

# CPC COOPERATIVE PATENT CLASSIFICATION

## Y02B INDEXING SCHEME RELATING TO CLIMATE CHANGE MITIGATION TECHNOLOGIES RELATED TO BUILDINGS, e.g. INCLUDING HOUSING AND APPLIANCES OR RELATED END-USER APPLICATIONS

<b>10/00</b>	<b>Integration of renewable energy sources in buildings</b>	20/342	. . . . for driving the LEDs directly from an AC voltage source, e.g. with only passive components
10/10	. Photovoltaic [PV]	20/343	. . . . Linear regulators
10/12	. . Roof systems for PV cells	20/345	. . . . . configured as a current source
10/14	. . PV hubs	20/346	. . . . Switching regulators
10/20	. Solar thermal	20/347	. . . . . configured as a current source
10/22	. . Evacuated solar collectors	20/348	. . . . Resonant bridges
10/24	. . Air conditioning or refrigeration systems	20/36	. . Organic LEDs, i.e. OLEDs for general illumination
10/30	. Wind power	20/38	. . Constructional details
10/40	. Geothermal heat-pumps	20/383	. . . Adaptation to Edison sockets
10/50	. Hydropower in dwellings	20/386	. . . Retrofitting in tubes
10/60	. Use of biomass for heating	20/40	. Control techniques providing energy savings
10/70	. Hybrid systems	20/42	. . based on timing means or schedule
10/72	. . Uninterruptible or back-up power supplies integrating renewable energies	20/44	. . based on detection of the user
<b>20/00</b>	<b>Energy efficient lighting technologies</b>	20/445	. . . Controlling the access to premises
20/10	. Energy saving technologies for incandescent lamps	20/46	. . based on detection of the illumination level
20/12	. . Halogen lamps	20/48	. . Smart controllers
20/125	. . . High voltage halogen lamps	20/70	. Used in particular applications
20/14	. . Specially adapted circuits	20/72	. . in street lighting
20/142	. . . for resonant dimming, e.g. by means of high frequency resonant bridges	<b>30/00</b>	<b>Energy efficient heating, ventilation or air conditioning [HVAC]</b>
20/144	. . . for pulse modulation dimming	30/08	. relating to domestic heating, space heating or domestic hot water heating or supply systems [DHW]
20/146	. . . for phase control dimming	30/10	. . using boilers ( <a href="#">not used, see subgroups</a> )
20/148	. . . . for reverse phase control dimming	30/102	. . . Condensing boilers
20/16	. Gas discharge lamps, e.g. fluorescent lamps, high intensity discharge lamps [HID] or molecular radiators	30/104	. . . . Moistening the combustion air with condensate from the combustion gases
20/18	. . Low pressure and fluorescent lamps	30/106	. . . . Removing condensate from the heater
20/181	. . . Fluorescent powders	30/108	. . . Modular boilers, i.e. connecting different sections within a boiler or cascading multiple boilers
20/183	. . . Specially adapted circuits	30/12	. . Hot water central heating systems using heat pumps
20/185	. . . . Self-resonant bridges	30/123	. . . Self contained heating units using heat pumps
20/186	. . . . Controlled bridges	30/126	. . . . combined with the use of heat accumulated in storage masses
20/188	. . . . . with dedicated cathode heating circuitry	30/14	. . Central heating systems having more than one heat source
20/19	. . Mechanical details of compact fluorescent lamps	30/16	. . Central heating systems using steam or condensate extracted or exhausted from steam engine plants
20/20	. . High pressure [UHP] or high intensity discharge lamps [HID]	30/18	. . Domestic hot-water supply systems using recuperated or waste heat
20/202	. . . Specially adapted circuits	30/20	. . Heat consumers, i.e. devices to provide the end user with heat
20/204	. . . . Details of the starting circuit	30/22	. . . Low temperature radiators, i.e. convectors, radiators or a mixture of both with increased heat-exchange surface being suitable for systems working with a low temperature heat transfer medium
20/206	. . . . . for hot restarting		
20/208	. . . . providing detection and prevention of anomalous lamp operating conditions		
20/22	. . Other discharge lamps		
20/30	. Semiconductor lamps, e.g. solid state lamps [SSL] light emitting diodes [LED] or organic LED [OLED]		
20/32	. . Electroluminescent panels ( <a href="#">not used, see subgroups</a> )		
20/325	. . . Specially adapted circuits		
20/34	. . inorganic LEDs ( <a href="#">not used, see subgroups</a> )		
20/341	. . . Specially adapted circuits		

30/24	. . . ceiling, wall or underfloor heating arrangements for being used in combination with water central heating system	40/12	. . Induction cooking in kitchen stoves ( <a href="#">not used, see subgroups</a> )
30/26	. . . Radiant panels electrically heated	40/123	. . . Control circuit or coil power supply
30/28	. . . Direct fired air heaters, i.e. the air being in direct contact with the exhaust gases of the burner	40/126	. . . Coil arrangements
30/50	. Systems profiting of external/internal conditions ( <a href="#">not used, see subgroups</a> )	40/14	. . Microwave ovens ( <a href="#">not used, see subgroups</a> )
30/52	. . Heat recovery pumps, i.e. heat pump based systems or units able to transfer the thermal energy from one area of the premises or part of the facilities to a different one, improving the overall efficiency	40/143	. . . Control circuit or magnetron power supply
30/54	. . Free-cooling systems ( <a href="#">not used, see subgroups</a> )	40/146	. . . Load impedance matching, e.g. by acting upon phase or frequency
30/542	. . . Air based, e.g. mixed outside air and recirculation systems	40/16	. . Improved cooking stoves ( <a href="#">not used, see subgroups</a> )
30/545	. . . Cooling using dew point control and direct humidifiers	40/163	. . . Fuel efficient biomass cooking stoves
30/547	. . . Using energy from the ground by air circulation, e.g. "Canadian well"	40/166	. . . Fuel efficient gas cooking stoves
30/56	. . Heat recovery units ( <a href="#">not used, see subgroups</a> )	40/18	. . Solar cooking stoves or furnaces
30/563	. . . Air to air	40/30	. Relating to refrigerators or freezers ( <a href="#">not used see subgroups</a> )
30/566	. . . Water to water	40/32	. . Motor speed control of compressors or fans
30/60	. Other technologies for heating or cooling ( <a href="#">not used, see subgroups</a> )	40/34	. . Thermal insulation
30/62	. . Absorption based systems	40/40	. Relating to dish-washers ( <a href="#">not used, see subgroups</a> )
30/625	. . . integrating combined heat and power generation [CHP] systems, i.e. trigeneration	40/42	. . Motor speed control of pumps
30/64	. . Adsorption based systems	40/44	. . Heat recovery, e.g. of washing water
30/66	. . Magnetic cooling	40/46	. . Optimisation of water quantity, e.g. of hot water
30/70	. Efficient control or regulation technologies ( <a href="#">empty, see subgroups</a> )	40/50	. Relating to washing machines
30/72	. . Electric or electronic refrigerant flow control	40/52	. . Motor speed control of drum or pumps
30/74	. . Technologies based on motor control ( <a href="#">not used, see subgroups</a> )	40/54	. . Heat recovery, e.g. of washing water
30/741	. . . Speed regulation of the compressor	40/56	. . Optimisation of water quantity
30/743	. . . Condensing pressure control	40/58	. . Solar heating
30/745	. . . Speed regulation of pumps in flow control systems	40/70	. Relating to laundry dryers ( <a href="#">not used, see subgroups</a> )
30/746	. . . Speed regulation of fans in flow control systems	40/72	. . Motor speed control of drum or fans
30/748	. . . Speed regulation of fans and pumps in cooling towers	40/74	. . Solar heating
30/76	. . Centralised control ( <a href="#">not used, see subgroups</a> )	40/80	. Related to vacuum cleaners ( <a href="#">not used, see subgroups</a> )
30/762	. . . of heating or domestic hot water [DHW] systems	40/82	. . Motor speed or motor power consumption control
30/765	. . . of refrigeration machines, plants or systems, including combined heating and refrigeration systems or heat-pumps	40/84	. . Motor overheating or overloading prevention
30/767	. . . of air distribution systems	40/90	. Energy efficient batteries, ultracapacitors, supercapacitors or double-layer capacitors charging or discharging systems or methods specially adapted for portable applications
30/78	. . Ventilation adapted to air quality	<b>50/00</b>	<b>Energy efficient technologies in elevators, escalators and moving walkways</b>
30/80	. Ultrasonic humidifiers	50/10	. in elevators
30/90	. Passive houses; Double facade technology ( <a href="#">not used, see subgroups</a> )	50/12	. . Energy saving technologies
30/92	. . with air flow into the conditioned premises or facilities	50/122	. . . by adapted call allocation
30/94	. . Improving the thermodynamic properties of the premises or facilities	50/125	. . . by adapting the motion profile
<b>40/00</b>	<b>Technologies aiming at improving the efficiency of home appliances</b>	50/127	. . . by control of auxiliary devices
40/10	. Relating to domestic cooking ( <a href="#">not used, see subgroups</a> )	50/14	. . Energy recuperation technologies
		50/142	. . . with electrical storage
		50/144	. . . with mechanical storage
		50/146	. . . with pressure storage
		50/148	. . . by delivering current to the grid for hydraulic elevators
		50/20	. in escalators and moving walkways
		50/22	. . Energy saving technologies
		50/225	. . . by adapting the motion profile
		50/24	. . Energy recuperation technologies
		<b>60/00</b>	<b>Information and communication technologies [ICT] aiming at the reduction of own energy use</b>
		60/10	. Energy efficient computing
		60/12	. . Reducing energy-consumption at the single machine level, e.g. processors, personal computers, peripherals, power supply
		60/1203	. . . involving a plurality of components

- 60/1207 . . . acting upon the main processing unit
- 60/121 . . . . Low-power processors
- 60/1214 . . . . Performance modes
- 60/1217 . . . . Frequency modification
- 60/1221 . . . . Clock disabling
- 60/1225 . . . Access, addressing or allocation within memory systems or architectures, e.g. to reduce power consumption or heat production, or to increase battery life
- 60/1228 . . . Interconnection, or transfer of information or other signals between, memories, peripherals or central processing units
- 60/1232 . . . Acting upon peripherals
- 60/1235 . . . . the peripheral being a bus
- 60/1239 . . . . the peripheral being a memory control unit [MCU]
- 60/1242 . . . . the peripheral being a display
- 60/1246 . . . . the peripheral being disc or storage devices
- 60/125 . . . . . The peripheral being a CD-ROM unit
- 60/1253 . . . . the peripheral being a cursor control device
- 60/1257 . . . . the peripheral being a keyboard
- 60/126 . . . . the peripheral being a modem
- 60/1264 . . . . the peripheral being a PCMCIA card
- 60/1267 . . . . the peripheral being a printer
- 60/1271 . . . . . Data transfer to print units
- 60/1275 . . . Cooling means for computing equipment provided with thermal management
- 60/1278 . . . Power management
- 60/1282 . . . . Selective power distribution
- 60/1285 . . . . Controlling the supply voltage
- 60/1289 . . . . Monitoring user presence
- 60/1292 . . . . Battery monitoring
- 60/1296 . . . . Power strips aiming to energy efficient operation
- 60/14 . . Reducing energy-consumption by means of multiprocessor or multiprocessing based techniques, other than acting upon the power supply
- 60/142 . . . Resource allocation
- 60/144 . . . Scheduling
- 60/146 . . . Increasing resource utilisation, e.g. virtualisation, consolidation
- 60/148 . . . Load distribution
- 60/16 . . Reducing energy-consumption in distributed systems
- 60/162 . . . Delegation or migration
- 60/165 . . . Monitoring
- 60/167 . . . Resource sharing
- 60/18 . . Reducing energy consumption at software or application level
- 60/181 . . . Compilation
- 60/183 . . . Installation
- 60/185 . . . At application level, i.e. feedback, prediction, usage patterns
- 60/186 . . . Suspending or hibernating, performance or eco-modes, operating system support, e.g. advanced configuration and power interface [ACPI]
- 60/188 . . . Information retrieval in databases
- 60/30 . . Techniques for reducing energy-consumption in wire-line communication networks
- 60/31 . . using reduced link rate, e.g. adaptive link rate, not involving auto-negotiation
- 60/32 . . using subset functionality
- 60/33 . . by selective link activation in bundled links
- 60/34 . . by operating in low-power or sleep mode
- 60/35 . . . specifically suitable for Ethernet, e.g. IEEE802.3az
- 60/36 . . . specifically suitable for DSL
- 60/40 . . High level techniques for reducing energy-consumption in communication networks
- 60/41 . . by proxying, i.e. delegating network functionalities while in low-power mode, e.g. ECMA 393 standard
- 60/42 . . by energy-aware routing
- 60/43 . . by signaling and coordination, e.g. signaling reduction, link layer discovery protocol [LLDP], control policies, green TCP
- 60/44 . . . specifically suitable for Ethernet, e.g. IEEE802.3az
- 60/45 . . . specifically suitable for DSL
- 60/46 . . Application modification for reducing energy-consumption, e.g. green peer-to-peer,
- 60/50 . . Techniques for reducing energy-consumption in wireless communication networks
- 70/00 Technologies for an efficient end-user side electric power management and consumption**
- 70/10 . . Technologies improving the efficiency by using switched-mode power supplies [SMPS], i.e. efficient power electronics conversion ([not used, see subgroups](#))
- 70/12 . . Power factor correction technologies for power supplies
- 70/123 . . . Passive technologies
- 70/126 . . . Active technologies
- 70/14 . . Reduction of losses in power supplies ([not used, see subgroups](#))
- 70/1408 . . . Low frequency active rectification, i.e. from a low frequency AC grid or generator
- 70/1416 . . . Converters benefiting from a resonance, e.g. resonant or quasi-resonant converters ([not used, see subgroups](#))
- 70/1425 . . . . in non-galvanically isolated DC/DC converters
- 70/1433 . . . . in galvanically isolated DC/DC converters
- 70/1441 . . . . in DC/AC or AC/DC converters
- 70/145 . . . . in AC/AC converters
- 70/1458 . . . Synchronous rectification ([not used, see subgroups](#))
- 70/1466 . . . . in non-galvanically isolated DC/DC converters
- 70/1475 . . . . in galvanically isolated DC/DC converters
- 70/1483 . . . by using wide band gap based power semiconductors, i.e. power converters integrating silicon carbide [SiC], gallium nitride [GaN], gallium arsenide [GaAs] or diamond power switches
- 70/1491 . . . Other technologies for reduction of losses, e.g. non-dissipative snubbers, diode reverse recovery losses minimisation, zero voltage switching [ZVS], zero current switching [ZCS] or soft switching converters
- 70/16 . . Efficient standby or energy saving modes, e.g. detecting absence of load or auto-off

- 70/30 . Systems integrating technologies related to power network operation and communication or information technologies for improving the carbon footprint of the management of residential or tertiary loads, i.e. smart grids as climate change mitigation technology in the buildings sector, including also the last stages of power distribution and the control, monitoring or operating management systems at local level ([smart grids supporting the management or operation of end-user stationary applications in general, including technologies with no associated climate change mitigation effect Y04S 20/00](#)) (not used, see subgroups)
- 70/32 . . End-user application control systems (not used, see subgroups)
- 70/3208 . . . characterised by the aim of the control (not used, see subgroups)
- 70/3216 . . . . General power management systems
- 70/3225 . . . . Demand response systems, e.g. load shedding, peak shaving
- 70/3233 . . . . The system entering an energy saving mode, i.e. sleep, low-power or standby modes
- 70/3241 . . . . Domotics or building automation systems
- 70/325 . . . . . involving home automation communication networks
- 70/3258 . . . characterised by the end-user application (not used, see subgroups)
- 70/3266 . . . . The end-user application being or involving home appliances
- 70/3275 . . . . . The home appliances being or involving heating ventilating or air conditioning [HVAC] units
- 70/3283 . . . . . The system involving the remote operation of lamps or lighting equipment
- 70/3291 . . . . The end-user application involving uninterruptible power supply [UPS] systems or standby or emergency generators ([for uninterruptible power supply systems or standby or emergency generators in the last power distribution stages Y04S 20/12](#))
- 70/34 . . Smart metering supporting the carbon neutral operation of end-user applications in buildings (not used, see subgroups)
- 70/343 . . . Systems which determine the environmental impact of user behavior
- 70/346 . . . Systems which monitor the performance of renewable electricity generating systems, e.g. of solar panels
- 80/00 Architectural or constructional elements improving the thermal performance of buildings**
- 80/10 . Insulation
- 80/12 . . Slab shaped vacuum insulation
- 80/14 . . Slab shaped aerogel insulation
- 80/20 . Windows or doors
- 80/22 . . Glazing
- 80/24 . . . Vacuum glazing
- 80/26 . . . Other special glazing, e.g. aerogel
- 80/28 . . Wooden or plastic frames with extra insulation
- 80/30 . Roofs
- 80/32 . . Roof garden systems
- 80/34 . . Roof coverings with high solar reflectance
- 80/40 . Floors specially adapted for storing heat or cold
- 80/50 . Light dependent control systems for sun shading
- 90/00 Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation**
- 90/10 . Applications of fuel cells in buildings
- 90/12 . . Cogeneration of electricity with other electric generators
- 90/14 . . Emergency, uninterruptible or back-up power supplies integrating fuel cells
- 90/16 . . Cogeneration or combined heat and power generation, e.g. for domestic hot water
- 90/18 . . Fuel cells specially adapted to portable applications, e.g. mobile phone, laptop
- 90/20 . Systems integrating technologies related to power network operation and communication or information technologies mediating in the improvement of the carbon footprint of the management of residential or tertiary loads, i.e. smart grids as enabling technology in buildings sector (not used, see subgroups) ([Smart grids supporting the management or operation of end-user stationary applications in general, including technologies with no associated climate change mitigation effect Y04S 20/00](#))
- 90/22 . . Systems characterised by the monitored, controlled or operated end-user elements or equipments (not used, see subgroups)
- 90/222 . . . the elements or equipments being or involving energy storage units, uninterruptible power supply [UPS] systems or standby or emergency generators involved in the last power distribution stages ([energy storage units involved in power generation, transmission or distribution Y04S 10/14; uninterruptible power supply systems or standby or emergency generators as end-user application Y04S 20/248](#))
- 90/224 . . . the elements or equipments being or involving protection elements, switches, relays or circuit breakers
- 90/226 . . . the elements or equipments being or involving power plugs, sockets, adapters or power strips
- 90/228 . . . the element or elements being a direct current power network, grid or distribution line
- 90/24 . . Smart metering mediating in the carbon neutral operation of end-user applications in buildings (not used, see subgroups)
- 90/241 . . . Systems characterised by remote reading
- 90/242 . . . . from a fixed location
- 90/243 . . . . from a mobile location
- 90/244 . . . . the remote reading system including mechanisms for turning on/off the supply
- 90/245 . . . Displaying of usage with respect to time, e.g. monitoring evolution of usage, relating usage to weather conditions
- 90/246 . . . Utility meters which are networked together, e.g. within a single building
- 90/247 . . . Retrofitting of installed meters
- 90/248 . . . Systems oriented to metering of generated energy or power
- 90/26 . . Communication technology specific aspects (not used, see subgroups)

- 90/2607 . . . Details of the transmission structure or support between the monitoring, controlling or managing units and monitored, controlled or operated electrical equipment ([not used, see subgroups](#))
- 90/2615 . . . . using the power network as support for the transmission
- 90/2623 . . . . . using pulsed signals
- 90/263 . . . . . using modification of a parameter of the network power signal
- 90/2638 . . . . using a data transmission bus
- 90/2646 . . . . using phone lines
- 90/2653 . . . . using wireless data transmission
- 90/2661 . . . . . By means of mobile telephony
- 90/2669 . . . . using Internet
- 90/2676 . . . Aspects related to the treatment or conditioning of data or signals ([not used, see subgroups](#))
- 90/2684 . . . . associated with communication via dedicated transmission supports
- 90/2692 . . . . associated with communication via the power transmission network