may either use the VAT exemption for the buildings and the land taken as a whole, or opt for taxation of the whole.

4.1.2.3. **The notion of "land"** – VAT rules for the supply of land depend on the type of land supplied. It is therefore important to clarify the three types of "land" that the Directive distinguishes: building land, land on which a building stands and land which has not been built on. Building land is defined as ***"any unimproved or improved land defined as such by the Member States"*** (Article 12(3)). The Directive leaves it entirely to the Members States to determine what is meant by the land on which a building stands (Article 12(2)) and does not specify what is meant by land which has not been built on. However, the CJEU clarified that land which has not been built on but is intended to be built on should be considered as building land even if at the time of the transaction the works have not yet started (see, for instance, ***Woningstichting Maasdriel*** (C-543/11) and ***Don Bosco Onroerend Goed*** (C-461/08)).

4.1.2.4. **The notion of "building"** – A building is defined as ***"any structure fixed to or in the ground"*** (Article 12(2)).

4.1.2.5. **One single supply or multiple supplies** – Where the supply of immovable property is accompanied by the supply of services or movable property linked to the immovable property, one should verify whether these supplies should be assessed separately from the point of view of VAT. For VAT purposes, every supply must in principle be regarded as distinct and independent. However, if a transaction comprises several elements, the question arises whether it is to be regarded as one single supply or as several distinct and independent supplies which must be assessed separately.

4.1.2.6. According to settled case-law of the CJEU, a transaction entailing several supplies must be regarded as one single supply if the supplies (i) form a single, indivisible economic supply, which would be artificial to split or (ii) consist of one principal supply in relation to which the other supplies are ancillary, i.e. when these supplies do not constitute for customers an end but a means of better enjoying the principal supply.

4.1.2.7. Accordingly, where there is a single supply involving land on which a building stands and the supply of that land predominates, the whole transaction may be VAT exempt. Conversely, if the sale of land or buildings is ancillary to a taxable supply, it may be treated in accordance with the VAT status of that supply.

4.1.3. Leasing or Letting of Immovable Property

4.1.3.1. **VAT exemption** – As a general rule, the VAT Directive requires the Member States to exempt from VAT the leasing or letting of immovable property under conditions that they have to determine (Article 135(1)(l)). However, Member States may limit the scope of the exemption (Article 135(2)). For example, the CJEU confirmed that Member States may decide to make all leasing and letting of immovable property liable to VAT except for residential property (see ***Amengual Far*** (C-12/98)).

4.1.3.2. **Exception for the letting of permanently installed equipment and machinery** – The VAT Directive enshrines a number of exceptions to this general VAT exemption, including as regards ***"the letting of permanently installed equipment and machinery"*** (Article 135(2)(c)).

4.1.3.3. **One single supply or multiple supplies** – If a transaction comprises several elements, the question may arise whether it is to be regarded as one single supply or as several distinct and independent supplies. In this context, the CJEU ruled that the lease of a restaurant together with the equipment and kitchen appliances constitutes one single supply (***Mailat*** (C-17/18)). In the same vein, the CJEU decided that the transfer of the use of vineyards which also entailed the transfer of certain assets and intangible rights was to be considered as one single supply (***Sequeira Mesquita*** (C-278/18)). Conversely, the qualification of letting does not apply if the transaction essentially concerns the supply of services rather than simply making property available. In this respect, the CJEU observed that making available sport facilities such as a golf course or a football stadium generally entails not only the passive activity of making the course available but also a large number of commercial activities. In such cases, the use of the facilities will only qualify as a lease if it constitutes the main service supplied in the transaction (***Pula Parking*** (C-551/15) and ***Stockholm Lindöpark*** (C-150/99)).

Legislation

Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax

4.2. Green Taxation

4.2.1. **Taxation in support of green transition** – In order to reach the environmental policy goals imposed by the European Green Deal and to switch to cleaner energy, more sustainable industry and greener habits, the European Commission emphasises the importance of fostering Green Taxation. This means imposing taxes on energy, transport, pollution, resources, energy products, etc. In its Report "Taxation in support of green transition" published in 2020, the European Commission recommended taxing greenhouse gas directly, giving priority to taxes over tax incentives and reducing environmentally harmful subsidies and tax incentives.

4.2.2. Revision of the Energy Taxation Directive 2003/96/EC – The European Commission is undertaking a revision of the Energy Taxation Directive in order to align it with the EU's regulatory framework and policy objectives in the area of climate and energy. According to the European Commission, this revision is needed to ***"overhaul the way in which energy products are taxed in the EU and to make sure that it better reflects the EU's climate ambitions"***.

4.2.3. The Proposal aims to preserve the EU single market by updating the scope and the structure of tax rates, and rationalising the use of optional tax exemptions and reductions. It therefore focuses on two main areas:

- The introduction of a new structure of tax rates based on the energy content and environmental performance of fuels and electricity. Consequently, fossil fuels will be subject to higher minimum tax rates while renewable energies (such as biofuels, synthetic fuels, and hydrogen) will be subject to lower minimum tax rates;
- The broadening of the taxable base by including more products in the scope of the Directive and by removing some of the current national exemptions and rate reductions, with much less margin for Member States to set rates below the minima for specific sectors.

4.2.4. EU Emissions Trading Systems – The European Commission has also issued a Proposal for revising the EU Emissions Trading Systems which introduces emissions trading to the road transport and building sectors.

Legislation

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Taxation in support of green transition: an overview and assessment of existing tax practices to reduce greenhouse gas emissions, final report, 2021

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757

Proposal of 14 July 2021 for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast)

5. Schedule of EU legislation

5.1. PME Valuation for Statutory Needs under EU Company Law

Council Regulation (EC) No 2157/2001 of 8 October 2001 on the Statute for a European company (SE)

Council Directive 2001/86/EC of 8 October 2001 supplementing the Statute for a European company with regard to the involvement of employees

Council Regulation (EC) No 1435/2003 of 22 July 2003 on the Statute for a European Cooperative Society (SCE)

Directive (EU) 2017/1132 of the European Parliament and of the Council of 14 June 2017 relating to certain aspects of company law

Directive (EU) 2019/1151 of the European Parliament and of the Council of 20 June 2019 amending Directive (EU) 2017/1132 as regards the use of digital tools and processes in company law

Directive (EU) 2019/2121 of the European Parliament and of the Council of 27 November 2019 amending Directive (EU) 2017/1132 as regards cross-border conversions, mergers and divisions

5.2. PME Valuation for Company Accounts

Council Directive 91/674/EEC of 19 December 1991 on the annual accounts and consolidated accounts of insurance undertakings

Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards

Directive 2003/51/EC of the European Parliament and of the Council of 18 June 2003 amending Directives 78/660/EEC, 83/349/EEC, 86/635/EEC and 91/674/EEC on the annual and consolidated accounts of certain types of companies, banks and other financial institutions and insurance undertakings

Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC

Commission Recommendation of 6 May 2008 on external quality assurance for statutory auditors and audit firms auditing public interest entities

Commission Regulation (EC) No 1126/2008 of 3 November 2008 adopting certain international accounting standards in accordance with Regulation (EC) No 1606/2002 of the European Parliament and of the Council

Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC

Regulation (EU) No 537/2014 of the European Parliament and of the Council of 16 April 2014 on specific requirements regarding statutory audit of public-interest entities and repealing Commission Decision 2005/909/EC

Directive 2014/56/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2006/43/EC on statutory audits of annual accounts and consolidated accounts

Directive (EU) 2021/2101 of the European Parliament and of the Council of 24 November 2021 amending Directive 2013/34/EU as regards disclosure of income tax information by certain undertakings and branches

5.3. PME Valuation for Credit Institutions

Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012

Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC

ECB Manual of June 2018 for Asset Quality Review

EBA Guidelines of 29 may 2020 on loan origination and monitoring

Proposal of 27 October 2021 for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 as regards requirements for credit risk, credit valuation adjustment risk, operational risk, market risk and the output floor

EBA Single Rulebook

5.4. PME Valuation for Insurance and Reinsurance Institutions

Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)

Directive 2014/51/EU of the European Parliament and of the Council of 16 April 2014 amending Directives 2003/71/EC and 2009/138/EC and Regulations (EC) No 1060/2009, (EU) No 1094/2010 and (EU) No 1095/2010 in respect of the powers of the European Supervisory Authority (European Insurance and Occupational Pensions Authority) and the European Supervisory Authority (European Securities and Markets Authority)

Commission Delegated Regulation (EU) 2015/35 of 10 October 2014 supplementing Directive 2009/138/EC of the European Parliament and of the Council on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)

EIOPA Guidelines of 14 September 2015 on recognition and valuation of assets and liabilities other than technical provisions (EIOPA-BoS-15/113)

5.5. PME Valuation for Investment Funds

Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC

Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS)

Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010

Commission Delegated Regulation (EU) No 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision

Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions

Proposal of 25 November 2021 for a Directive of the European Parliament and of the Council amending Directives 2011/61/EU and 2009/65/EC as regards delegation arrangements, liquidity risk management, supervisory reporting, provision of depositary and custody services and loan origination by alternative investment funds

ECA Special report 04/2022 of 21 February 2022 on Investment funds

5.6. PME Valuation for Transfer Pricing

OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations of 20 January 2022

5.7. PME Valuation for State Aid Rules

Article 107(1) of the Treaty on the Functioning of the European Union

Communication from the Commission of 26 March 2009 on the treatment of impaired assets in the Community banking sector

Commission Notice of 19 July 2016 on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union

5.8. Health and Safety

Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and

Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Directive 2009/127/EC of the European Parliament and of the Council of 21 October 2009 amending Directive 2006/42/EC with regard to machinery for pesticide application

Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC

Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation, amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council

Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles

Directive 2014/29/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of simple pressure vessels

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

Directive 2014/33/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to lifts and safety components for lifts

Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres

Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC

Directive 2014/68/EU of the European Parliament and of the Council of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment

Regulation (EU) 2016/424 of the European Parliament and of the Council of 9 March 2016 on cableway installations and repealing Directive 2000/9/EC

Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC

Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC

Regulation (EU) 2019/1020 of the European Parliament and of the Council of 20 June 2019 on market surveillance and compliance of products and amending Directive 2004/42/EC and Regulations (EC) No 765/2008 and (EU) No 305/2011

Commission Implementing Decision (EU) 2019/1923 of 18 November 2019 on the harmonised standards for cableway installations drafted in support of Regulation (EU) 2016/424 of the European Parliament and of the Council

Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, amending Regulation (EU) 2018/858 of the European Parliament and of the Council and repealing Regulations (EC) No 78/2009, (EC) No 79/2009 and (EC) No 661/2009 of the European Parliament and of the Council and Commission Regulations (EC) No 631/2009, (EU) No 406/2010, (EU) No 672/2010, (EU) No 1003/2010, (EU) No 1005/2010, (EU) No 1008/2010, (EU) No 1009/2010, (EU) No 19/2011, (EU) No 109/2011, (EU) No 458/2011, (EU) No 65/2012, (EU) No 130/2012, (EU) No 347/2012, (EU) No 351/2012, (EU) No 1230/2012 and (EU) 2015/166

Commission Recommendation (EU) 2020/403 of 13 March 2020 on conformity assessment and market surveillance procedures within the context of the COVID-19 threat

Commission Implementing Decision (EU) 2021/76 of 26 January 2021 on harmonised standards for lifts and safety components for lifts drafted in support of Directive 2014/33/EU of the European Parliament and of the Council

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 11 March 2020, A new Circular Economy Action Plan for a cleaner and more competitive Europe, COM/2020/98

Proposal of 21 April 2021 for a Regulation of the European Parliament and of the Council on machinery products

Proposal of 30 June 2021 for a Regulation of the European Parliament and of the Council on general product safety, amending Regulation (EU) No 1025/2012 of the European Parliament and of the Council, and repealing Council Directive 87/357/EEC and Directive 2001/95/EC of the European Parliament and of the Council

Commission Implementing Decision (EU) 2021/1182 of 16 July 2021 on the harmonised standards for medical devices drafted in support of Regulation (EU) 2017/745 of the European Parliament and of the Council

Commission Recommendation (EU) 2021/1433 of 1 September 2021 on conformity assessment and market surveillance procedures within the context of the COVID-19 threat

5.9. Environmental Assessments

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment

5.10. Water

Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment

Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources

Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration

Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks

Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/ EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption

Communication of 12 May 2021 from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil", COM/2021/400

5.11. Pollution

European Parliament and Council Directive 94/63/EC of 20 December 1994 on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations

Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors

Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air

Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Directive 2009/126/EC of the European Parliament and of the Council of 21 October 2009 on Stage II petrol vapour recovery during refuelling of motor vehicles at service stations

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants

Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery, amending Regulations (EU) No 1024/2012 and (EU) No 167/2013, and amending and repealing Directive 97/68/EC

Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants

Regulation (EU) 2019/631 of the European Parliament and of the Council of 17 April 2019 setting CO_2 emission performance standards for new passenger cars and for new light commercial vehicles, and repealing Regulations (EC) No 443/2009 and (EU) No 510/2011

Regulation (EU) 2019/1242 of the European Parliament and of the Council of 20 June 2019 setting CO_2 emission performance standards for new heavy-duty vehicles and amending Regulations (EC) No 595/2009 and (EU) 2018/956 of the European Parliament and of the Council and Council Directive 96/53/EC

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Regulation (EU) 2020/1040 of the European Parliament and of the Council of 15 July 2020 amending Regulation (EU) 2016/1628 as regards its transitional provisions in order to address the impact of the COVID-19 crisis

Communication of 12 May 2021 from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil", COM/2021/400

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2019/631 as regards strengthening the CO_2 emission performance standards for new passenger cars and new light commercial vehicles in line with the Union's increased climate ambition, COM/2021/556

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC as regards aviation's contribution to the Union's economy-wide emission reduction target and appropriately implementing a global market-based measure, COM/2021/552

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council, COM/2021/559

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council on ensuring a level playing field for sustainable air transport, COM/2021/561

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC, COM/2021/562

Proposal of 5 April 2022 for a Directive of the European Parliament and of the Council amending Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) and Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste, COM/2022/156

5.12. Liability for Environmental Damage and Waste

Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Commission Notice Guidelines of 7 April 2021 providing a common understanding of the term 'environmental damage' as defined in Article 2 of Directive 2004/35/EC of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage, 2021/C 118/01

Communication of 12 May 2021 from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All, EU Action Plan: "Towards Zero Pollution for Air, Water and Soil", COM/2021/400

5.13. Energy

Article 194(1) of the Treaty on the Functioning of the European Union

Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC

Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products

Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council

Communication of 28 November 2018 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, COM/2018/773

Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources

Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757, COM/2021/551

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, COM/2021/557

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council on energy efficiency (recast), COM/2021/558

Proposal of 14 July 2021 for a Regulation of the European Parliament and of the Council establishing a Social Climate Fund, COM/2021/0206

Proposal of 30 March 2022 for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC, COM/2022/142

5.14. PME Valuation and Taxation

Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax

Communication of 11 December 2019 from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM/2019/640

Taxation in support of green transition: an overview and assessment of existing tax practices to reduce greenhouse gas emissions, final report, 2021

Proposal of 14 July 2021 for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757

Proposal of 14 July 2021 for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast)

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Denmark

DANSK EJENDOMSMAEGLERFORENING (DE)
Danish Association of Chartered Estate Agents

France

ASSOCIATION FRANÇAISE DES SOCIÉTÉS D'EXPERTISE IMMOBILIÈRE (AFREXIM)
French Association of Property Valuation Companies

CHAMBRE DES EXPERTS IMMOBILIERS DE FRANCE (CEIF-FNAIM)
Chamber of Real Estate Valuers of France

COMPAGNIE NATIONALE DES EXPERTS IMMOBILIERS (CNEI)
National Company of Real Estate Experts

CONFÉDÉRATION DES EXPERTS FONCIERS (CEF)
Confederation of Property Valuers

CONSEIL SUPÉRIEUR DU NOTARIAT (CSN)
High Council for the Notarial Profession

INSTITUT FRANÇAIS DE L'EXPERTISE IMMOBILIÈRE (IFEI)
French Institute of Real Estate Valuation

SYNDICAT NATIONAL DES PROFESSIONNELS IMMOBILIERS (SNPI)
National Association of Real Estate Professionals

UNION DES SYNDICATS DE L'IMMOBILIER (UNIS)
National Union of Property Professions

Georgia

საქართველოს დამოუკიდებელ შემფასებელთა საზოგადოება
INDEPENDENT VALUERS SOCIETY OF GEORGIA (IVSG)

Germany

BUND DER ÖFFENTLICH BESTELLTEN VERMESSUNGSINGENIEURE e.V. (BDVI)
German Association of Publicly Appointed Surveyors

BUNDESVERBAND ÖFFENTLICH BESTELLTER UND VEREIDIGTER SOWIE QUALIFIZIERTER SACHVERSTÄNDIGER (BVS)
Association of Publicly Certified and Qualified Experts

IMMOBILIENVERBAND DEUTSCHLAND IVD BUNDESVERBAND der IMMOBILIENBERATER, MAKLER, VERWALTER, und SACHVERSTÄNDIGEN e.V.
German Real Estate Professional Association

Greece

Σύλλογος Εκτιμητών Ελλάδος (ΣΕΚΕ)
ASSOCIATION OF GREEK VALUERS (AVAG)

PEOPLECERT HELLAS S.A.
Certification Body

Ireland

INSTITUTE OF PROFESSIONAL AUCTIONEERS & VALUERS (IPAV)

Italy

ASSOCIAZIONE SOCIETÀ DI VALUTAZIONI IMMOBILIARI (ASSOVIB)
Association of Property Valuation Companies

CONSIGLIO NAZIONALE GEOMETRI e GEOMETRI LAUREATI (CNGeGL)
National Council of Italian Surveyors

ISTITUTO di ESTIMO e VALUTAZIONE (IEV)
E-Valuations - Institute of Estimation and Valuation

ISTITUTO ITALIANO di VALUTAZIONE IMMOBILIARE (IsIVI)
Italian Institute for Real Estate Valuation

Kosovo

SHOQATES SE VLERESUESVE TE KOSOVES (SHVK)
Kosovo Appraisers Association (KAA)

Latvia

LATVIJAS IPASUMU VERTETAJU ASOCIACIJA (LIVA)
Latvian Association of Property Appraisers

Lithuania

LIETUVOS TURTO VERTINTOJU ASOCIACIJA (LTVA)
Lithuanian Association of Property Valuers

LIETUVOS VERTINTOJŲ RŪMAI (LVR)
Lithuanian Chamber of Appraisers

Mexico

FEDERACIÓN DE COLEGIOS DE VALUADORES (FECOVAL)
Federation of Appraisal Colleges of Mexico

Montenegro

INSTITUT OVLAŠĆENIH PROCJENJIVAČA CRNE GORE (IOPCG)
Institute of Certified Valuers of Montenegro

NACIONALNO UDRUŽENJE PROCJENITELJA CRNE GORE (NUPCG)
National Association of Valuers of Montenegro (NAVM)

UDRUŽENJE NEZAVISNIH PROCJENJIVAČA CRNE GORE (CUP)
Association of Independent Valuers of Montenegro

Netherlands

NEDERLANDS REGISTER VASTGOED TAXATEURS (NRVT)
Real Estate Valuers Register of the Netherlands

NEDERLANDSE COÖPERATIEVE VERENIGING VAN MAKELAARS EN TAXATEURS IN ONROERENDE GOEDEREN NVM U.A. (NVM)
Dutch Association of Real Estate Brokers and Valuers

Vastgoedpro
Association of Real Estate Agents and Valuers of the Netherlands

VBO
Dutch Association of Real Estate Agents and Valuers

WAARDERINGSKAMER
Netherlands Council for Real Estate Assessment

North Macedonia

ASOCIJACIJA NA NEZAVISNI PROCENUVACI
Association of Independent Valuers (AIV)

BIRO ZA SUDSKI VESTACENJA (BSV)
Bureau for Court Expertise

KOMORA NA PROCENUVACI NA REPUBLIKA SEVERNA MAKEDONIJA (KPRSM)
Chamber of Valuers of the Republic of North Macedonia

Norway

NORSK TAKST (NT)
Norwegian Surveyors and Valuers Association

Poland

POLSKA FEDERACJA STOWARZYSZEŃ RZECZOZNAWCÓW MAJĄTKOWYCH (PFSRM)
The Polish Federation of Valuers' Associations

Portugal

ASSOCIAÇÃO NACIONAL DE AVALIADORES IMOBILIÁRIOS (ANAI)
National Association of Real Estate Valuers

ASSOCIAÇÃO PROFISSIONAL DAS SOCIEDADES DE AVALIAÇÃO (ASAVAL)
Professional Association of Valuation Companies of Portugal

Romania

ASOCIATIA NAŢIONALĂ A EVALUATORILOR AUTORIZAŢI DIN ROMÂNIA (ANEVAR)
National Association of Authorised Romanian Valuers

Russian Federation

SUSPENDED

ПАРТНЕРСТВО РОССИЙСКОГО ОБЩЕСТВА ОЦЕНЩИКОВ (ПРОО)
Partnership of the Russian Society of Appraisers

РОССИЙСКАЯ КОЛЛЕГИЯ ОЦЕНЩИКОВ (РКО)
Russian Board of Appraisers

РОССИЙСКОЕ ОБЩЕСТВО ОЦЕНЩИКОВ (РОО)
Russian Society of Appraisers

Serbia

NACIONALNO UDRUZENJE PROCENITELJA SRBIJE (NUPS)
National Association of Valuers of Serbia

Slovenia

SLOVENSKI INSTITUT ZA REVIZIJO (SIR)
Slovenian Institute of Auditors

Spain

ASOCIACIÓN ESPAÑOLA DE VALORACIÓN INMOBILIARIA Y URBANÍSTICA (AEVIU)
Spanish Association of Real Estate and Urban Appraisal

CONSEJO GENERAL DE LA ARQUITECTURA TÉCNICA DE ESPAÑA (CGATE)
Spanish General Council of Technical Architecture

CONSEJO SUPERIOR DE COLEGIOS DE ARQUITECTOS DE ESPAÑA (CSCAE)
High Council of the Orders of Architects of Spain

Sweden

SAMHÄLLSBYGGARNA-SFF
The Swedish Professionals for the Built Environment

Turkey

TÜRKİYE DEĞERLEME UZMANLARI BİRLİĞİ (TDUB)
Turkish Appraisers Association

Ukraine

АСОЦІАЦІЯ СПЕЦІАЛІСТІВ БАНКІВСЬКОЇ ОЦІНКИ УКРАЇНИ (АСБОУ)
Ukrainian Association of Bank Valuation Specialists

УКРАЇНСЬКЕ ТОВАРИСТВО ОЦІНЮВАЧІВ (УТО)
Ukrainian Society of Appraisers

United Arab Emirates

دائرة الأراضي و الأملاك دبي
DUBAI LAND DEPARTMENT (DLD)

United Kingdom

CENTRAL ASSOCIATION OF AGRICULTURAL VALUERS (CAAV)

INSTITUTE OF REVENUES RATING AND VALUATION (IRRV)

United States of America

APPRAISAL INSTITUTE (AI)

INTERNATIONAL ASSOCIATION of ASSESSING OFFICERS (IAAO)

GLOSSARY OF TERMS

A

Alternative use value

The value of the PME under a use other than the present one.

B

Basis of value

A statement of the fundamental assumptions for undertaking a valuation for a defined purpose.

C

Continued use value

The value under the assumption that the PME contributes to the ongoing activity of the company by being in operation and usually by generating cash flows.

Cost approach

A valuation approach that provides an indication of value based on the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction.

Current cost new

Replacement or reproduction cost (see below)

D

Date of valuation

The date to which the opinion of value applies.

Depreciation

An opinion of a PME's loss of value due to any cause in relation to its current cost new.

Desktop valuation

Valuation without inspection.

Detail method (also known as the 'summation method')

A method requiring that a current cost new be assigned to each individual component of an asset.

Direct capitalisation method

A method that measures value by dividing a single period net income by a capitalisation rate.

Discounted cash flow (DCF)

A method that measures value based on the expected future cash flows discounted to present value.

E

Economic / external obsolescence

Loss in value due to influences outside the PME. It is the type of obsolescence that is not inherent to the PME, but rather to factors associated with the wider economic environment.

Economic life

The anticipated length of time during which the PME could generate financial returns or provide a non-financial benefit in its current use.

Effective age

The apparent age of PME in comparison with new PME of like kind; that is, the age indicated by the current condition of the PME.

Equipment

A tool or set of tools necessary for performing a particular task.

F

Fair Value (for accounting purposes)

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.

Fair Value (general definition)

The price that would be received to sell plant, machinery and equipment in an orderly transaction between identified willing market participants possessing full knowledge of all the relevant facts, making their decision in accordance with their respective objectives.

Forced sale value

A sum that could be obtained for the asset where, for whatever reason, the seller is under constraints that require the disposal of the asset under conditions that do not conform with the definition of Market Value.

Functional obsolescence

Loss in value associated with reduced efficency and utility of the PME.

G

Going concern value

The value of a business entity that is expected to continue its operation into the foreseeable future.

H

Highest and best use (HABU)

The use of PME that is physically possible, reasonably probable, legal or likely to become so, and that results in the highest value of the PME at the date of valuation.

Historical cost

The cost of an asset when it was first placed into service by its first owner, and was bought as new.

I

Income approach

A valuation approach based on capitalising or discounting the estimated future income to be derived from the asset(s).

Indemnity value

The cost necessary to replace, repair or rebuild the insured PME to a condition substantially the same as, but not better or more extensive than, its condition at the time when the damage occurred, taking into consideration age, condition, and remaining useful life.

Insurable value

The cost of replacing the damaged asset(s) with materials of similar kind and quality with or without any deduction for depreciation, depending on the insurance policy adopted.

Investment value

The value of an asset or group of assets calculated on the basis of specific investment criteria.

L

Liquidation value

The estimated amount that creditors or equity holders could reasonably expect to receive in the event of liquidation of the company's PME, when sold piecemeal or in whole.

M

Machine

An apparatus made up of an identified number of parts that harmoniously operate together in order to perform the task for which it was designed.

Machinery

A group of machines or the parts of a machine that make it work.

Macroidentification

A procedure used by the valuer to obtain a reasonable understanding of the setting in which the PME is operated.

Microidentification

A procedure used by the valuer to obtain a reasonable understanding of the individual characteristics of the PME.

Market approach

A valuation approach based on comparing the PME with the evidence obtained from market transactions or offers that fulfil the criteria for the relevant basis of value and asset type.

Market Rent

The estimated amount for which the plant, machinery and equipment should be rented on the date of valuation between a willing lessor and a willing lessee on the terms of the actual or assumed rental agreement in an arm's-length transaction other after proper marketing wherein the parties had each acted knowledgeably, prudently and without being under compulsion.

Market Value

The estimated amount for which the plant, machinery and equipment should exchange on the date of valuation between a willing buyer and a willing seller in an arm's-length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without being under compulsion.

O

Operational obsolescence

A loss in value resulting from differences in utility/operability between market equivalent or standard in a certain area of PME, and the subject PME.

P

Physical life

The anticipated length of time during which the equipment could be used before being worn out or beyond cost-effective repair, assuming routine maintenance but disregarding any potential for future refurbishment or reconstruction.

Plant

A combination of buildings or structures together with the relevant infrastructure and machinery and equipment all together serving a specific production plan.

Portfolio

A collection of assets owned by a person or entity, and which are to be valued as a whole.

R

Recognised European Plant, Machinery & Equipment Valuer (REV-PME)

A valuer recognised by TEGOVA for her/his qualification, knowledge and professional experience in plant, machinery & equipment valuation.

Reinstatement value

The cost necessary to replace, repair, or rebuild the insured PME to a condition substantially the same as, but not better or more extensive than, its condition when new.

Remaining useful life

The useful life of the asset minus its age, expressed in the same units of the PME's useful life, and taking into account any completed refurbishments or other factors that have increased or decreased its operating life.

Replacement cost

The cost that a market participant would pay based on replicating the utility of the asset, not its exact physical properties.

Reproduction cost

The current cost of making a replica of the asset using the same, or closely similar, materials.

Residual value

The estimated value of PME at the end of its useful life.

S

Salvage value

The value of an asset or of its constituent parts, when it is disposed of as a whole or as separate components for an alternative (sometimes inferior) use or for spare parts.

Scrap value

The value of an asset when it is no longer usable and is disposed of for the materials it contains.

Special assumption

An assumption made where instructions differ from the actual facts existing at the date of valuation.

Special purchaser

An individual for whom the asset has a higher value than for other market participants.

Special value

An opinion of value that incorporates consideration of characteristics that have a particular value to a special purchaser.

Synergistic value

A value created when the total value of several assets (or of several legal interests in the same asset) combined is greater than the value of the sum of their parts.

T

Technological obsolescence

Loss in value between new and subject PME resulting from material, design and technological differences.

Terminal value

The value of PME at the end of its useful life after the hold period.

Terms of engagement

The specific terms of the contract between the valuer and the client.

Total insurable value

The value of insurance covering the full replacement cost of the covered PME as well as the business' income loss in the event that the insured risk materialises.

Trending method

A method of estimating an asset's reproduction cost 'as new' in which an index or trend factor is applied to the asset's historical cost to convert the known cost into an indication of current cost.

U

Useful life

The time frame in which the PME is expected to effectively operate as designed and specified by the manufacturer.

V

Valuation approach

The way in which, having regard to the available evidence, the valuer considers how to determine the value of the subject PME.

Valuation method

The particular procedure, based on one or more valuation approaches, used by the valuer to arrive at a determination of value.

Valuation methodology

The process by which a valuer undertakes the valuation of the PME, including the selection of the approach or approaches to be applied, the choice of method(s) and the use of models or techniques in order to interpret the valuation inputs and reach conclusions based on them.

Valuation Report

A document detailing the scope, key assumptions, valuation methods, and conclusions of an assignment, providing a professional opinion of value supported by a recognised basis or bases of valuation within the framework of European Plant, Machinery & Equipment Valuation Standards.

Valuation review

The assessment of another valuer's report, not a revaluation.

NOTES

The European Group of Valuers' Associations unites 72 national valuers' associations from 38 countries representing 70 000 qualified valuers either self-employed or employed by specialist consultancies, private sector companies, government departments or financial institutions both local and international. Its European Valuation Standards (EVS) are cited as reliable standards for the valuation of residential immovable property for mortgage lending purposes in the EU Mortgage Credit Directive and have been given precedence over all other standards by the European Central Bank in successive editions of its Asset Quality Review manual for the updating of banks' real estate collateral values. The first edition of European Business Valuation Standards was published in 2020.

Plant, machinery & equipment (PME) valuation is prevalent among a number of TEGOVA members with valuation firms or individual valuers often combining real estate and/or business valuation with plant, machinery & equipment valuation practice.

In this book, concepts such as 'fixed assets' and 'in situ'/'ex situ' values, scrap value and the three types of obsolescence (technological, functional and economic) and many more particular to PME are defined and standardised, in order to set a common language for valuation practice in the European Union, the European Economic Area, candidate EU member states and EU-associated and Neighbourhood countries.

This book also serves the many practicing valuers throughout Europe who are asked to assess the value of both real estate and PME for lending purposes, financial reporting, and business purposes, helping bridge both fields of practice to deliver quality valuations to the highest standard.

These Standards, like all Blue Books, are in lock step with the EU regulatory framework. Environmental protection, energy conservation, health and safety in particular are becoming drivers for the depreciation of assets; valuers need uniform guidance in dealing with such issues.

This Blue Book was conceived and designed to foster convergence in PME valuation across Europe, providing common ground and best practice regarding methodology, reporting and valuation approaches to a fast-mutating industrial landscape.

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