EBC

Energy in Buildings and Communities Programme

International Energy Agency

Terminology and Definitions (Annex 56)

Energy in Buildings and Communities Programme

March 2017

iea Energy Technology Network

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Preface

The International Energy Agency

The International Energy Agency (IEA) was established in 1974 within the framework of the Organisation for Economic Co-operation and Development (OECD) to implement an international energy programme. A basic aim of the IEA is to foster international co-operation among the 28 IEA participating countries and to increase energy security through energy research, development and demonstration in the fields of technologies for energy efficiency and renewable energy sources.

The IEA Energy in Buildings and Communities Programme

The IEA co-ordinates research and development in a number of areas related to energy. The mission of the Energy in Buildings and Communities (EBC) Programme is to develop and facilitate the integration of technologies and processes for energy efficiency and conservation into healthy, low emission, and sustainable buildings and communities, through innovation and research. (Until March 2013, the IEA-EBC Programme was known as the Energy in Buildings and Community Systems Programme, ECBCS.)

The research and development strategies of the IEA-EBC Programme are derived from research drivers, national programmes within IEA countries, and the IEA Future Buildings Forum Think Tank Workshops. The research and development (R&D) strategies of IEA-EBC aim to exploit technological opportunities to save energy in the buildings sector, and to remove technical obstacles to market penetration of new energy efficient technologies. The R&D strategies apply to residential, commercial, office buildings and community systems, and will impact the building industry in five focus areas for R&D activities:

- Integrated planning and building design
- Building energy systems
- Building envelope
- Community scale methods
- Real building energy use

The Executive Committee

Overall control of the IEA-EBC Programme is maintained by an Executive Committee, which not only monitors existing projects, but also identifies new strategic areas in which collaborative efforts may be beneficial. As the Programme is based on a contract with the IEA, the projects are legally established as Annexes to the IEA-EBC Implementing Agreement. At the present time, the following projects have been initiated by the IEA-EBC Executive Committee, with completed projects identified by (*):

Annex 1: Load Energy Determination of Buildings (*)
Annex 2: Ekistics and Advanced Community Energy Systems (*)
Annex 3: Energy Conservation in Residential Buildings (*)
Annex 4: Glasgow Commercial Building Monitoring (*)
Annex 5: Air Infiltration and Ventilation Centre
Annex 6: Energy Systems and Design of Communities (*)
Annex 7: Local Government Energy Planning (*)
Annex 8: Inhabitants Behaviour with Regard to Ventilation (*)
Annex 9: Minimum Ventilation Rates (*)
Annex 10: Building HVAC System Simulation (*)
Annex 11: Energy Auditing (*)
Annex 12: Windows and Fenestration (*)
Annex 13: Energy Management in Hospitals (*)
Annex 14: Condensation and Energy (*)
Annex 15: Energy Efficiency in Schools (*)
Annex 16: BEMS 1- User Interfaces and System Integration (*)
Annex 17: BEMS 2- Evaluation and Emulation Techniques (*)
Annex 18: Demand Controlled Ventilation Systems (*)

Annex 19: Low Slope Roof Systems (*)
Annex 20: Air Flow Patterns within Buildings (*)
Annex 21: Thermal Modelling (*)
Annex 22: Energy Efficient Communities (*)
Annex 23: Multi Zone Air Flow Modelling (COMIS) (*)
Annex 24: Heat, Air and Moisture Transfer in Envelopes (*)
Annex 25: Real time HVAC Simulation (*)
Annex 26: Energy Efficient Ventilation of Large Enclosures (*)
Annex 27: Evaluation and Demonstration of Domestic Ventilation Systems (*)
Annex 28: Low Energy Cooling Systems (*)
Annex 29: Daylight in Buildings (*)
Annex 30: Bringing Simulation to Application (*)
Annex 31: Energy-Related Environmental Impact of Buildings (*)
Annex 32: Integral Building Envelope Performance Assessment (*)
Annex 33: Advanced Local Energy Planning (*)
Annex 34: Computer-Aided Evaluation of HVAC System Performance (*)
Annex 35: Design of Energy Efficient Hybrid Ventilation (HYBVENT) (*)
Annex 36: Retrofitting of Educational Buildings (*)
Annex 37: Low Exergy Systems for Heating and Cooling of Buildings (LowEx) (*)
Annex 38: Solar Sustainable Housing (*)
Annex 39: High Performance Insulation Systems (*)
Annex 40: Building Commissioning to Improve Energy Performance (*)
Annex 41: Whole Building Heat, Air and Moisture Response (MOIST-ENG) (*)
Annex 42: The Simulation of Building-Integrated Fuel Cell and Other Cogeneration Systems (FC+COGEN-SIM) (*)
Annex 43: Testing and Validation of Building Energy Simulation Tools (*)
Annex 44: Integrating Environmentally Responsive Elements in Buildings (*)
Annex 45: Energy Efficient Electric Lighting for Buildings (*)
Annex 46: Holistic Assessment Tool-kit on Energy Efficient Retrofit Measures for Government Buildings (EnERGo) (*)
Annex 47: Cost-Effective Commissioning for Existing and Low Energy Buildings (*)
Annex 48: Heat Pumping and Reversible Air Conditioning (*)
Annex 49: Low Exergy Systems for High Performance Buildings and Communities (*)
Annex 50: Prefabricated Systems for Low Energy Renovation of Residential Buildings (*)
Annex 51: Energy Efficient Communities (*)
Annex 52: Towards Net Zero Energy Solar Buildings
Annex 53: Total Energy Use in Buildings: Analysis & Evaluation Methods (*)
Annex 54: Integration of Micro-Generation & Related Energy Technologies in Buildings
Annex 55: Reliability of Energy Efficient Building Retrofitting - Probability Assessment of Performance & Cost (RAP-RETRO)
Annex 56: Cost Effective Energy & CO2 Emissions Optimization in Building Renovation
Annex 57: Evaluation of Embodied Energy & CO2 Emissions for Building Construction
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Annex 69: Strategy and Practice of Adaptive Thermal Comfort in low Energy Buildings
Annex 70: Building Energy Epidemiology
Annex 71 Building energy performance assessment based on in-situ measurements
Annex 72: Assessing Life Cycle related Environmental Impacts Caused by Buildings

Annex 73: Towards Net Zero Energy Public Communities
Annex 74: Energy Endeavour
Annex 75 Cost-effective building renovation at district level combining energy efficiency and renewables

Working Group - Energy Efficiency in Educational Buildings (*)
Working Group - Indicators of Energy Efficiency in Cold Climate Buildings (*)
Working Group - Annex 36 Extension: The Energy Concept Adviser (*)
Working Group - Survey on HVAC Energy Calculation Methodologies for Non-residential Buildings

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1. Introduction

When several partners from different countries work together on one common topic, often the problem arises that basically all people talk about the same topic but in detail often country-specific basic conditions are different. For example, in some countries the energy-related surface for the energy performance calculation is the gross floor area, in other countries it is the net floor area and other countries again choose other surface areas.

To form a uniform basis for all further work in the IEA EBC Annex 56, country-related terms and definitions, normative and legal framework conditions as well as different national indicators were collected for each country.

This report comprises the result of the joint coordination works and should serve as a basis for a common understanding.

2. Structure

The report is devided in four main parts:

- Chapter 3 includes at the very beginning a list of several technical terms and their translation into Czech, Danish, French, German, Italian, Durch, Finnish, Norwegian, Portuguese, Spanish and Swedish. This chapter serves therfore quasi as a dictionary for specific technical terms.
- Chapter 4 contains important terms and definitions to the topic briefly described.
- In chapter 5 some information about the different framework conditions in the partner countries can be found. So it is noted how the “mayor renovation“ is defined in each country, which legal requirements have to be fulfilled and also how the subsidies for the building renovation are defined.
- Chapter 6 includes further information about national definitions and methods, such as details about the different reference surfaces, energy flows, energy balances and the used balance boundaries. In chapter 7 conversion factors in each partner coutnry are listed.

3. Dictionary

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
air change rate	Intenzity výměny vzduchu	luftskifte	luchtversingssnelheid	ilmanvaihtuvuus	taux (m) de renouvellement (m) d'air	Luftwechselrate (f)	tasso di ricambio	luftskifte	taxa de renovação de ar	ratio de renovación de aire	luftomsättning
air conditioning	klimatizace	klimatisering	klimaatregeling	ilmastointi	air conditionné (m)	Klimaanlage (f)	condizionamento dell'aria	klimatisering	ar condicionado	aire acondicionado	klimatisering
air tightness	vzduchotěsnost	lufttæthed	luchtdichtheid	ilmatiiviys	etanchéité (f) à l'air (m)	Luftundurchlässig-keit (f), Luftdichtheit (f)	tenuta all'aria	lufttetthet	estanqueidade ao ar	estanqueidad al aire	lufttäthet
allocation	přidělení	allokering	toewijzing	kohdentaminen	affectation (f)	Allokation, Zuordnung (f)	allocazione	allokering	afetação	asignación	allokering
apparent recycling/ reuse rate	recyklace/opětovné použití	genanvendelsesrate	recycling	näennäinen kierrätys / uudelleenkäyttöaste	taux apparent (m) de recyclage/ réemploi (m)	Rezyklier-/ Wiederverwertungs-anteil/ -rate (f)	tasso di riuso/ riciclaggio apparente	gjenvinningstakt	reciclagem parcial/ taxa de reciclagem	reciclaje parcial / tasa de reutilización	återvinningtakt
assessment	posouzení/ hodnocení	vurdering	beoordeling	arviointi	evaluation (f)	(Ab-,Ein-)Schätzung, Beurteilung (f)	valutazione	vurdering	avaliação	evaluación	värdering
basement	suterén	kælder	kelder	kellari	fondation (f) / cave (f)	Grundmauer (f) / Keller (m)	fondazione/ pavimento	kjeller	cave	sótano	grund / källare
bearing wall	nosná stěna	bærende væg	dragende muur	kantava seinä	mur porteur (m)	tragende Mauer (f), tragende Wand (f)	muro portante	bærevegg	parede resistente	muro portante	bärande vägg
boiler	kotel	kedel	ketel	kattila	chaudière (f)	Kessel (m)	caldaia	kjel	caldeira	caldera	Brännare/panna
building envelope	obvodový plášť	klimaskærm	gebouwschil	rakennuksen vaippa	enveloppe (f) du bâtiment (m)	Gebäudehülle (f)	involucro dell'edificio	klimaskjerm	envolvente do edifício	envolvente del edificio	Byggnadsskal/klimatskärm
building manager	správce budovy	byggeleder	gebouwbeheerder	isännöitsijä	gestionnaire (m)	Gebäudebetreiber (m), Gebäude-bewirtschafter (m)	gestore dell'edificio	bygningsforvalter	gestor do edifício	gestor del edificio	fastighetsförvaltare
building-integrated technical system (bits)	Integrované technické systémy budovy	bygningsintegreret teknisk system	technische installaties	rakennukseen integroitu tekninen järjestelmä	installatins techniques du bâtiment	Gebäudetechnik (-systeme)	sistema tecnico integrato all'edificio	bygningsintegrert teknisk system	sistemas técnicos do edifício	sistemas técnicos del edificio	Byggnads-integrerade tekniska system
building owner	vlastník budovy	bygningsejer	gebouweigenaar	rakennuksen omistaja	propriétaire (m) du bâtiment (m), maître (m) de l'ouvrage (m)	Gebäudeeigentümer (m), Gebäudeeigentümerin (f)	proprietario dell'edificio	byggeier	proprietário	propietario	fastighetsägare

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
building site	staveniště	byggeplads	bouwplaats	rakennuspaikka	chantier de construction (m)	Bauplatz (m), Baustelle (f)	sito di costruzione	byggeplass	estaleiro	ubicación del edificio	byggplats
building stock	stavební fond	bygningsmasse	gebouwvoorraad	rakennuskanta	parc (m) de bâtiments (m)	Gebäudebestand (m)	patrimonio edilizio	bygningsmasse	parque imobiliário	parque inmobiliario	fastighetsbestånd
characterisation	charakterizace	karakterisering	karakterisering	luonnehdinta	caractérisation (f)	Beschreibung (f), Charakterisierung (f)	caratterizzazione	karakterisering	caracterização	caracterización	karaktärisering
closed/open loop recycling	uzavřená/zpětná vazba recyklace	lukket/åbent kredsløb (genanveldelse)	open-loop-recycling	suljetun / avoimen piirin kierrätys	recyclage (m) en boucle fermée/ouverte (f)	(Wieder-/Weiter) Verwertung (f)	ciclo aperto/ chiuso riciclo	lukket/åpent kretsløp	ciclo de reciclagem fechado/aberto	ciclo de reciclaje cerrado/abierto	öppet/ slutet kretslopp
construction element	stavební prvek	bygningselement	bouwelement	rakennuselementti	elément (m) de construction (f)	Bauelement (n)	elemento costruttivo	bygningselement	elemento construtivo	elemento constructivo	byggnadselement
contractor	dodavatel	entreprenør	aannemer	urakoitsija	entrepreneur (m)	Auftragnehmer (m), Auftragnehmerin (f)	contraente/ appaltatore	entreprenør	empreiteiro	promotor	entreprenör
coverage (building -)	zastřešení	dækning (bygning -)	dakbedekking	(rakennuksen) kattavuus	couverture (d'un bâtiment) (f)	Dachwerk (n), Bedachung (f), Dach (n)	copertura	(tak-) tekking	cobertura	cobertura	taktäckning
critical review	hodnotící zpráva	kritisk gennemgang	kritische beoordeling	kriittinen tarkastelu/arvio	revue critique (f)	kritische Begleitung bzw. Begutachtung (f)	revisione critica	kritisk gjennomgang	revisão crítica	revisión crítica	kritisk granskning
daylight factor	činitel denního osvětlení	dagslysfaktor	daglichtfactor	päivänvalokerroin	facteur de lumière du jour (flj) (m)	Tageslichtquotient (m)	fattore di luce diurna	dagslysfactor	fator luz do dia	factor de luz del día	dagsljusfaktor
detached house	samostatně stojící dům	parcelhus	vrijstaand huis	omakotitalo / pientalo	maison isolée (f)	Einzelhaus (n)	abitazione singola	småhus	moradia isolada	vivienda unifamiliar	Fristående småhus
district heating	teplárenská síť	fjernvarme	warmtenet	kaukolämmitys	chauffage urbain (m)	Fernwärme (f)	teleriscaldamento	fjernvarme	sistema de aquecimento urbano	sistema de calefacción urbana ("district heating" is also used in spanish)	fjärrvärme
domestic waste	domovní odpad	husholdningsaffald	huishoudelijk afval	kotitalousjäte	déchets ménagers (m)	Hausmüll (n)	rifiuto domestico	husholdningsavfall	lixo doméstico	residuos domésticos	hushållsavfall
ecobalance	ekologická bilance	økobalance	eco-balans	ekotase	ecobilan (m)	Ökobilanz (f)	ecobilancio	økobalanse	equilíbrio ambiental	equilibrio ambiental	ekobalans
ecolabel	ekoznačení	miljømærke	eco label	ekomerkki	marque environnementale (f), écolabel (m)	Umweltzeichen (n)	ecolabel	miljømerke	rótulo ecológico	etiqueta ecológica	miljömärkning

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
efficiency	účinnost	effektivitet	efficientie	tehokkuus / hyötysuhde / suorituskyky	rendement (chaudière) (m), efficacité (pompe à chaleur) (f)	Wirkungsgrad (m)	efficienza	effektivitet	eficiência	eficiencia	effektivitet
elementary flow	základní tok	elementært flow	elementaire stroom	(perus-/alkeis-) virtaus	flux élémentaire (m)	Elementarfluss (m)	flusso specifico	Elementær strøm	fluxo elementar	flujo elemental	grundflöde
embodied energy	svázaná energie	indeholdt energi	energie- inhoud	sitoutunut energia	contenu énergétique (m)	Graue Energie (f)	energia incorporata	innbygd energi	energia incorporada	energía embebida	inbyggd energi
emission	emise	emission	emissie	päästö / emissio	emission (f)	Emission (f)	emissione	emisjon, utslipp	emissão	emisión	emission/utsläpp
energy vector	vektor energie	energi vektor	energiedrager	energian lähde	vecteur énergétique (m)	Energieträger (m)	vettore energetico	Energibærer	vetor energético	vector energético	energibärare
energy consumption	spotřeba energie	energiforbrug	energieconsumptie, energiegebruik	energian kulutus	consommation, d'énergie (f)	Energieverbrauch (m)	consumo energetico	Energiforbruk	consumo de energia, utilização de energia	consumo energético	energianvändning
energy recovery	zpětné využití energie	energigenvinding	hergebruik van energie	energian talteenotto	récupération d'énergie (f)	Abwärmenutzung (f), Energierückgewinnung (f)	energia recuperata	energigjenvinning	recuperação de energia	recuperación de energía	energiåtervinning
energy requirement	energetické požadavky	energibehov	benodigde energie	energian tarve	besoins énergétiques (m, pl)	Energiebedarf (m)	fabbisogno energetico	Energibehov	requisitos energéticos	requisitos energéticos	energibehov
environment	životní prostředí	miljø	omgeving, milieu	ympäristö	environnement (m)	Umwelt (f)	ambiente	miljø	ambiente	ambiente	Miljö
environmental impact	dopad na životní prostředí	miljøpåvirkning	milieu-impact / gevolgen voor het milieu	ympäristövaikutus	impact environnemental (m)	Umwelt(ein-/aus)wirkung (f)	impatto ambientale	miljøpåvirkning	impacto ambiental	impacto ambiental	Miljöpåverkan
environmental profile	environmentální profil	miljøprofil	milieuprofiel	ympäristöprofiili	profil environnemental (m)	Umweltbelastungs-profil (n)	profilo ambientale	miljøprofil	perfil ambiental	perfil ambiental	Miljöprofil
exhaust air	odváděný vzduch	afkastluft	afgevoerde lucht	poistoilma	air extrait (m)	Abluft (f)	aria di estrazione	avtrekksluft, avkastluft	extração de ar	aire extraido	Frånluft
flow chart	vývojový diagram	rutediagram	procesdiagram	vuokaavio	diagramme (m) des flux (m)	Flussdiagramm (n)	diagramma di flusso	flytskjema	diagrama de fluxos	diagrama de flujos	Flödesschema
fossil fuel	fosilní paliva	fossilt brændsel	fossiele brandstoffen	fossiilinen polttoaine	combustibles fossiles (m)	fossiler Energieträger (m)	combustibile fossile	fossilt brensel	combustivel fóssil	combustible fósil	fossilt bränsle
from cradle to gate	od kolébky k bráně	cradle to gate	van wieg tot poort	kehdosta portille	du berceau à la sortie de l'usine	von der Wiege bis zum Ausgang	dalla culla alla porta	fra vugge til port	«do berço à porta » da extração até à saída da fábrica	"de cuna a puerta" de extracción a la salida de fábrica	från vaggan till grinden

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
from cradle to grave	od kolébky do hrobu	cradle to grave	van wieg tot graf	kehdosta hautaan	du berceau à la tombe	von der Wiege bis zum Grab	dalla culla alla tomba	fra vugge til grav	«do berço ao túmulo» da extração até à deposição	"de la cuna a la tumba"	från vaggan till graven
fuel	palivo	brændstof	brandstof	polttoaine	Combustible (usage fixe) (m)	Brennstoff (m)	combustibile	Brensel	combustível	combustible	bränsle
fuel/gasoline	palivo/benzin	benzin	brandstof/benzine	polttoaine / bensiini	Carburant (usage mobile) (m)	Treibstoff (m) (für Fahrzeuge)	combustibile/ benzina	Brensel, flytende bresel, Drivstoff	combustível	combustible, gasolina	flytande bränsle
functional unit	funkční jednotka	funktionel enhed	functionele eenheid	toiminnallinen yksikkö	unité fonctionnelle (f)	funktionale Einheit, Funktionseinheit (f)	unità funzionale	funksjonell enhet	unidade funcional	unidad funcional	funtionell enhet
global warming	globální oteplování	global opvarmning	opwarming van de aarde	ilmaston lämpeneminen	réchauffement climatique (m)	globale Erwärmung (f), Treibhauseffekt (m)	riscaldamento globae	global oppvarming	aquecimento global	calentamiento global	global uppvärmning
global warming potential (gwp)	potenciál globálního oteplování (GWP)	global warming (gwp)	potentiele bijdrage aan de opwarming van de aarde (?)	ilmaston lämpeneminemis -potentiaali	potentiel de réchauffement climatique	Treibhausgaspotential (n)	potenziale di riscaldamento globale	globalt oppvarmingspotentiale	potencial de aquecimento global	potencial de calentamiento global	Global uppvärmnings-potential
greenhouse effect	skleníkový efekt	drivhuseffekt	broeikaseffect	kasvihuoneilmiö	effet (m) de serre (f)	Treibhauseffekt (m)	effetto serra	drivhuseffekt	efeito de estufa	efecto invernadero	växthuseffekt
primary energy	primární energie	primær energi	primaire energie	primäärienergia	energie primaire (f)	Primärenergie (f)	energia primaria	primærenergi	energia primária	energía primaria	primärenergi
guideline	směrnice	retningslinje	richtlijn	ohje	recommandation (f)	Leitfaden	lineaguida	veiledning, retningslinje	recomendação/orientação	recomendación, orientación	rekommendation
hazardous waste	nebezpečný odpad	farligt affald	schadelijk afval	ongelmajäte	déchets spéciaux (m)	Sondermüll (m)	rifiuto speciale	farlig avfall	resíduos perigosos	residuos peligrosos	Farligt avfall
heat loss	tepelné ztráty	varmetab	warmteverlies	lämpöhäviö	perte thermique (f)	Wärmeverlust (m)	perdita di calore	varmetap	perdas de calor	pérdidas de calor	värmeförlust
heating	vytápění	opvarmning	verwarming	lämmitys	chauffage (m)	Heizung (f)	riscaldamento	oppvarming	aquecimento	calefacción	uppvärmning
heating load	otopný výkon	varmebehov	warmtelast	lämpökuorma	charge (f) de chauffage	Heizleistung (f)	carico termico	varmelast	carga de aquecimento	carga de calefacción	värmelast
heating period	otopné období	opvarmningsperiode	verwarmingstijd	lämmityskausi	saison (f) de chauffe (f)	Heizperiode (f)	periodo di riscaldamento	oppvarmingsperiode	estação de aquecimento	periodo de calefacción	Uppvärmningperiod/ eldningssäsong
heating value	výhřevnost	brændværdi	verbrandingswaarde, verwarmingsvermogen	lämpöarvo	pouvoir calorifique (m)	Heizwert (m)	potere calorifico	Brennverdi	poder calorífico	calor específico	värmevärde
immission	imisní	immision	immissie	pitoisuuksien	immission (f)	Immission (f)	immissione	Immisjon	imissão		immission
impact	účinek	indvirkning	impact	vaikutus	impact (m)	Wirkung (f)	Impatto	påvirkning, innvirkning	impacto	impacto	påverkan

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
inert waste	inertní odpad	inert affald	inert afval	kaatopaikkajäte	déchets inertes (m, pl)	inerter Abfall (m)	rifiuto inerte	Inert avfall	resíduos inertes	residuos inertes	inert avfall
insulation (thermal -)	izolace(tepelná)	isolering (termisk)	(thermische)isolatie	Eriste (thermal insulation = lämpöeristys)	isolation thermique (f)	Isolierung (f), Wärmedämmung (f)	Isolante (termico)	isolering (varme-)	isolamento (térmico)	aislamiento (térmico)	värmeisoloering
interior climate	vnitřní prostředí	indeklima	binnenklimaat	sisäilmasto	climat intérieure (m), ambiance intérieure (f)	Innen(raum)klima (n)	clima interno	Inneklima	ambiente interior	ambiente interior	inneklimat
building site (us)	staveniště	byggeplads	bouwplaats	rakennuspaikka	chantier (m) de construction (f)	Bauplatz (m), Baustelle (f)	ubicazione dell'edificio	Byggeplass	estaleiro	ubicación del edificio	byggplats
landfill/to	skládka	deponering/til	stortplaats/ storten	landfill = kaatopaikka	décharge (f)/ mettre en	Deponie (f)/ deponieren	inviare in discarica	Deponi	aterro	vertedero	deponi, avfallsplats
life cycle	životní cyklus	livscyklus	levenscyclus	elinkaari	cycle (m) de vie (f)	Lebenszyklus (m)	ciclo di vita	livssyklus, livsløp	ciclo de vida	ciclo de vida	livscykel
life cycle assessment, (lca)	hodnocení životního cyklu (LCA)	livscyklusanalyse (lca)	levenscyclusanalyse	elinkaariarvio	analyse (f) du cycle de vie, acv	Lebenszyklusanalyse (f)	valutazione del ciclo di vita (LCA)	livsløpsvurdering	avaliação de ciclo de vida	análisis de ciclo de vida	livscykelanalys, lca
life cycle impact assessment (lcia)	hodnocení dopadů životního cyklu (LCIA)	livscykluspåvirk-ningsanalyse (lcia)	levenscyclusassessment	elinkaaren vaikutusten arviointi	evaluation (f) des impacts (m) du cycle de vie	Lebenszykluswirkungsschätzung (f)	valutazione dell'impatto del ciclo di vita (LCIA)	livsløpseffektvurdering	avaliação do impacto no ciclo de vida	análisis de impacto del ciclo de vida	värdering av livscykelpåverkan
life cycle inventory analysis	invertalizační analýza životního cyklu	livscyklus lageranalyse	levenscyclusinventarisatie	elinkaaren inventaarioanalysi	inventaire (m) du cycle de vie	Sachbilanz (f)	analisi d'inventario del ciclo di vita	livsløpsregnskap	análise de inventário de ciclo de vida	análisis de inventario del ciclo de vida	livscykelinventering
life cycle stage/ step	fáze životního cyklu/krok	livscyklus trin	stap in de levenscyclus	elinkaarivaihe	période/ étape (f) du cycle de vie	Lebens(abschnitt (m)/ -zyklusphase)	periodo del ciclo di vita	livsløpsstadium	fase/etapa do ciclo de vida	fase/etapa del ciclo de vida	livscykeletapp
limit value	mezní hodnota	grænseværdi	grenswaarde	raja-arvo	valeur limite (f)	Grenzwert (m)	valore limite	grenseverdi	valor limite	valor límite	gränsvärde
local authority	místní orgán	lokal myndighed	lokale overheid	paikallisviranomainen	collectivité locale (f)	lokale Behörde (f)	autorità locale	lokal myndighet	autoridade local	autoridad local	lokal församling/ myndighet
loss	ztráta	tab	verlies	häviö	perte, déperdition (f)	Verlust (m)	perdita	tap	perda	pérdida	förlust
maintenance	údržba	vedligehold	onderhoud	huolto / ylläpito / kunnossapito	entretien (m), maintenance (f)	Instandhaltung (f)	manutenzione	vedlikehold	manutenção	mantenimiento	underhåll
managing building owner	správa vlastníka budovy	bygherre	gebouwbeheerder/ -eigenaar	rakennuksen omistaja	maître d'ouvrage gestionnaire (m)	Gebäudebesitzer /in, Gebäudebewirt-schafter/in (m/f)	gestore dell'edificio	bygningsforvalter			förvaltare
mandator	příkazce	fuldmagtsgiver	opdrachtgever	toimeksiantaja	mandant (m)	Auftraggeber/in (m/f)	mandante	Fullmaktagiver, oppdragsgiver	responsável	responsable	uppdragsgivare
masonry	zdivo	murværk	metselwerk	muuraus	travaux (m, pl) de maçonnerie (f), gros-oeuvre (m)	Mauerwerk (n)	costruzione in muratura	murverk	alvenaria	albañilería	murverk

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
master builder	stavitel, mistr	bygmester	bouwheer	rakennusmestari	maître d'oeuvre, architecte (m)	Baumeister, Polier (m)	progettista dell'edificio	byggmester	empreiteiro geral	arquitecto ?	byggmästare
material	materiál	materiale	materiaal	materiaali	matière (f), matériau (m)	Material (n)	materiale	material	material	material	material
mean value	střední hodnota	middelværdi	gemiddelde waarde	keskiarvo	moyenne (f)	Durchschnitt (m)	valore medio	middelverdi	valor médio	valor medio	medelvärde
measurement	měření	måling	meting	mittaus	mesurage (m), mesure (f)	Messung (f)	misura	måling	medição	medición, medida	mätning
mechanical ventilation	mechanické větrání	mekanisk ventilation	mechanische ventilatie	koneellinen ilmanvaihto	ventilation mécanique (vmc) (f)	mechanische Lüftung (f)	ventilazione meccanica	mekanisk ventilasjon	ventilação mecânica	ventilación mecánica	mekanisk ventilation
monitoring	sledování, kontrola	overvågning	monitoring	seuranta, valvonta	surveillance (f), contrôle (m)	Überwachung (f)	monitoraggio	overvåkning	monitorização	monitorización	övervakning, mätning
multicriteria analysis	multikriteriální analýza	multikriterieanalyse	multicriteria-analyse	monikriteerianalyysi, monimuuttuja-analyysi	analyse multicritères (f)	Multikriterienanalyse (f)	analisi multicriterio	multikriterianalyse	análise multicritério	análisis multicriterio	multikriteriaanlys
multi-storey dwelling	vícepodlažní obytný dům	etagebolig	woongebouw, flat	asuinkerrostalo	habitation collective (f)	Mehrfamilienhaus (n)	edificio multi-appartamenti	bygård, blokk	edifício multifamiliar	bloque de viviendas /edificio de viviendas	flerfamiljshus
natural ventilation	přirozené větrání	naturlig ventilation	natuurlijke ventilatie	painovoimainen ilmanvaihto	ventilation naturelle (f)	freie/natürliche Lüftung (f)	ventilazione naturale	naturlig ventilasjon	ventilação natural	ventilación natural	naturlig ventilation
one-family house, single family house	jednobytový rodinný dům, rodinný dům	enfamiliehus	eengezinswoning	omakotitalo	habitation individuelle (f)	Einfamiliehaus (n)	edificio mono familiare	enebolig	habitação unifamiliar	edificio unifamiliar	enfamiljhus, småhus
operating costs	provozní náklady	driftsomkostninger	bedrijfskosten	käyttökustannukset	coûts (m, pl) d'utilisation (f)	Betriebskosten (f, pl)	costi operativi	driftkostnader	custos de operação	costes de operación	driftskostnad
operational decision-making	operativní rozhodování	operationel beslutningsproces	operationele besluitvorming	operatiivinen päätöksenteko	décision opérationnelle (f)	Entscheidungsfindung (f)	decisore operativo	driftsbeslutting	tomada de decisão operacional	toma de decisión operacional	driftsbeslut
outdoor climate	venkovní klima	udeklima	buitenklimaat	ulkoilmasto	climat extérieur (m)	Aussenklima (n)	clima esterno	Uteklima	clima exterior	clima exterior	utomhusklimat
pollution (air, water, soil -)	znečištění (vzduch, voda, půda -)	forurening (luft, vand, jord -)	vervuiling, verontreiniging (lucht, water, bodem)	ilman saastuminen, veden saastuminen, maaperän saastuminen (pollution = saastuminen)	pollution (f) de l'air (m), de l'eau (f), du sol (m)	Luft-, Wasser, Bodenverschmutzung (f)	inquinanti aria, acqua suolo,…)	Forurensing (luft-, vann-, jord-)	poluição	contaminación (aire, agua, suelo...)	luft-, vatten, markförorening

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
primary energy consumption	spotřeba primární energie	primær energiforbrug	primair energiegebruik	primäärienergian kulutus	consommation d'énergie primaire (f)	Primärenergieverbrauch (m)	consumo di energia primaria	primærenergiforbruk	consumo de energia primária	consumo de energía primaria	primärenergiförbrukning
process tree	proces, postup	procestræ	procesboom	prosessikaavio	arbre des procédés (m)	Prozessbaum (m)	diagramma di processo	prosesstre	diagrama de tarefas	diagrama de tareas	processträd
raw material	surovina	rå materiale	ruwe materialen/ grondstoffen	raaka-aine	matière première (f)	Rohstoff (m), Rohmaterial (n)	materiale grezzo	råmaterial	matéria prima	materia prima	råmaterial
rebuilding	přestavba	ombygning	renovatie	uudelleen rakentaminen	reconstruction (f)	Wiederaufbau, Umbau (m)	ricostruzione	ombygging	reconstrução	reconstrucción	ombyggnad
recycling	recyklace	genbrug	recycling	kierrätys, uusiokäyttö	recyclage (m)	Rezyklierung (f)/ Recycling (n), Wiederverwendung (f)	riciclo	resirkulering, gjenvinning	reciclagem	reciclaje	återbruk, återvinning
rehabilitation	obnova	rehabilitering	renovatie/restauratie	kunnostus	restauration (f)	Wiederinstandsetzung (f)	restauro	renovering, rehabilitering	reabilitação	rehabilitación	restaturering
relative humidity	relativní vlhkost	relativ fugtighed	relatieve luchtvochtigheid	suhteellinen kosteus	degré hygrométrique (m), humidité relative (f)	Feuchtigkeitsgrad (m), relative Feuchtigkeit (f)	umidità relativa	relativ fuktighet	humidade relativa	humedad relativa	relativ fuktighet
renewable	obnovitelný	vedvarende	hernieuwbaar	uusiutuva	renouvelable	erneuerbar	rinnovabile	Fornybar	renovável	renovable	förnybar
renovation	renovace	renovering	renovatie	kunnostus, peruskorjaus	rénovation (f)	Renovierung (f), Renovation (f), Erneuerung (f)	ristrutturazione	renovering, modernisering	renovação	renovación	renovering
research institution	výzkumná instituce	forksningsinstitution	onderzoeksinstituut	tutkimuslaitos	organisme (m) de recherche (f)	Forschungseinrichtung (f)	istituto di ricerca	Forskningsinstitusjon	instituição de investigação	institución de investigación	forskningsinstitution
reuse	opakované použití	genbrug	hergebruik	uudelleenkäyttö, uusiokäyttö	réutilisation (f)	Wiederverwendung (f)	riuso	Gjenbruk	reutilizar	reutilizar	återbruk, återanvändning
room	místnost	værelse	kamer	huone	pièce (f), local (m)	Zimmer (n), Raum (m)	stanza/ ambiente interno	Rom	quarto/divisão/ assoalhada	habitación / estancia / cuarto	rum
sensitivity analysis	citlivotní analýza	følsomhedsanalyse	gevoeligheidsanalyse	herkkyysanalyysi	analyse (f) de sensibilité (f)	Sensitivitätanalyse (f)	analisi di sensitività	sensitivitetsanalyse	análise de sensibilidade	análisis de sensibilidad	känslighetsanalys
service life	provozní životnost	levetid	gebruiksduur	käyttöikä	durée de vie	Nutzungsdauer (f)	vita utile	levetid	vida útil	vida util	livslängd
service provider	poskytovatel služeb	tjenesteudbyder	dienstverlener	palveluntarjoaja	prestataire (m) de services (m)	Dienstleister/in (m/f)	fornitore di servizi	tjenesteyter	prestador de serviços	proveedor de servicios	tjänsteföretag
specific consumption	měrná spotřeba	specifikt forbrug	specifieke consumptie	ominaiskulutus	consommation spécifique (f)	spezifischer Verbrauch (m)	consumo specifico	spesifikt forbruk	consumo específico	consumo específico	specifik förbrukning
standardisation	normalizace	standardisering	standaardisatie	standardointi	normalisation (f)	Normierung (f)	standardizzazione	standardisering	standardização/normalização	estandarización	Normering/-standardisering
flat, apartment	byt	lejlighed	appartement	huoneisto	appartement (m)	Wohnung (f)	appartamento	Leilighet	apartamento	apartamento / piso.	lägenhet
surface	povrch	overflade	oppervlak	pinta	surface (f)	Fläche (f), Oberfläche (f)	superficie	overflate	superfície	superficie	yta

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surface area	plocha povrchu	overfladeareal	oppervlakte	pinta-ala	superficie (f)	Fläche (f), Oberfläche (f)	estensione superficiale	overflateareal	área da superfície	área / superficie	yta
system boundary	hranice systému	systemgrænse	systeemgrens	järjestelmäraja	frontière (f) du système (m)	Systemgrenze (f)	confine del sistema	systemgrense	fronteira do sistema	límites del sistema	systemgräns
target	cíl	mål	doel	tavoite	objectif (m)	Ziel (n)	obiettivo	Mål	alvo	objetivo	mål
tender	nabídka	bud	tender	tarjous	soumission, offre (f)	Ausschreibung (f)	offerta/proposta	Anbud	proposta	oferta / propuesta	anbud
thermal comfort	tepelná pohoda	termisk komfort	thermisch comfort	lämpöviihtyvyys, terminen viihtyvyys	confort thermique (m)	thermische/r Behaglichkeit/Komfort (f/m)	comfort termico	termisk komfort	conforto térmico	confort térmico	termisk komfort
thermal inertia	tepelná setrvačnost	termisk inerti	thermische traagheid	terminen hitaus	inertie thermique (f)	thermische Trägheit (f)	inerzia termica	termisk treghet	inércia térmica	inercia térmica	värmetröghet
thermal insulation	tepelná izolace	termisk isolering	warmteisolatie	lämmöneristys	isolation thermique (f)	Wärmedämmung (f)	isolamento termico	varmeisolering	isolamento térmico	aislamiento térmico	värmeisolering
threshold	práh	grænse	drempel	kynnysarvo, raja-arvo	seuil (m)	Schwelle (f)	soglia	terskel	limiar/limite	umbral / límite	tröskel
tightness	těsnost	tæthed	vastheid, dichtheid (i.e. air tightness = luchtdichtheid	tiiviys	etanchéité (f)	Dichtigkeit (f)	tenuta	tetthet	estanquidade	estanqueidad	täthet
total embodied energy	celková svázaná spotřeba energie	total indeholdt energi	totale energie - inhoud	sitoutunut kokonaisenergia	contenu énergétique total (m)	gesamte Graue Energie (f)	contento energetico totale	Total innbygd energi	energia incorporada total	energía total embebida	total inbyggd energi
uncertainty analysis	analýza nejistoty	usikkerhedsanalyse	onzekerheidsanalyse	epävarmuusanalyysi	analyse (f) d'incertitude (f)	Fehlerabschätzung (f)	analisi di incertezza	usikkerhetsanalyse	análise de incerteza	análisis de incertidumbre	osäkerhetsanalys
user of residential building	uživatel bytového domu	bruger af beboelsesejendom	bewoner	asuinrakennuksen käyttäjä	usager (m) de bâtiment résidentiel (m)	Gebäudebewohner/-in (m/f), Nutzer/-in (m/f)	utente dell'edificio residenziale	beboer	morador	ocupante / usuario / habitante	boende/brukare
valuation	ocenění	værdiansættelse	waardering	arvostus, arviointi, arvio	pondération (f)	Bewertung (f)	valutazione	verdivurdering	avaliação	evaluación	bedömning, värdering
ventilation	větrání	ventilation	ventilatie	ilmanvaihto	ventilation (f)	Lüftung (f)	ventilazione	ventilasjon, luftskifte	ventilação	ventilación	ventilation, luftomsättning
wall, partition	stěna, příčka (dělící stěna)	væg, skillevæg	muur, scheidingsmuur	seinä, väliseinä	mur (m), paroi (f)	Wand (f)	muro/ separazione	vegg, skillevegg	parede, parede divisória	pared, partición	yttervägg, mellanvägg
waste	odpad	affald	afval	jäte	déchet (m)	Abfall (m)	rifiuto/ residuo	avfall	resíduo	residuo	avfall
waste disposal	nakládání s odpady	bortskaffelse af affald	afvalplaats	jätehuolto	traitement (m) des déchets (m, pl)	Abfallbeseitigung (f)	trattamento dei rifiuti	avfallshåndtering	tratamento de resíduos	tratamiento de residuos	avfallshantering
waste elimination	odstraňování odpadu	affald afbrænding	afvalverwijdering	jätteiden hävittäminen	elimination (f) des déchets (m,pl)	Abfallentsorgung (f)	eliminazione dei rifiuti	avfallseliminering	eliminação de resíduos	eliminación de residuos	avfallseliminering

English	Czech	Danish	Dutch	Finnish	French	German	Italian	Norwegian	Portuguese	Spanish	Swedish
weighing factor, wheight	váhový faktor	vægtfaktor	wegingsfactor	painokerroin	facteur/coefficient (m) de pondération (f), pondération (m)	Gewichtungsfaktor (m), Gewicht (n)	fattore di pesatura, peso	vekt	fator de ponderação, peso	factor/coeficiente de ponderación, ponderación	viktningsfaktor
well-being	pohoda, zdar	velvære	welzijn	hyvinvointi	bien-être (m)	Wohlbefinden (n)	benessere	velvære	bem-estar	bienestar	välbefinnande

4. Terms and Definitions

Term	Definition
Carbon Dioxide Equivalent (CO_{2eq})	A simple way to place emissions of various climate change agents on a common footing to account for their effect on climate. It describes, for a given mixture and amount of greenhouse gas, the equivalent weight of carbon dioxide that would have the same global warming ability, when measured over a specified timescale. For the purpose of this report, greenhouse gas emissions (unless otherwise specified) are the sum of the basket of greenhouse gases listed in this glossary under the entry: "Greenhouse Gases covered by the Kyoto Protocol"
Global Warming Potential (GWP)	A relative index that enables comparison of the climate effect of the emissions of various greenhouse gases (and other climate changing agents). Carbon dioxide, the greenhouse gas that causes the greatest radiative forcing because of its overwhelming abundance, is chosen as the reference gas.
Greenhouse Gases covered by the Kyoto Protocol	Include the six main greenhouse gases, as listed in Annex A of the Kyoto Protocol: Carbon dioxide (CO_2); Methane (CH_4); Nitrous oxide (N_2O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); and Sulphur hexafluoride (SF_6).
Kyoto Protocol	The international environmental treaty intended to reduce greenhouse gas emissions. It adds additional provisions to the United Nations Framework Convention on Climate Change.
Montreal Protocol	The multilateral environmental agreement dealing with the depletion of the earth's ozone layer.
Primary energy	Energy that has not been subjected to any conversion or transformation process. Primary energy includes non-renewable energy and renewable energy. If both are taken into account it can be called total primary energy. For a building, it is the energy used to produce the energy delivered to the building. It is calculated from the delivered and exported amounts of energy carriers, using conversion factors.
Thermal envelope	Shell of the building as barrier to the loss of the interior heat or to the penetration of unwanted outside heat into the building. It refers to the walls, windows, roof and basement floor of the building.
U value	Measure of the envelope's component energy performance [W/(m2 K)]; how low is this value, better is the component's energy performance. Many Countries impose the U values for new constructions or for refurbishments. The U value can be obtained both for opaque components and for windows.
Boiler efficiency	The ratio of heat absorbed in steam/ water to the heat supplied in fuel, usually measured in percent.
COP	The steady-state performance of an electric compression heat pump at a given set of temperature conditions is referred to as the coefficient of performance (COP). It is defined as the ratio of heat delivered by the heat pump and the electricity supplied to the compressor.
EER	The Energy Efficiency Ratio (EER) of a particular cooling device is the ratio of output cooling to input electrical power at a given operating point.
Cogeneration	Simultaneous generation in one process of thermal energy and electrical or mechanical energy
System thermal loss	Thermal loss from a technical building system for heating, cooling, domestic hot water, humidification, dehumidification or ventilation that does not contribute to the useful output of the system
Energy source	Source from which useful energy can be extracted or recovered either directly or by means of a conversion or transformation process. Examples include oil or gas fields, coal mines, sun, forests etc.
Energy carrier	Substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes.

Renewable energy	Energy from sources that are not depleted by extraction, such as solar energy (thermal and photovoltaic), wind, water power, renewed biomass.
Non-renewable energy	Energy taken from a source which is depleted by extraction (e.g. fossil fuels)
LCIA – Life Cycle Impact Assessment	Phase of Life Cycle Assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts of a product system" (ISO 14044:2006). Impact assessment should address ecological and human health effects; it should also address resource depletion.
Embodied Energy	Embodied energy is defined as the total energy inputs consumed throughout a product's life-cycle. Initial embodied energy represents energy used for the extraction of raw materials, transportation to factory, processing and manufacturing, transportation to site, and construction. Once the material is installed, recurring embodied energy represents the energy used to maintain, replace, and recycle materials and components of a building throughout its life. One fundamental purpose for measuring this quantity is to compare the amount of energy produced or saved by the product in question to the amount of energy consumed in producing it.

5. Legal and normative framework conditions

Renovation-related definitions	
Country	**Austria**
"Major renovation"	Renovation that concerns more than 25% of the building envelope, unless the total investment for the renovation (envelope and technical value).
Legal requirements	Max. HD (heating demand) referring to the reference climate below: **25 x (1 + 2,5 / l_c)** but not more than **87,5** kWh/m²a. Mandatory target U-values for the building components; mandatory high-efficient energy supply systems based on "alternative energy sources";
Subsidies	Several subsidy programmes by the federal government, federal provinces or municipalities; generally two main aspects are addressed: Subsidies related to the object (building renovation itself-gained by the building owner) or subsidies related to the subject (occupant/ tenant acc. to his/her monthly income or financial situation)
Country	**Czech Republic**
"Major renovation"	"Major renovation" defined in decree 78/2013 par. 6 as a change in more or equal 25% of gross floor area (GFA).
Country	**Denmark**
"Major renovation"	No definition of "major renovation" any more in DK, we have only renovation requirements on component level
Legal requirements	The renovation should be economically sound ((lifetime x yearly savings)/ investments >1.33)
Subsidies	It is possible for the house owner to subtract 15.000 DKK in his income for each person above 18 years living in the house – however max 30.000 DKK per household per year.
Country	**Finland**
"Major renovation"	No definition of a "Major renovation". But any alteration that effects the outward appearance or my effect safety or health conditions of users have to apply for a building permit.
Legal requirements	The "Land Use and Building Act" defines requirements for building permits and for repair works; (http://www.finlex.fi/en/laki/kaannokset/1999/19990132)
Subsidies	Repair and energy grants (http://www.ara.fi/default.asp?node=692&lan=en) Within an approved authorization in the State Budget, repair and energy grants can be made by The Housing Finance and Development Centre of Finland for improvements in the condition and quality of individual apartments and apartment buildings Energy grants (http://www.ara.fi/default.asp?node=692&lan=en) The purpose of the grants is to improve the energy economy of residential buildings. Grants are aimed at reducing both energy consumption and emissions of greenhouse gases. Grants are awarded for conducting independent energy audits, for external repair work to as defined in legislation, for improving the ventilation and heating systems, and for implementing renewable energy sources. The grant covers up to 25 % of the approved costs. Grants are awarded by the local authority
Country	**Italy**
"Major renovation"	Definitions as in D.Lgs.192/2005, D.Lgs.311/2006 and DPR 59/2009.
Legal requirements	Energy performances requirements are requested 1) for the whole building if the Net Floor Area is greater than 1000 m²

	1a) for a complete renovation of the building envelope and 1b) in the case of extraordinary repairs for building demolition and building reconstruction; 2) for the enlarged portion of the building if the enlarged Volume is greater than 20% of the original one; 3) for specific parts or elements as thermal systems (boiler replacement), envelope components (windows)
Subsidies	National subsidy program for upgrading to more efficient buildings have been proposed starting 2007 until 2012: 55% of the global costs could be financed if the operations are performed following regulations of the Government Decrees.
Country	**Norway**
"Major renovation"	Not defined properly.
Legal requirements	Requirements are the same as the requirements for new buildings.
Subsidies	National subsidy program for upgrading to low-energy or Norwegian passive house standard.
Country	**Portugal**
"Major renovation"	A major renovation is a renovation which exceeds 25% of building value (calculated based on a reference value for square meter and by type of building set annually by decree)
Legal requirements	If it is a major renovation the regulation requires compliance with existing energy use requirements.
Subsidies	*No subsidies*
Country	**Spain**
"Major renovation"	Not defined properly. When intervening in existing buildings, there are three circunstances under which the intervention or those components modified must comply with the existing regulation on the "Limitation of the energy demand".
Legal requirements	1) When the intervention produces changes in internal or external conditions of an element of the thermal envelope that lead to an increase in energy demand of the building, the features of this element must fulfill the requirements set out in the section "Limitation of the energy demand" 2) In the renovations where more than 25% of the total area of the thermal envelope of the building is renewed and in those renovations where the characteristic use of the building is changed the energy demand of the building will be limited so that it is less than the reference building (same building with the thermal performance of the components of the envelope set by the regulation). 3) In other renovations not considered in the previous cases, the elements of the thermal envelope that are substantially replaced, incorporated or modified must comply with the limitations of maximum thermal transmittance and air permeability established in the regulations depending on the climate zone. When several elements of the thermal envelope are simultaneously modified, these thermal transmittance values may be overtaken if the resulting energy demand is equal to or lower than that obtained by applying the values of the regulation to these elements.
Subsidies	*National subsidy program for measures on the building envelope and loan for the improvement of energy efficiency of thermal systems and lighting ot the replacement of heating/cooling systems with conventional energy by biomass or geothermal energy. Regional subsidies and loans for energy efficiency improvements.*
Country	**Switzerland**
"Major renovation"	A major renovation is a renovation which either exceeds 25% of building value (value of the building assurance) or 200'000 CHF (ca. 165'000 €)
Legal requirements	If it is a major renovation the building permit requires that compliance with existing energy use requirements is certified. Verification can be done by single building parts or an overall calculation of energy needs of the building which is renovated. The requirements depend on the ration of envelope area and heated area. Requirements correspond to the requirements for new building x 1.25 (125%).
Subsidies	Federal subsidy program for measures on the building envelope, cantonal and sometimes additional communal programs for heating systems and renewables as well as for complying with the Minergie Standards.
Country	**Sweden**
"Major renovation"	No definition of "major renovation" in Sweden

Legal requirements	In principle the energy requirements of the current building code have to be fulfilled for a renovation, but the renovation should be economically sound and features of interest to preserve architecturally and historically have to be considered.
Subsidies	

6. National indicators

Building (construction)-related indicators	
Net Floor Area (conditioned) – NFA [m²]	**Total conditioned floor area inside the building envelope excluding the external and internal walls and vents, shafts, stairs, (unoccupied) attics, basements, garages; The area is not reduced by partition walls or other moveable furnishing.**
Country	**Austria**
Applicability in your country	YES
Reference	OIB RL 6 / Pkt. 2.6, ÖNorm B1800 "Determination of areas and volumes of buildings" / ÖNorm B8110-6 "Thermal insulation in building construction. Principles and verification methods – Heating demand and cooling demand." Annex B – Calculation of the partition of gross floor area and gross volume within attics
Country	**Denmark**
Applicability in your country	NO
Country	**Finland**
Applicability in your country	YES
Remark	Used for expressing the living area, not to determine energy consumption
Country	**Italy**
Applicability in your country	YES
Reference	UNI/TS 11300-1, Energy performance of buildings
Remarks	Part 1: Evaluation of energy need for space heating and cooling
Country	**Norway**
Applicability in your country	YES
Reference	"NTA", NS 3940, area inside the building envelope excluding the external and internal construction walls
Country	**Portugal**
Applicability in your country	YES
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)" Portuguese definition includes unmoveable closets and excludes partition walls.
Country	**Spain**
Applicability in your country	YES
Country	**Sweden**
Applicability in your country	YES
Reference	Boverket (Swedish Building Code BBR)
Remarks	It is a measure of floor area, measured in square meters, in temperature-controlled areas that are intended to be heated to more than 10 degrees, and bounded by the inside of the building envelope. There is also a definition according to SS 02 10 53, which is not used very often in connection with energy use. The SS excludes staircases etc.
Country	**Switzerland**
Applicability in your country	YES but as "Net Floor Area (conditioned and unconditioned)"

Reference	Norm SIA 416 "Areas and Volumes of Buildings and Installations
Remarks	Definition is slightly different: Net Floor Area comprises total conditioned and not conditioned floor area inside the building envelope excluding the external and internal construction walls (towards internal court yards) but includes internal walls dividing rooms, vents, shafts, stairs, (unoccupied) attics, basements, internal garages; The area is not reduced by partition walls or other moveable furnishing.
Suggestion for modification of the definition	For energy purposes in Switzerland the notion "Heated Net Floor area" ("Energiebezugsfläche") corresponding to the heated part of net floor area is commonly used (heated area with a room height of less than 1 meter is excluded). Heated net floor area is about 85% of net floor area

Gross Floor Area (conditioned) – GFA [m²]	**Sum of the covered area of all conditioned floors of a building measured outside the thermal envelope (e.g. exterior wall). Unconditioned rooms within the conditioned envelope are counted; Unoccupied, unheated basements, attics, garages outside the thermal envelope are excluded;**
Country	**Austria**
Applicability in your country	YES See „Net Floor Area“
Reference	ÖNorm B1800; ÖNorm B8110-6 (that is relevant for the energy indicators).
Remarks	The ÖNorm B8110-6 excludes all spaces in conditioned attics that are below 1,50 m room height and the area of stairwells above 2m2
Country	**Czech Republic**
Applicability in your country	YES
Reference	Total conditioned floor area inside the building envelope including the external and internal walls. Acc. to Czech decree 318/2012 Coll., par 2, r); defined as „energeticky vztazna plocha”.
Country	**Denmark**
Applicability in your country	YES Total conditioned floor area inside the building envelope including the external and internal walls. Danish Building code (BR10) Appendix 1
Country	**Finland**
Applicability in your country	YES
Country	**Italy**
Applicability in your country	NO
Reference	See „Net Floor Area“
Country	**Norway**
Applicability in your country	YES
Reference	“BTA” Defined in NS 3940. Comprising all areas within the building, conditioned and not conditioned. Excludes all spaces in conditioned attics that are below 1,50 m room height.
Country	**Portugal**
Applicability in your country	YES
Reference	D.R. nº 9/2009 de 29 de Maio “Conceitos técnicos nos domínios do ordenamento do território e do urbanismo a utilizar pelos instrumentos de gestão territorial”
Remarks	Portuguese definition is only used in connection with town planning regulations. Includes on each floor, the thickness of the external walls, the covered circulation spaces (atria, galleries, corridors, stairwells and elevator boxes) and the covered outdoor spaces (porches, sheds, balconies and covered terraces).

Country	Spain
Applicability in your country	NO
Country	**Sweden**
Applicability in your country	YES
Reference	SS 02 10 53
Remarks	Excludes opening in light well, other opening in floor structure than hole for stairs/ramp
Country:	**Switzerland**
Applicability in your country	YES but as Gross Floor Area, comprising all areas within the building, conditioned and not conditioned (including exterior walls and unconditioned areas inside the building envelope but outside the thermal envelope).
Reference	Norm SIA 416 "Areas and Volumes of Buildings and Installations"

Net Gross Area – NGA [m²]	Floor dimensions measured between the inner surfaces of external or party walls, disregarding any internal wall. Perimeter wall thickness, external projections, balconies and unconditioned spaces (clearly divided) is excluded.
Country	**Austria**
Applicability in your country	*NO*
Country	**Czech Republic**
Applicability in your country	*YES*
Reference	NGA is defined in the Czech standard CSN EN ISO 13789
Country	**Denmark**
Applicability in your country	*NO*
Country	**Finland**
Applicability in your country	*YES*
Country	**Italy**
Applicability in your country	*YES*
Reference	See DPR192/05 and D.Lgs 311/06
Country	**Norway**
Applicability in your country	*YES*
Reference	"BRA", defined in NS 3940. (Conditioned part of BRA is relevant for the energy indicators).
Country	**Portugal**
Applicability in your country	*NO*
Country	**Spain**
Applicability in your country	*NO*
Country	**Sweden**
Applicability in your country	NO

Country	**Switzerland**
Applicability in your country	*NO*

Net Floor Area acc. to the EnEV (Germany) – NFA_{EnEV} [m²]	**The net floor area acc. to the EnEV is calculated by means of the gross volume: NFA_{EnEV} = 0,32 x V; the figure is not related to any real floor dimension.**
Country	**Austria**
Applicability in your country	*NO*
Country	**Czech Republic**
Applicability in your country	*NO*
Country	**Denmark**
Applicability in your country	*NO*
Country	**Finland**
Applicability in your country	*NO*
Country	**Italy**
Applicability in your country	*NO*
Country	**Norway**
Applicability in your country	*NO*
Country	**Portugal**
Applicability in your country	*NO*
Country	**Spain**
Applicability in your country	*NO*
Country:	**Sweden**
Applicability in your country	*NO*
Country	**Switzerland**
Applicability in your country	*NO*

Treated Floor Area – TFA [m²]	**Reference area used by the German "*Passivhausinstitut*"; Total area inside the insulated building envelope excluding external and internal walls; Unheated technical rooms or the basement which are inside the conditioned thermal envelope are counted with 60%; Spaces between 1,0 and 2,0 m height are counted with 50%;**
Country	**Austria**
Applicability in your country	*YES* - TFA is used within the field of passive houses (verification with PHPP generally)
Country	**Czech Republic**
Applicability in your country	*YES* *TFA is used only for energy calculation of passive houses (verification with PHPP software generally) for users.*
Remarks	TFA is not allowed to be used for energy audits and energy certification of houses according the Czech law, public notice no. 78/2013).

Country	Denmark
Applicability in your country	*NO*
Country	**Finland**
Applicability in your country	*NO*
Country	**Italy**
Applicability in your country	*NO*
Country	**Norway**
Applicability in your country	*YES*
Reference	TFA is used within the field of passive houses following the international passive house standard (verification with PHPP generally). Energy calculation of passive houses is in most cases following the Norwegian passive house standard and NS 3031.
Country	**Portugal**
Applicability in your country	*NO*
Country	**Spain**
Applicability in your country	*NO*
Country	**Sweden**
Applicability in your country	*NO*
Country	**Switzerland**
Applicability in your country	*NO*

Conditioned net volume – V_n [m^3]	**Building volume calculated by means of the net floor area and the related room height.**
Country	**Austria**
Applicability in your country	*YES* Indicator not generally unknown, but yet not that common applied as others, despite buildings with ventilation systems (future increasing number may lead to more penetration of the indicator
Country	**Czech Republic**
Applicability in your country	*YES*
Country	**Denmark**
Applicability in your country	*NO*
Country	**Finland**
Applicability in your country	*YES*
Country	**Italy**
Applicability in your country	*YES*
Reference	UNI/TS 11300-1, Energy performance of buildings Part 1: Evaluation of energy need for space heating and cooling
Remarks	Italian TS defines the "Climatised environment"
Country	**Norway**
Applicability in your country	*YES*

Reference	Used in house pressure testing.
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)"
Country	**Spain**
Applicability in your country	*YES*
Country	**Sweden**
Applicability in your country	*YES*
Remarks	Indicator not generally unknown, but yet not that commonly applied as others
Country	**Switzerland**
Applicability in your country	*NO*

Conditioned gross volume – V_G [m^3]	**Building volume enclosing the outer surface of the conditioned building parts; Unconditioned basements and garages, unoccupied and unconditioned attics, winter gardens or loggias are excluded;**
Country	**Austria**
Applicability in your country	*YES see* "Net Floor Area"
Remarks	The V_G includes contrary to the gross floor area all spaces within conditioned attics disregarding the room height.
Country	**Czech Republic**
Applicability in your country	*YES*
Reference	Total conditioned volume inside the building envelope including the external and internal walls. Czech standard ČSN 730540-part 1(par. 4.8.16) and part 2 (par.3.1).
Country	**Denmark**
Applicability in your country	*YES*
Country	**Finland**
Applicability in your country	*YES*
Country	**Italy**
Applicability in your country	*YES*
Reference	National Law published because of EU Dir. 2002/91/CE: D.Lgs 192/2005 and D.Lgs. 311/2006
Country	**Norway**
Applicability in your country	*YES*
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.R. nº 9/2009 de 29 de Maio "Conceitos técnicos nos domínios do ordenamento do território e do urbanismo a utilizar pelos instrumentos de gestão territorial"

Remarks	Portuguese definition is only used in connection with town planning regulations. It considers the volume above the external ground.
Country	**Spain**
Applicability in your country	*YES*
Remarks	Actually in the regulations there is no definition of conditioned volume but in any case it should be always refered to the net area since the heating demand / consumption is calculated referred to the net area..
Country	**Sweden**
Applicability in your country	*NO*
Country	**Switzerland**
Applicability in your country	*NO*

Envelope area - A_h [m²]	**Envelope area enclosing all conditioned building parts;**
Country	**Austria**
Applicability in your country	*YES*
Reference	ÖNorm B 1800 "Determination of areas and volumes of buildings" ÖNorm B 8110-6 "Thermal insulation in building construction – Part 6: Principles and verification methods – Heating and cooling demand"
Country	**Czech Republic**
Applicability in your country	*YES*
Reference	Czech standard ČSN 730540-1(par. 4.8.14)
Country	**Denmark**
Applicability in your country	*YES*
Reference	Calculation of the heat loss from buildings - Danish Standard 418
Country	**Finland**
Applicability in your country	*YES*
Country	**Italy**
Applicability in your country	*YES*
Reference	National Law published because of EU Dir. 2002/91/CE: D.Lgs 192/2005 and D.Lgs. 311/2006
Country	**Norway**
Applicability in your country	*YES*
Reference	Used to describe the compactness of a building.
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)"
Remarks	In Portugal, the envelope is divided in exterior envelope, interior envelope and elements in contact with ground. Exterior envelope is comprised by elements dividing conditioned building areas from the external

	environment. Interior envelope is comprised by elements dividing conditioned building areas from unconditioned areas as well as from other dwellings from other building.
Country	**Spain**
Applicability in your country	*YES*
Country	**Sweden**
Applicability in your country	*YES*
Remarks	Used for relating results from fan pressurization of buildings
Country	**Switzerland**
Applicability in your country	*YES*
Reference	Norm SIA 380/1:2009 "Thermal Energy in Buildings"
Remarks	"Thermal Envelope Area" is the "Envelope Area" without areas towards heated neighbouring rooms

Envelope to volume ratio – A_h/V_G [m^{-1}]	**Ratio of envelope area (conditioned building parts) to conditioned gross volume.**
Country	**Austria**
Applicability in your country	*YES*
Reference	ÖNorm B 1800 "Determination of areas and volumes of buildings" ÖNorm B 8110-6 "Thermal insulation in building construction – Part 6: Principles and verification methods – Heating and cooling demand"
Remarks	The "I_c" indicator ($I_c=V_G/A_h$) is used to determine the building related limit for the heating demand of buildings.
Country	**Czech Republic**
Applicability in your country	*YES*
Reference	Acc. to Czech decree 78/2013 Coll., Annex 1, par. 6. Czech standard ČSN 730540-1(par. 4.8.17)
Country	**Denmark**
Applicability in your country	*NO*
Country	**Finland**
Applicability in your country	*NO*
Remarks	But can be calculated
Country	**Italy**
Applicability in your country	*YES*
Reference	National Law published because of EU Dir. 2002/91/CE: D.Lgs 192/2005 and D.Lgs. 311/2006
Country	**The Netherlands**
Applicability in your country	*YES NO*
Country	**Norway**
Applicability in your country	*YES*
Reference	Used to describe the compactness of a building.
Country	**Portugal**

Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto “Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)”
Remarks	In Portugal the ratio is between the envelope area (external and internal) to the conditioned net volume.
Country	**Spain**
Applicability in your country	*YES*
Remarks	Not really defined by the regulation but generally known.
Country	**Sweden**
Applicability in your country	*YES*
Remarks	Discussed for low energy buildings
Country	**Switzerland**
Applicability in your country	*YES* as ration of Thermal Envelope Area to Heated Area as defined above
Reference	Norm SIA 380/1:2009 "Thermal Energy in Buildings"

Basic energy-related indicators	
Delivered Energy (EN 15603:2008) – DE [kWh]	**Energy that is delivered to the technical building system as thermal (heating, cooling) or electric energy (splitted by energy carriers). The delivered energy is measured at the interface to the building itself.**
Country	**Austria**
Applicability in your country	*YES*
Reference	OIB guideline no. 6
Remarks	Yet the delivered energy for residential buildings considers: Heating, DHW, auxiliary By Oct. 2011 the revised version of the OIB guideline no. 6 was published: therein the delivered energy considers: Heating, DHW, auxiliary and household The amount of energy from the household is counted by 50% of internal heat gain arising from persons, appliances in case of heating)
Country	**Czech Republic**
Applicability in your country	*YES*
Reference	Acc. to Czech decree 78/2013 (par. 4.1)
Country	**Denmark**
Applicability in your country	*YES*
Reference	Calculation program Be10 (Guidelines 213 Energy Demand of Buildings)
Remarks	The calculation program Be10 calculates the net energy demands and the gross energy demand of a building divided in primary energy to electricity and primary energy for heating
Country	**Finland**
Applicability in your country	*NO*
Remarks	Consumed energy is measured.
Country	**Italy**

Applicability in your country	*YES*
Reference	UNI/TS 11300-1: Energy performance of buildings Part 1: Evaluation of energy need for space heating and cooling DPR 59/2009 for cooling energy of buildings and D.Lgs. 192/2005 and D.Lgs. 311/2006
Country	**Norway**
Applicability in your country	*YES*
Reference	Defined in NS 3031. Housing: Heating, DHW, auxiliary, lighting and household Non-residential: Heating, cooling, DHW, auxiliary, lighting and technical devices
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)"
Remarks	The energy provided to users in different forms (electricity, natural gas, propane or butane, biomass, etc..) and expressed in commercial significant units (Kwh, m³, Kg, …)
Country	**Spain**
Applicability in your country	*YES*
Country	**Sweden**
Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR)
Remarks	The energy that, in normal use, during a normal year is delivered to a building (often referred to as purchased energy) for heating, comfort cooling, hot water and facility electricity.
Country	**Switzerland**
Applicability in your country	*YES*
Reference	Norm SIA 2031"Energieausweis für Gebäude (Energy Certificates for Buildings)
Remarks	Often used notion: "Final Energy" = across building perimeter delivered energy and on site produced and used energy

Primary Energy – PE [kWh_{PE}]	**According to the EN 15603 the primary energy indicates the total amount of energy for the extraction of the energy carrier, the transformation and the transport to the site where it is used. That includes efforts concerning processing, storage, generation, transmission, distribution and delivery. Optionally disposal can be addressed as well. The primary energy can be separated into a non-renewable ($PE_{r.}$) or renewable part ($PE_{n.r.}$).**
Country	**Austria**
Applicability in your country	*YES*
Reference	Primary energy conversion factors that are used are taken from: GEMIS, EN 15603, PHPP
Remarks	Since October 2011 the OIB – guideline 6 offers conversion factors that have to be used for the energy performance certificate. They will come into effect in each of the 9 provinces not until the change of the law or enactments is conducted.
Country	**Czech Republic**

Applicability in your country	*YES*
Reference	Acc. to Czech decree 78/2013 Coll., par. 2, j); Annex 3.
Country	**Denmark**
Applicability in your country	*YES*
Reference	Factors related to a stepwise approach until 2020: Building Regulations 2010/ Low energy class 2015/ Building class 2020
Remarks	Building Regulations 2010: primary energy factors: Electricity 2.5 all other energy carriers 1.0 Low energy class 2015: Electricity 2.5, district heating 0.8 all other energy carriers 1.0 Building class 2020: Electricity 1.8, district heating 0.6 all other energy carriers 1.0
Country	**Finland**
Applicability in your country	*YES*
Reference	The new building code gives factors on how to calculate based on the energy source
Country	**Italy**
Applicability in your country	*YES*
Reference	Primary energy conversion factors that are used are taken from: EN 15603, National Authority for Energy and Gas EEN 2008 The conversion factors for biomasses, solar energy, district heating,.. aren't yet published
Country	**Norway**
Applicability in your country	*YES*
Reference	Primary energy conversion factors can be taken from EN 15603.
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto “Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)”
Remarks	The energetic resource as available in nature. Portuguese unit for primary energy is kgep or tep
Country	**Spain**
Applicability in your country	*YES*
Country	**Sweden**
Applicability in your country	*YES*
Remarks	Not yet any national agreement on factors
Country	**Switzerland**
Applicability in your country	*YES* Raw energy which has not been technically converted or transported
Reference	Norm SIA 203 "Energy Certificates for Buildings", Merkblatt SIA 2032 "Embodied Energy" and 2040 "SIA Efficiency Path"
Remarks	Distinguishing "Non Renewable Primary Energy" and "Renewable Primary Energy"

CO_2-Equivalent - $CO_{2\,equ}$ [g] or [kg] or [t]	The equivalent carbon dioxide describes how much global warming a given type and amount of greenhouse gas may cause, using the functionally equivalent amount or concentration of CO_2 as the reference (the GWP of CO_2 is 1). The Global Warming Potential (GWP) describes the amount of contribution of a gas in question to the amount of heat trapped by a similar mass of carbon dioxide.
Country	**Austria**
Applicability in your country	*YES*
Country	**Czech Republic**
Applicability in your country	*YES*
Reference	Defined in the Czech standard ČSN EN 15978
Country	**Denmark**
Applicability in your country	*YES*
Country	**Finland**
Applicability in your country	*YES*
Remarks	Different calculation methods
Country	**Italy**
Applicability in your country	*YES*
Country	**Norway**
Applicability in your country	*YES*
Country	**Portugal**
Applicability in your country	*YES*
Remarks	No national agreement
Country	**Spain**
Applicability in your country	*YES*
Country	**Sweden**
Applicability in your country	*YES*
Remarks	No national agreement
Country	**Switzerland**
Applicability in your country	*YES*

Conversion factors - f_{PE}, f_{CO2equ} [-]	A conversion approach is applied to convert different energy sources into the same equivalence type so that they can be accumulated and compared. There are various conversion methods with distinct factors based on different principles which can result in significant differences.
Country	**Austria**
Applicability in your country	*YES*
Reference	Conversion factors that are used are taken from: GEMIS, EN 15603, PHPP
Remarks	Since October 2011 the OIB – guideline 6 offers conversion factors that have to be used for the energy performance certificate. They will come into effect in each of the 9 provinces not until the change of the law or enactments is conducted.

Country	Czech Republic
Applicability in your country	*YES*
Reference	Acc. to Czech decree 78/2013 Coll., Annex 1. Tab. 4, Annex 3.
Country	**Denmark**
Applicability in your country	*YES*
Reference	See "Primary Energy"
Country	**Finland**
Applicability in your country	*YES*
Reference	Values given in the new building codes on the year 2012.
Country	**Italy**
Applicability in your country	*YES*
Reference	See Primary Energy
Country	**Norway**
Applicability in your country	*YES*
Reference	Conversion factors can be taken from EN 15603.
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)"
Country	**Spain**
Applicability in your country	*YES*
Country	**Sweden**
Applicability in your country	*YES*
Reference	*See Primary Energy*
Remarks	Indirectly by having different energy requirements if heating is based on electricity and installed electric power is higher than 10 W/m²
Country	**Switzerland**
Applicability in your country	*YES*
Reference	Norm SIA 2031, Appendices D and H; Merkblatt SIA 2040 "SIA Energy Efficiency Path"
Remarks	Primary energy- and CO2- conversion factors for Switzerland

Costs per saved/ reduced PE – [€/kWh$_{PE}$]	Necessary investment in [€] to gain a reduction of 1 kWh primary energy (anyhow measures, VAT, etc. are excluded) based on the primary energy use before
Country	**Austria**
Applicability in your country	*YES*
Remarks	Not used as reference in common, but benchmarks were used by experts

Country	**Czech Republic**
Applicability in your country	*YES*
Remarks	Not used as reference in common, but benchmarks are used by experts.
Country	**Denmark**
Applicability in your country	*YES*
Country	**Finland**
Applicability in your country	*YES*
Remarks	But costs vary a lot
Country	**Italy**
Applicability in your country	*NO*
Country	**Norway**
Applicability in your country	*YES*
Reference	Not used as reference in common, but benchmarks were used by experts.
Country	**Portugal**
Applicability in your country	*NO*
Country	**Spain**
Applicability in your country	*NO*
Country	**Sweden**
Applicability in your country	*NO*
Country	**Switzerland**
Applicability in your country	*YES*
Remarks	Correct definition of the reference situation (anyhow measures) for determining energy and GHG-related costs is crucial. In Switzerland empirical costs often comprise VAT (8%)

Costs per saved/ reduced $CO_{2\ equ}$ – [€/t $CO_{2\ equ}$]	**Necessary investment in [€] to gain a reduction of 1 t $CO_{2\ equ}$ (*anyhow* measures, VAT, etc. are excluded) based on the emissions before renovation.**
Country	**Austria**
Applicability in your country	*YES*
Remarks	Not used as reference in common, but benchmarks were used by experts
Country	**Czech Republic**
Applicability in your country	*YES*
Remarks	Not used as reference in common, but benchmarks are used by experts.
Country	**Denmark**
Applicability in your country	*YES*
Remarks	Not used as reference in common, but benchmarks are used by experts
Country	**Finland**

Applicability in your country	*YES*
Remarks	Not usually utilized but can be calculated
Country	**Italy**
Applicability in your country	*NO*
Country	**Norway**
Applicability in your country	*YES*
Reference	Not used as reference in common, but benchmarks were used by experts.
Country	**Portugal**
Applicability in your country	*NO*
Remarks	In Portuguese Building Certification System a factor of 0,0012 is used to convert Primary Energy (Kgep) in CO2 emissions
Country	**Spain**
Applicability in your country	*NO*
Country	**Sweden**
Applicability in your country	*NO*
Country	**Switzerland**
Applicability in your country	*YES*
Remarks	Correct definition of the reference situation (anyhow measures) for determining energy and GHG-related costs is crucial. In Switzerland empirical costs often comprise VAT (8%)

Heating Degree Days – HDD [Kd/a]	**Indicator for heating demand related to the climate of the building location. The adding of the differences between each day's mean temperature and a base temperature above which a building is assumed to be heated within the heating period. In many countries) the indoor temperature considers a contribution of average internal heat gains about 3°C.**
Country	**Austria, Switzerland, Liechtenstein**
Applicability in your country	*YES*
Reference	$HDD_{12/20}$
Remarks	Heating limit is fixed at 12°C, the indoor temperature is fixed at 20°C (HGT 20/12)
Country	**Czech Republic**
Applicability in your country	*YES*
Reference	Heating limit is fixed at 12°C, the indoor temperature is fixed at 20°C for residential buildings according to the Czech standard CSN EN ISO 15927- Part 6 Accumulated temperature differences (degree days) (ISO 15927-6:2007).
Country	**Denmark**
Applicability in your country	*YES*
Reference	$HDD_{17/20}$
Country	**Finland**
Applicability in your country	*YES*
Country	**Italy**

Applicability in your country	*YES*
Remarks	HDD are used for Italian Climatic zones definition
Country	**Norway**
Applicability in your country	*YES*
Reference	HDD (Energigradtall/ Heizgradtage, nicht Gradtagszahl). Difference between average day temperature and 17°C. Heating limit is fixed at 17°C. The mean daily temperature is calculated based on the Köppen formula.
Remarks	Meteorologisk institutt, Bjørn Aune
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)"
Remarks	Base temperature is 18°C. No contribution from internal gains is here considered.
Country	**Spain**
Applicability in your country	*YES*
Reference	Thecnical Guide "Condiciones climáticas exteriores de proyecto". IDAE
Remarks	HDD $_{20/20}$ and HDD $_{15/15}$. There have been set for all the Spanish cities but they aren't commonly used anymore for heating demand calculation.
Country	**Sweden**
Applicability in your country	*YES*
Reference	Swedish Meteorological and Hydrological Institute
Remarks	Heating limit is fixed at diurnal average 12°C for April and September, 11 °C for August, 10 °C for May-July, 13 °C for October, the indoor temperature is fixed at 17 °C (17 °C to 20 °C is internal gains)

Cooling degree days - CDD	**Indicator for the cooling demand related to the climate of the building location. The adding of the differences between the outside air temperature (that was higher than a specific base temperature) and a base temperature (requested indoor temperature limit) is assumed to be cooled within the cooling period.**
Country	**Austria**
Applicability in your country	*YES*
Reference	ÖNorm B8110-3 "Thermal protection in building construction – Heat storage and solar impact";
Remarks	The prevention of overheating (by passive measures like inertia, shading devices and night ventilation) is mandatory for all residential buildings – that implies that residential buildings may not be cooled actively. The verification has to be done according to the ÖNorm B8110-3
Country	**Czech Republic**
Applicability in your country	*NO*
Country	**Denmark**
Applicability in your country	*NO*
Country	**Finland**

Applicability in your country	*YES*
Country	**Italy**
Applicability in your country	*NO*
Country	**Norway**
Applicability in your country	*YES*
Country	**Portugal**
Applicability in your country	*NO*
Remarks	Base temperature is 25°C for cooling period, and there is no climatic region with average temperature above that value.
Country	**Spain**
Applicability in your country	*YES*
Reference	Thecnical Guide "Condiciones climáticas exteriores de proyecto". IDAE
Remarks	CDD $_{20/20}$
Country	**Sweden**
Applicability in your country	*NO*
Country	**Switzerland**
Applicability in your country	*YES*

Energy-flow-related indicators	
Energy need for heating or cooling – [kWh/m^2_x]	**Heat to be delivered to, or extracted from a conditioned space to maintain the intended temperature conditions during a given period.**
Country - [kWh/m$^2_{GFA}$]	**Austria**
Applicability in your country	*YES*
Reference	ÖNorm H 5056 "Energy performance of buildings – Energy use for heating systems" ÖNorm H 5058 "Energy performance of buildings – Energy use for cooling systems" ÖNorm B 8110-6 "Thermal insulation in building construction - Part 6: Principles and verification methods - Heating demand and cooling demand" OIB guideline no.6 Reference area for performance indicator: Gross Floor Area (**GFA**)
Remarks	Energy needs for heating are determined taking into account interior heat sources and passive solar gains (taking into account shading effects of systems and neighbored built environment). The building design and adequate passive measures have to guarantee that overheating will not occur during building operation. Therefore no cooling demand is calculated for residential buildings.
Country - [kWh/m$^2_{GFA}$]	**Czech Republic**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{GFA}$]	**Denmark**
Applicability in your country	*YES*
Reference	The calculation program Be10: Guidelines 213 Energy Demand of Buildings

	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{GFA}$]	**Finland**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{NFA}$]	**Italy**
Applicability in your country	*YES*
Reference	UNI TS 11300-1 Reference area for performance indicator: Net Floor **(NFA**)
Country -[kWh/m$^2_{NGA}$]	**Norway**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Gross Area (**NGA**)
Country - [kWh/m$^2_{NFA}$]	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)"; Reference area for performance indicator: Net Floor Area (**NFA**)
Country - [kWh/m$^2_{NFA}$]	**Spain**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Floor Area (NFA)
Country - [kWh/m$^2_{NFA}$]	**Sweden**
Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR) Reference area for performance indicator: Net Floor (**NFA**)
Country - [kWh/m$^2_{NFA}$]	**Switzerland**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Floor Area (**NFA**)
Remarks	Energy needs for heating (and cooling) are determined taking into account interior heat sources and passive solar gains (taking into account shading effects of the building environment)

Energy need for domestic hot water (DHW) - [kWh/m^2_X]	**Heat to be delivered to the needed amount of domestic hot water to raise its temperature from cold network temperature to the pre-fixed delivery temperature at the delivery point.**
Country- [kWh/m$^2_{GFA}$]	**Austria**
Applicability in your country	*YES*
Reference	Same references as for "Energy need for heating" Reference area for performance indicator: Gross Floor Area (**GFA**)
Remarks	The energy performance certificate calculation uses a standard that bases on the building type (for example: residential buildings) and square meter gross floor area
Country - [kWh/m$^2_{GFA}$]	**Czech Republic**
Applicability in your country	*YES*

Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{GFA}$]	**Denmark**
Applicability in your country	*YES*
Reference	The calculation program Be10: Guidelines 213 Energy Demand of Buildings Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{GFA}$]	**Finland**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Remarks	Usually an estimate of the total heating energy demand, design values given in the building code
Country - [kWh/m$^2_{NFA}$]	**Italy**
Applicability in your country	*YES*
Reference	UNI/TS 11300-2: Energy performance of buildings Part 2: Evaluation of primary energy need and of system efficiencies for space heating and domestic hot water production Reference area for performance indicator: Net Floor Area (**NFA**)
Country - [kWh/m$^2_{NGA}$]	**Norway**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Gross Area (**NGA**)
Country - [kWh/m$^2_{NFA}$]	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto “Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)” Reference area for performance indicator: Net Floor Area (NFA)
Remarks	The reference consumption of hot water for use in dwellings is 40 litre of hot water at 50°C per person per day. ΔT 35ºC, affected by the efficiency of the shower (0,9 to 1,0)
Country - [kWh/m$^2_{NFA}$]	**Spain**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Floor Area (NFA)
Country - [kWh/m$^2_{NFA}$]	**Sweden**
Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR) Reference area for performance indicator: Net Floor Area (**NFA**)
Remarks	No specific requirement on DHW, but included in the energy requirement
Country - [kWh/m$^2_{NFA}$]	**Switzerland**
Applicability in your country	*YES*
Reference	Norm SIA 380/1:2009 "Thermal Energy in Buildings" Reference area for performance indicator: Net Floor Area (**NFA**)
Remarks	Usually a standardised energy value per person or m^2 is applied, distinguishing different types of buildings (by the use of building)

Energy need for lighting - [kWh/m^{2}x]	Electric energy to be delivered for lighting (fixed installed)- within the apartments and all public spaces within the building (external lighting is excluded);
Country - [kWh/m^{2}GFA]	**Austria**
Applicability in your country	*YES* but only considered for non-residential buildings;
Reference	ÖNorm H 5059 "Energy performance of buildings – energy use for lighting. National amendment referring to ÖNorm EN 15193" Reference area for performance indicator: Gross Floor Area (**GFA**)
Remarks	For non-residential buildings either a detailed calculation or a default value related to the floor space may be used; For residential buildings the energy certificate does not take energy need for lighting into account.
Country - [kWh/m^{2}GFA]	**Czech Republic**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m^{2}GFA]	**Denmark**
Applicability in your country	*YES and NO* – it is only considered for non-residential buildings
Reference	The calculation program Be10: Guidelines 213 Energy Demand of Buildings Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m^{2}GFA]	**Finland**
Applicability in your country	*YES*
Reference	Design values given in the building code. Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m^{2}NFA]	**Italy**
Applicability in your country	*YES*
Reference	EN 15193 Energy performance of buildings Energy requirements for lighting Reference area for performance indicator: Net Floor Area (**NFA**)
Country - [kWh/m^{2}NGA]	**Norway**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Gross Area (**NGA**)
Country - [kWh/m^{2}NFA]	**Portugal**
Applicability in your country	*NO*
Reference	Reference area for performance indicator: Net Floor (**NFA**)
Remarks	Energy consumed for lighting purposes is only directly considered in non-residential buildings. In residential buildings lighting energy consumption is not considered, being only estimated the internal load resulting from the lighting devices
Country - [kWh/m^2]	**Spain**
Applicability in your country	*NO*
Remarks	Energy consumed for lighting purposes is only directly considered in non-residential buildings. In residential buildings lighting energy consumption is not considered, only the heat internal gain resulting from the lighting devices is fixed by the normative to calculate the heating demand.
Country - [kWh/m^{2}NFA]	**Sweden**

Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR) Reference area for performance indicator: Net Floor (**NFA**)
Remarks	No specific requirement on fixed lighting, but included in the energy requirement
Country - [kWh/m$^2_{NFA}$]	**Switzerland**
Applicability in your country	*YES Electric energy for lighting: Calculation and requirements for different zones of building use in the building*
Reference	Norm SIA 380/4 "Electrical Energy in Buildings" Reference area for performance indicator: Net Floor (**NFA**)

Energy need for ventilation - [kWh/m^2_X]	**Electric energy to be delivered the operation of a ventilation system for air transport (not included energy input for pre-heating or pre-cooling the air) and energy input to a humidification system.**
Country - [kWh/m$^2_{GFA}$]	**Austria**
Applicability in your country	*YES* but only considered for non-residential buildings;
Reference	ÖNorm H 5057 "Energy performance of buildings – energy use for ventilation systems of residential and non-residential buildings" Reference area for performance indicator: Gross Floor Area (**GFA**)
Remarks	The energy performance certificate for residential buildings does not take the energy need for ventilation into account.
Country - [kWh/m$^2_{GFA}$]	**Czech Republic**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{GFA}$]	**Denmark**
Applicability in your country	*YES*
Reference	The calculation program Be10: Guidelines 213 Energy Demand of Buildings Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m^2]	**Finland**
Applicability in your country	*YES and NO*
Remarks	Heating losses due to ventilation are calculated in the design phase, does not refer to electrical energy need for ventilation
Country - [kWh/m^2]	**Italy**
Applicability in your country	*NO*
Country - [kWh/m$^2_{NGA}$]	**Norway**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Gross Area (**NGA**)
Country - [kWh/m$^2_{NFA}$]	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)"; Reference area for performance indicator: Net Floor (**NFA**)

Remarks	The electrical power required for the functioning of mechanical ventilation systems is considered to calculate the total energy use.
Country - [kWh/m^2]	**Spain**
Applicability in your country	*NO*
Remarks	In order to calculate the heating demand a constant ventilation rate is assumed to guarantee the indoor air quality but it is supposed to be natural ventilation.
Country - [kWh/m$^2_{NFA}$]	**Sweden**
Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR) Reference area for performance indicator: Net Floor (**NFA**)
Remarks	No specific requirement on electricity for ventilation, but included in the energy requirement
Country - [kWh/m$^2_{NFA}$]	**Switzerland**
Applicability in your country	*YES* Electric energy for ventilation: Calculation and requirements for different zones of building use in the building
Reference	Norm SIA 380/4 "Electrical Energy in Buildings" Reference area for performance indicator: Net Floor (**NFA**)

Energy need for other services - [kWh/m^2_X]	**Electric energy need for appliances providing other services than heating, cooling, lighting, ventilation; e.g: auxiliary energy for pumps, operation of elevators, fire safety systems,..**
Country - [kWh/m$^2_{GFA}$]	**Austria**
Applicability in your country	*YES and NO: YES* → basically auxiliary energy for pumps within the heating system and DHW preparation is considered within the energy performance certificate – it is summarized within the term "Heiztechnikenergiebedarf" (~ *energy need for heating technique*); this energy incorporates that amount of energy that is lost while the energy for heating is generated, stored, distributed and dissipated; the use of solar energy or heat pumps within the system lower this amount (they are integrated as "efficiency measures"); *NO* → Energy for elevators, fire safety systems, etc. are not incorporated anyhow
Reference	Same references as for "energy need for heating" Reference area for performance indicator: Gross Floor Area (**GFA**)
Remarks	The "Heiztechikenergiebedarf" might be seen as difference between the energy need and the final energy (losses and efficiency of system) but due to the fact that a solar thermal generated energy or energy from heat pumps lowers that value it is not transparent of the system per se is efficient or renewable generated energy lowers the demand of inefficient system or high losses.
Country - [kWh/m^2]	**Czech Republic**
Applicability in your country	*NO* *The energy for pumps and operation of building services is included in the energy need for heating and DHW. Energy for elevators, fire safety systems, etc. are not incorporated anyhow (Czech decree No 78/2013, par. 4)*
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m^2]	**Denmark**
Applicability in your country	*NO*
Remarks	Electricity for operating the heating, cooling, ventilation and DHW systems is included (pumps and fans etc.)
Country - [kWh/m^2]	**Finland**

Applicability in your country	*NO*
Reference	Heating loads due to electrical appliances are calculated or estimated during design based on the building code
Country - [kWh/m^2]	**Italy**
Applicability in your country	*NO*
Country - [kWh/m$^2_{NGA}$]	**Norway**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Net Gross Area (NGA)/
Country - [kWh/m$^2_{NFA}$]	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de desempenho energético dos edifícios de comércio e serviços (RECS)"" Reference area for performance indicator: Net Floor Area (**NFA**)
Country - [kWh/m^2]	**Spain**
Applicability in your country	*NO*
Country - [kWh/m$^2_{NFA}$]	**Sweden**
Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR) Reference area for performance indicator: Net Floor (**NFA**)
Remarks	No specific requirement on electricity for other services, but included in the energy requirement
Country - [kWh/m^2]	**Switzerland**
Applicability in your country	*NO*

Energy need for household - [kWh/m^{2}x]	**Electric energy that is needed within the apartments to fulfil the user's specific lifestyle.**
Country - [kWh/m$^2_{GFA}$]	**Austria**
Applicability in your country	*YES and NO: YES* → the new draft for the OIB guideline no. 6 incorporates the household as a numerical value of 50% of the internal heat gains arising from persons and machines in case of heating (for residential buildings); *NO* → currently the OIB guideline no.6 is valid for the calculation of the energy performance certificate and therein it is not considered;
Reference	OIB guideline no 6 Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m^2]	**Czech Republic**
Applicability in your country	*NO*
Remarks	However in Net ZEB calculations is used.
Country - [kWh/m^2]	**Denmark**
Applicability in your country	*NO*
Remarks	Only considered as the internal heat gains. However, included in Net ZEB calculations

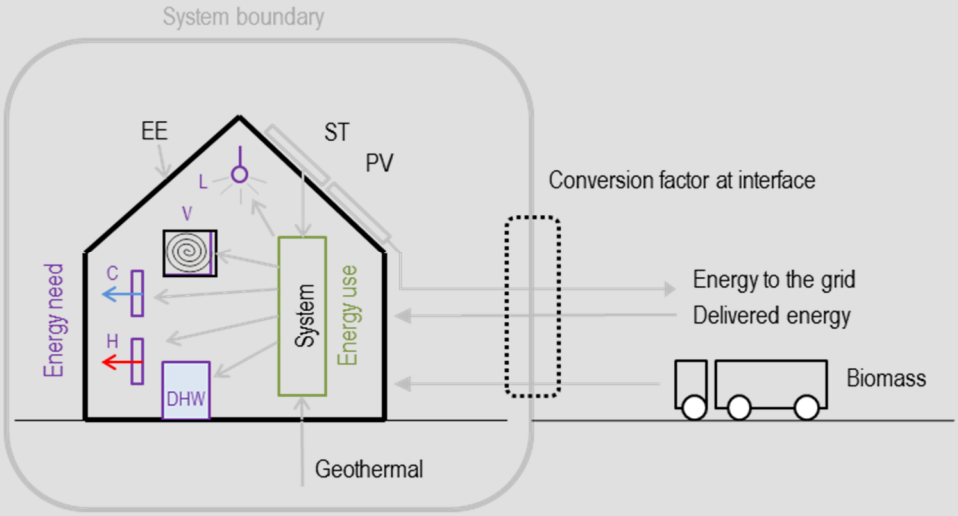
Country - [kWh/m$^2_{GFA}$]	**Finland**
Applicability in your country	*YES*
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Remarks	Measured by apartment/house, estimated during the design phase
Country - [kWh/m^2]	**Italy**
Applicability in your country	*NO*
Country - [kWh/m^2]	**Norway**
Applicability in your country	*NO*
Remarks	Included in "Energy need for other services".
Country - [kWh/m^2]	**Portugal**
Applicability in your country	*NO*
Country - [kWh/m^2]	**Spain**
Applicability in your country	NO
Country - [kWh/m$^2_{NFA}$]	**Sweden**
Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR) Reference area for performance indicator: Net Floor (**NFA**)
Remarks	Not included in the building code requirements.
Country - [kWh/m$^2_{NFA}$]	**Switzerland**
Applicability in your country	*NO*

Energy use for space heating and cooling, respectively the categories above - [kWh/m^2_X]	**Energy input to the heating system to satisfy the energy need for heating or cooling;** **Obviously while monitoring energy use of a building and the technical building system (or energy source) serves several purposes (e.g: heating + dhw or household + lighting + ventilation) it can be difficult to split the energy use into that used for each purpose.** **Hence it has to be indicated as combined quantity.**
Country - [kWh/m$^2_{GFA}$]	**Austria**
Applicability in your country	*YES and NO: YES* → In case of projects realized with subsidies or as pilot projects within several funding programmes it is – depending on the funding scheme – mandatory to implement several monitoring, verification and energy book-keeping systems; *NO* → Yet buildings commonly realized within the standard are not obliged to prove their performance;
Reference	Reference area for performance indicator: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{GFA}$]	**Czech Republic**
Applicability in your country	*YES*
Reference	Defined in Czech standard ČSN EN ISO 13790.
Country - [kWh/m$^2_{GFA}$]	**Denmark**
Applicability in your country	*NO*
Remarks	Only in demonstration projects individual monitoring is performed – else no demand for detailed monitoring. In the calculation it is possible to split up all the individual energy uses.

Country - [kWh/m$^2_{GFA}$]	**Finland**
Applicability in your country	*YES*
Reference	Reference area: Gross Floor Area (**GFA**)
Country - [kWh/m$^2_{NFA}$]	**Italy**
Applicability in your country	*YES*
Reference	UNI/TS 11300-2 "Energy performance of buildings. Part 2: Evaluation of primary energy need and of system efficiencies for space heating and domestic hot water production; UNI/TS11300-3 "Energy performance of buildings. Part 3: Evaluation of primary Energy and system efficiencies for space cooling" Reference area: Net Floor (**NFA**)
Country - [kWh/m$^2_{NGA}$]	**Norway**
Applicability in your country	*YES*
Reference	NS 3031 Reference area: Net Gross Area (**NGA**), NS 3940
Country - [kWh/m$^2_{NFA}$]	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto "Regulamento de desempenho energético dos edifícios de comércio e serviços (RECS)" Reference area: Net Floor (**NFA**)
Remarks	Only applicable for non-residential buildings in which it is mandatory to install: a) monitoring system from an installed capacity of 100kw; b) management system energy from an installed capacity of 200Kw; c) energy management system with the possibility of centralized optimization parameter from an installed capacity of 250kW.
Country - [kWh/m^2]	**Spain**
Applicability in your country	*NO*
Remarks	Periodic evaluation of the performance of the systems for heating and cooling depending on the installed power.
Country - [kWh/m^2]	**Sweden**
Applicability in your country	*NO*
Remarks	Only in demonstration projects individual monitoring is performed – else no demand for detailed monitoring. In the calculation it is possible to split up all the individual energy uses.
Country - [kWh/m$^2_{NFA}$]	**Switzerland**
Applicability in your country	Listed above already

Energy-balance-related definitions

Energy balance



System boundary	**The system boundary defines the range of energy flows and resources that are considered within the calculation or balance – the boundaries and the scope may differ from country to country;**
Country	**Austria**
Applicability in your country	*YES and NO:* The energy flows considered are the delivered energy and the generated energy on-site. Thereby the term "delivery energy" will be introduced furthermore to indicate the amount of energy that is necessary to be obtained regarding the own consumption of on-site production. Scope is different (no lighting or ventilation etc. considered, generated solar thermal energy integrated as efficiency
Country	**Czech Republic**
Applicability in your country	*YES.*
Country	**Denmark**
Applicability in your country	*YES*
Country	**Finland**
Applicability in your country	*YES and NO:* A bit differently defined in the building code.
Country	**Italy**
Applicability in your country	*YES*
Country	**Norway**
Applicability in your country	*YES*
Remarks	The Norwegian building energy labelling system is using the "delivered energy" term.
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. 118/2013 de 20 de agosto Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)" and "Regulamento de desempenho energético dos edifícios de comércio e serviços (RECS)"
Remarks	The boundary is the building envelope, and the energy consumption inside the building. In residential buildings is considered: heating, cooling, ventilation and domestic hot water. In non-residential buildings is also considered the internal and external lighting, as well as appliances and other equipment.

Country	Spain
Applicability in your country	*YES*
Remarks	The boundary is the building envelope, and the energy consumption inside the building. In residential buildings is considered: heating, cooling and domestic hot water. In non-residential buildings is also considered the lighting.
Country	**Sweden**
Applicability in your country	*YES*
Reference	Boverket (building code BBR)
Remarks	The boundary is the building envelope. The energy use is considered which, for normal use, during a normal year is delivered to a building (often called purchased energy) for heating, comfort cooling, dhw and other energy needed for operating the building
Country	**Switzerland**
Applicability in your country	Definition is ok, corresponding to the Swiss definition of delivered energy

Period of time – 1 year [a]	The basis for calculating the energy related figures is generally one year.
Country	**Austria**
Applicability in your country	*YES*
Remarks	Although the reference period of time is one year (mainly used for the energy performance certificate) the calculation methodology is monthly based.
Country	**Czech Republic**
Applicability in your country	*YES*
Remarks	Although the reference period of time is one year (mainly used for the energy performance certificate and audits) the calculation methodology is monthly based for space heating.
Country	**Denmark**
Applicability in your country	*YES*
Remarks	Although the reference period of time is one year the calculation methodology is monthly based.
Country	**Finland**
Applicability in your country	*YES*
Country	**Italy**
Applicability in your country	*YES*
Country	**Norway**
Applicability in your country	*YES*
Country	**Portugal**
Applicability in your country	*YES*
Reference	D.L. nº 118/2013 de 20 de agosto “Regulamento de Desempenho Energético dos Edifícios de Habitação (REH)”;
Remarks	One year
Country	**Spain**
Applicability in your country	*YES*

Country	Sweden
Applicability in your country	*YES*
Reference	Boverket (Swedish Building Code BBR)
Country	**Switzerland**
Applicability in your country	Same as in Austria

7. Conversion factors

			EN 15603:2008	Remark	PHPP 2007	Remark	Austria Gemis Version 4.5[5]	Remark	Austria OIB-guideline 6 as from 04/2012[28]	Remark	Czech Republic	Remark	Denmark 2010/2015/2020	Remark	Finland [29]	Remark	Germany Gemis Version 4.5[4]	Remark	Italy	Remark	Netherlands	Remark	Norway [35] Norsk Standard 3031 Kap. 8	Remark	Portugal	Remark	Spain	Remark	Sweden	Remark	Switzerland	Remark	Switzerland KBOB	Remark
Electricity-Grid	PE, n.r.	kWh_p/kWh_e	3.14	[1]	2.70		1.30	[6]	2.15		3.00			[22]			2.61		2.174		2.56		3.14	[1]							2.64	[12,14]	2.64	
national	PE, total	kWh_p/kWh_e	3.31	[1]			1.91	[6]	2.62		3.20		2,50 / 2,50 / 1,80	[21]	1.70		2.96				2.45		3.31	[1]	2.50	[26]	2.60	[33]	2,2 - 3,0	[26]	2.97	[13,14]	3.05	
	CO_2 Equiv.	g/kWh_e	617.00	[2]	680.00		389.00	[6]	417.00		746.64		391.00	[23]			633.00				608.00		617.00	[2]	144.00	[26]	649.00	[33]	105.00	[26]	147.60	[12,14]	148.56	
Electicity-Grid	PE, n.r.	kWh_p/kWh_e																													3.33	[12,20]	3.32	
UCTE or other	PE, total	kWh_p/kWh_e																													3.53	[13,20]	3.54	
	CO_2 Equiv.	g/kWh_e																													594.00	[12,20]	594.52	
Natural gas	PE, n.r.	kWh_p/kWh_e	1.36		1.10		1.12		1.17		1.10		1.00	[22]			1.12		1.00		1.00		1.36								1.11	[12]	1.11	
	PE, total	kWh_p/kWh_e	1.36				1.12		1.17		1.10		1,00 / 1,00 / 1,00	[21]	1.00	[30]	1.12				1.00		1.36		1.00	[26]	1.10	[33]			1.15	[13]	1.12	
	CO_2 Equiv.	g/kWh_e	277.00	[2]	250.00		268.00		236.00		308.88		204.00	[23]			244.00				204.00		277.00	[2]	202.00	[26]	204.00	[33]	212.00	[26]	237.60	[12]	237.01	
Heating Oil	PE, n.r.	kWh_p/kWh_e	1.35		1.10		1.11		1.23		1.20		1.00	[22]			1.11		1.00		1.00		1.35						1.11	[27]	1.23	[12]	1.23	
	PE, total	kWh_p/kWh_e	1.35				1.13	[7]	1.23		1.20		1,00 / 1,00 / 1,00	[21]	1.00	[30]	1.11				1.00		1.35		1.00	[26]	1.08	[33]	1.11	[27]	1.24	[13]	1.24	
	CO_2 Equiv.	g/kWh_e	330.00	[2]	310.00		302.00		311.00				266.00	[23]			302.00				279.00		330.00	[2]	267.00	[26]	287.00	[33]	280.00	[27]	298.80	[12]	297.69	
Wood (log)	PE, n.r.	kWh_p/kWh_e	0.09		0.20		0.01		0.06	[10]	0.10		0.00	[24]			0.01		0.30	[34]			0.09								0.05	[12]	0.05	
	PE, total	kWh_p/kWh_e	1.09				1.01		1.08	[10]	1.10		1,00 / 1,00 / 1,00	[21]			1.01						1.09		1.00	[27]	0.00	[33]	1.05	[27]	1.06	[13]	1.06	
	CO_2 Equiv.	g/kWh_e	14.00	[2]	50.00		6.00		4.00	[10]	12.60		0.00	[24]			6.00				0.00		14.00	[2]	0.00	[27]	0.00	[33]	9.00	[27]	14.40	[12]	12.73	
Wood pellets	PE, n.r.	kWh_p/kWh_e	0.06				0.14		0.06	[10]	0.20		0.00	[24]			0.14						0.06								0.06	[12]	0.21	
	PE, total	kWh_p/kWh_e	1.06				1.16		1.08	[10]	1.20		1,00 / 1,00 / 1,00	[21]			1.16						1.06		1.00	[27]	0.00	[33]	0.11	[27]	1.22	[13]	1.22	
	CO_2 Equiv.	g/kWh_e	4.00	[2]			41.00		4.00	[10]	38.88		0.00	[24]			41.00				0.00		4.00	[2]	0.00	[27]	0.00	[33]	6.00	[27]	36.00	[12]	36.76	
RE	PE, n.r.	kWh_p/kWh_e																																
generated on-site	PE, total	kWh_p/kWh_e																																
	CO_2 Equiv.	g/kWh_e																																
District Heating	PE, n.r.	kWh_p/kWh_e			0.80		0.76				1.00		0.60				0.76														0.64	[19,12]	0.64	
70% CHP	PE, total	kWh_p/kWh_e					0.77				1.10		1,00 / 0,80 / 0,60	[21]			0.77										0.00	[33]			0.65	[19,13]	0.65	
(fossil)	CO_2 Equiv.	g/kWh_e			240.00		219.00						192.00	[23]			219.00										0.00	[33]			108.00	[19,12]	135.66	
Distric Heating	PE, n.r.	kWh_p/kWh_e							0.28		0.10		0.60																		0.10	[17,12]	0.10	
(Heating plant	PE, total	kWh_p/kWh_e							1.60		1.10		1,00 / 0,80 / 0,60	[21]															1.00	[28]	1.66	[17,13]	1.66	
renewable)	CO_2 Equiv.	g/kWh_e							51.00				192.00	[23]															62-83	[28]	46.80	[17,12]	47.57	
Distric Heating	PE, n.r.	kWh_p/kWh_e			1.50				1.38				0.60																		1.68	[18,12]	1.68	
(Heating plant	PE, total	kWh_p/kWh_e							1.52				1,00 / 0,80 / 0,60	[21]																	1.69	[18,13]	1.69	
non renewable)	CO_2 Equiv.	g/kWh_e			410.00				291.00				192.00	[23]																	403.20	[18,12]	403.74	
Distric Heating	PE, n.r.	kWh_p/kWh_e			0.70	[3]			0.20				0.60																		2.33	[16,12]		
(high efficient	PE, total	kWh_p/kWh_e							0.92				1,00 / 0,80 / 0,60	[21]											0.88	[28]								
CHP/ Default)	CO_2 Equiv.	g/kWh_e			-0.07	[3]			73.00				192.00	[23]											90.82	[28]					486.00	[16,12]		
Distric Heating	PE, n.r.	kWh_p/kWh_e											0.60																					
(high efficient	PE, total	kWh_p/kWh_e							≥0.30	[11]			1,00 / 0,80 / 0,60	[21]																				
CHP/ Best Case)	CO_2 Equiv.	g/kWh_e											192.00	[23]																				
District Heating	PE, n.r.	kWh_p/kWh_e							1.00				0.60																		0.80	[15, 12]	0.80	
Waste Heat	PE, total	kWh_p/kWh_e							1.00				1,00 / 0,80 / 0,60	[21]																	0.85	[15,13]	0.81	
(Default)	CO_2 Equiv.	g/kWh_e							20.00				192.00	[23]																	162.00	[15,12]	163.48	
District Heating	PE, n.r.	kWh_p/kWh_e											0.60																					
Waste Heat	PE, total	kWh_p/kWh_e							≥0.30	[11]			1,00 / 0,80 / 0,60	[21]																				
(Best Case)	CO_2 Equiv.	g/kWh_e											192.00	[23]																				
District Cooling	PE, n.r.	kWh_p/kWh_e																																
	PE, total	kWh_p/kWh_e													0.40	[32]																		
	CO_2 Equiv.	g/kWh_e																																

Key	
PE	The Primary Energy Indicator (PE) is a numerical coefficient to indicate the amount of primary energy that has to be expended to achieve usable energy at the point of delivery or interface.
PE, n.r.	The Primary Energy Indicator non renewable (PE, n.r.) indicates only the new renewable part of primary energy. This component addresses the use of fossile fuels or other non-renewable sources or pollutants. The renewable component of the primary energy is therein neglected.
PE, total	The Primary Energy Indicator total (PE, total) indicates the entire primary energy that has to be afforded to supply 1 kWh usable energy at a point of delivery or interface.
CO_2 Equiv	The CO2 Equivalent (CO2 Equiv.) is a numerical coefficient to express the amount of carbon dioxide emissions caused by the utilized energy at the point of delivery or interface. Other greenhouse gas emissions are included, expressed by "equivalent emissions".

Remarks

1 Electricity UCPTE Mix 1996. Values 2009: 432g/kWh

2 "Co-efficient" for CO_2 Production

3 Natural Gas CHP plant (70% CHP)

4 All Factors calculated with Gemis 4.5 related to German framework (power supply system + imports, etc.)

5 All Factors calculated with Gemis 4.5 related to Austrian framework (power supply system + imports, etc.)

6 Power prod. with 60% hydro, but incl. imports 50% from hydro power

7 Austrian basis of calculation differs from the German one

9 OIB guidelines reperesent the technical part of the Austrian building codes, valid for all 9 federal provinces, but the guideline enters into force by specific required enactment by each province (e.g: Styria scheduled by April 2012)

10 Biomass general

11 Separate verification necessary

12 "SIA Energy Efficiency Path", SIA-Merkblatt 2040, 2011

13 ESU-Services (2008): "Primary Energy Factor of Energy Systems", Version 1.1, April 30th 2008

14 Electricity mix of Swiss electricity consumption

15 District heating from waste incineration plant;

16 District heating from Gas-CHP

17 Wood heating plant

18 Oil heating plant, for Gas heating plant: PEI n.r. = 1.56, CO2equi =313.12

19 Gas cogeneration unit, block gas combined heat and power plant

20 UCTE - Mix

21 In Denmark the conversion factors used in calculations have been politically established for 2010, 2015 and 2020, i.e. the three numbers given for PEI, total. They do not include extraction and transportation.

22 The PEI, n.r. are mean values for Denmark. In reality these will vary from place to place. These include both extraction and transportation. The non-renewable part of the primary energy indicator for electricity will vary over time and with region, therefore it is difficult to describe it in a single number.

23 The CO_2 Equiv. are mean values for Denmark. In reality these will vary from place to place. These include

24 Not including extraction and transportation.

25 Primary energy factors have to be used in energy calculations for non-residential buildings. NS-EN 15603, E can be used. National primary energy factors and CO_2 equiv. are not adopted.

26 All factors in accordance with DL 79 and 80/2006. These values are expected to change with the new building regulations (mid 2012)

27 Wood and wood pellets are considered as renewable energy sources, without GHG emissions

28 Despacho nº 14076/2010 (These conversion factors are only used for the network of production and distribution of cold and heat of Climaespaço, Parque das Nações, based on the technology of trigeneration)

29 E-value = energy bought (delivered) to the building * factor for the energy source

30 Fossile fuels in general

31 Factor valid for delivered energy from district heating in general

32 Factor valid for delivered energy from district cooling in general

33 CALENER, software for certification of energy efficiency in buildings.
http://www.minetur.gob.es/energia/desarrollo/eficienciaenergetica/certificacionenergetica/programacalener/paginas/documentosreconocidos.aspx

34 CTI 14- Biomass

www.iea-ebc.org

EBC is a programme of the International Energy Agency (IEA)