



Area 3 - Responsible Architecture

Clean Energy Package / EPBD: ACE position and proposals of amendments

Draft version

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Veuillez noter que seule les parties CONTEXTE, POINTS CLES et POSITION POLITIQUE ont été traduites en français. Les propositions d'amendement (à partir de la page 8) sont uniquement disponibles en anglais.

CONTEXTE

Le 30 novembre 2016, la Commission européenne a adopté un paquet de mesures intitulé *Une Energie Propre pour tous les Européens* ayant pour objectif d'« accélérer, modifier et consolider la transition de l'économie de l'UE vers une énergie propre et, ce faisant, créer de l'emploi et générer de la croissance dans de nouveaux secteurs économiques et de nouveaux modèles d'entreprises ». Le paquet comprend plusieurs mesures législatives, dont une proposition pour réviser la Directive Performance Énergétique des Bâtiments (EPBD) comme suit :

- Extension de la définition des systèmes techniques de bâtiment afin d'englober la production d'électricité et les infrastructures d'électromobilité sur site ;
- Les stratégies de rénovation à long terme deviendraient une composante des plans nationaux intégrés en matière d'énergie et de climat et devraient être notifiées par les États membres à la Commission au plus tard le 1 janvier 2019 pour la période post-2020. Ces stratégies porteraient sur la rénovation du parc de bâtiments résidentiels et non résidentiels.
- Systèmes techniques de bâtiment : la proposition introduit des exigences concernant :
 - o les infrastructures destinées à l'électromobilité
 - o le renforcement du recours à des systèmes de suivi, d'automatisation et de contrôle électronique des bâtiments, de façon à simplifier les inspections; et
 - o l'introduction d'un «indicateur d'intelligence» signalant dans quelle mesure le bâtiment peut adapter son fonctionnement aux besoins de ses occupants et du réseau et améliorer sa performance.
- Incitations financières : la Directive serait complétée par deux nouvelles dispositions concernant l'utilisation des certificats de performance énergétique (CPE) pour évaluer les économies réalisées grâce aux rénovations financées à l'aide d'aides publiques, en comparant les CPE émis avant et après rénovation. Les bâtiments publics ayant une surface supérieure à un certain seuil devraient divulguer leur performance énergétique.
- Inspections : outre une simplification des dispositions, l'actualisation prévoit la mise en œuvre de régimes d'inspections régulières plus efficaces, qui pourraient servir à s'assurer du maintien ou de l'amélioration de la performance énergétique des bâtiments.
- Annexe I : celle-ci serait modifiée en vue d'accroître la transparence et la cohérence du processus de détermination de la performance énergétique au niveau national ou régional et de prendre en considération l'importance de l'environnement intérieur.



POINTS CLES DE LA POSITION DU CAE

Le CAE plaide pour une vision ambitieuse et clairement définie sur le long terme, à l'horizon 2050, pour le parc immobilier de l'UE, avec des jalons en 2030 et 2040, ceci afin de créer un cadre réglementaire stable, propice aux décisions d'investissement. L'actuelle révision de l'EPBD sera en principe la dernière avant dix ans. Dans un secteur qui évolue très rapidement, il est impératif de créer des solutions robustes sur le long terme pour résoudre les problèmes posés par l'actuelle Directive.

Les propositions d'amendements du CAE ont été guidées par les cinq principes suivants – leur application améliorerait considérablement les conditions du marché pour la rénovation énergétique des bâtiments :

1. **Valider les Certificats de Performance Énergétique (CPE) avec des données mesurées de la performance opérationnelle. Seuls des CPE validés devraient être utilisés pour étayer les instruments financiers ou les contrats de performance ;**
2. **La rénovation énergétique doit être incitée et réglementée dans le cadre de mises à niveau fonctionnelles et esthétiques globales des bâtiments afin d'accélérer l'amélioration de l'efficacité énergétique des bâtiments existants ;**
3. **Reconnaître la nécessité de cibler les améliorations dans les quatre piliers de la performance des bâtiments : la consommation des ressources naturelles, la qualité de l'environnement intérieur, la satisfaction des occupants et la valeur tout au long du cycle de vie du bâtiment ;**
4. **L'efficacité énergétique des bâtiments doit être définie dans une perspective de cycle de vie. Les méthodes d'évaluation des coûts du cycle de vie et d'analyse du cycle de vie doivent être intégrées dans les normes et critères de référence en matière d'efficacité des coûts et de performance énergétique ;**
5. **Rendre disponible les données – Harmoniser les méthodes de mesure entre les Etats Membres ainsi qu'entre les performances calculées et celles réellement atteintes et mettre en place des dispositions permettant la divulgation de ces informations afin d'assurer l'amélioration rapide et continue des mesures et technologies en matière d'efficacité énergétique.**

POSITION POLITIQUE DU CAE – VERS DES BÂTIMENTS SAINS QUI UTILISENT EFFICACEMENT LES RESSOURCES

Le CAE s'engage à travailler avec le Conseil et le Parlement européen pour une plus grande reconnaissance du rôle de l'architecture pour un changement radical dans la performance des bâtiments et l'accélération de la rénovation énergétique des bâtiments existants.

LES QUATRE PILLIERS DE LA PERFORMANCE DES BÂTIMENTS

La législation actuelle de l'UE a permis d'améliorer la performance de l'enveloppe des bâtiments et d'améliorer l'efficacité théorique des systèmes installés. En ce qui concerne l'intégration de l'architecture du bâtiment et de la conception des systèmes, de plus en plus de preuves scientifiques montrent la **nécessité d'envisager les performances du bâtiment dans une perspective plus large englobant l'ensemble du cycle de vie**, afin de mieux prendre en compte



le comportement des occupants (un facteur majeur de la performance énergétique du bâtiment¹) ainsi que les avantages non énergétiques d'un meilleur environnement intérieur. Le CAE demande donc une plus grande reconnaissance des quatre piliers de la performance du bâtiment, à savoir :

1. Réduire la consommation des ressources naturelles, y compris l'énergie, l'eau, les matériaux, la création de déchets et les impacts environnementaux ;
2. Améliorer la qualité de l'environnement intérieur, y compris la qualité de l'air intérieur, le confort thermique, la lumière du jour, l'acoustique, la biophilie ;
3. Augmenter la satisfaction des occupants, y compris la santé des occupants et leur perception de la fonctionnalité du bâtiment, de la qualité de l'environnement intérieur et de la façon dont le bâtiment répond à leurs besoins ;
4. Augmenter la valeur, démontrée par un coût du cycle de vie plus faible, une plus grande valeur sur le marché, une plus grande adaptabilité et une meilleure résilience face aux changements d'utilisation et changements climatiques.

LES INDICATEURS DE PERFORMANCE DES BÂTIMENTS – propositions d'amendements aux articles 2, 8 (5)

Une comparaison transparente entre les performances calculées et mesurées dans les quatre piliers de la performance du bâtiment et tout au long du cycle de vie d'un bâtiment est essentielle. La mise en œuvre des évaluations du cycle de vie dans les normes de construction ouvrira de nouvelles zones d'invention pour des solutions de conception dans le domaine de l'économie circulaire des bâtiments, permettant des économies d'énergie dans la production et la construction des bâtiments et des composants.

De manière cruciale, davantage de bien-être, une meilleure productivité, de meilleures capacités d'apprentissage, etc. résultant d'environnements intérieurs améliorés sont des aspects qui ne figurent pas dans les calculs coût / bénéfice et ne sont donc pas pris en compte dans les processus de décision de rénovation. Le secteur a besoin de toute urgence **de meilleures méthodes pour tenir compte des avantages non énergétiques**. La révision devrait être liée – potentiellement via le développement de l'indicateur d'intelligence (article 8 (5)) – au nouveau cadre d'indicateurs pour l'évaluation de la performance environnementale des bâtiments en cours d'élaboration par la Commission², afin de faciliter la communication claire et transparente de ces aspects de la conception et de la construction. Une définition plus claire des termes de la Directive (article 2), tels que "*conditions générales caractérisant le climat intérieur*" et "*utilisation à laquelle est destiné le bâtiment*", serait également un pas dans la bonne direction. En suivant le principe de « priorité à l'efficacité énergétique » et le concept de « bâtiment dont la consommation d'énergie est quasi nulle » (NZEB), le futur parc immobilier sera plus efficace et performant. Dans le même temps, l'UE devrait promouvoir et aspirer à un parc immobilier plus sain, plus confortable et plus abordable. Le CAE croit que la vision d'un "*parc immobilier décarboné*" et la définition d'un NZEB devraient être convergentes (article 2). Les deux définitions devraient intégrer une approche en terme de cycle de vie.

¹ Dans les bâtiments anciens, les calculs surestiment la consommation de 60 à 80% : les occupants sont conscients de la mauvaise performance du bâtiment et ont un comportement plus économe en énergie. À l'inverse, comme le montrent les évaluations post-occupation, la consommation d'énergie de nouveaux bâtiments est sous-estimée car les contrôles électroniques consomment de l'énergie, ne réalisent pas les économies attendues et sont souvent la source d'une mauvaise qualité de l'environnement intérieur.

² Voir le site Internet du JRC pour en savoir plus : http://susproc.jrc.ec.europa.eu/Efficient_Buildings



APPROCHE DU CYCLE DE VIE – propositions d'amendements à l'article 2 et l'Annexe I

L'EPBD révisée devrait intégrer des principes en matière de cycle de vie guidant l'efficacité énergétique dans les bâtiments et demander un calcul du coût du cycle de vie en tant que méthode standardisée pour les calculs de l'efficacité des coûts. Les exigences actuelles en matière de NZEB pour les nouveaux bâtiments sont si difficiles à respecter qu'il n'est pas possible d'économiser davantage d'énergie en exigeant, par exemple, une isolation plus épaisse. L'EPBD révisée devrait donc permettre d'inclure l'énergie intrinsèque / "énergie grise" dans les calculs. Dans les Etats membres où les NZEB sont obligatoires depuis 2015 pour les nouveaux bâtiments, comme par exemple au Danemark, l'énergie utilisée en opération est maintenant du même ordre de grandeur que l'énergie intrinsèque des matériaux de construction, vue sur une durée de vie de 30 ans. Il est donc plus rentable de réduire l'énergie intrinsèque des matériaux que d'économiser des kWh/m² avec toujours plus d'isolation pour atteindre un niveau nZEB.

Le calcul des coûts du cycle de vie et les évaluations du cycle de vie doivent servir de méthodes pour documenter la faisabilité et les impacts environnementaux. Les évaluations du cycle de vie doivent être mises en œuvre parce que la réduction des impacts environnementaux – en particulier les émissions de gaz à effet de serre - sont parmi les principales raisons politiques d'accroître l'efficacité énergétique.

À cette fin, le CAE demande une **définition plus claire des termes « rentabilité » et « optimal en fonction des coûts » au titre de l'article 2 ainsi que l'inclusion des impacts intrinsèque dans la méthode de calcul.**

LES DÉTERMINANTS ARCHITECTURAUX DE LA PERFORMANCE DES BÂTIMENTS – propositions d'amendements aux articles 2a, 10 et Annexe I (4)

Malgré l'intention de l'EPBD d'accorder la priorité aux mesures d'efficacité passive, l'absence d'un mécanisme de retour d'information sur les performances réellement atteintes a contribué à préférer de manière systémique les mesures "actives" aux solutions "passives" en matière d'efficacité énergétique, ce qui a affecté en particulier la qualité des rénovations et les taux de rénovation des bâtiments historiques. Pourtant, les solutions en matière d'enveloppes sont plus robustes, durables et moins coûteuses en termes de fonctionnement, ont une durée de vie plus longue (20-50 ans), sont plus conviviales et génèrent une plus grande satisfaction des occupants que les systèmes techniques. À l'inverse, les solutions en matière de systèmes techniques de bâtiment ont des coûts d'exploitation et de maintenance plus élevés, consomment de l'énergie et sont davantage sujets à un risque de sous-performance.

L'architecture d'un bâtiment, sa connexion à son site et à ses utilisateurs, sa configuration et sa matérialité sont des déterminants majeurs de l'efficacité de l'utilisation des ressources et du bien-être des occupants et régissent également la fonctionnalité, l'adaptabilité et la résilience à long terme d'un bâtiment. Le CAE préconise que le vocabulaire du cadre législatif pour la performance énergétique des bâtiments accorde **une plus grande priorité aux moyens architecturaux pour l'amélioration de la performance des bâtiments sur le long terme**, y compris une meilleure hiérarchisation des solutions passives, à faible intensité technologique, testées localement, qui ne consomment pas d'énergie en fonctionnement et ayant un risque plus faible de sous-performance.

ACCENT SUR LA PERFORMANCE MESURÉE EN UTILISATION – propositions d'amendements aux articles 2 (3), 2 (12), 8 (5), 8 (6), 10, 14, 15 et 20

Il existe des exemples bien documentés des conséquences imprévues du fait de ne pas prendre en



compte la phase opérationnelle, notamment :

- l'écart important entre la performance énergétique attendue et obtenue des bâtiments (au Royaume-Uni en moyenne entre 1,5 et 2 fois plus élevée que celle calculée) ;
- taux élevés de non-conformité (environ 30% au Danemark) ;
- une complexité souvent excessive des systèmes des bâtiments ;
- qualité environnementale intérieure compromise ;
- des coûts d'entretien plus élevés que prévu des solutions d'efficacité énergétique.

Le manque de relation claire entre les notations des CPE et la performance énergétique atteinte en opération a ajouté des risques inutiles aux investissements en matière d'efficacité énergétique et la crédibilité des CPE en a également souffert. Le CAE fait valoir que des modifications mineures de l'actuelle EPBD pour permettre la validation des performances calculées avec des données mesurées en fonctionnement amélioreraient la qualité de l'architecture ainsi que la performance du bâtiment en utilisation.

Une norme de calcul pour réconcilier la performance calculée et la performance mesurée sera nécessaire pour soutenir cela, en lien avec le système de certification volontaire pour les bâtiments non résidentiels (EVCS).

Un tel changement accélérerait le développement des mesures qui utilisent moins d'énergie pour améliorer les fonctionnalités d'un bâtiment tout en augmentant de manière intrinsèque la satisfaction et le bien-être des occupants. Les changements proposés visent également à s'attaquer aux risques associés au fait de préférer les solutions mécanisées et automatisées pour créer des environnements intérieurs sains et productifs.

Le CAE s'oppose fermement à l'utilisation des CPE pour surveiller les améliorations en matière d'économies d'énergie suite à des travaux de rénovation tant que ces certificats ne sont pas **validés par des données mesurées de l'énergie utilisée**. Si les CPE ne sont pas validés par des données mesurées de l'énergie utilisée, comparer des CPE avant et après les travaux de rénovation aurait de graves conséquences.

Les informations contenues dans les CPE devraient être incluses dans des bases de données nationales gérées de manière centralisée, qui devraient également servir de base à l'observation du parc immobilier et à l'élaboration de mesures dans le cadre de la mise en œuvre des stratégies nationales de rénovation.

INDICATEUR D'INTELLIGENCE – propositions d'amendements au paragraphe 6 de l'article 8

Le CAE demande une clarification de la définition, de la portée et des objectifs de l'indicateur d'intelligence proposé : Qu'est-ce qui sera mesuré exactement ? En utilisant quels paramètres ? Quelle utilisation sera faite des résultats obtenus ? Qui effectuera les mesures ? Quels bâtiments seront inclus ? Comment les risques associés à l'automatisation des bâtiments seront-ils pris en compte ? Le CAE invite la Commission à consulter les parties prenantes du secteur de la construction avant de développer cet indicateur. Il estime que tout indicateur d'intelligence doit être cohérent et compatible avec le cadre d'indicateurs que la Commission (DG ENVI) développe actuellement pour évaluer la performance environnementale des bâtiments, ainsi qu'avec l'initiative Passeport du Bâtiment.



PASSEPORTS DE RÉNOVATION DU BÂTIMENT : des feuilles de route personnalisées pour des rénovations en profondeur et de meilleurs bâtiments – propositions d'amendements à l'article 20

Le CAE soutient l'idée d'un Passeport de Rénovation du Bâtiment (PRB), promu notamment par le Building Performance Institute Europe (BPIE)³. Un PRB devrait être « un document - au format électronique ou papier - présentant une feuille de route de rénovation étape par étape sur le long terme (15 ou 20 ans) pour un bâtiment spécifique, résultant d'un audit énergétique réalisé sur place, répondant à des critères de qualité spécifiques et des indicateurs établis pendant la phase de conception et en dialogue avec le propriétaire du bâtiment. Les avantages prévus en termes de réduction des factures de chauffage, d'amélioration du confort et de réduction du CO2 sont une partie constitutive du PRB et sont expliqués dans une communication facile à comprendre. La feuille de route de rénovation peut être combinée à un répertoire d'informations liées au bâtiment (journal de bord) sur des aspects tels que la consommation et la production d'énergie, la maintenance exécutée et les plans du bâtiment. La collecte de données sur place est la première étape vers la création d'un PRB". Ces PRB doivent être délivrés par des experts indépendants, certifiés et expérimentés. Ils doivent être personnalisés selon le type de bâtiment, le profil du propriétaire et les caractéristiques nationales afin d'augmenter leur valeur en tant qu'outils pour guider les décisions d'investissement. Le CAE fait valoir que les résultats des évaluations de la valeur du bien avant et après la rénovation devraient également être ajoutés au PRB. Les données des PRB attribuables devraient être mises à disposition à des fins de recherche et des données anonymisées à des fins commerciales.

ACCÉLÉRER LA RÉNOVATION DES BÂTIMENTS - propositions d'amendements aux articles 2 (10), 2a et 10

Ces dernières années, le financement des mesures d'efficacité énergétique, en particulier pour la rénovation du parc existant, a été découplé de l'investissement dans la conception spatiale et architecturale des bâtiments. Des législations axées sur des solutions techniques à l'efficacité énergétique ont eu pour conséquence de réduire l'intérêt économique de procéder à la rénovation spatiale et architecturale dans le cadre d'une rénovation éco-énergétique. Alors que les États Membres de l'UE se lancent dans l'un des plus importants efforts jamais entrepris pour rénover le parc existant, il est possible d'améliorer la mise en œuvre des mesures d'efficacité énergétique en reliant les instruments financiers à la conception et la rénovation architecturale. En reconnectant l'efficacité énergétique avec les déterminants du marché pour la rénovation architecturale, l'investissement public dans l'efficacité énergétique offrira davantage de rendements et rendra les solutions techniques plus robuste et attractives. Le CAE soutient le développement de mécanismes de financement innovants en faveur de l'efficacité énergétique et des ressources dans les bâtiments qui reconnaissent l'architecture comme une solution plutôt qu'un coût additionnel.

La majorité des propriétés ne possèdent pas de certificats PEB si elles ne sont pas en location ou en vente. Pour parvenir à augmenter les taux de rénovations énergétiques **les incitations financières doivent se concentrer sur les améliorations étant effectuées entre les transactions immobilières**. Le CAE promeut des modifications dans l'EPBD qui incitent à une intégration beaucoup plus étroite des rénovations performatives, fonctionnelles, spatiales, et matérielle des bâtiments.

Réfléchir en terme de cycle de vie est crucial pour stimuler le taux de rénovation et pour trouver des gains rapides en matière d'efficacité énergétique et des solutions efficaces pour le climat. Les

³ <http://bpie.eu/publication/renovation-passports>



rénovations se produisent généralement lorsque les bâtiments changent de propriétaire ou de locataire. C'est le moment où les besoins fonctionnels changent et doivent être pris en compte. La conception des critères de rénovation énergétique devrait cibler ces situations. Sans quoi, les rénovations se produisent lorsque les bâtiments sont détériorés, entre les transactions. Les utilisateurs manquent souvent dans ces cas de ressources économiques. C'est pourquoi les instruments financiers combinant les rénovations architecturales et performatives sont essentiels pour augmenter les taux de rénovation. De tels instruments doivent être étayés par des CPE qui reflètent la consommation énergétique du bâtiment en opération.

SEUILS DE DÉCLENCHEMENT – DÉFINITION DE RENOVATION IMPORTANTE - propositions d'amendements à l'article 2 (10)

Les exigences légales actuelles en matière de rénovation énergétique ne fonctionnent pas comme elles le devraient. Aujourd'hui, il existe des exigences en matière de rénovation énergétique si l'on remplace plus de 25% de l'enveloppe du bâtiment. L'exigence est réellement appliquée uniquement si elle est considérée comme une rénovation énergétique économiquement viable. Mais les règles sont de facto une barrière car la rénovation n'est jamais économiquement viable si l'on considère uniquement l'efficacité énergétique sur le court terme. Les améliorations sont possibles grâce aux avantages sociaux qu'elles offrent en termes d'aménagement et de confort. Ceci entraîne une augmentation de la valeur de la propriété, souvent associée à des améliorations architecturales plutôt qu'à des rénovations énergétiques n'ayant que pour but une moindre consommation énergétique. Pour un parc immobilier efficace sur le plan énergétique, il serait plus efficace de **remplacer la définition de "rénovation importante" par un système de comparaison - par ex. améliorer le CPE d'au moins deux classes - pour toute rénovation majeure nécessitant un permis de construire, à condition que la Directive mettent en place des CPE plus robustes.** Les propriétaires devraient pouvoir éviter cette demande seulement s'ils peuvent prouver par un calcul du coût du cycle de vie que cette rénovation majeure ne sera pas possible dans les 30 ans.

PRECARITE ENERGETIQUE

Le CAE se félicite de l'accent mis sur la pauvreté énergétique. L'accroissement de la valeur des propriétés résultant d'améliorations de l'efficacité énergétique peut réduire l'accès au logement social – ceci doit être abordé par les stratégies nationales.



ACE PROPOSALS OF AMENDMENTS TO THE COMMISSION'S PROPOSAL

The document is structured to include the Commission's proposals in the left column, alongside ACE proposals of amendments on the right. In the right column, ACE proposals of deletion are strikethrough and highlighted in red (~~deletion~~), while proposals of additions are in blue (~~addition~~). Each proposal of amendment is followed by a justification.

Article 2

Definitions

Commission's proposal	ACE proposal of amendment
<p>3. 'technical building system' means technical equipment for the heating, cooling, ventilation, hot water, lighting or for a combination thereof, of a building or building unit;</p> <p>3. 'technical building system' means technical equipment for space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, on-site electricity generation, on-site infrastructure for electro-mobility, or a combination of such systems, including those using energy from renewable sources, of a building or building unit;</p>	<p>3. 'technical building system' means technical equipment for the heating, cooling, ventilation, hot water, lighting or for a combination thereof, of a building or building unit;</p> <p>3. 'technical building system' means technical equipment for space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, the provision of energy usages as per ISO Standard 12655 and the systems required for on-site electricity generation, on-site infrastructure for electro-mobility, or a combination of such systems, including those using energy from renewable sources, of a building or building unit;</p>
<p><i>Justification</i></p> <p>ACE believes that broadening the scope of reported energy end uses incorporating previously 'unregulated' uses, such as controls and vertical transportation, is important for the following reasons:</p> <ul style="list-style-type: none">- Unregulated energy use can be responsible for over a third of a building's energy consumption⁴;- They have a big impact on the design and operation of a building and the successful integration of building services in the building's architecture to achieve low energy consumption in use;- They are important contributors to indoor environment and occupants' comfort;- Omitting previously 'unregulated' systems and end uses from the definition of building systems resulted in fragmented responsibility for the design, installation, commissioning and	

⁴ See:

- Energy Consumption Guides 19 on Energy use in offices, which provides benchmarks for the assessment of the energy performance of office buildings: [http://www.cibse.org/getmedia/7fb5616f-1ed7-4854-bf72-2dae1d8bde62/ECG19-Energy-Use-in-Offices-\(formerly-ECON19\).pdf.aspx](http://www.cibse.org/getmedia/7fb5616f-1ed7-4854-bf72-2dae1d8bde62/ECG19-Energy-Use-in-Offices-(formerly-ECON19).pdf.aspx)
- The Building Data Exchange: <http://www.buildingdataexchange.org.uk>



operation of these systems. This has been highlighted by several studies as a major cause of unexpectedly high energy consumption in buildings⁵;

- There is now sufficient data in the public domain and standards to allow the standardised calculation of such parameters and detailed submetering requirements that allow any occupant behaviour related deviation from such standards to be corrected for as part of the certification process⁶. It is essential that the property industry learns from the mistakes of the car industry and returns to measuring what it aims to reduce rather than a 'notional' performance.

ACE proposes to include a reference to the ISO standard 12655, which provides a set of clear definitions, terms and procedures for presenting the energy use in buildings in a consistent and uniform way. Such a comprehensive expression of building energy use is of great importance for the reconciliation of calculated and measured energy consumption and it is conducive to:

- a) Regulating the presentation of the energy use of buildings with respect to data collection, metering and analysis;
- b) Providing a uniform platform for the assessment and comparison of building energy;
- c) Laying the foundation of energy data collection, metering, statistics, audit and analysis for both regional and national buildings.

Learn more on ISO standard 12655 on ISO website⁷.

PROPOSALS OF CHANGES TO OTHER PARAGRAPHS IN ARTICLE 2

2. Nearly zero-energy building

Current EPBD	ACE proposals of change
2. 'nearly zero-energy building' means a building that has a very high energy performance, as determined in accordance with Annex I. The nearly zero or very low amount of energy required should be covered to a very significant	2. 'nearly zero-energy building' means a healthy and comfortable building that has a very high energy performance, constructed with minimal energy, waste and environmental impact , as determined in accordance with Annex I. The

⁵ See: <http://www.buildingdataexchange.org.uk>

⁶ See:

- Burman, E., Kimpian, J., and Mumovic, D., 2012. Towards an integrated building energy assessment framework to account for the externality of performance gap, Proceedings of the First International Conference on Urban Sustainability and Resilience (ISSN 2051-1361) Poster Presentation, 5-7 November 2012, University College London, London, UK.)
- Burman, E., Mumovic, D., Kimpian, J. 2014. *Analysis of the Applicability of the UK National Calculating Methodology to Energy Efficiency Finance of Non-domestic Buildings: A Case Study Approach*, [Forthcoming, submitted to Building Simulation and Optimisation 2014, London]
- EPB standard ISO/FDIS 52000-1:2016(E)
- Burman, E., Mumovic, D., and Kimpian, J., 2013. *A Methodology for Measurement and Verification of Energy Performance under the Framework of the European Directive for Energy Performance of Buildings*, proceedings of the 6th International Conference on Sustainable Energy & Environmental Protection (SEEP 2013), pp. 239-250, 20-23 August 2013, Maribor, Slovenia.

⁷ <https://www.iso.org/obp/ui/#iso:std:iso:12655:en>



extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby;	nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby;
<p style="text-align: center;"><i>Justification</i></p> <p>ACE believes that the definitions 'nearly zero-energy building' should be converging with the vision for a 'decarbonized building stock' (see below proposal for a definition of 'decarbonized building stock' page 11). Both of them should incorporate life cycle approach.</p>	

10. Major renovation

Current EPBD	ACE proposals of change
<p>10. 'major renovation' means the renovation of a building where:</p> <p>(a) the total cost of the renovation relating to the building envelope or the technical building systems is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated; or</p> <p>(b) more than 25 % of the surface of the building envelope undergoes renovation;</p> <p>Member States may choose to apply option (a) or (b).</p>	<p>10. 'major renovation' means the renovation of a building where:</p> <p>(a) the total cost of the renovation relating to the building envelope or the technical building systems is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated; or</p> <p>(b) more than 25 % of the surface of the building envelope undergoes renovation;</p> <p>(c) more than 50% of Gross Internal Area undergoes renovation.</p> <p>Member States may choose to apply option (a), or (b) and/or (c).</p>



Justification

ACE challenges the definition of 'major renovation', which is acting as a market deterrent for undertaking renovation. Instead ACE argues that Point 10 could be entirely omitted if the robustness of EPCs is sufficiently increased to reflect the achieved and not the notional performance of buildings. Data disclosure through EPCs will in themselves highlight the need to better plan for the operational functionality of buildings, if predicted performance improvements are to be achieved. Further incentives may be required to support the creation of financial instruments that would jointly support functional and performative retrofits, such as a requirement for performance and valuation data to be disclosed before and after renovation.

ACE suggests that, if the term is retained, then clause (c) is added to recognise that removal and reinstatement of surface finishes form a significant part of cost and upheaval for deep renovation. Once a significant indoor area is affected by renovation then it is reasonable to expect that prior to reinstating internal finishes the fabric and systems upgrades required to improve the thermal efficiency of the building are implemented throughout.

12. Energy Performance Certificate

Current EPBD	ACE proposals of change
12. 'energy performance certificate' means a certificate recognised by a Member State or by a legal person designated by it, which indicates the energy performance of a building or building unit, calculated according to a methodology adopted in accordance with Article 3;	12. 'energy performance certificate' means a certificate recognised by a Member State or by a legal person designated by it, which indicates the energy performance of a building or a building unit, calculated according to a methodology adopted in accordance with Article 3 and validated as within range of achieved measured energy consumption in use;
<p><i>Justification</i></p> <p>It is essential that the EPC certification is validated with measured consumption achieved in use to ensure that financial incentives are based on robust certificates that indicate real reductions in energy use. Unintended consequences of current EPCs include:</p> <ul style="list-style-type: none"> - significantly higher than expected energy consumption in use, - investment in energy efficiency measures that offer no or significantly lower than expected return on investment, - high maintenance and operating costs and - compromised indoor environmental quality. <p>Validated EPCs are required to kick-start a virtuous cycle of continuous performance improvement based on evidence. Such an improvement in certification would allow investors to make robust links between performance improvements and value, which is currently not possible to establish as EPCs are not perceived to relate to achieved performance in use.</p>	



14. Cost-optimal level

Current EPBD	ACE proposals of change
<p>14. 'cost-optimal level' means the energy performance level which leads to the lowest cost during the estimated economic lifecycle, where:</p> <p>(a) the lowest cost is determined taking into account energy-related investment costs, maintenance and operating costs (including energy costs and savings, the category of building concerned, earnings from energy produced), where applicable, and disposal costs, where applicable; and</p> <p>(b) the estimated economic lifecycle is determined by each Member State. It refers to the remaining estimated economic lifecycle of a building where energy performance requirements are set for the building as a whole, or to the estimated economic lifecycle of a building element where energy performance requirements are set for building elements.</p> <p>The cost-optimal level shall lie within the range of performance levels where the cost benefit analysis calculated over the estimated economic lifecycle is positive;</p>	<p>14. 'cost-optimal level' means the energy performance level which leads to the lowest cost and lowest risk of under-performance during the estimated economic lifecycle, where:</p> <p>(a) the lowest cost is determined taking into account energy-related investment costs, maintenance and operating costs (including energy costs and savings, the category of building concerned, earnings from energy produced), where applicable, and disposal costs, where applicable; and</p> <p>(b) the estimated economic lifecycle is determined by each Member State. It refers to the remaining estimated economic lifecycle of a building where energy performance requirements are set for the building as a whole, or to the estimated economic lifecycle of a building element where energy performance requirements are set for building elements.</p> <p>(c) where the risks of under-performance are factored in based on the gap between calculated and measured performance in use and calculated nationally for each system.</p> <p>The cost-optimal level shall lie within the range of performance levels where the cost benefit analysis calculated over the estimated economic lifecycle is positive;</p>
<p style="text-align: center;"><i>Justification</i></p> <p>The assumptions made in life-cycle calculations do not require the evaluation of risks associated with different energy efficiency measures despite evidence showing that these risks can contribute on average to 1.5-3-fold increases in energy consumption in operation⁸. There is a need to base life-cycle calculations on more realistic performance predictions by collecting and analysing data relating to the success of different systems nationally. While it is arguable that operating factors can have a big influence on these risks it has to be acknowledged that solutions that are well-designed, are easy to use or require no active maintenance, such as passive systems, present significantly lower operating risks, which needs to be taken into account.</p>	

⁸ Kimpian, J., Burman, E., Bull, J., Paterson, G., Mumovic, D., 2013. *Getting Real about Energy Use in Non-domestic Buildings*, [CIBSE ASHRAE 2014 Conference, London]



PROPOSALS OF NEW DEFINITIONS UNDER ARTICLE 2

- **“decarbonised building stock”** means healthy, comfortable and highly energy efficient buildings, with a very low energy demand, supplied by renewable energy sources and intelligently integrated into a decarbonised, flexible energy system as well as constructed with minimal energy, waste and environmental impact.
- **‘Individual building renovation passport’** means a document – in electronic or paper format – that outlines a long-term (up to 20 years) step-by-step renovation roadmap for a specific building, resulting from an on-site energy audit and fulfilling specific quality criteria and indicators established in consultation with the building owner.
- **‘general indoor climate conditions’** means thermal, including resilience to overheating, pollutant free air provision, acoustic and daylighting conditions.
- **‘designated function’** of a building includes the building’s ability to meet occupant needs as well as functional adaptability, including the ability to adapt to long term changes in use types and occupant needs.

Justification

The additional definitions are necessary to establish common principles for a harmonised improvement of the European building stock (*“decarbonised building stock”* and *‘Individual building renovation passport’*) and to clarify terms used under Article 4 points 1 and 2 (*“general indoor climate conditions”* and *“designated function”*) to go some way to recognise all four pillars of building performance.

While it could be left to MS to decide on a specific definition and strategy to achieve the goal to decarbonise the building stock by 2050, it is essential that the principles on how a decarbonised building stock would look like are commonly established. To achieve the energy transition and deliver all its benefits to the EU citizens, it is imperative to send clear signal to the market about how the future should look like.

By following the energy Union’s Efficiency First principle and NZEB principle (which is already established in the directive), the future building stock will be more efficient and better performing. At the same time, the EU should promote and aspire to a healthier, more comfortable and more affordable building stock.

In addition, ACE believes that *‘Smartness indicator’* as referred to under Article 8 requires interim definition that recognises the risks associated with the design, installation, commissioning, operation and maintenance needs of automated services. These systems have been highlighted as a primary cause of the performance gap and the source of excessive mitigation and maintenance costs in modern buildings.

Additional guidelines and standards should be created to support the transparent reporting and certification of all energy end uses and related technical building systems, in particular:

- the reporting of occupant density and hours of use;
- the concepts of “cost-effective”, “estimated economic lifecycle” (Article 5 / Annex III, and already to be considered in guidelines);
- targeted and achieved indoor climate conditions, indoor comfort parameters;
- nearly zero energy buildings.



New Article 2a
Long-term renovation strategy

Commission's proposal	ACE proposal of amendment
<p>1. Member States shall establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private. This strategy shall encompass:</p> <p>(a) an overview of the national building stock based, as appropriate, on statistical sampling;</p> <p>(b) identification of cost-effective approaches to renovations relevant to the building type and climatic zone;</p> <p>(c) policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations;</p> <p>(d) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions;</p> <p>(e) an evidence-based estimate of expected energy savings and wider benefits.</p>	<p>1. Member States shall establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private. This strategy shall encompass:</p> <p>(a) an overview of the national building stock based, as appropriate, on statistical sampling;</p> <p>(b) identification of life cycle cost-effective approaches to renovations relevant to the building type and climatic zone and their alignment with relevant functional retrofit scenarios;</p> <p>(c) policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations;</p> <p>(d) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions;</p> <p>(e) an evidence-based estimate of expected energy savings and wider benefits.</p>
<p style="text-align: center;"><i>Justification</i></p> <p>ACE proposes an addition to (b) under paragraph 1:</p> <p>(b) identification of life cycle cost-effective approaches to renovations relevant to the building type and climatic zone and their alignment with relevant functional retrofit scenarios;</p> <p>Cost efficiency needs to be assessed using Life Cycle Costing (LCC) calculations. This will stimulate longer term investments and solutions that are needed to improve the rate of energy retrofitting of the existing building stock. Quantifying the net present value of future energy savings and the long term robustness and feasibility of design solutions using LCC will help decision makers and property owners decide the best solutions.</p> <p>“<i>Relevant functional retrofit</i>” includes capacity enhancements such as roof and side extensions, creation of semi-outdoor buffer spaces such as balconies, façade shading and lightwells, kitchen and bathroom upgrades.</p> <p>This is to promote the alignment of functional and performative upgrades of buildings. Functional upgrades occur with much greater frequency than energy efficient retrofits. These already require the replacement or addition of structure, wiring, plumbing and finishes similar to deep renovation. Common energy efficiency retrofit in domestic scenarios reduce energy consumption on average between 5-10% and only deep renovation can improve energy efficiency by more than the 30% required to meet efficiency targets. In addition, energy efficiency retrofits by themselves contribute to between 0.5-1% of increase in property values, while a functional/architectural retrofit can increase</p>	



property values by an order of magnitude. Providing advantageous financing for all retrofit projects willing to improve energy efficiency by more than 30% is a win-win scenario for all stakeholders and is more likely to achieve a step change in the uptake of energy efficient retrofits than providing finance for energy efficiency only. See comments on 'major renovation' under point 2a.

Commission's proposal	ACE proposal of amendment
<p>2. In their long-term renovation strategy referred to in paragraph 1, Member States shall set out a roadmap with clear milestones and measures to deliver on the long-term 2050 goal to decarbonise their national building stock, with specific milestones for 2030.</p> <p>In addition, the long term strategies shall contribute to the alleviation of energy poverty.</p>	<p>2. In their long-term renovation strategy referred to in paragraph 1, Member States shall set out a roadmap with clear milestones and measures to deliver on the long-term 2050 goal to decarbonise their national building stock, with specific milestones for 2030.</p> <p>Member states shall define nearly zero EMISSION building standards and benchmarks to be fully implemented in building regulations by 2030 for new buildings and retrofits of the existing building stock.</p> <p>Near zero EMISSION building standards need to be documented using Life Cycle Assessment (LCA) methods to calculate energy and resource use associated impacts of buildings.</p> <p>The accuracy of LCAs should be continuously improved by requiring all building components to have Environmental Product Declarations (EPD) based on the actual and specific resource use of the given component implemented by 2030.</p> <p>In addition, the long term strategies shall contribute to the alleviation of energy poverty.</p>
<p style="text-align: center;"><i>Position</i></p> <p>ACE believes that the current wording "2050 goal to decarbonise their national building stock" is too vague. It calls on the co-legislator to clarify the EU long-term 2050 vision. The EU needs an ambitious and clearly defined long-term 2050 vision, with key milestones in 2030 and 2040, in order create a stable regulatory framework, conducive to investment decisions. ACE advocates for a resource efficient and comfortable building stock by 2050 – see proposal of definition of "decarbonised building stock" under article 2.</p> <p>Energy efficiency is a primary means to achieve the political aims of energy security and climate change mitigation. This should be reflected in the revision of the EPBD by linking energy efficiency to</p>	



carbon emission savings and environmental impacts. These are calculated using Life Cycle Assessment (LCA) methods and Environmental Product Declarations (EPD) to account for operational and embodied energy uses and the associated environmental impacts of building operation, fabrication and possible reuse and recycling of building elements.

This will connect the EPBD to the upcoming policy on circular economy and the great potentials the circular economy carries for economic growth, job creation and resource efficiency and availability. In the case of Denmark, an ambitious implementation of circular economy has an economic potential of an 0,8-1,4% increase in the Danish GDP and a 3-7% reduction in carbon footprint by 2035 according to the Ellen MacArthur Foundation⁹. Half of these benefits are found in the construction sector through recycling, digital fabrication and documentation as well as greater efficiency in space use. Reaping the benefits of the circular economy, carbon savings and overall resource efficiency require better access to data and quality of data on building performance and the embodied energy and carbon emissions of materials and components in buildings. LCA is an ISO 14040 standardized method, but input data are often based on generic values which often do not reflect the regional differences and product specific resource uses and environmental impacts accurately.

Therefore the framework and data quality of LCAs and EPDs should be consistently and continuously improved by defining a step by step procedure for implementing EPDs for all building components based on the specific data of the components' fabrication by 2030.

ACE welcomes the focus on energy poverty and recognises that increasing the value of properties as part of energy efficiency retrofits can result in diminished access to social housing, which must be addressed by national strategies.

Commission's proposal	ACE proposal of amendment
<p>3. To guide investment decisions as referred to in point (d) in paragraph 1, Member States shall introduce mechanisms for:</p> <p>(a) the aggregation of projects, to make it easier for investors to fund the renovations referred to in points (b) and (c) in paragraph 1;</p> <p>(b) de-risking energy efficiency operations for investors and the private sector; and</p> <p>(c) the use of public funding to leverage additional private sector investment or address specific market failures.</p>	<p>3. To guide investment decisions as referred to in point (d) in paragraph 1, Member States shall introduce mechanisms for:</p> <p>(a) the aggregation of projects, to make it easier for investors to fund the renovations referred to in points (b) and (c) in paragraph 1;</p> <p>(b) identifying overlaps with relevant functional retrofits scenarios</p> <p>(c) de-risking energy efficiency operations for investors and the private sector; and</p> <p>(d) the use of public funding to leverage additional private sector investment or address specific market failures.</p> <p>(e) identifying the benefits of renovation in terms of indoor environmental quality and occupant satisfaction.</p>

⁹ https://www.ellenmacarthurfoundation.org/assets/downloads/government/20151113_DenmarkCaseStudy.pdf
See page 26



Justification

ACE proposes the addition of a new (b) under paragraph 3:

(b) identifying beneficial overlaps with relevant functional retrofits scenarios

This is to promote the alignment of functional and performative upgrades of buildings. Functional upgrades, including capacity enhancements such as roof and side extensions, creation of semi-outdoor buffer spaces such as balconies, façade shading and lightwells, kitchen and bathroom upgrades, occur with much greater frequency than energy efficient retrofits. These already require the replacement or addition of structure, wiring, plumbing and finishes similar to deep renovation. Common energy efficiency retrofit in domestic scenarios reduce energy consumption on average between 5-10% and only deep renovation can improve energy efficiency by more than the 30% required to meet efficiency targets. In addition, energy efficiency retrofits by themselves contribute to between 0.5-1% of increase in property values, while a functional/architectural retrofit can increase property values by an order of magnitude. Providing advantageous financing for all retrofit projects willing to improve energy efficiency by more than 30% is a win-win scenario for all stakeholders and is more likely to achieve a step change in the uptake of energy efficient retrofits than providing finance for energy efficiency only. See comments on 'major renovation' under point 2a.

ACE suggests the addition of a new (e) under paragraph 3:

(e) identifying the benefits of renovation in terms of indoor environment quality and occupants' satisfaction.

ACE shares the view that the renovation of the existing building stock is the most important task for reaching the climate protection targets. Energy efficiency is central to fighting climate change. Strategies to achieve significant reductions in building energy use must also deliver better indoor environmental quality, building functionality and occupant satisfaction in order to provide long-term solutions and to avoid any unintended consequences. It is also important to recognise that indoor environmental quality and improved building functionality act as far greater incentives for occupiers and investors to finance energy efficient retrofits and that to achieve resilient buildings it is essential to target all these four pillars of building performance.

Article 6 **New buildings**

Commission's proposal	ACE proposal of amendment
<p>1. Member States shall take the necessary measures to ensure that new buildings meet the minimum energy performance requirements set in accordance with Article 4.</p> <p>For new buildings, Member States shall ensure that, before construction starts, the technical, environmental and economic feasibility of high-efficiency alternative systems such as those listed below, if available, is considered and taken into account:</p> <p>(a) decentralised energy supply systems</p>	<p>1. Member States shall take the necessary measures to ensure that new buildings meet the minimum energy performance requirements set in accordance with Article 4.</p> <p>For new buildings, Member States shall ensure that, before construction starts, the technical, environmental and economic feasibility of high-efficiency alternative systems such as those listed below, if available, is considered and taken into account:</p> <p>(a) decentralised energy supply systems</p>



<p>based on energy from renewable sources;</p> <p>(b) cogeneration;</p> <p>(c) district or block heating or cooling, particularly where it is based entirely or partially on energy from renewable sources;</p> <p>(d) heat pumps.</p> <p>2. Member States shall ensure that the analysis of alternative systems referred to in paragraph 1 is documented and available for verification purposes.</p> <p>3. That analysis of alternative systems may be carried out for individual buildings or for groups of similar buildings or for common typologies of buildings in the same area. As far as collective heating and cooling systems are concerned, the analysis may be carried out for all buildings connected to the system in the same area.</p>	<p>based on energy from renewable sources;</p> <p>(b) cogeneration;</p> <p>(c) district or block heating or cooling, particularly where it is based entirely or partially on energy from renewable sources;</p> <p>(d) heat pumps.</p> <p>2. Member States shall ensure that the analysis of alternative systems referred to in paragraph 1 is documented and available for verification purposes.</p> <p>3. That analysis of alternative systems may be carried out for individual buildings or for groups of similar buildings or for common typologies of buildings in the same area. As far as collective heating and cooling systems are concerned, the analysis may be carried out for all buildings connected to the system in the same area.</p>
<p>ACE position</p> <p>ACE agrees with the Commission's analysis and welcomes the deletion of these provisions: the requirement to assess the technical, environmental and economic feasibility of high-efficiency alternative systems under Article 6(1) of the EPBD is effectively redundant because the obligation for all new buildings to be nearly zero-energy buildings implicitly requires an assessment of locally available high-efficiency alternative systems.</p>	

Article 7 Existing buildings

Commission's proposal	ACE proposal of amendment
<p>Member States shall take the necessary measures to ensure that when buildings undergo major renovation, the energy performance of the building or the renovated part thereof is upgraded in order to meet minimum energy performance requirements set in accordance with Article 4 in so far as this is technically, functionally and economically feasible.</p> <p>Those requirements shall be applied to the renovated building or building unit as a whole. Additionally or alternatively, requirements may be applied to the renovated building elements. Member States shall in addition take the</p>	<p>Member States shall take the necessary measures to ensure that when buildings undergo major renovation, the energy performance of the building or the renovated part thereof is upgraded in order to meet minimum energy performance, general indoor climate and designated functional requirements set in accordance with Article 4 in so far as this is technically, functionally and economically feasible.</p> <p>Those requirements shall be applied to the renovated building or building unit as a whole. Additionally or alternatively, requirements may be applied to the renovated building elements. Member States shall in addition take the</p>



<p>necessary measures to ensure that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, is retrofitted or replaced, the energy performance of the building element meets minimum energy performance requirements in so far as this is technically, functionally and economically feasible.</p> <p>Member States shall determine these minimum energy performance requirements in accordance with Article 4.</p> <p>Member States shall encourage, in relation to buildings undergoing major renovation, the consideration and taking into account of high-efficiency alternative systems, as referred to in Article 6(1), in so far as this is technically, functionally and economically feasible.</p>	<p>necessary measures to ensure that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, is retrofitted or replaced, the energy performance of the building element meets minimum energy performance requirements in so far as this is technically, functionally and economically feasible.</p> <p>Member States shall determine these minimum energy performance requirements in accordance with Article 4.</p> <p>Member States shall encourage, in relation to buildings undergoing major renovation, the consideration and taking into account of high-efficiency alternative systems, as referred to in Article 6(1), in so far as this is technically, functionally and economically feasible.</p>
<p style="text-align: center;"><i>ACE position</i></p> <p>See comments on the term ‘major renovation’ under Article 2 (10)</p> <p>The purpose of using energy in buildings is to create a comfortable, healthy and productive indoor environment. Passive architecture measures on their own cannot fully deliver these and require mechanical enhancements. Adding the term ‘<i>general indoor climate and designated functional</i>’ in the first paragraph is the first step towards re-directing market focus away from purely mechanical solutions to indoor environmental quality towards more holistic and innovative means of achieving indoor comfort.</p> <p>ACE requests a clearer definition of the term “<i>technically, functionally and economically feasible</i>” in the context of ‘cost-optimal’ interventions.</p>	

Article 8

Technical building systems

Commission’s proposal	ACE proposal of amendment
<p>1. Member States shall, for the purpose of optimising the energy use of technical building systems, set system requirements in respect of the overall energy performance, the proper installation, and the appropriate dimensioning, adjustment and control of the technical building systems which are installed in existing buildings. Member States may also apply these system requirements to new buildings.</p> <p>System requirements shall be set for new, replacement and upgrading of technical building systems and shall be applied in so far as they are</p>	<p>1. Member States shall, for the purpose of optimising the energy use of technical building systems, set system requirements in respect of the overall energy performance, the proper installation, and the appropriate dimensioning, adjustment and control of the technical building systems which are installed in existing buildings. Member States may also apply these system requirements to new buildings.</p> <p>System requirements shall be set for new, replacement and upgrading of technical building systems and shall be applied in so far as they are</p>



<p>technically, economically and functionally feasible.</p> <p>The system requirements shall cover at least the following:</p> <ul style="list-style-type: none">(a) heating systems;(b) hot water systems;(c) air conditioning systems;(d) large ventilation systems; <p>or a combination of such systems.</p> <p>2. Member States shall encourage the introduction of intelligent metering systems whenever a building is constructed or undergoes major renovation, whilst ensuring that this encouragement is in line with point 2 of Annex I to Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity (16). Member States may furthermore encourage, where appropriate, the installation of active control systems such as automation, control and monitoring systems that aim to save energy.</p> <p>2. Member States shall ensure that in all new non-residential buildings and in all existing non-residential buildings undergoing major renovation with more than ten parking spaces, at least one of every ten is equipped with a recharging point within the meaning of Directive 2014/94/EU on the deployment of alternative fuels infrastructure, which is capable of starting and stopping charging in reaction to price signals. This requirement shall apply to all non-residential buildings, with more than ten parking spaces, as of 1 January 2025.</p> <p>Member States may decide not to set or apply the requirements referred to in the previous subparagraph to buildings owned and occupied by small and medium-sized enterprises as defined in Title I of the Annex to Commission Recommendation 2003/361/EC of 6 May 2003.</p> <p>3. Member States shall ensure that newly built residential buildings and those undergoing major renovations, with more than ten parking spaces, include the pre-cabling to enable the installation</p>	<p>technically, economically and functionally feasible.</p> <p>The system requirements shall cover at least the following:</p> <ul style="list-style-type: none">(a) heating systems;(b) hot water systems;(c) air conditioning systems;(d) large ventilation systems; <p>or a combination of such systems.</p> <p>2. Member States shall encourage the introduction of intelligent metering systems whenever a building is constructed or undergoes major renovation, whilst ensuring that this encouragement is in line with point 2 of Annex I to Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity (16). Member States may furthermore encourage, where appropriate, the installation of active control systems such as automation, control and monitoring systems that aim to save energy.</p> <p>2. Member States shall ensure that in all new non-residential buildings and in all existing non-residential buildings undergoing major renovation with more than ten parking spaces, at least one of every ten is equipped with a recharging point within the meaning of Directive 2014/94/EU on the deployment of alternative fuels infrastructure, which is capable of starting and stopping charging in reaction to price signals. This requirement shall apply to all non-residential buildings, with more than ten parking spaces, as of 1 January 2025.</p> <p>Member States may decide not to set or apply the requirements referred to in the previous subparagraph to buildings owned and occupied by small and medium-sized enterprises as defined in Title I of the Annex to Commission Recommendation 2003/361/EC of 6 May 2003.</p> <p>3. Member States shall ensure that newly built residential buildings and those undergoing major renovations, with more than ten parking spaces, include the pre-cabling to enable the installation</p>
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<p>of recharging points for electric vehicles for every parking space.</p> <p>4. Member States may decide not to set or apply the requirements referred to in paragraphs 2 and 3 to public buildings which are already covered by Directive 2014/94/EU.</p>	<p>of recharging points for electric vehicles for every parking space.</p> <p>4. Member States may decide not to set or apply the requirements referred to in paragraphs 2 and 3 to public buildings which are already covered by Directive 2014/94/EU.</p>
<p style="text-align: center;"><i>Justification</i></p> <p><u>Point 1, second paragraph:</u></p> <p>See comments on the term 'major renovation' under Article 2 (10).</p> <p>ACE requests a clearer definition of the term "<i>technically, functionally and economically feasible</i>" in the context of 'cost-optimal' interventions.</p> <p><u>Point 2 deleted</u></p> <p>Metering and monitoring needs to then be clarified elsewhere, such as under Article 2a and Article 8 point 6.</p> <p><u>Points 2, 3, 4</u></p> <p>ACE welcomes the new provisions regarding recharging points for electro mobility.</p>	

Commission's proposal	ACE proposal of amendment
<p>5. Member States shall ensure that, when a technical building system is installed, replaced or upgraded, the overall energy performance of the complete altered system is assessed, documented it and passed on to the building owner, so that it remains available for the verification of compliance with the minimum requirements set pursuant to paragraph 1 and the issue of energy performance certificates. Member States shall ensure that this information is included in the national energy performance certificate database referred to in Article 18(3).</p>	<p>5. Member States shall ensure that, when a technical building system is installed, replaced or upgraded, the overall energy performance of the complete altered system is assessed, documented it and passed on to the building owner, so that it remains available for the verification of compliance with the minimum requirements set pursuant to paragraph 1 and the issue of energy performance certificates. Member States shall ensure that this information is included in the national energy performance certificate database referred to in Article 18(3).</p> <p>5.a. Information regarding the intended operation and maintenance of the technical building system installed must be easily made available either through printed or digital documentation.</p>
<p style="text-align: center;"><i>Justification</i></p> <p><u>Point 5</u></p>	



ACE welcomes point 5 but calls for clarification:

- What are the boundaries of “*complete altered system*” and could these be defined under Article 2a?
- What is the minimum threshold for the definition of a system?
- ACE recommends that the Smartness Indicator should include the digital storage of such data – i.e. in the form of a digital building passport

Smartness indicator should include the digital storage of such data – i.e. a digital building passport.

New point 5a

Inclusion of intended operational profiles and maintenance schedules are frequently missing from building documentation. There is an opportunity to formalise the disclosure of such information through a Digital Building Passport, a form of digital ‘Log Book’ that accompanies a building during transactions if the datasets can accommodate related data.

Commission’s proposal	ACE proposal of amendment
<p>6. The Commission is empowered to adopt delegated acts in accordance with Article 23 supplementing this Directive with a definition of ‘smartness indicator’ and with the conditions under which the ‘smartness indicator’ would be provided as additional information to prospective new tenants or buyers.</p> <p>The smartness indicator shall cover flexibility features, enhanced functionalities and capabilities resulting from more interconnected and built-in intelligent devices being integrated into the conventional technical building systems. The features shall enhance the ability of occupants and the building itself to react to comfort or operational requirements, take part in demand response and contribute to the optimum, smooth and safe operation of the various energy systems and district infrastructures to which the building is connected.</p>	<p>6. The Commission is empowered to adopt delegated acts in accordance with Article 23 supplementing this Directive with a definition of ‘smartness indicator’ and with the conditions under which the ‘smartness indicator’ would be provided as additional information to prospective new tenants or buyers.</p> <p>The smartness indicator shall cover flexibility features, enhanced functionalities and capabilities resulting from more interconnected and built-in intelligent devices being integrated into the conventional technical building systems. The features shall enhance the ability of occupants and the building itself to react to comfort or operational requirements, take part in demand response and contribute to the optimum, smooth and safe operation of the various energy systems and district infrastructures to which the building is connected. Such systems shall allow feedback on achieved performance including the metering and monitoring of the energy consumption of technical building systems as well as indoor environmental quality.</p>
<p style="text-align: center;"><i>Justification</i></p> <p>ACE calls for a clarification of the definition, scope and objectives of the proposed smartness indicator: What will be measured exactly? Using which parameters? What use will be made of the</p>	



results? Who will measure? Which buildings will be included? How will they account for the risks associated with automation in buildings? ACE invites the Commission to consult the stakeholders of the construction sector before developing this. It believes that any smartness indicator shall be coherent and compatible with the framework of indicators currently being developed by the Commission (DG ENVI) to assess the environmental performance of buildings and with the Building Passport initiative.

Providing feedback on the energy consumption of technical building systems and indoor environmental quality is essential to ensure that smart systems in fact deliver the expected improvements in building performance.

Article 10

Financial incentives and market barriers

Commission's proposal	ACE proposal of amendment
<p>6. Member States shall take account of the cost optimal levels of energy performance when providing incentives for the construction or major renovation of buildings.</p> <p>6. Member States shall link their financial measures for energy efficiency improvements in the renovation of buildings to the energy savings achieved due to such renovation. These savings shall be determined by comparing energy performance certificates issued before and after renovation.</p> <p>6a. When Member States put in place a database for registering EPCs it shall allow tracking the actual energy consumption of the buildings covered, regardless of their size and category. The database shall contain the actual energy consumption data of buildings frequently visited by the public with useful floor area of over 250 m² which shall be regularly updated.</p> <p>6b. Aggregated anonymised data compliant with EU data protection requirements shall be made available on request, at least for the public</p>	<p>6. Member States shall take account of the cost optimal levels of energy performance when providing incentives for the construction or major renovation of buildings.</p> <p>6. Member States shall link their financial measures for energy efficiency improvements in the renovation of buildings to the energy savings achieved due to such renovation. These savings shall be determined by comparing energy performance certificates validated to be within range of achieved measured energy consumption data and issued before and after renovation.</p> <p>6a. When Member States put in place a database for registering EPCs it shall allow tracking the actual energy consumption over time, the basic building configuration, including if feasible its relevant LCA-data (grey energy), the envelope performance and technical building systems of the buildings covered, regardless of their size and category. The database shall contain the actual energy consumption data of buildings frequently visited by the public all non-domestic buildings with useful floor area of over 250 m² which shall be regularly updated.</p> <p>6b. Aggregated anonymised data, including if</p>



<p>authorities for statistical and research purposes.</p>	<p>feasible its relevant LCA-data (grey energy), building configuration, envelope performance and technical building systems, compliant with EU data protection requirements shall be made available on request, at least for the public authorities for statistical and research purposes in the public domain.</p> <p>6c. When Member States put in place a database for registering EPCs, it shall allow the storage of energy consumption data before and after maintenance, as well as operational and maintenance data relating to the operating and maintenance requirements of its technical systems.</p>
<p><i>Justification</i></p> <p><u>Point 6</u></p> <p>ACE support this, providing that the EPCs are validated with measured energy use to give credibility to the certificates. Should the EPCs not be validated with measured energy use, this would result in severe unintended consequences.</p> <p><u>Point 6a</u></p> <p>ACE calls on the co-legislator to define what actual energy consumption means and specify which data will be recorded. Primary energy use of buildings and associated emissions should be disclosed at the minimum along with basic data on building configuration (m2, floor to floor heights, orientation, no of thermal zones and m2). The lodging of energy end uses and indoor environmental quality should be required for all buildings, with a 'high' smartness indicator.</p> <p>ACE advocates that the database shall contain the actual energy consumption data of all non domestic buildings, and not just of "<i>buildings frequently visited by the public</i>". The rollout of operational ratings is the first step towards a better focus on operational performance and helps create a level playing field for stakeholders in the property sectors. In several member States commercial landlords and developers are undertaking voluntary reporting, such as the Better Building Partnership's scheme¹⁰ in the UK and are campaigning on national level to implement operational ratings to help achieve real savings in energy consumption and maintenance costs. Operational Ratings (OR) are also considered to be a cost-effective vehicle for performance contracting and can support the validation of EPCs. Where adopted, Operational Ratings have provided a major incentive for industry and policy makers to undertake detailed research of the factors affecting energy consumption in use.</p> <p><u>Point 6b</u></p> <p>ACE calls for a broad disclosure of the actual energy consumption data: aggregated anonymised data shall made available in the public domain, to ensure the rapid and continuous improvement of energy efficiency measures and technologies.</p>	

¹⁰ <http://www.betterbuildingspartnership.com.au>



Point 6c

The regular maintenance of technical equipment is important to reduce the decrease of its energy-efficiency.

Article 14 Inspection of heating systems

Commission's proposal	ACE proposal of amendment
<p>1. Member States shall lay down the necessary measures to establish a regular inspection of the accessible parts of systems used for heating buildings, such as the heat generator, control system and circulation pump(s), with boilers of an effective rated output for space heating purposes of more than 20 kW. That inspection shall include an assessment of the boiler efficiency and the boiler sizing compared with the heating requirements of the building. The assessment of the boiler sizing does not have to be repeated as long as no changes were made to the heating system or as regards the heating requirements of the building in the meantime.</p> <p>Member States may reduce the frequency of such inspections or lighten them as appropriate, where an electronic monitoring and control system is in place.</p> <p>1. Member States shall lay down the necessary measures to establish a regular inspection of the accessible parts of systems used for heating buildings, such as the heat generator, control system and circulation pump(s) for non-residential buildings with total primary energy use of over 250MWh and for residential buildings with a centralised technical building system of a cumulated effective rated output of over 100 kW. That inspection shall include an assessment of the boiler efficiency and the boiler sizing compared with the heating requirements of the building. The assessment of the boiler sizing does not have to be repeated as long as no changes were made to the heating system or as</p>	<p>1. Member States shall lay down the necessary measures to establish a regular inspection of the accessible parts of systems used for heating buildings, such as the heat generator, control system and circulation pump(s), with boilers of an effective rated output for space heating purposes of more than 20 kW. That inspection shall include an assessment of the boiler efficiency and the boiler sizing compared with the heating requirements of the building. The assessment of the boiler sizing does not have to be repeated as long as no changes were made to the heating system or as regards the heating requirements of the building in the meantime.</p> <p>Member States may reduce the frequency of such inspections or lighten them as appropriate, where an electronic monitoring and control system is in place.</p> <p>1. Member States shall lay down the necessary measures to establish an regular annually inspection and assessment of the accessible parts of systems used for heating buildings, such as the heat generator, control system and circulation pump(s) for non-residential buildings with total primary energy use of over 250MWh and for residential buildings with a centralised technical building system of a cumulated effective rated output of over 100 kW. That inspection shall include an assessment of the boiler efficiency and the boiler sizing compared with the heating requirements of the building. The assessment of the boiler sizing does not have to be repeated as long</p>



regards the heating requirements of the building in the meantime.	as no changes were made to the heating system or as regards the heating requirements of the building in the meantime.
<p style="text-align: center;"><i>ACE position</i></p> <p>Heating systems should be serviced annually and the related certificates should be included in a building's digital Log Book /Building Passport</p> <p>Non-compliance was extremely high with previous system but that is not a reason to remove performance validation altogether. The inspection of heating systems should be incentivised to avoid operational and maintenance risks.</p> <p>A building management system in itself is no guarantee that any of the information provided by the system is acted upon – and usually such systems are not installed with the monitoring and reporting features enabled.</p> <p>Inspections should be carried out by independent assessor or if automated energy and benchmarking is opted for then the data should be made available in the public domain and be subjected to quality checks.</p>	

Commission's proposal	ACE proposal of amendment
<p>2. Member States may set different inspection frequencies depending on the type and effective rated output of the heating system whilst taking into account the costs of the inspection of the heating system and the estimated energy cost savings that may result from the inspection.</p> <p>3. Heating systems with boilers of an effective rated output of more than 100 kW shall be inspected at least every two years. For gas boilers, this period may be extended to four years.</p> <p>4. As an alternative to paragraphs 1, 2 and 3 Member States may opt to take measures to ensure the provision of advice to users concerning the replacement of boilers, other modifications to the heating system and alternative solutions to assess the efficiency and appropriate size of the boiler. The overall impact of this approach shall be equivalent to that arising from the provisions set out in paragraphs 1, 2 and 3.</p> <p>Where Member States choose to apply the measures referred to in the first subparagraph,</p>	<p>2. Member States may set different inspection frequencies depending on the type and effective rated output of the heating system whilst taking into account the costs of the inspection of the heating system and the estimated energy cost savings that may result from the inspection.</p> <p>3. Heating systems with boilers of an effective rated output of more than 100 kW shall be inspected at least every two years. For gas boilers, this period may be extended to four years.</p> <p>4. As an alternative to paragraphs 1, 2 and 3 Member States may opt to take measures to ensure the provision of advice to users concerning the replacement of boilers, other modifications to the heating system and alternative solutions to assess the efficiency and appropriate size of the boiler. The overall impact of this approach shall be equivalent to that arising from the provisions set out in paragraphs 1, 2 and 3.</p> <p>Where Member States choose to apply the measures referred to in the first subparagraph,</p>



~~they shall submit to the Commission a report on the equivalence of those measures to measures referred to in paragraphs 1, 2 and 3 of this Article by 30 June 2011 at the latest. Member States shall submit these reports to the Commission every three years. The reports may be included in the Energy Efficiency Action Plans referred to in Article 14(2) of Directive 2006/32/EC.~~

~~5. After receiving the national report from a Member State about the application of the option as described in paragraph 4, the Commission may request further specific information regarding the requirements and equivalence of the measures set out in that paragraph. In that case, the Member State concerned shall present the requested information or propose amendments within nine months.~~

2. As an alternative to paragraph 1 Member States may set requirements to ensure that non-residential buildings with total primary energy use of over 250 MWh per year are equipped with building automation and control systems. These systems shall be capable of:

(a) continuously monitoring, analysing and adjusting energy usage;

(b) benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement;

(c) allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers.

~~they shall submit to the Commission a report on the equivalence of those measures to measures referred to in paragraphs 1, 2 and 3 of this Article by 30 June 2011 at the latest. Member States shall submit these reports to the Commission every three years. The reports may be included in the Energy Efficiency Action Plans referred to in Article 14(2) of Directive 2006/32/EC.~~

~~5. After receiving the national report from a Member State about the application of the option as described in paragraph 4, the Commission may request further specific information regarding the requirements and equivalence of the measures set out in that paragraph. In that case, the Member State concerned shall present the requested information or propose amendments within nine months.~~

2. As an alternative to paragraph 1 Member States may set requirements to ensure that non-residential buildings with total primary energy use of over 250 MWh per year are equipped with building automation and control systems. These systems **as handed over** shall be **capable of installed to carry out the activities listed under points a-d**:

(a) continuous monitoring, **communication**, analysis and adjusting **of** energy usage;

(b) benchmarking **of** the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement;

(c) **allowing** communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers;

(d) submission of anonymised annual energy use data in the public domain and attributable data for inspection purposes.

Justification

ACE proposes to rephrase the last sentence of the point 2 as capability does not mean it actually is set up on site to do it: *These systems **as handed over** shall be **capable of installed to carry out the***



activities listed under points a-d

ACE proposes a new (d)

(d) submission of annual energy use data in the public domain

In order to ensure the rapid and continuous improvement of energy efficiency measures and technologies an evidence base needs to be created to underpin robust legislation and to provide feedback on the effectiveness of different energy efficiency measures. Therefore data from buildings in use needs to be made available in the public domain automatically.

Commission's proposal	ACE proposal of amendment
<p>3. As an alternative to paragraph 1 Member States may set requirements to ensure that residential buildings with centralised technical building systems of a cumulated effective rated output of over 100 kW are equipped:</p> <p>(a) with continuous electronic monitoring that measures systems' efficiency and inform building owners or managers when it has fallen significantly and when system servicing is necessary, and</p> <p>(b) with effective control functionalities to ensure optimum generation, distribution and use of energy.</p>	<p>3. As an alternative to paragraph 1 Member States may set requirements to ensure that residential buildings with centralised technical building systems of a cumulated effective rated output of over 100 kW are equipped installed to carry out the activities listed under points a-c:</p> <p>(a) with continuous electronic monitoring that measures systems' efficiency and inform building owners or managers when it has fallen significantly and when system servicing is necessary, and</p> <p>(b) with effective control functionalities to ensure optimum generation, distribution and use of energy;</p> <p>(c) in the case of automated systems the inspection shall be carried out remotely.</p>
<p><i>Justification</i></p> <p>ACE proposes to rephrase the last sentence of the point 3 as capability does not mean it actually is set up on site to do it: <i>These systems as handed over shall be capable of installed to carry out the activities listed under points a-c</i></p> <p>ACE proposes a new (c)</p> <p>(c) in the case of automated systems the inspection shall be carried out remotely.</p> <p>Automation carries additional risks, which means that inspection is imperative for these systems. Installing automated systems provides the economic benefit of low-cost remote inspections rather than exempting inspections altogether. Automation is relatively new technology, likely to undergo intensive development over the coming decade. Inspections are an important tool for gathering feedback and expertise required to spur the market on towards continuous improvements.</p>	



Article 15

Inspection of air-conditioning systems

Commission's proposal	ACE proposal of amendment
<p>1. Member States shall lay down the necessary measures to establish a regular inspection of the accessible parts of air-conditioning systems of an effective rated output of more than 12 kW. The inspection shall include an assessment of the air-conditioning efficiency and the sizing compared to the cooling requirements of the building. The assessment of the sizing does not have to be repeated as long as no changes were made to this air-conditioning system or as regards the cooling requirements of the building in the meantime.</p> <p>Member States may reduce the frequency of such inspections or lighten them, as appropriate, where an electronic monitoring and control system is in place.</p> <p>1. Member States shall lay down the necessary measures to establish a regular inspection of the accessible parts of air-conditioning systems for non-residential buildings with total primary energy use of over 250MWh and for residential buildings with a centralised technical building system of a cumulated effective rated output of over 100 kW. The inspection shall include an assessment of the air-conditioning efficiency and the sizing compared to the cooling requirements of the building. The assessment of the sizing does not have to be repeated as long as no changes were made to this air-conditioning system or as regards the cooling requirements of the building in the meantime.</p> <p>2. The Member States may set different inspection frequencies depending on the type and effective rated output of the air-conditioning system, whilst taking into account the costs of the inspection of the air-conditioning system and the estimated energy cost savings that may result from the inspection.</p> <p>3. In laying down the measures referred to in paragraphs 1 and 2 of this Article, Member</p>	<p>1. Member States shall lay down the necessary measures to establish a regular inspection of the accessible parts of air-conditioning systems of an effective rated output of more than 12 kW. The inspection shall include an assessment of the air-conditioning efficiency and the sizing compared to the cooling requirements of the building. The assessment of the sizing does not have to be repeated as long as no changes were made to this air-conditioning system or as regards the cooling requirements of the building in the meantime.</p> <p>Member States may reduce the frequency of such inspections or lighten them, as appropriate, where an electronic monitoring and control system is in place.</p> <p>1. Member States shall lay down the necessary measures to establish a regular annual inspection of the accessible parts of air-conditioning systems for non-residential buildings with total primary energy use of over 250MWh and for residential buildings with a centralised technical building system of a cumulated effective rated output of over 100 kW. The inspection shall include an assessment of the air-conditioning efficiency, and the sizing compared to the cooling requirements of the building. The assessment of the sizing does not have to be repeated as long as no changes were made to this air-conditioning system or as regards the cooling requirements of the building in the meantime.</p> <p>2. The Member States may set different inspection frequencies depending on the type and effective rated output of the air-conditioning system, whilst taking into account the costs of the inspection of the air-conditioning system and the estimated energy cost savings that may result from the inspection.</p> <p>3. In laying down the measures referred to in paragraphs 1 and 2 of this Article, Member</p>



~~States shall, as far as is economically and technically feasible, ensure that inspections are carried out in accordance with the inspection of heating systems and other technical systems referred to in Article 14 of this Directive and the inspection of leakages referred to in Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases (17).~~

~~4. As an alternative to paragraphs 1, 2 and 3 Member States may opt to take measures to ensure the provision of advice to users on the replacement of air conditioning systems or on other modifications to the air conditioning system which may include inspections to assess the efficiency and appropriate size of the air conditioning system. The overall impact of this approach shall be equivalent to that arising from the provisions set out in paragraphs 1, 2 and 3.~~

~~Where Member States apply the measures referred to in the first subparagraph, they shall, by 30 June 2011 at the latest, submit to the Commission a report on the equivalence of those measures to the measures referred to in paragraphs 1, 2 and 3 of this Article. Member States shall submit these reports to the Commission every three years. The reports may be included in the Energy Efficiency Action Plans referred to in Article 14(2) of Directive 2006/32/EC.~~

~~5. After receiving the national report from a Member State about the application of the option as described in paragraph 4, the Commission may request further specific information regarding the requirements and equivalence of the measures set in that paragraph. In this case, the Member State concerned shall present the requested information or propose amendments within nine months.~~

2. As an alternative to paragraph 1 Member States may set requirements to ensure that non-residential buildings with total primary energy use of over 250 MWh per year are equipped with building automation and control systems. These systems shall be capable of:

(a) continuously monitoring, analysing and

~~States shall, as far as is economically and technically feasible, ensure that inspections are carried out in accordance with the inspection of heating systems and other technical systems referred to in Article 14 of this Directive and the inspection of leakages referred to in Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases (17).~~

~~4. As an alternative to paragraphs 1, 2 and 3 Member States may opt to take measures to ensure the provision of advice to users on the replacement of air conditioning systems or on other modifications to the air conditioning system which may include inspections to assess the efficiency and appropriate size of the air conditioning system. The overall impact of this approach shall be equivalent to that arising from the provisions set out in paragraphs 1, 2 and 3.~~

~~Where Member States apply the measures referred to in the first subparagraph, they shall, by 30 June 2011 at the latest, submit to the Commission a report on the equivalence of those measures to the measures referred to in paragraphs 1, 2 and 3 of this Article. Member States shall submit these reports to the Commission every three years. The reports may be included in the Energy Efficiency Action Plans referred to in Article 14(2) of Directive 2006/32/EC.~~

~~5. After receiving the national report from a Member State about the application of the option as described in paragraph 4, the Commission may request further specific information regarding the requirements and equivalence of the measures set in that paragraph. In this case, the Member State concerned shall present the requested information or propose amendments within nine months.~~

2. As an alternative to paragraph 1 Member States may set requirements to ensure that non-residential buildings with total primary energy use of over 250 MWh per year are equipped with building automation and control systems. These systems shall be capable of:

(a) continuously monitoring,



<p>adjusting energy usage;</p> <p>(b) benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement;</p> <p>(c) allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers.</p> <p>3. As an alternative to paragraph 1 Member States may set requirements to ensure that residential buildings with centralised technical building systems of a cumulated effective rated output of over 100 kW</p> <p>(a) with continuous electronic monitoring that measures systems' efficiency and inform building owners or managers when it has fallen significantly and when system servicing is necessary, and</p> <p>(b) with effective control functionalities to ensure optimum generation, distribution and use of energy.</p>	<p>communication, analysis and adjustment of energy usage;</p> <p>(b) benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement;</p> <p>(c) allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers.</p> <p>3. As an alternative to paragraph 1 Member States may set requirements to ensure that residential buildings with centralised technical building systems of a cumulated effective rated output of over 100 kW</p> <p>(a) with continuous electronic monitoring that measures systems' efficiency and inform building owners or managers when it has fallen significantly and when system servicing is necessary, and</p> <p>(b) with effective control functionalities to ensure optimum generation, distribution and use of energy.</p> <p>(c) in the case of automated systems the inspection shall be carried out remotely.</p>
<p style="text-align: center;"><i>Justification</i></p> <p>See justification under Article 14.</p>	

Article 20
Information

Commission's proposal	ACE proposal of amendment
<p>2. Member States shall in particular provide information to the owners or tenants of buildings on energy performance certificates and inspection reports, their purpose and objectives, on cost-effective ways to improve the energy</p>	<p>2. Member States shall in particular provide information to the owners or tenants of buildings on energy performance certificates and inspection reports, their purpose and objectives, on cost-effective ways to improve the energy</p>



<p>performance of the building and, where appropriate, on financial instruments available to improve the energy performance of the building.</p> <p>2. Member States shall in particular provide information to the owners or tenants of buildings on energy performance certificates, their purpose and objectives, on cost-effective ways to improve the energy performance of the building and, where appropriate, on financial instruments available to improve the energy performance of the building.</p>	<p>performance of the building and, where appropriate, on financial instruments available to improve the energy performance of the building.</p> <p>Member States shall in particular set up accessible and transparent advisory tools, such as energy performance certificates, individual building renovation passports, renovation advice, and one-stop-shops for consumers.</p> <p>Member States shall in particular provide Through these tools, Member States shall provide information to the owners or tenants of buildings on energy performance certificates, their purpose and objectives, on cost-effective ways to improve the energy performance of the building in line with national renovation strategies, and, where appropriate, on available financial instruments available to improve the energy performance of the building.;</p> <p>Individual building renovation passports outline a long-term (up to 20 years) step-by-step renovation roadmap for a specific building, resulting from an on-site energy audit and fulfilling specific quality criteria and indicators established in consultation with the building owner;</p> <p>One-stop-shops are physical or digital places of advisory service, which are easily accessible and provide independent advice.</p>
<p style="text-align: center;"><i>Justification</i></p> <p>Statement by BPIE: In-depth information provided to building owners and tenants about the tools available in each Member States to improve energy performance of buildings will contribute to successfully implement and deliver on the long-term renovation strategies (Art. 2a). Together with difficulty to access finance, a recognised barrier to renovation is the lack of knowledge about what to do, where to start, and which measures to implement in which order.</p> <p>One-stop-shops should be close to the consumer to ensure he/she finds all the relevant and commercially independent information in the same place, including financial support available, lists of certified experts, and tools to develop a personalised renovation plan (e.g. individual building renovation passport).</p>	



ANNEX I

Common general framework for the calculation of energy performance of buildings (referred to in Article 3)

Commission's proposal	ACE proposal of amendment
<p>1. The energy performance of a building shall be determined on the basis of the calculated or actual annual energy that is consumed in order to meet the different needs associated with its typical use and shall reflect the heating energy needs and cooling energy needs (energy needed to avoid overheating) to maintain the envisaged temperature conditions of the building, and domestic hot water needs.</p> <p>1. The energy performance of a building shall reflect its typical energy use for heating, cooling, domestic hot water, ventilation and lighting.</p> <p>The energy performance of a building shall be expressed by a numeric indicator of primary energy use in kWh/(m².y), harmonised for the purpose of both energy performance certification and compliance with minimum energy performance requirements. The energy performance and the methodology applied for its determination shall be transparent and open to innovation.</p> <p>Member States shall describe their national calculation methodology following the national annex framework of related European standards developed under mandate M/480 given by the European Commission to the European Committee for Standardisation (CEN).</p>	<p>1. The energy performance of a building shall be determined on the basis of the calculated or actual annual energy that is consumed in order to meet the different needs associated with its typical use and shall reflect the heating energy needs and cooling energy needs (energy needed to avoid overheating) to maintain the envisaged temperature conditions of the building, and domestic hot water needs.</p> <p>1. The energy performance of a building shall reflect its typical energy use for heating, cooling, domestic hot water, ventilation and lighting, the provision of all energy usages as per ISO Standard 12655 and the systems required for on-site electricity generation, on-site infrastructure for electro-mobility, or a combination of such systems, including those using energy from renewable sources, of a building or building unit.</p> <p>The energy performance of a building shall be expressed by a numeric indicator of primary energy use in kWh/(m².y), harmonised for the purpose of both energy performance certification and compliance with minimum energy performance requirements. The energy performance and the methodology applied for its determination shall be transparent and open to innovation.</p> <p>Member States shall describe their national calculation methodology following the national annex framework of related European standards developed under mandate M/480 as per ISO/FDIS 52000-1:2016(E) given by the European Commission to the European Committee for Standardisation (CEN).</p>
<p style="text-align: center;"><i>Justification</i></p> <p>The terms 'transparent' and 'open to innovation' require further clarification in the following sentence: <i>The energy performance and the methodology applied for its determination shall be transparent and open to innovation.</i> The completion of the ISO/FDIS 52000-1:2016(E) standard intended to underpin the EU Voluntary Certification Scheme makes it possible to harmonise the reporting metrics across</p>	



Member States.

Commission's proposal	ACE proposal of amendment
<p>2. The energy performance of a building shall be expressed in a transparent manner and shall include an energy performance indicator and a numeric indicator of primary energy use, based on primary energy factors per energy carrier, which may be based on national or regional annual weighted averages or a specific value for on-site production.</p> <p>The methodology for calculating the energy performance of buildings should take into account European standards and shall be consistent with relevant Union legislation, including Directive 2009/28/EC.</p> <p>2. The energy needs for space heating, space cooling, domestic hot water and adequate ventilation shall be calculated in order to ensure minimum health and comfort levels defined by Member States.</p> <p>The calculation of primary energy shall be based on primary energy factors per energy carrier, which may be based on national or regional annual weighted averages or on more specific information made available for individual district system.</p> <p>Primary energy factors shall discount the share of renewable energy in energy carriers so that calculations equally treat: (a) the energy from renewable source that is generated on-site (behind the individual meter, i.e. not accounted as supplied), and (b) the energy from renewable energy sources supplied through the energy carrier.</p>	<p>2. The energy performance of a building shall be expressed in a transparent manner and shall include an energy performance indicator and a numeric indicator of primary energy use, based on primary energy factors per energy carrier, which may be based on national or regional annual weighted averages or a specific value for on-site production.</p> <p>The methodology for calculating the energy performance of buildings should take into account European standards and shall be consistent with relevant Union legislation, including Directive 2009/28/EC.</p> <p>2. The energy needs for energy usages as per ISO Standard 12655 and the systems required for on-site electricity generation, on-site infrastructure for electro-mobility, or a combination of such systems, including those using energy from renewable sources, of a building or building unit, shall be calculated in order to ensure minimum health and comfort levels defined by Member States in relation to general indoor climate conditions as defined under Article 2 Point 3a.</p> <p>The calculation of primary energy shall be based on primary energy factors per energy carrier, which may be based on national or regional annual weighted averages or on more specific information made available for individual district system.</p> <p>Primary energy factors shall discount the share of renewable energy in energy carriers so that calculations equally treat: (a) the energy from renewable source that is generated on-site (behind the individual meter, i.e. not accounted as supplied), and (b) the energy from renewable energy sources supplied through the energy carrier.</p>
<p><i>Justification</i></p> <p>All major energy end uses should be calculated or estimated and these estimates declared as part of</p>	



certification and when checking against minimum health and comfort levels.

Minimum Health and Comfort Levels in Nations States should be aligned with the terminology 'general indoor climate conditions' as defined in Article 2 Point 3a.

Commission's proposal	ACE proposal of amendment
<p>3. The methodology shall be laid down taking into consideration at least the following aspects:</p> <p>(a) the following actual thermal characteristics of the building including its internal partitions:</p> <p>(i) thermal capacity</p> <p>(ii) insulation</p> <p>(iii) passive heating</p> <p>(iv) cooling elements; and</p> <p>(v) thermal bridges</p> <p>...</p> <p>4. The positive influence of the following aspects shall, where relevant in the calculation, be taken into account:</p> <p>(a) local solar exposure conditions, active solar systems and other heating and electricity systems based on energy from renewable sources;</p> <p>(b) electricity produced by cogeneration;</p> <p>(c) district or block heating and cooling systems;</p> <p>(d) natural lighting.</p>	<p>3. The methodology shall be laid down taking into consideration at least the following aspects:</p> <p>(a) the following actual thermal and hygroscopic characteristics of the building including its</p> <p>(i) thermal capacity</p> <p>(ii) insulation</p> <p>(iii) passive heating</p> <p>(iv) cooling elements; and</p> <p>(v) thermal bridges</p> <p>...</p> <p>4. The positive influence of the following aspects shall, where relevant in the calculation, be taken into account:</p> <p>(a) local solar exposure conditions,</p> <p>(b) spatial and material configuration of the building</p> <p>(c) active solar systems and other heating and electricity systems based on energy from renewable sources;</p> <p>(d) electricity produced by cogeneration;</p> <p>(e) district or block heating and cooling systems;</p> <p>(f) natural lighting</p> <p>5. The Energy performance of Buildings shall be reported within a larger benchmarking framework of buildings' contribution to a 'decarbonised building stock'. Member states shall define near zero emission building standards to be implemented in building regulations by 2030. Buildings' emissions shall be calculated using ISO 14040 LCA methods based on actual and specific EPD data on the environmental impacts associated</p>



	with materials' and component's resource efficiency and environmental impacts implemented by 2030. Member states shall work to ensure increased data reliability on EPDs.
<p style="text-align: center;"><i>Justification</i></p> <p>The building configuration and materiality as well as the envelope performance have a major impact on the energy performance outcomes. Declaration of these should be part of the drive towards transparency across nation states.</p> <p>Declaring the hygroscopic characteristics of the building fabric is essential to recognise humidity and thermal buffering capabilities of the building fabric and its potential contribution to passive heating and cooling. Without this inclusion there is a high risk of mis-specifying insulation and vapour barrier products as well as compromising the thermal and humidity buffering capabilities of historic building envelopes.</p> <p>Accounting for the contribution of buildings towards decarbonisation opens up a new avenue of innovation in carbon savings in the design of the built environments. In Denmark where NZEB has been standard building regulations since 2015, it has become very difficult to achieve further cost efficient energy savings in the operational energy use of buildings. Shifting the focus towards saving embodied energy and carbon emissions through circular economy and recycling of materials shows much higher growth potentials as noted above. These savings of energy, resources and carbon emissions are documented using Life Cycle Assessments and Life Cycle Costing methods which should be implemented over the duration of the EPBD in a step by step process. In the case of Denmark NZEB classes for 2015 and 2020 were adopted as voluntary classes in 2010, which proved to stimulate the entire building sector value chain to develop the necessary competencies, skills and technologies to achieve those aims very effectively. Adding embodied energy and emissions will stimulate the next wave of circular economy innovations in building performance.</p>	

ANNEX II

Independent control systems for energy performance certificates and inspection reports

Commission's proposal	ACE proposal of amendment
<p>1. The competent authorities or bodies to which the competent authorities have delegated the responsibility for implementing the independent control system shall make a random selection of at least a statistically significant percentage of all the energy performance certificates issued annually and subject those certificates to verification.</p> <p>1. The competent authorities or bodies to which the competent authorities have delegated the</p>	<p>1. The competent authorities or bodies to which the competent authorities have delegated the responsibility for implementing the independent control system shall make a random selection of at least a statistically significant percentage of all the energy performance certificates issued annually and subject those certificates to verification.</p> <p>1. The competent authorities or bodies to which the competent authorities have delegated the</p>



<p>responsibility for implementing the independent control system shall make a random selection of all the energy performance certificates issued annually and subject them to verification. The sample shall be of a sufficient size to ensure statistically significant compliance results.</p> <p>The verification shall be based on the options indicated below or on equivalent measures:</p> <ul style="list-style-type: none"> (a) validity check of the input data of the building used to issue the energy performance certificate and the results stated in the certificate; (b) check of the input data and verification of the results of the energy performance certificate, including the recommendations made; (c) full check of the input data of the building used to issue the energy performance certificate, full verification of the results stated in the certificate, including the recommendations made, and on-site visit of the building, if possible, to check correspondence between specifications given in the energy performance certificate and the building certified. <p>2. The competent authorities or bodies to which the competent authorities have delegated the responsibility for implementing the independent control system shall make a random selection of at least a statistically significant percentage of all the inspection reports issued annually and subject those reports to verification.</p> <p>3. When information is added to a database it shall be possible for national authorities to identify the originator of the addition, for monitoring and verification purposes.</p>	<p>responsibility for implementing the independent control system shall make a random selection of all the energy performance certificates issued annually and subject them to verification. The sample shall be of a sufficient size to ensure statistically significant compliance results.</p> <p>The verification shall be based on the options indicated below or on equivalent measures:</p> <ul style="list-style-type: none"> (a) validity check of the input data of the building used to issue the energy performance certificate and the results stated in the certificate; (b) check of the input data and verification of the results of the energy performance certificate, including the recommendations made; (c) full check of the input data of the building used to issue the energy performance certificate, full verification of the results stated in the certificate, including the recommendations made, and on-site visit of the building, if possible, to check correspondence between specifications given in the energy performance certificate and the building certified. <p>2. The competent authorities or bodies to which the competent authorities have delegated the responsibility for implementing the independent control system shall make a random selection of at least a statistically significant percentage of all the inspection reports issued annually and subject those reports to verification.</p> <p>3. When information is added to a database it shall be possible for national authorities and researchers to identify the originator of the addition, for monitoring and verification purposes.</p>
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