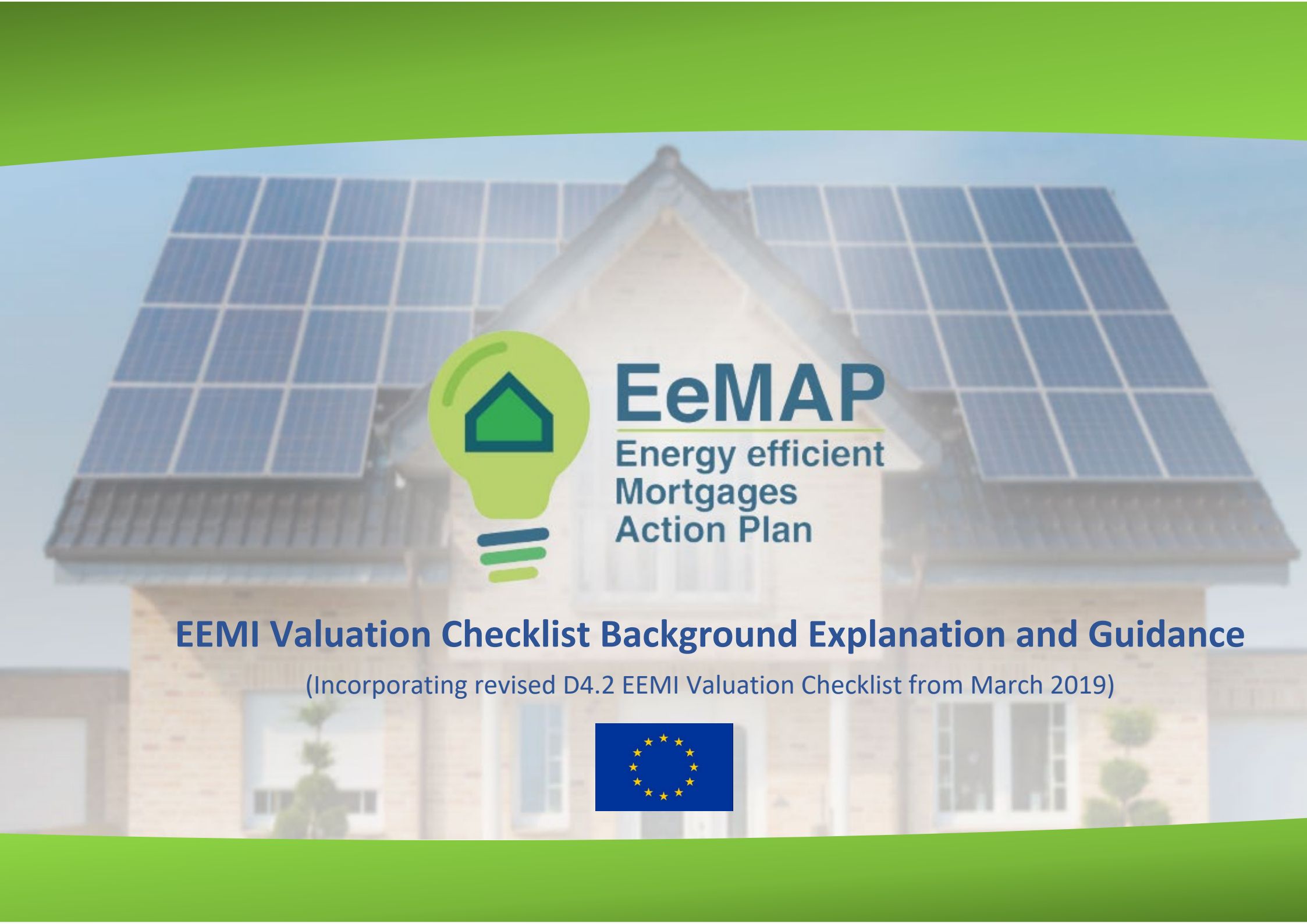

EeMAP
Energy efficient
Mortgages
Action Plan

EEMI Valuation Checklist Background Explanation and Guidance

(Incorporating revised D4.2 EEMI Valuation Checklist from March 2019)

Purpose of the checklist

Introduction for valuers

The expectation, in line with the RICS Valuation - Global Standards 2017, is that valuers will undertake sufficient due diligence, including in relation to sustainability factors, to accurately provide an estimate of Market Value and to comment on sustainability factors in their report.

The checklist below is aimed at complementing existing valuation instructions in the context of mortgage lending. Since no standard reporting template exists, some of the indicators listed below might already be part of existing valuation instructions by banks. If the instruction allows, however, it is advised to consider and make specific reference to those indicators and linked observed energy efficiency characteristics which potentially could have an impact on value.

The checklist is intended to serve different lending scenarios. These include but are not limited to:

- Origination of a new or extension of an existing mortgage for a property undergoing renovation,
- Origination of a new mortgage for an already energy efficient property,
- Re-mortgage.

The purpose of the checklist is to record and report the information collected in a transparent way for the instructing bank. The checklist does not require the valuer necessarily to undertake additional due diligence or inspection, although in some cases it is recognised that some extra work may be involved.

A number of the indicators listed below, such as building age, building condition, etc., are already part of what valuers are commenting on as part of the valuation report.

The reason for inclusion of these indicators on the Energy Efficient Mortgage checklist is that the information and characteristics that sit behind these indicators also have a bearing on the building's energy performance levels. For example, the age of the building may provide information as to the type of

construction, materials used, potential level of insulation and thermal mass all of which can give valuable clues as to the likely energy efficiency of the building. In other words, valuers are encouraged to look at standard indicators through an energy efficiency lens.

The checklist does not attempt to be a comprehensive list of all factors which the valuer will consider and it does not suggest that any alteration to current market value will result, although it could impact the lending decision taken by the bank.

Checklist structure and assessment format

The checklist is presented in the format of a **Red**, **Amber**, **Green** (RAG) rating for each of the listed indicators in the categories A, *'Core Indicators'* and C, *'Assessment Summary'*. In category B *'Commentary Regarding Additional Energy Performance-Related Risk Consideration'*, the valuer is only required to provide comments in relation to the respective indicators listed.

It is also recognised that data may not always be available. RICS advise valuers that they should gather data which pertains to sustainability if such data are available. It does not place a duty on valuers to gather data which are not normally available or difficult to obtain. However, over time, it is anticipated that more data will be gathered by clients and, therefore, be available to valuers.

Checklist Background Explanation and Guidance

Background Explanation and Guidance is provided to valuers providing secured lending valuation in Europe to assist them in completing the RAG ratings. It has been devised in alignment with the individual ratings.

When using the Guidance, it is important to acknowledge that market expectations vary across countries and between sub-markets and that EU member states fall within several climatic zones and that this has an impact on both the country building codes/regulations and on the development of market 'norms'. The Background Explanation and Guidance is available here: https://eemap.energyefficientmortgages.eu/

In addition, dedicated training material has been developed to support valuers using the checklist. The training material is freely accessible via the following link: https://eemap.energyefficientmortgages.eu/

Introduction for banks

The purpose of the RAG rating checklist below is to provide 'at a glance' information to help banks understand the potential risks to loans moving forward. Depending on the lending scenario and/or the property-specific information already available/recorded, lending institutions may wish to complement existing valuation instructions with selected indicators from the checklist as capturing information on the indicators below is essential for measuring the performance of energy efficient mortgages and for benchmarking them in relation to key risk indicators such as probability of default (PD) or loss given default (LGD).

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Authors: U. Hartenberger, D. Lorenz, S. Sayce
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INSTRUCTIONS FOR USE OF RAG RATING

Please complete the grid below in accordance with the colour code. The description column only needs completing if the factor is not detailed in your valuation report. The comment column is for you to provide a brief rationale for your 'RAG' judgement where this is not obvious.

If your instruction precludes you for completing the full checklist, as a minimum, complete Section A and/or the Assessment Summary section C only.

Red: Below market norm/average/expectation – value actually/potentially at risk over period of proposed loan

Amber: On or near market norm/average/expectation – may be at risk in medium term

Green: Above market norm/average/expectation - likely to present a lower value risk moving forward

EeMAP
Energy efficient Mortgages Action Plan

THE ENERGY EFFICIENT MORTGAGE INITIATIVE VALUATION CHECKLIST (Status March 2019)

	Indicators with potential impact on energy demand	Description (if not already included in valuation report)	Red (does not meet market norm/average)	Amber (in line with market norm/average)	Green (beyond market norm/average)	Comments	Explanatory Notes on RAG rating
CORE INDICATORS							
A1	**Availability of EPC / EPC rating**						**Red:** no or outdated EPC; EPC rating below local market norm for that building type in the market **Amber:** EPC accurate; rating either average for building type in the local market or just above **Green**: EPC accurate and recent; rating significantly better than both local market norm (normally taken as 2 grades above local average)
A2	**Calculated &/or measured energy in kWh/m2/pa**						**Red:** calculated or measured energy consumption significantly above expected local market norm for building type/size in given climatic zone and / or consumption level appears inaccurate when taking account RAG rating for other core indicators **Amber:** calculated or measured energy accurate and lies within a small range (plus or minus) of expected norm for building type within climatic zone

							Green: calculated or measured energy accurate and significantly better than other reference buildings within climatic zone
A3	**Availability of Building documentation beyond EPC (guarantees etc; evidence of regulatory compliance)**						**Red:** documentation not available and/or records inconsistent and inconclusive **Amber:** some documentation available that would allow conclusions to be drawn in relation to the building's energy performance **Green**: substantial amount of building documentation available (over and above EPC or mandatory certificate)
A4	**Building age, type and overall condition**						**Red:** building type indicates quality below modern construction standards; all /some core elements of the building structure (including walls, roof, windows and doors) in need of repair or dilapidated, significantly impairing energy performance; building age potentially indicates quality and energy performance below modern construction standards **Amber:** apart from slight lack of repair, building's structure appears to be in line with normal expectations for building type/age, having been subject to regular maintenance; some improvements to original construction have been undertaken and higher levels of efficiency have been achieved or would be easily achievable in a cost-efficient way **Green:** structure is inherently efficient due to either its thermal mass or having been designed

							to a high level of energy efficiency and is well maintained or, since construction, has undergone improvements/upgrades to enhance energy efficiency with structural elements now all in very good modern repair and condition
A5	**Level of insulation and air tightness (walls, roof, floor, windows, doors)**						**Red**: building shows inadequate insulation and air tightness levels, equivalent to sub-optimal energy performance **Amber**: insulation and air tightness levels in line with normal market expectation and building code requirements **Green**: insulation and air tightness levels of building envelope and components, such as windows and doors, are such that the building's thermal quality (either for keeping heat in or keeping it out) exceeds local building code requirements and has not led to any evidence of condensation
A6	**Age, type and condition of heating system**						**Red**: older type conventional heating system run on fossil fuel (i.e. coal, gas or oil) or older electric space heaters (such as storage heaters) or evidence that portable appliances are being used; absence of service records **Amber**: building heated by modern efficient boiler with programmable radiators or modern efficient programmable electric heaters where electricity is/can be sourced primarily through non-fossil generation **Green**: heating system consists of heating system solely based on renewable energy sources (such as biomass, e.g. wood or pellets) or no conventional heating system required due

							to building's design; system well-maintained with up-to date service records
A7	**Age, type and condition of cooling / ventilation system (if any)**						**Red**: centralised older type cooling / ventilation system or older type individual wall mounted heat exchange units or evidence of portable appliances being used or where the presence or need for mechanical cooling goes against market expectations; no evidence of service records **Amber**: modern efficient cooling/ ventilation system evidentially meeting current national regulatory standards - normally less than ten years old, well maintained with service records and where consumption data, if available, would indicate that it is performing to good efficiency standards **Green**: cooling/ventilation/air conditioning system fuelled from renewable sources or no need for cooling / ventilation system - due to the building's design, climate or building siting/orientation
COMMENTARY REGARDING ADDITIONAL ENERGY PERFORMANCE-RELATED RISK CONSIDERATIONS							**Considerations to bear in mind**
B1	**Evidence of, or potential for, renewables on site (electricity and/or heat**						Renewable energy installations (e.g. solar, wind, ground heat pump., etc) on site? In the absence of such installations, assessment of potential and feasibility (both technically and economically)?

B2	**Primary energy source**							Source of energy used for the building, i.e. fossil fuels (gas, oil) or renewables (either through on-site generation or through green grid)?
B3	**Orientation, exposure, evidence of external solar control**							Potentially higher heating or cooling requirements due to unfavourable orientation and exposure coupled with lack of adequate external shading or solar control?
B4	**Lighting system**							In-built modern lighting appliances, designed for and fitted with low energy bulbs?
B5	**Smart controls**							Smart energy consumption metering installed? Automated sensor system in place ensuring unoccupied spaces are not lit except where required for essential security purposes?
ASSESSMENT SUMMARY								
		Description (if not already included in valuation report)	**Red (does not meet market norm/average)**	**Amber (in line with market norm/average)**	**Green (beyond market norm/average)**	**Grey (no data available)**	**Comment If required**	
C1	**Requirements for upgrade**							**Red**: property requires very significant and essential upgrade expenditure in relation to the overall value of the property to bring it to modern good standard (this will often relate to works to the envelope, e.g. walls or roof)

								Amber: property requires works which are minor and within the scope of recurrent works, such as boiler or cooling replacement, new light fittings, etc. **Green:** no requirements for upgrade work
C2	**Ease of upgrade**							**Red**: upgrade very likely to be extremely disruptive thus adding significantly to cost **Amber**: some disruption likely, but no particular issues expected **Green:** upgrade is easy, non-disruptive and not expensive in relation to overall costs
C3	**Market expectations**							**Red:** property is below the general expectation in terms of its energy performance and requires (possibly) significant capital investment to bring it to the market norm **Amber:** property is in line with expectations currently but is likely to require some work 'within cycle' to retain its position **Green:** property is significantly better than would be expected, possibly due to reliance on renewables, a well- insulated envelope appropriate to the location and any level of weather exposure, modern good quality services and with little expectation of upgrade needs within the medium term
C4	**Risk of value decline based on energy assessments**							**Red:** lending risk in relation to energy efficiency of the building is significantly above average **Amber**: risk of value decline in line with market norm **Green**: property presents a lower than average risk

EEMI VALUATION CHECKLIST BACKGROUND EXPLANATIONS AND GUIDANCE

		CORE INDICATORS
A1	**Availability of EPC / EPC rating**	An Energy Performance Certificate (EPC) is a mandatory requirement within EU member states for properties when they are marketed. Each country has introduced their own system and the valuer should be aware of the methodology used to produce the EPC, what it measures and the level of reliability that can be placed upon it as a guide to the energy efficiency of the building being valued. It should be appreciated that, while it may often be a useful guide, it may not always give a full and accurate indication of the building's energy performance. If the property has a valid EPC, the EPC rating should be declared and assessed against the national/regional normal/average for the type of property; the valuer should therefore be cognisant of the general level of EPC ratings and any market implications thereof. Their currency and accuracy may depend on the date at which they were produced, and the methodology used. The date on which the EPC was last prepared can be critical in determining its usefulness as a) methodologies change and b) the building or some of its services may have been altered since the certificate was issued and c) more recent EPCs, such as the so-called EPC+, tend to be of higher quality in terms of accuracy than older ones. **The valuer should assess the EPC rating accordingly, normally as follows:** **Red:** no or outdated EPC; EPC rating below local market norm for that building type in the market **Amber:** EPC accurate; rating either average for building type in the local market or just above **Green**: EPC accurate and recent; rating significantly better than both local market norm (normally taken as 2 grades above local average)

A2	**Calculated &/or measured energy in kWh/m2/pa**	In some jurisdictions, information in relation to the calculated and/or measured energy in kWh/m2/pa may be available. Where this is the case, it should be compared with the expected norms for the type of building and the local climatic conditions, bearing in mind that new buildings will normally be required to meet higher efficiency standards than older ones. The valuer should therefore be aware of what the local average for a 'good' building of that type of property should be in the climatic zone in which it is situated. **The valuer should assess the calculated or measured energy consumption accordingly, normally as follows:** **Red:** calculated or measured energy consumption significantly above expected local market norm for building type/size in given climatic zone and / or consumption level appears inaccurate when taking account RAG rating for other core indicators **Amber:** calculated or measured energy accurate and lies within a small range (plus or minus) of expected norm for building type within climatic zone **Green**: calculated or measured energy accurate and significantly better than other reference buildings within climatic zone
A3	**Availability of Building documentation beyond EPC (guarantees etc; evidence of regulatory compliance)**	One of the challenges facing any valuer (and buyer) of a building is often a lack of documentation in relation to energy (or indeed other) characteristics. Where documentation is available in the form of guarantees; service records, etc., there can be greater confidence in assessing energy performance levels. Documentation to be considered here will also extend to voluntary certificates, building passports, building files, planning documentation, life-cycle assessments, ecological footprint analysis, etc. The presence of such documentation may not indicate that the property *is* energy efficient, but it should enable the valuer to have a better-informed view. Valuers are advised to ask whether such documentation exists and, if it does, to see and assess it as part of their due diligence. A lack of such documentation does not of itself render the asset below expectation, but over time this may change. **The valuer should be aware of what documentation would be expected for a property of the type being valued in that location and assess its availability accordingly, normally as follows:** **Red:** documentation not available and/or records inconsistent and inconclusive **Amber:** some documentation available that would allow conclusions to be drawn in relation to the building's energy performance

		Green: substantial amount of building documentation available (over and above EPC or mandatory certificate)
A4	**Building age, type and overall condition**	A valuation is not a structural survey and completion of this checklist does not imply that the valuer has undertaken due diligence more than is consistent with normal valuation instruction. However, a visual inspection should allow the valuer to form an initial view regarding the age, type and structural condition and their respective impact on energy performance. The type of construction can materially impact on the energy efficiency of a building. Many older, heavy-weight construction buildings with high levels of thermal mass may retain heat and keep the building at an even temperature; while not likely to be extremely efficient, such structures may in some cases be more efficient than those constructed in lightweight materials. This is particularly true for buildings dating from the period immediately following the Second World War when levels of insulation and quality of materials and overall construction were generally very limited in some European countries as the stock had to be quickly rebuilt. Structural types such as these which are not well built and where energy efficiency measures would be expensive and/or difficult to achieve would generally be regarded as energy inefficient. **The valuer should assess the building age, type and overall condition accordingly, normally as follows:** **Red:** building type indicates quality below modern construction standards; all /some core elements of the building structure (including walls, roof, windows and doors) in need of repair or dilapidated, significantly impairing energy performance; building age potentially indicates quality and energy performance below modern construction standards **Amber:** apart from slight lack of repair, building's structure appears to be in line with normal expectations for building type/age, having been subject to regular maintenance; some improvements to original construction have been undertaken and higher levels of efficiency have been achieved or would be easily achievable in a cost-efficient way **Green:** structure is inherently efficient due to either its thermal mass or having been designed to a high level of energy efficiency and is well maintained or, since construction, has undergone improvements/upgrades to enhance energy efficiency with structural elements now all in very good modern repair and condition
A5	**Level of insulation and air tightness**	The quality of insulation and the level of airtightness of the building may not be immediately obvious on inspection, depending on the typology of the building. As illustrated under A4, the building's age and overall condition may help to establish this.

	(walls, roof, floor, windows, doors)	**Walls:** The age of the building may provide a guide as to the likely level of insulation, but this wilnot be definitive. Clearly, where there is good documentation, the information regarding the building's age can be obtained. Where documentation is not available, the valuer will have to make a judgement, both as to what is installed and what could be, if the insulation is deemed to be sub-optimal. Local knowledge is essential as to what might constitute best practice. For some building typologies solid wall (internal or external) can be installed but this is often expensive in comparison to energy savings and internal wall insulation is prone to cause condensation and may in some cases result in reduced internal floor space. It also may not always be easy to assess from a visual inspection while cavity wall fill may often be evidenced more easily. The valuer should also be aware that, where a property is highly insulated, it could result in a lack of ventilation or a failure in the integrity of the cavity leading to damp issues which could threaten the fabric /use of the property. **Windows and doors:** The quality of the windows and doors (particularly external ones) and their respective frames have been shown to have a demonstrable impact on capital value. In part, this is due to their contribution to improving energy efficiency; in part it is connected to comfort, added security and, in some cases, aesthetic improvement and enhanced occupier experience. As technologies improve, so the level of efficiency achieved will depend, not only on whether windows (and external doors if they contain glass) are single/double or triple glazed and properly fitted, but also on the energy efficiency of the glazing installed. Therefore, the age of the windows and doors may be pertinent to assessing the quality of the glazing. Similarly, the frames and their installation are critical to proving an airtight envelope. Valuers should ensure that their inspection allows a judgement as to the quality of the frames and their installation in energy performance terms. However, it should be recognised that the expectation as to the standard expected both within the regulatory framework and by market players varies from country to country and may in many cases be closely related to climatic zones. **Roof:** Depending on the typology of the building and the access to the roof and any roof void, it may or may not be possible to carry out an inspection that will suffice to allow of a judgement in respect of roof insulation. Where the roof is flat or has a very low pitch, the construction may be such that insulation, both to protect against heat loss in colder climates and heat build-up in hotter climatic zones, is integral to the design. With pitched roof buildings, the insulation typically will be a combination of some insulating material within the structure but additionally, loose fill insulation above the ceiling to the top floor may be installed. The required amount of such insulation will vary from country to country and by climatic zones. Furthermore, in the case of terraced buildings, it is important that there is physical separation of any roof void between the subject property and any adjacent properties; if there is not, heat/cold will be able to transfer between buildings.

		Floor: The existence and/or type of floor insulation may not be immediately obvious on inspection, depending on the typology of the building and on the floor coverings, although the floor coverings themselves may provide some level of insulation or cooling. The age of the building may also provide a guide as to the likely level of insulation, but this will not be definitive. Clearly, where there is good documentation this can be obtained. Where documentation is not available, the valuer will have to make a judgement, both as to what is installed and what could be feasible to install, if the insulation appears to be sub-optimal. Again, local knowledge is essential as to what might constitute best practice for floor insulation for that type of building. Floor insulation will normally be required not just at the ground level, but at every level to ensure that the building can be compartmentalised for heating/cooling purposes. **Valuers should assess the quality of insulation and level of air tightness accordingly, normally as follows:** **Red**: building shows inadequate insulation and air tightness levels equivalent to sub-optimal energy performance **Amber**: insulation and air tightness levels in line with normal market expectation and building code requirements **Green**: insulation and air tightness levels of building envelope and components, such as windows and doors are such that the building's thermal quality (either for keeping heat in or keeping it out) exceeds local building code requirements and has not led to any evidence of condensation
A6	**Age, type and condition of heating system**	Not every building requires space heating: this will depend on local climate conditions and the fundamental structure of the building. The fact that a building does require space heating does not of itself render the building energy inefficient under current definitions. What is important for this purpose is that the heating system is effective and of a type that is compatible with energy efficiency thresholds and low carbon output. While the shift towards net zero energy buildings (NZEBs) and Passivhaus standards of construction is moving apace and many newer buildings are designed to no longer require heating systems, such buildings still form a small minority of stock. Therefore, it is important to consider that, for the large majority of existing buildings throughout Europe, a heating system will be required. For the purposes of advising on energy efficiency characteristics, it is still possible to consider a building with a conventional boiler system to provide central heating as meeting the 'market norm' though not to a full 'green' standard unless the boiler uses biomass fuel or fully runs on 'green' electricity. The age and the condition of the overall heating system, including the radiators and

		temperature controls will impact considerably on the level of efficiency. Tthis will normally only be established by a visual inspection combined with any data supplied by the building owner/occupier. The valuer should also enquire as to maintenance and service records and consumption data, but it should be borne in mind that lifestyle and age of occupants and occupation density can have large impact on such data, so it is not a reliable guide to efficiency. It should also be borne in mind that in some cases, an older system that has been regularly serviced system may be more efficient than a more recently installed one which has not been serviced. **The valuer should assess the age, type and condition of heating system accordingly, normally as follows:** **Red**: older type conventional heating system run on fossil fuel (i.e. coal, gas or oil) or older electric space heaters (such as storage heaters) or evidence of portable appliances being used; absence of service records **Amber**: building heated by modern efficient boiler with programmable radiators or modern efficient programmable electric heaters where electricity is/can be sourced primarily through non-fossil generation **Green**: heating system consists of heating system solely based on renewable energy sources (such as biomass, e.g. wood or pellets) or no conventional heating system required due to building's design; system well-maintained with up-to date service records
A7	**Age, type and condition of o cooling/ ventilation system**	Not every building requires space cooling, ventilation or air conditioning. Its presence and use will always depend on the local climate conditions, the fundamental structure of the building and the opportunities for natural ventilation. However, it is estimated that cooling now accounts for 10% of energy use in Europe and this figure is set to rise rapidly. The cooling required may also depend on the building's siting, context and orientation. For example, a building in a shaded setting or predominantly north facing is less likely to require cooling. The fact that a building does require space cooling, ventilation and /or air conditioning, other than through open windows, does not necessarily render the building energy inefficient under current definitions. It is critical is that any system that is installed is well-maintained and utilises up to date technology. Like any building services, cooling systems require regular maintenance. They are also subject to technological obsolescence. Furthermore, regulatory standards are regularly updated both by EU and national standards. For the purpose of advising on energy efficiency characteristics, it is still possible to consider a building with a cooling system as meeting the 'market norm' though not a full 'green' standard. Age and condition of the system will impact considerably on the level of efficiency. This will normally only be established by a visual inspection combined with any data supplied by the building owner/occupier. The valuer should also enquire as to service records. It should also be borne in mind that

		in some cases, an older system that has been regularly serviced may be more efficient than a more recently installed one which has not been serviced or is a low-grade installation. What is important for this purpose is that the systems are effective and of a type that is compatible with energy efficiency thresholds and low carbon output. **The valuer should assess the age, type and condition of the of cooling and ventilation and air-conditioning system accordingly, normally as follows:** **Red**: centralised older type cooling / ventilation system or older type individual wall mounted heat exchange units or evidence that portable appliances are being used or where the presence or need for mechanical cooling goes against market expectations; no evidence of service records **Amber**: modern efficient cooling/ ventilation system evidentially meeting current national regulatory standards - normally less than ten years old, well maintained with service records and where consumption data, if available, would indicate that it is performing to good efficiency standards **Green**: cooling/ventilation/air conditioning system fuelled from renewable sources or no need for cooling / ventilation system - due to the building's design, climate or building siting/orientation
COMMENTARY REGARDING ADDITIONAL ENERGY PERFORMANCE-RELATED RISK CONSIDERATIONS		
B1	**Evidence of, or potential for, renewables on site (electricity and/or heat)?**	For a building to be energy efficient there is no requirement to have renewable energy sources on site- though many buildings now do in the form of solar panels, ground or air source heat pumps or biomass boilers – though in reality, the last listed are not truly carbon free, due to embodied carbon in production or the transport of pellets. The valuer should be aware of what types of renewable energy sources are practical in the location of the property. For example, a solar PV system will not be effective as a replacement for other forms of energy if the system is installed in a position where it gets little daylight and in a country with limited sunlight. If possible, the valuer should ask for information as to the % of energy consumed provided by the on-site generation. In addition, the valuer should, if feasible, ascertain the age of the installation, given that many solar panels, for

		example may become life expired due to newer technologies being adopted by the market. It follows that the valuer must use their professional judgement in deciding how to rate any on-site renewable sources of energy. In this, they should be aware that in some settings such installations may be impractical or would be prohibitively expensive.
B2	**Primary energy source**	EU policy is to reduce and in time eradicate the use of fossil fuels as an energy source. Accordingly, over time energy from coal, oil or gas will be replaced by use of wind, water, solar or biomass. Renewable energy can be produced on-site, locally, or through a national or regional grid. While it is clear when a property is taking its energy from an on-site renewable source, this may not be clear where it is obtained from the grid. The valuer, knowing the locale, should be able to determine whether or not, a 'green' grid is available and, through questioning, whether the current supply is available from renewable sources. However, in many cases grid electricity is a choice for the consumer – and in this case it cannot be relied upon in terms of determining the energy efficiency of the property. Therefore, in providing a commentary on this indicator, the valuer can only rely on what is available locally. In some countries, for multi-occupancy blocks the landlord may have control over the primary energy source; for individual houses and in some flatted arrangements this is a consumer choice matter.
B3	**Orientation, exposure, evidence of external solar control**	The energy demand of a building will, in part, depend on its orientation and exposure. A building that is predominantly north or east facing, situated in a colder climate is likely to require more heating than one that is south or west facing. Conversely, in warmer regions south and west facing buildings may require more cooling. The position of the building can also be important: a building that is sited in an isolated position on a hilltop will require more heating /cooling than one that is sheltered. The presence/absence of tall vegetation or buildings surrounding the property will affect levels of daylight and may thus also influence the degree of heating/cooling required. Although orientation and exposure levels of a building may have an impact on the energy requirements of a building, there are some locations/climatic conditions where, whatever the siting, there is a large exposure to daylight/potential solar heat gain/glare. In these cases, the energy efficiency of the building may be compromised. However, there are some measures that can be introduced to reduce the impact of solar heat gain. Traditionally, the method used to control for this are manually operated shutters, blinds or canopies. However, more recently other techniques have been developed and are commonly used. One way is through the type of glass used in the windows or the installation of automatically operated in-built blinds to windows; the other is through external shading systems, such as solar controlled shutters and Brise Soleil, both of which work to reduce or stop the sun's

		rays before they come into contact with glazed surfaces. Although normally associated with commercial buildings, such solar controlled systems are increasingly used within domestic settings.
B4	**Lighting system**	The lighting system of a building is important in energy efficiency terms – especially in countries where the amount of daylight and sunshine hours is low. While the biggest impact is in terms of the type of lightbulbs used – many in portable appliances, such as desk and table lamps, the in-built lighting systems and smart controls including automated switching systems can play a part. A building's energy efficiency will be enhanced where it operates on sensor systems and where all in-built lighting is designed for low energy bulbs. It is acknowledged that in some countries the EPC rating may reflect the lightbulbs used in portable appliances, but for this criterion the valuer should assess the in-built systems and automated lighting controls.
B5	**Smart controls**	Under the new, revised EU Energy Performance of Buildings Directive (EPBD), a common European scheme for rating the smart readiness of buildings, optional for member states, will be introduced. Smart technologies will be further promoted, for instance through requirements on the installation of building automation and control systems and on devices that regulate temperature at room level.
ASSESSMENT SUMMARY		
C1	**Requirements for upgrade**	In the light of the grades awarded and the survey inspection, the valuer should here note any potential upgrades that would move the overall categorisation up from e.g. a 'Red' to an 'Amber' overall rating. If a building is rated overall at Red or Amber, there is likely to be upgrade work required immediately or in the near future. The valuer is asked to reflect on whether, in relation to the overall value of the property, this expenditure is very significant and essential, and would there be marked as **Red**; often this will relate to works to the envelope, e.g. walls or roof. This would indicate a Red rating. Where works are minor and within the scope of recurrent works, such as boiler or cooling replacement, new light fittings, the judgement will be **Amber**. Where the valuer considers that there are no requirements for upgrade, the judgement will be **Green**. They would also advise on which particular aspects would be most likely to result in an overall upgrade. In so doing the valuer is not expected to provide detailed information- but simply a 'first line' opinion as to what might result in significant energy efficiency gains. This would not replicate any advice

		contained in the EPC though it might address the same/similar issues. The valuer is reporting his / her judgement about the aspects that would have the most important impacts on the value whereas EPC recommendations will (in theory at least) be focussed on simple payback due to energy savings. The valuer is not expected to obtain costings for any work but to use his/her skill, expertise and experience to make a judgement. However, there may be some cases where, in the valuer's opinion, a valuation of the asset does require input from an energy assessor or building surveyor/building engineer before reaching their value judgement. In such cases the rating will be established after such additional report has been obtained.
C2	**Ease of upgrade**	As above, what is required is a generalised judgement – not a detailed estimate of a work programme. The key consideration is the extent to which the works are disruptive – and could involve the borrower in costs of e.g. alternative accommodation – or could be easily accommodated alongside works of decoration or e.g. kitchen or bath/shower room refits. The valuer will not have conducted a structural building survey and will not be expected to supply a full report on what could be achieved, the cost of upgrade or the ease of achieving a significant upgrade. However, in some circumstances the valuer will have an informed view as to whether or not it would prove feasible or viable to undertake upgrades. For example, replacing an old boiler with a modern condensing one might be easily achieved; to convert to a heat pump system may well depend on the nature of the fabric. Where is very likely to be extremely disruptive and thus add significantly to cost (and hence reduce the return on investment, the rating will be a **Red**. Where there is some disruption likely, but no particular issues are noted, the rating will normally be **Amber**, and where installation is easy, non-disruptive and will not be expensive in relation to overall costs, the rating will be **Green**.
C3	**Market expectations**	Property markets are complex and diverse. The standard expectations of market players vary according to location and value bracket among other factors. The valuer is asked to reflect on the overall energy efficiency characteristics of the property and make a judgement as to whether the property is below the general expectation and requires (possibly) significant capital investment to bring it to the market norm **(Red)** or is in line with expectations currently but is likely to require some work 'within cycle' to retain its position **(Amber)** or significantly better than would be expected, possibly due to reliance on renewables, a well- insulated envelope appropriate to the location and any level of weather exposure , modern good quality services and with little expectation of upgrade needs within the medium term **(Green)**.

		The valuer is not required to undertake a survey to do this but use his/her usual professional judgement to reflect on market expectations and direction of travel. This should represent a summary assessment of all ratings awarded as part of this checklist, based on the valuer's knowledge and expertise of the market norm/average in the location in which the property is located.
C4	**Risk of value decline based on energy assessments**	This is perhaps the most important judgement that the valuer is asked to make in completing this assessment. It is acknowledged that, in most markets, there may be little current local market evidence to directly link energy efficiency to market value, however energy performance is rising up the list of consumer preferences. Various studies have shown that energy efficiency is beginning to play a bigger role in the determination of market value. While the evidence of any price premiums for 'green' or discounts for 'brown' buildings may be disputed and are, undoubtedly, variable dependent on the market, the locality and the type and value bracket of the building, any prudent lender will wish to be appraised of the risks that the overall energy efficiency (or lack thereof) of the property being offered as security for a loan, presents. Additionally, legislative and regulatory frameworks are encouraging consumer awareness or incentivising the choice of 'greener' stock. Furthermore, as new stock comes on to the market which is more energy efficient, that which is not may suffer value decline (a so-called 'brown discount'). Valuers are asked to grade the subject property according to the level of risk of value decline due to the energy efficiency characteristics weighed against other valuer drivers. In this overall judgement the valuer is asked to consider whether the lending risk in relation to energy efficiency of the building is significantly above the average **(Red)**, in line with the market norm **(Amber)** or presents a lower than average risk **(Green)**. It has to be noted in this context, that a single red or some amber ratings for individual indicators do not prevent the valuer from awarding an overall green rating if the majority of indicators are rated above market norm/average.

EeMAP – Energy efficient Mortgages Action Plan is an initiative led by the European Mortgage Federation - European Covered Bond Council (EMF-ECBC), Ca' Foscari University of Venice, RICS, the Europe Regional Network of the World Green Council, E.ON and SAFE Goethe University Frankfurt.

For more information, visit: www.energyefficientmortgages.eu

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