Supplementary Materials

Table S1. Studies of Cluster 1.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Study on Auto-DR and pre-cooling of commercial buildings with thermal mass in California	2010	10.1016/j.enbuild.2010.01.008	73	Energy saving/HVAC systems	Simulation with previous validation of field experiment	Commercial buildings	V	Bioclimatic	California (warm climate)	The electrical demand during the peak period was reduced by 15–30% on the auto-demand response event days.
Residential response to critical-peak pricing of electricity: California evidence	2010	10.1016/j.energy.2009.07.022	82	Energy saving/HVAC systems	Results of a field experiment	3 types of buildings	II	SPP	California, 4 climatic zones	Critical-peak pricing can help to the possibility of achieving a 5% reduction in residential energy consumption.
Peak load reductions: Electric load shifting with mechanical pre-cooling of residential buildings with low thermal mass	2015	10.1016/j.energy.2015.02.011	46	Energy saving/HVAC systems	Simulation	Residential buildings	I	IECC	12 cities of 12 climate zones	Pre-cooled strategy can help to shift of 50–99% of annual peak cooling electricity to off-peak (% depending on climate zone).
A state-of-the-art review of evaporative cooling systems for building applications	2016	10.1016/j.rser.2015.10.066	68	Energy saving/HVAC systems	Review	–	II	Bioclimatic	Hot and dry climatic conditions	The evaporative cooling systems have great potential to save energy in hot and arid climatic zones.
Temperature and cooling demand reduction by green-roof types in different climates and urban densities: A co-simulation parametric study	2017	10.1016/j.enbuild.2017.03.066	48	Outdoor thermal comfort/Energy saving potential	Simulation	Neighbourhood	I	Köppen	4 cities of the world, 4 climate zones	Cooling demand reduction by 5.2% was observed in hot-arid climate on the hottest day of the year with fully intensive green roofs, and the smallest savings of 0.1% were found with semi-extensive green roofs in a temperate climate.
Temporal and spatial variability of urban heat island and thermal comfort within the Rotterdam agglomeration	2015	10.1016/j.buildenv.2014.08.029	112	Outdoor thermal comfort	Results of the field experiment	City	VII	Urban climate zone	Rotterdam, mild maritime climate	Urban areas show a larger number of discomfort hours compared to the reference rural area. These results can be related to the much lower wind velocities in urban areas.
Urban form and density as indicators for summertime outdoor ventilation potential: A case study on high-rise housing in Shanghai	2013	10.1016/j.buildenv.2013.08.019	52	Urban planning/Outdoor thermal comfort	Simulation	City	II	Urban climate zone	Shanghai, China	Increasing the sky view factor by 10% with a finding of the optimal form and location of high-rise buildings, could increase the wind velocity ratio by 7–8% in the urban area and can help to improve outdoor thermal comfort.
A holistic approach to energy efficient building forms	2010	10.1016/j.enbuild.2010.03.013	87	UHI mitigation	Simulation	City	VI	Location	Latitude 48.00°	Residential Solar Block supports strategies for mitigating the UHI through increased airflow between buildings. This effect can be different in different parts of the world.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Modelling impacts of roof reflectivity, integrated photovoltaic panels and green roof systems on sensible heat flux into the urban environment	2011	10.1016/j.buildenv.2011.06.012	97	UHI mitigation	Simulation with previous validation	Roof	I	ASHRAE	6A, 5A, 4C, 4A, 3B, 2A	Simulation of roof heat balance. Replaced black membrane roof by a PV–covered white or a PV-covered green roof can reduce the total sensible flux by 50%.
Experimental measurements and numerical model for the summer performance assessment of extensive green roofs in a Mediterranean coastal climate	2013	10.1016/j.enbuild.2013.30.054	55	Green roofs/Potential energy saving	Results of field experiment/Mathematical model	Roof	IV	Köppen	Mediterranean coastal climate Italy-Agugliano	The roof with dense vegetation has a thermal gain reduction by ~60% compared with the roof with no vegetation.
A model of vegetated exterior facades for evaluation of wall thermal performance	2013	10.1016/j.buildenv.2013.04.027	89	Green façades	Mathematical model and validation	Façade	IV	Location	Chicago	A layer of plants added to a façade can improve its thermal resistance by 0.0–0.7m²K/W, depending on a range of inputs for wall parameters, climatic zones and plant characteristics (especially leaf area index).
Monitoring the energy-use effects of cool roofs on California commercial buildings	2005	10.1016/j.enbuild.2004.11.013	78	Cool roofs/Energy saving	Results of field experiment/Numerical modelling	Retail store, elementary school, and a four-building cold storage facility	I	California EC	16 climate zones of California	Energy savings with the installation of a cool roof can reach 6–15 kWh/m²/year, 3–6 kWh/m²/year and 4.5–7.4 kWh/m²/year of conditioned area for a retail store, school and cold storage facility, respectively, in different climate zones.
Inclusion of cool roofs in non-residential Title 24 prescriptive requirements	2005	10.1016/S0301-4215(03)00206-4	63	Cool roofs/Energy saving	Simulation	Non-residential building	I	California EC	16 climate zones of California	Average annual cooling energy savings of approximately 3.2 kWh/m² by using cool roofs in California
Numerical simulation of phase change material composite wallboard in a multi-layered building envelope	2013	10.1016/j.enconman.2013.02.003	75	PCM/Energy saving potential	Numerical modelling	Residential buildings	I	IECC	Minneapolis, Louisville, and Miami (3 zones)	PCM performance highly depends on the weather conditions, emphasising the necessity to choose different PCMs in different climate zones.
Energy saving potential of phase change materials in major Australian cities	2014	10.1016/j.enbuild.2014.04.027	61	PCM/Energy saving potential	Simulation	Residential buildings	II	Australia BC	8 cities in 6 climate zones of Australia	PCM has the potential to reduce the building energy consumption by 17–23% in Australian cities under cold temperate, mild temperate and warm temperate zones. For each city PCM with an optimum melting point was found.
Simulating the effects of cool roof and phase change materials (PCM)-based roof to mitigate urban heat island (UHI) in prominent US cities	2016	10.1016/j.energy.2015.11.082	61	PCM/UHI mitigation/Energy saving potential	Simulation	Hospital	I	IECC	7 cities in 7 climate zones of USA	The maximum heat gains flux through the roof was 54% lower for the PCM roof than for the cool roof with different albedo values.
Simulation-based optimisation of PCM melting temperature to improve the energy performance in buildings	2017	10.1016/j.apenergy.2017.05.107	68	PCM/Energy saving potential	Simulation	Multi-family residential apartment	II	Köppen	57 cities and 19 climate zones	In a house cooling dominant climate the best melting point temperature for PCM (walls and roof) to reduce annual energy consumption is close to a maximum of 26 °C (melting range of 24–28 °C), whereas in a house heating dominant climates PCM with a lower melting temperature

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
										of 20 °C (melting range of 18–22 °C) gives higher annual energy benefits.
The economic impact of integrating PCM as passive system in buildings using the Fanger comfort model	2016	10.1016/j.enbuild.2015.12.006	59	PCM/Thermal comfort/Energy saving potential/HVAC operational schedules	Simulation	Residential and office operational schedules of HVAC system	IV	Köppen	Madrid	Fanger model to control HVAC thermostat operation used in PCM-incorporated buildings. In the Madrid climate zone, PCM with 27 °C achieved higher energy savings in summer (cooling period) whereas PCM with 23 °C was most effective in winter (heating period).
Annual energy analysis of concrete containing phase change materials for building envelopes	2015	10.1016/j.enconman.2015.06.068	42	PCM/Energy saving	Numerical modelling	Residential building	I	California EC	Climate zone 3 (San Francisco) and 9 (Los Angeles)	The addition of microencapsulated PCM to the walls of the building reduced the cooling load in the mid-size single-family home in San Francisco and Los Angeles by 85% to 100% and 53% to 82%, respectively.
Review of bioclimatic architecture strategies for achieving thermal comfort	2015	10.1016/j.rser.2015.04.095	69	Architectural strategies/Energy saving potential	Review	–	VII	Bioclimatic	–	Fourteen climate zones were established and recommended according to the possible bioclimatic strategies that would facilitate reductions in energy consumption.
Optimal design of residential building envelope systems in the Kingdom of Saudi Arabia	2015	10.1016/j.enbuild.2014.09.083	58	Envelope/Energy saving	Simulation	Residential building	III	Location	5 cities in Saudi Arabia	Finding optimal insulation for buildings can reduce energy consumption by up to 47.3%.
Life cycle energy analysis of a residential building with different envelopes and climates in Indian context	2012	10.1016/j.apenergy.2011.05.054	60	Envelope/CZ/Energy saving	Simulation	Residential building	I	India BC	India 5 climate zones	Life cycle energy (LCE) savings are significant (10–30%) with the application of optimal insulation to the walls and roof. Maximum LCE savings with insulation are observed for a warm and humid climate and least for moderate climate.
Performance analysis of domestic rainwater harvesting systems under various European climate zones	2012	10.1016/j.resconrec.2012.02.006	52	Rainwater harvest systems/CZ	Mathematical analysis	–	II	Köppen	46 geographical points in Europe	Optimum domestic rainwater harvesting system design under various precipitation regimes in Europe. The cold and humid temperate zones show the highest water-saving efficiency values.

* August 2020 WOS.

Table S2. Studies of Cluster 3.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Energy conservation potential, HVAC installations and operational issues in Hellenic airports	2003	10.1016/j.enbuild.2003.09.006	50	Multicriterial optimisation/Energy saving	Energy audit/Simulation	Airports	II	Greece BC	3 climate zones	A set of energy saving measures is presented for airports, which will not affect thermal comfort and improve IEQ. At the same time, energy consumption will be reduced by 15–35% in airport buildings.
Energy saving in airports by trigeneration. Part I: Assessing economic and technical potential	2006	10.1016/j.applthermaleng.2006.01.019	46	CHCP systems/Energy saving potential	Mathematical analysis	Airports	III	Location	Milan, Rome, Palermo	Economic and technical criteria are proposed for assessing the feasibility of using the CHCP system at Italian airports. The use of the system is possible throughout the year and in the south of Italy, the energy saving potential is greater.
A review on energy, economical and environmental benefits of the use of CHP systems for small commercial buildings for the North American climate	2009	10.1002/er.1630	45	CHCP systems/Energy saving potential	Review	Commercial buildings	I	ASHRAE	9 cities in 9 climate zones (8, 7, 6B, 5B, 4C, 3B, 3A, 2A, 1A)	It is more profitable to operate a CHP system during normal working hours than to operate the system 24 h a day. Furthermore, the performance of a CHP system is highly dependent on the location where it is installed.
Life cycle assessment of a solar combined cooling heating and power system in different operation strategies	2012	10.1016/j.apenergy.2011.08.046	62	CHCP systems/Energy saving potential	Mathematical model	Office building	VI	Location	Beijing	Solar CHCP system in FEL and FTL operation strategies in the LCA context was analysed. It was found that for an office building in Beijing, in terms of performance the FTL mode of operation is better for the solar CHCP system, but in the ecological aspect, FEL operational mode is better.
Multi-objective optimisation design and operation strategy analysis of BCHP system based on life cycle assessment	2012	10.1016/j.energy.2011.11.014	56	CHCP systems/Energy saving	Mathematical analysis	Commercial building	VI	Location	Beijing	When the CHCP system runs FTL mode, the maximum energy saving can be achieved. When the CHCP system runs FEL the environmental benefits are better.
Analysis and optimisation of the use of CHP–ORC systems for small commercial buildings	2010	10.1016/j.enbuild.2010.03.019	50	CHCP systems/Energy saving	Simulation	Commercial office building	III	ASHRAE	6 cities USA (8, 7, 3B, 3A, 2A, 1A)	The CHP–ORC system performance strongly depends on the location where it is installed. For all the evaluated cities, the use of a CHP–ORC system reduces the cost, primary energy consumption and

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
										carbon dioxide emissions for the same building operating solely with a CHP system. To achieve effective results, the system must have a 12-h operating mode in all climate zones.
Multi-criteria analysis of combined cooling, heating and power systems in different climate zones in China	2010	10.1016/j.apenergy.2009.06.027	119	CHCP systems/Energy saving potential	Mathematical analysis	Hotels	I	China BC	5 climate zones	The results indicate that the CHCP system in FTL mode in the cold climate, where the building requires more heating during the year, achieves more benefit over a separate system while the CHCP system in FEL mode suits the building having stable thermal demand in mild climate zone.
Effects of load-following operational methods on combined heat and power system efficiency	2014	10.1016/j.apenergy.2013.10.063	44	CHCP systems/Energy saving	Mathematical model	Hotels	I	ASHRAE	16 cities of the 15 climate zones (8, 7, 6B, 6A, 5B, 5A, 4C, 4B, 4A, 3C, 3B(2), 3A, 2B, 2A, 1A)	In different climatic zones, the hybrid method of functioning of the CHP system based on the hourly change method and the monthly change method can raise the CHP system efficiency value to 71–87% and 74–86%, respectively.
Influence analysis of building types and climate zones on energetic, economic and environmental performances of BCHP systems	2011	10.1016/j.apenergy.2011.03.016	63	CHCP systems/Energy saving potential	Mathematical model	Hotel, school, office, hospital	I	China BC	5 climate zones	The CHP system in the office building consumes less energy, spends less and emits less CO_2 among the four categories of buildings throughout the year in 5 climate zones.
Integrated assessment of combined cooling heating and power systems under different design and management options for residential buildings in Shanghai	2012	10.1016/j.enbuild.2012.04.023	48	CHCP systems/Energy saving potential	Mathematical model	Residential buildings	VI	Köppen (without ref.)	Shanghai (Subtropical maritime monsoon climate)	According to the simulation results, gas engine and fuel cell-based CHCP systems are feasible options from the energy and environmental viewpoints, but at the cost of poor economic performance.
Analysis of the economic feasibility and reduction of a building’s energy consumption and emissions when	2016	10.1016/j.apenergy.2015.12.080	69	CHCP systems/Energy saving	Simulation	Residential buildings	I	Spain BC	Cadiz, Seville, Barcelona, Madrid, Burgos (5 climate zones)	Integrating hybrid solar thermal/PV/micro-CHP systems have an average of 28% less CO_2 emissions in all climates in comparison with conventional systems. Primary energy consumption is 9.8% less

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
integrating hybrid solar thermal/PV/micro-CHP systems										in warm climates and 16% less in cold climates, while LCC is 40% more in a warm climate and 26% more in a cold climate.
Optimal option of distributed energy systems for building complexes in different climate zones in China	2012	10.1016/j.apenergy.2011.08.044	50	CHCP systems/Energy saving potential	Mathematical model	Residential building complex; Public building complex; Mixed building complex	I	China BC	5 climate zones	The Distributed Energy Resource (DER) system is particularly preferable in Shanghai from both the economic and environmental benefits, followed by Guangzhou, Beijing and Harbin; while the benefits in Kunming are marginal. Although the concept of renewable energy town results in reasonable environmental performance cutting more than 20% CO_2 emissions for most systems, minor or even negative economic benefits are encountered in all cities.
Analysis of energy saving potential of air-side free cooling for data centres in worldwide climate zones	2013	10.1016/j.enbuild.2013.04.013	67	Energy saving/HVAC systems	Simulation	Data centres	I	ASHRAE	17 cities/17 climate zones (1A, 1B, 2A, 2B, 3A-C, 4A-C, 5A-C, 6A, 6B, 7, 8)	High energy saving potential of the free cooling energy efficiency of data centres was observed in mixed-humid and warm marine climate zones.
What drives the carbon mitigation in Chinese commercial building sector? Evidence from decomposing an extended Kaya identity	2018	10.1016/j.scitotenv.2018.04.043	55	Standards for energy conservation and carbon mitigation	Mathematical model	Commercial buildings	–	–	–	The reduction in carbon emissions in the commercial buildings sector in China was 625.9 $MtCO_2$ in 2001–2015, which is the result of the effective building energy efficiency policy.
Impact of climate change on energy use in the built environment in different climate zones—A review	2012	10.1016/j.energy.2012.03.044	146	Climate change and energy consumption	Review	Different types of buildings	–	–	–	Mitigation of the effects of climate change in warm climates can be achieved through raise summer setpoint temperature, lower lighting load, adaptive thermal comfort application, solar-powered cooling and climate data update.

* August 2020 WOS.

Table S3. Studies of Cluster 4.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
The adaptive model of thermal comfort and energy conservation in the built environment	2001	10.1007/s0048401 00093	214	Thermal comfort	Results of the field experiment	160 buildings	II	Köppen	Different climate zones	The importance of applying the adaptive thermal comfort model for free-running or naturally ventilated buildings was noted, as well as the energy saving potential of using this model for air conditioning and ventilation of buildings in moderate climates of the world.
Thermal comfort in naturally ventilated buildings: revisions to ASHRAE Standard 55	2002	10.1016/S0378-7788(02)00005-1	564	Thermal comfort/Energy saving potential	Results of the field experiment	160 buildings	II	Köppen	Different climate zones	General description of the adaptive thermal comfort model and the spatial distribution of the hypothetical energy savings potential when this comfort model is applied in the USA.
An adaptive thermal comfort model for the Tunisian context: a field study results	2005	10.1016/j.enbuild.2004.12.003	82	Thermal comfort	Results of the field experiment	Residential and office buildings	II	Tunis BC	5 cities in 2 climate zones	Description of the methodology of the development of an adaptive thermal comfort model in residential and office buildings in Tunisia. It has also been shown that the population of Tunisia has great potential for adaptation to climate and seasons.
Thermal comfort in naturally ventilated and air-conditioned buildings in humid subtropical climate zone in China	2008	10.1007/s00484-007-0133-4	58	Thermal comfort	Results of the field experiment	Private and public, residential and office, flats or two-story buildings	V	Köppen (without ref.)	5 cities in the Humid Subtropical Climate zone of China	Thermal comfort analysis in 111 buildings in 5 cities of China. The range of accepted temperature in naturally ventilated buildings (25.0–31.6 °C) was wider than that in air-conditioned buildings (25.1–30.3 °C), which suggests that occupants in naturally ventilated buildings seemed to be more tolerant of higher temperatures.
Air movement acceptability limits and thermal comfort in Brazil's hot humid climate zone	2010	10.1016/j.buildenv.2009.06.005	100	Thermal comfort	Results of the field experiment	Educational building, classrooms	IV	Köppen	Maceio city in Hot-Humid Climate zone of Brazil	The effect of wind speed on thermal comfort inside a natural ventilated building. The minimal air velocity required was at least 0.4 m/s for 26 °C reaching 0.9 m/s for operative temperatures up to 30 °C.
Quantifying the relevance of adaptive thermal comfort models	2007	10.1016/j.buildenv.2005.08.023	62	Thermal comfort/Energy saving potential	Simulation	Office buildings	V	Köppen	Moderate Maritime Climate zones (Eindhoven and Prague)	For moderate climate zones, the adaptive model is only applicable during summer and can reduce by 10% of the energy consumption in naturally conditioned

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
in moderate thermal climate zones										buildings or buildings with a high degree of occupant control.
Assessing the natural ventilation cooling potential of office buildings in different climate zones in China	2009	10.1016/j.renene.2009.05.015	44	Renewable energy systems/Thermal comfort/Energy saving potential	Simulation	Office buildings	I	China BC	5 climate zones	The cooling potential of natural ventilation (with the application of adaptive thermal comfort) depends on climatic zones and varies over a wide range.
Forty years of Fanger's model of thermal comfort: comfort for all?	2008	10.1111/j.1600-0668.2007.00516.x	271	Thermal comfort	Review	–	–	–	different climate zones	Criticism and improvement opportunity of the PMV model of thermal comfort in different climates.
Thermal sensation of Hong Kong people with increased air speed, temperature and humidity in air-conditioned environment	2010	10.1016/j.buildenv.2010.03.016	60	Thermal comfort	Results of the field experiment	Office buildings	IV	Köppen (without ref.)	Warm and Humid Climate zone, Hong Kong	Gender differences were noted in heat sensation, and Hong Kong citizens are sensitive to temperature and air speed, but not humidity. With air speed at 0.1–0.2 m/s, clothing level 0.55 clo. and metabolic rate 1 met., the neutral temperature was found around 25.4 °C for a sedentary working environment.
Adaptive thermal comfort model for different climatic zones of Northeast India	2011	10.1016/j.apenergy.2011.01.019	77	Thermal comfort	Results of the field experiment	Naturally ventilated buildings	II	India BC	3 climate zones	The seasonal variability of the adaptive thermal comfort model is revealed. The adaptive thermal comfort model more suitable in comparison with the PMV model in these climatic conditions.
Field studies of thermal comfort across multiple climate zones for the subcontinent: India Model for Adaptive Comfort (IMAC)	2016	10.1016/j.buildenv.2015.12.019	104	Thermal comfort	Results of the field experiment	Office buildings	II	India BC	5 climate zones	Development of Indian Model of Adaptive Comfort for office buildings in 5 cities (for naturally ventilated, mixed-mode and air-conditioned buildings)
Field studies on human thermal comfort—An overview	2013	10.1016/j.buildenv.2013.02.015	130	Thermal comfort	Review	Office, residential, classroom	II	Köppen	4 climate zones	Conditioned spaces have narrower comfort zones compared to free-running buildings. Across climatic zones, the most popular means of adaptation are related to the modification of air movement and clothing.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Adaptive thermal comfort in Australian school classrooms	2015	10.1080/09613218.2015.991627	72	Thermal comfort	Results of the field experiment	Educational building, classrooms	II	Australia BC	4 climate zones	The comfortable temperature for children was 1–2 °C lower than for adults.
Thermal comfort in educational buildings: A review article	2016	10.1016/j.rser.2016.01.033	84	Thermal comfort	Review	Educational buildings	II	Köppen	4 macro zones	Analysis of the results of field experiments over the past 50 years in educational buildings. Principal idea is to design buildings that will facilitate learning and overcome the state of discomfort with minimum energy consumption.
Extending air temperature setpoints: Simulated energy savings and design considerations for new and retrofit buildings	2015	10.1016/j.buildenv.2014.09.010	153	Energy saving/HVAC systems	Simulation	Office buildings	I	ASHRAE	7, 5A, 4A, 3C, 3B, 2B, 1A	The correct definition of the set-point temperature of thermostat can help to reduce energy consumption.
Thermostat strategies impact on energy consumption in residential buildings	2011	10.1016/j.enbuild.2010.09.024	62	Energy saving/HVAC systems	Mathematical analysis	Residential buildings	I	IECC	Detroit, Miami—2 climate zones	Setting the thermostat can optimise cooling and heating energy consumption in a residential building in 2 cities in the USA
Performance analysis of integrated earth–air–tunnel evaporative cooling system in hot and dry climate	2012	10.1016/j.enbuild.2011.12.024	40	Renewable energy systems/Energy saving	Simulation with previous validation of field test	–	IV	India BC	Ajmer city (India)	The earth–air–tunnel heat exchanger system provides 4500 MJ of cooling effect during the summer period and 4856 MJ of heating effect during winter with the thermal comfort zone specified ay ASHRAE-55.

* August 2020 WOS.

Table S4. Studies of Cluster 9.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Multivariate regression as an energy assessment tool in early building design + D40	2012	10.1016/j.buildenv.2012.04.021	86	Methodologies/Energy consumption	Mathematical analysis/ Simulation	Office buildings	I	ASHRAE	4 cities in the 4 climate zones (6A, 4B, 4A, 1A)	The multivariate regression method used to estimate the energy consumption of a building in the early design stages based on 27 parameters showed a high level of compliance with the simulation of energy consumption in Energy Plus (R^2 = 0.97),

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
										except for estimating energy consumption for heating in warm climates.
Heating and cooling building energy demand evaluation; a simplified model and a modified degree days approach	2014	10.1016/j.apenergy.2014.04.067	81	Methodologies/Energy consumption	Mathematical analysis/Simulation	The standard building block of two floors	III	Location	Cities in Europe	A dynamic model was presented to estimate heating/cooling energy consumption in buildings as a function of degree days. This model retains linearity even for small values of cooling degree days. Method error is not more than 8.2% compared to Energy Plus and TRNSYS.
Thermal comfort and building energy consumption implications—A review	2014	10.1016/j.apenergy.2013.10.062	409	Thermal comfort/Energy consumption	Review	–			–	Increasing the summer operating temperature has good energy saving potential as it can be applied in both new and existing buildings.
Energy and visual comfort analysis of lighting and daylight control strategies	2014	10.1016/j.buildenv.2014.04.028	74	Energy saving potential/Visual comfort	Simulation	–	I	ASHRAE	Abu-Dhabi, London, Baltimore (1B, 4A (2))	Fully integrated lighting and daylight control with blind tilt angle and height control can reduce energy consumption for lighting by a maximum average of 90% in studied cities.
Comparative study of energy regulations for buildings in Italy and Spain	2008	10.1016/j.enbuild.2008.03.007	47	Building standards/Energy efficiency	Simulation	Residential buildings	I	Italy BC and Spain BC	4 cities in 4 climate zones of Italy and 3 cities in 3 climate zones of Spain	The difference in climatic zoning and building standards of the two countries makes it impossible to use a unified procedure for energy certification of housing in Spain and Italy.
Comparative study on the indoor environment quality of green office buildings in China with a long-term field measurement and investigation	2015	10.1016/j.buildenv.2014.10.015	54	IEQ	Results of field experiment	Office buildings	II	China BC	Cold climate (2) and Hot summer and cold winter (1)	The result of the questionnaire survey shows that the green buildings in China demonstrate a significantly higher satisfaction level than the conventional buildings at the aspect of the thermal, acoustic environment, visual, IAQ, and the overall environment.
Sub-theme 1										
Analysis of annual heating and cooling energy requirements for office buildings in different climates in Turkey	2008	10.1016/j.enbuild.2007.05.008	97	Multiparameter optimisations	Simulation	Office buildings	I	Turkish BC	4 cities in 4 climate zones	Optimal characteristics of parameters such as insulation and thermal mass, building aspect ratio, colour of external surfaces, shading, window systems including window area and glazing system, ventilation rates and different outdoor air

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
										control strategies for each climate zones can help to reduce building energy consumption.
Energy performance of building envelopes in different climate zones in China	2008	10.1016/j.apenergy.2007.11.002	133	CZ/Building envelope/Multiparameter optimisations	Simulation	Office buildings	I	China BC	5 cities/5 climate zones	It has been demonstrated that, in different climatic zones, the chiller load/heat load is more dependent on thermal gains/losses through the floor in comparison with walls and roof.
Building energy efficiency in different climates	2008	10.1016/j.enconman.2008.01.013	93	Architectural strategies/Multiparameter optimisations	Simulation	Office buildings	I	China BC	5 cities/5 climate zones	Passive solar designs have great energy saving potential in cold climates, and energy efficient lighting designs and office equipment will help reduce energy consumption.
Thermal and economic windows design for different climate zones	2011	10.1016/j.enbuild.2011.08.019	48	Façades and windows/Multiparameter optimisations	Simulation/ LCC analysis	Residential buildings	III	Location	3 cities (Amman, Aqaba, Berlin)	Triple-glazed windows have shown the best energy saving results in all types of climate, but from an economic point of view, double glazing is weatherproof.
A comparative life cycle assessment of a transparent composite facade system and a glass curtain wall system	2011	10.1016/j.enbuild.2011.09.006	42	Façades and windows/Multiparameter optimisations	Simulation/ LCA analysis	Office buildings	VI	Location	USA, Detroit	Transparent composite façade systems have 7% less total life cycle energy and 11% less carbon emissions than glass curtain wall systems.
Design optimisation of energy efficient residential buildings in Tunisia	2012	10.1016/j.buildenv.2012.06.012	85	Multiparameter optimisations	Simulation	Residential buildings	I	Tunis BC	4 cities/climate zones	The presented multiparameter optimisation method was able to reduce the building's energy consumption by 50%. Furthermore, for each climatic zone, the optimal designs of the building under study were presented.
The effect of geometry factors on fenestration energy performance and energy savings in office buildings	2013	10.1016/j.enbuild.2012.10.035	54	Façades and windows/Multi-parameter optimisations	Simulation	Office buildings	I	ASHRAE	Zone2–7	Geometric factors (window orientation, window to wall ratio and room width to depth ratio) significantly affect energy consumption in hot climates and cold climates, but only marginally in temperate climates. Energy savings averaged 3% and 6%, reaching a maximum of 10% and 14% in hot climates and 1% in temperate and cold climates.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Impact of building design and occupancy on office comfort and energy performance in different climates	2014	10.1016/j.buildenv.2013.10.001	50	Multiparameter optimisations	Simulation	Office buildings	I	Köppen	3 cities (Alice Springs; Athens; Hamburg)	The relationship between climate, building design, building occupancy, thermal comfort and energy efficiency was presented.
An insight into actual energy use and its drivers in high-performance buildings	2014	10.1016/j.apenergy.2014.06.032	63	Multiparameter optimisations	Energy audit	Office buildings	III	Location	USA, China, Asia, Europa, Australia	Only a holistic approach to building design that takes into account climate, technology, human behaviour, and operation and maintenance practices can help maximise energy savings.
Commercial Building Energy Saver: An energy retrofit analysis toolkit	2015	10.1016/j.apenergy.2015.09.002	67	Tools and methodologies/Multiparameter optimisations	Simulation tool	Commercial buildings	I	California EC	16 climate zones of California	The application programming interface provides estimates of energy conservation and the search for the optimal design of buildings based on 100 parameters.
A novel approach for the simulation-based optimisation of the building's energy consumption using NSGA-II: Case study in Iran	2016	10.1016/j.enbuild.2016.05.052	47	Multiparameter optimisations	Simulation	Office buildings	I	Iran BC	4 cities/4 climate zones	The climate and the appropriate choice of architectural parameters are very important and critical in reducing a building's energy consumption.
Passive performance and building form: An optimisation framework for early-stage design support	2016	10.1016/j.solener.2015.12.020	59	Tools and methodologies	Simulation tool	Office buildings	I	ASHRAE	4 cities/4 climate zones (6A, 4A, 3B, 3A)	A passive performance optimisation framework (analysed in real urban conditions) can provide 4–17% energy use intensity reduction while improving daylight performance by 27–65% depending on terrain and climatic conditions.
Zero energy buildings and sustainable development implications—A review	2013	10.1016/j.energy.2013.01.070	214	Systems with renewable energy sources	Review	–	–	–	–	Energy efficiency measures and the introduction of renewable energy sources and other technologies for buildings have regionally and climate dependence.
Sub-theme 2										
Applicability of air-to-air heat recovery ventilators in China	2009	10.1016/j.applthermaleng.2008.04.003	50	HVAC systems/Energy saving	Mathematical analysis	–	II	China BC	Severe cold (3), Cold (2), Mild (2), Hot summer and warm winter (1)	The applicability of air-to-air heat recovery ventilators with mixed or separated fresh air unit with or without humidity-controlled depend on 5 climatic zones

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Efficiency of energy recovery ventilator with various weathers and its energy saving performance in a residential apartment	2010	10.1016/j.enbuild.2009.07.009	54	HVAC systems/Energy saving	Simulation	Residential buildings	II	China BC	2 cities in each of 5 climatic zones	Demonstrated seasonal dependence of weighted coefficients (latent and sensible heat efficient) of enthalpy efficiency of the energy recovery ventilator in different cities. Demonstrated that saved energy percentages by ERV depend on different enthalpy efficiencies.
Adequacy of air-to-air heat recovery ventilation system applied in low energy buildings	2012	10.1016/j.enbuild.2012.08.008	50	HVAC systems/Energy saving	Simulation	Flat, house, office	III	Bioclimatic	7 cities of France	The applicability of air-to-air heat recovery ventilators depends on the building types, the heating loads and ventilation device characteristics in different climatic zones.
Sub-theme 3										
Air-conditioning usage conditional probability model for residential buildings	2014	10.1016/j.buildenv.2014.06.022	60	HVAC systems/Occupant behaviour	Results of field experiment/Mathematical model	Residential buildings	II	China BC	Cold (1), Hot summer and cold winter (6), Hot summer and warm winter (1)	The air-conditioning usage conditional probability model was developed based on 34 residential buildings in 7 cities. This model reflects real air-conditioning usage very well.
Occupant behaviour and schedule modelling for building energy simulation through office appliance power consumption data mining	2014	10.1016/j.enbuild.2014.07.033	117	HVAC systems/Occupant behaviour	Numerical modelling	Office buildings	I	ASHRAE	17 cities/17 climate zones (1A, 1B, 2A, 2B, 3A-C, 4A-C, 5A-C, 6A, 6B, 7, 8)	Occupant behaviour and schedule modelling method are developed and tested in a medium-size office building. The simulation result shows an average of 8.39% increase in heating energy, 2.80% decrease in cooling energy and 4.07% decrease in fan energy for all the climate zones.
Energy savings from temperature setpoints and deadband: Quantifying the influence of building and system properties on savings	2016	10.1016/j.apenergy.2015.12.115	68	HVAC systems/Energy saving	Simulation	Office buildings	I	ASHRAE	16 cities of the 15 climate zones (8, 7, 6B, 6A, 5B, 5A, 4C, 4B, 4A, 3C, 3B(2), 3A, 2B, 2A, 1A)	The potential savings from selecting daily optimal setpoints for HVAC system in the range of 22.5 ± 3 °C in different climates and for small, medium and large office buildings, would lead to 10.09–37.03%, 11.43–21.01% and 6.78–11.34% savings, respectively, depending on the climate.
Sub-theme 4										
Solar powered net zero energy houses for southern Europe: Feasibility study	2011	10.1016/j.solener.2011.11.008	49	Renewable energy systems/Energy saving	Simulation	Residential net zero energy houses (NZEH)	IV	Bioclimatic	Mild southern European climate, Lisbon	The optimal size of the PV system varies by a factor of three and a half, depending on the efficiency of the building and electrical appliances used.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Energy performance of solar-assisted liquid desiccant air-conditioning system for commercial building in main climate zones	2014	10.1016/j.enconman.2014.09.006	44	Renewable energy systems/Energy saving	Mathematical analysis	Commercial building	I	Bioclimatic	5 cities 5 climate zones (Los Angeles, Boulder, Beijing, Houston, Singapore)	Use of solar energy for liquid desiccant AC system can help to reduce total building energy consumption by 40% in humid climates such as Houston and Singapore.
Investigation on the feasibility and performance of ground source heat pump (GSHP) in three cities in cold climate zone, China	2015	10.1016/j.renene.2015.06.019	67	Systems with renewable energy sources	Simulation	Office buildings	V	China BC	Cold climate	In a cold climate zone, soil temperature modelling for ten years was found to be important to assess the performance of the ground source heat pump.
Feasibility and performance study of the hybrid ground-source heat pump system for one office building in Chinese heating-dominated areas	2017	10.1016/j.renene.2016.10.006	121	Systems with renewable energy sources	Simulation	Office buildings	IV	China BC	Cold climate	Auxiliary heat source could improve ground source heat pump energy performance in cold climate.
Sub-theme 5										
Building energy simulation using multi-years and typical meteorological years in different climates	2008	10.1016/j.enconman.2007.05.004	63	Meteorological data/Energy simulation	Simulation	Office building	I	China BC	5 cities/5 climate zones	The results of the simulation of energy use based on the TMY data quite closely matched the results of the simulation based on long-term mean data in different climatic zones (mean bias errors ranged from −4.3% to 0%)
A new method to develop typical weather years in different climates for building energy use studies	2011	10.1016/j.energy.2011.07.053	35	Meteorological data/Energy simulation	Simulation	Office building	I	China BC	5 cities/5 climate zones	The TPCY methodology for generating weather data was presented, the results of the simulation of energy consumption showed slight differences with the results of simulation with TMY data and long-term average data.
Development of weighting factors for climate variables for selecting the energy reference year according	2012	10.1016/j.enbuild.2011.11.031	87	Meteorological data/Energy simulation	Mathematical analysis	–	I	Finland BC	4cities/4 climate zones	The energy reference year's selection method was improved with weighting factors. In a cold boreal climate, during the summer, temperature and solar radiation have a similar influence on heating and

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
to the EN ISO 15927-4 standard										cooling energy demand, whereas air humidity and wind speed have a minor effect. The energy reference year cannot be used to find the optimal HVAC system parameters.
A fresh look at weather impact on peak electricity demand and energy use of buildings using 30-year actual weather data	2013	10.1016/j.apenergy.2013.05.019	68	Meteorological data/Energy simulation	Simulation	Office building	I	ASHRAE	17 cities/17 climate zones (1A, 1B, 2A, 2B, 3A-C, 4A-C, 5A-C, 6A, 6B, 7, 8)	It is crucial to run multidecade simulations with Actual Meteorological Year weather data to fully assess the impact of weather on the long-term performance of buildings, and to evaluate the energy savings potential of energy conservation measures for new and existing buildings from a life cycle perspective.
Climate change adaptation pathways for Australian residential buildings	2011	10.1016/j.buildenv.2011.05.022	55	Climate change/Energy saving	Mathematical analysis	Residential buildings	I	Australia BC	8 climate zones	The measures for adaptation to climate change in energetical and economical aspects are presented and vary by climatic zones.
Impact of climate change on building energy use in different climate zones and mitigation and adaptation implications	2012	10.1016/j.apenergy.2011.11.048	91	Climate change/Energy saving	Simulation	Office building	I	China BC	5 cities/5 climate zones	In the future, in Harbin, the energy consumption for air conditioning a building will have a decreasing trend compared to other cities. Mitigation/adaptation methods—envelop, indoor design conditions and lighting load density, coefficient of performance of the HVAC system.
Modelling the energy demand projection of the building sector in Greece in the 21st century	2012	10.1016/j.enbuild.2012.02.043	68	Climate change/Energy demand	Simulation	Building stock	II	Greece BC	4 climate zones	The results show that the demand for heating energy for the construction sector in Greece could fall by about 50%, while the corresponding demand for cooling energy could rise by as much as 248% by 2100.
Impact of climate change heating and cooling energy use in buildings in the United States	2014	10.1016/j.enbuild.2014.07.034	102	Climate change/Energy consumption	Simulation	Residential and commercial buildings	II	ASHRAE	15 cities in zones 7(1), 6A (2), 5B(1), 5A(1), 4C(1), 4A(2), 3C(2), 3B(1), 3A(2), 2A(1), 1A(1)	In 2080, for climate zones 1–4 of the ASHRAE, a net increase in energy consumption is expected and for zones 6–7, a net decrease in energy consumption is expected.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Urban heat island and its impact on climate change resilience in a shrinking city: The case of Glasgow, UK	2012	10.1016/j.buildenv.2012.01.020	76	UHI	Mathematical analysis	–	VII	Urban climate zone	Glasgow, UK	It was revealed that the intensity of the urban heat island has increased over the past 50 years.

* August 2020 WOS.

Table S5. Studies without cluster.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
A method of identifying and weighting indicators of energy efficiency assessment in Chinese residential buildings	2010	10.1016/j.enpol.2010.08.018	50	Energy efficiency	Questionnaire survey	Residential buildings	V	China BC	Climate dependence methodology	The group analytical hierarchical process made it possible to identify 17 basic parameters out of 83 parameters that should be used to assess the energy efficiency of residential buildings in the hot summer and cold winter zone in China.
Climatic zoning and its application to Spanish building energy performance regulations	2008	10.1016/j.enbuild.2008.05.006	46	CZ	Mathematical analysis	–	VII	Spain BC	Andalusia	A method for the formation of weather data and determination of building climatic zones at the level of the mesometeorological scale is presented.
Comparison of low-energy office buildings in summer using different thermal comfort criteria	2007	10.1016/j.enbuild.2007.02.005	58	Thermal comfort/Energy saving	Results of field experiment, measurements	Office buildings	II	German BC	3 summer climate zones of Germany	Assessment of comfort in 12 office buildings with low energy consumption shows that the building in which natural heat sinks for cooling are used, provide good thermal comfort in a typical and warm summers in Germany.
Development of bioclimatic zones in Northeast India	2007	10.1016/j.enbuild.2007.01.015	43	CZ/Energy saving potential	Measurements	Residential buildings	VII	India BC	North-east India	Provides psychometric diagrams for bioclimatic zones in Northeast India that can be used to assess the potential of solar passive design strategies for residential buildings.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Effects of global warming on energy use for space heating and cooling in the United States	1995	https://www.jstor.org/stable/41323449	91	Climate change/Energy consumption	Mathematical analysis	The stock of residential and commercial buildings	II	US Energy Information Administration (EIA)	5 zones	It has been found that global warming of 1 °C will reduce projected US energy costs in 2010 by $ 5.5 billion (1991).
Energy demands and potential savings in European office buildings: Case studies based on EnergyPlus simulations	2013	10.1016/j.enbuild.2013.05.039	77	Multi-criterial optimisation/Energy saving potential	Simulation	Office buildings	I	Bioclimatic	Tallinn, London, Madrid	The energy saving potential of buildings is analysed based on three aspects—lighting optimisation, improved insulation of windows and external walls and optimisation of building orientation. It was found that there must be a careful approach to improving insulation in warm climates.
Evaluation of energy efficient design strategies for different climatic zones: Comparison of thermal performance of buildings in temperate-humid and hot-dry climate	2007	10.1016/j.enbuild.2006.08.004	75	CZ/Building envelope	Mathematical analysis/ Questionnaire survey	Residential buildings	I	Bioclimatic, Turkey BC	Istanbul and Mardin—two climatic zones	The importance of taking into account the thermal mass of the building envelope to simulate energy consumption in hot dry continental climates was noted.
Mitigation of CO_2 emissions from the EU-15 building stock—Beyond the EU directive on the energy performance of buildings	2006	10.1065/espr2005.12.289	58	Building standards	Mathematical model	Building stock	II	Zones based on HDD	3 climate zones	In Europe, it was found that 60% of carbon emissions in the building stock are from single-family dwellings, and 23% of emissions from non-residential buildings.
Optimal design and operation strategy for integrated evaluation of combined cooling heating and power (CCHP) system	2016	10.1016/j.energy.2016.01.060	84	CHCP systems/Energy saving	Mathematical model	Residential, office, hotel	IV	Köppen (without ref.)	Dalian, China—Maritime climate	The use of the CHCP system in a hotel was shown the maximum energy saving potential (42.28%) compared to other types of buildings due to the significantly stable electrical load. From an economic point of view, this system is not applicable in residential buildings.

Title	Year	DOI	CIT *	Theme	Type	Building Type/Scale	Type of Climate-Oriented Study	Type of Climatic Zoning	Region/CZ	Principal Conclusions
Optimal option of distributed energy systems for building complexes in different climate zones in China	2012	10.1016/j.apenergy.2011.08.044	50	CHCP systems/Energy saving potential	Mathematical analysis	Residential, Public and Mixed building complex	I	China BC	5 cities/5 climate zones	A distributed energy system can be used in Shanghai due to economic and environmental benefits, followed by Guangzhou, Beijing and Harbin; while the benefits from Kunming are negligible.
Passive Houses for different climate zones	2015	10.1016/j.enbuild.2015.07.032	59	Architectural strategies	Simulation	Residential buildings	I	Bioclimatic	Yekaterinburg, Tokyo, Shanghai, Las Vegas, Abu Dhabi, Singapore	It has been demonstrated how passive houses can be implemented in a variety of rather extreme climatic conditions, leading to the conclusion that they can be built almost anywhere in the world.
Potential for energy conservation in apartment buildings	2000	10.1016/S0378-7788(99)00028-6	99	Multi-criterial optimisation/Energy saving potential	Energy audit	Residential buildings	I	Greece BC	3 climate zones in Greece	Energy savings for space heating shows that savings from improved wall insulation range from 21 to 42% for insulation thicknesses of 3–5 cm. Improving floor insulation (5 cm) will also save 24–28% of the heating energy.
Solar air conditioning in Europe—an overview	2007	10.1016/j.rser.2005.02.003	264	Systems with renewable energy sources	Energy audit	Different types of buildings	–	–	Different climate zones	For southern Europe and the Mediterranean, solar cooling systems can result of 40–50% in primary energy savings.
Thermoeconomic analysis method for optimisation of insulation thickness for the four different climatic regions of Turkey	2010	10.1016/j.energy.2009.12.022	47	CZ/Building envelope	Mathematical model	–	I	Turkey BC	4 cities/4 climate zones	It is shown that an increase in the internal temperature from 18 to 22 C requires an increase in the optimal wall insulation thickness by 23% from 0.0663 m to 0.0816 m for the climatic zone of the city of Erzurum.

* August 2020 WOS.