

# CPC COOPERATIVE PATENT CLASSIFICATION

## Y GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS; GENERAL TAGGING OF CROSS-SECTIONAL TECHNOLOGIES SPANNING OVER SEVERAL SECTIONS OF THE IPC; TECHNICAL SUBJECTS COVERED BY FORMER USPC CROSS-REFERENCE ART COLLECTIONS [XRACs] AND DIGESTS

(NOTES omitted)

## Y02 TECHNOLOGIES OR APPLICATIONS FOR MITIGATION OR ADAPTATION AGAINST CLIMATE CHANGE

(NOTES omitted)

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

30/106	. . . Removing condensate from the heater	30/746	. . . Speed regulation of fans in flow control systems
30/108	. . . Modular boilers, i.e. connecting different sections within a boiler or cascading multiple boilers	30/748	. . . Speed regulation of fans and pumps in cooling towers
30/12	. . Hot water central heating systems using heat pumps	30/76	. . Centralised control (not used, see subgroups)
30/123	. . . Self contained heating units using heat pumps	30/762	. . . of heating or domestic hot water [DHW] systems
30/126	. . . combined with the use of heat accumulated in storage masses	30/765	. . . of refrigeration machines, plants or systems, including combined heating and refrigeration systems or heat-pumps
30/14	. . Central heating systems having more than one heat source	30/767	. . . of air distribution systems
30/16	. . Central heating systems using steam or condensate extracted or exhausted from steam engine plants	30/78	. . Ventilation adapted to air quality
30/18	. . Domestic hot-water supply systems using recuperated or waste heat	30/80	. Ultrasonic humidifiers
30/20	. . Heat consumers, i.e. devices to provide the end user with heat	30/90	. Passive houses; Double facade technology (not used, see subgroups)
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	30/92	. . with air flow into the conditioned premises or facilities
30/24	. . . ceiling, wall or underfloor heating arrangements for being used in combination with water central heating system	30/94	. . Improving the thermodynamic properties of the premises or facilities
30/26	. . . Radiant panels electrically heated	<b>40/00</b>	<b>Technologies aiming at improving the efficiency of home appliances</b>
30/28	. . . Direct fired air heaters, i.e. the air being in direct contact with the exhaust gases of the burner	40/10	. Relating to domestic cooking (not used, see subgroups)
30/50	. Systems profiting of external/internal conditions (not used, see subgroups)	40/12	. . Induction cooking in kitchen stoves (not used, see subgroups)
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	40/123	. . . Control circuit or coil power supply
30/54	. . Free-cooling systems (not used, see subgroups)	40/126	. . . Coil arrangements
30/542	. . . Air based, e.g. mixed outside air and recirculation systems	40/14	. . Microwave ovens (not used, see subgroups)
30/545	. . . Cooling using dew point control and direct humidifiers	40/143	. . . Control circuit or magnetron power supply
30/547	. . . Using energy from the ground by air circulation, e.g. "Canadian well"	40/146	. . . Load impedance matching, e.g. by acting upon phase or frequency
30/56	. . Heat recovery units (not used, see subgroups)	40/16	. . Improved cooking stoves (not used, see subgroups)
30/563	. . . Air to air	40/163	. . . Fuel efficient biomass cooking stoves
30/566	. . . Water to water	40/166	. . . Fuel efficient gas cooking stoves
30/60	. Other technologies for heating or cooling (not used, see subgroups)	40/18	. . Solar cooking stoves or furnaces
30/62	. . Absorption based systems	40/30	. Relating to refrigerators or freezers (not used see subgroups)
30/625	. . . integrating combined heat and power generation [CHP] systems, i.e. trigeneration	40/32	. . Motor speed control of compressors or fans
30/64	. . Adsorption based systems	40/34	. . Thermal insulation
30/66	. . Magnetic cooling	40/40	. Relating to dish-washers (not used, see subgroups)
30/70	. Efficient control or regulation technologies (empty, see subgroups)	40/42	. . Motor speed control of pumps
30/72	. . Electric or electronic refrigerant flow control	40/44	. . Heat recovery, e.g. of washing water
30/74	. . Technologies based on motor control (not used, see subgroups)	40/46	. . Optimisation of water quantity, e.g. of hot water
30/741	. . . Speed regulation of the compressor	40/50	. Relating to washing machines
30/743	. . . Condensing pressure control	40/52	. . Motor speed control of drum or pumps
30/745	. . . Speed regulation of pumps in flow control systems	40/54	. . Heat recovery, e.g. of washing water
		40/56	. . Optimisation of water quantity
		40/58	. . Solar heating
		40/70	. Relating to laundry dryers (not used, see subgroups)
		40/72	. . Motor speed control of drum or fans
		40/74	. . Solar heating
		40/80	. Related to vacuum cleaners (not used, see subgroups)
		40/82	. . Motor speed or motor power consumption control
		40/84	. . Motor overheating or overloading prevention
		40/90	. Energy efficient batteries, ultracapacitors, supercapacitors or double-layer capacitors charging or discharging systems or methods specially adapted for portable applications
		<b>50/00</b>	<b>Energy efficient technologies in elevators, escalators and moving walkways</b>

- 50/10 . in elevators
- 50/12 . . Energy saving technologies
- 50/122 . . . by adapted call allocation
- 50/125 . . . by adapting the motion profile
- 50/127 . . . by control of auxiliary devices
- 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
- 60/00 Information and communication technologies [ICT] aiming at the reduction of own energy use**
- 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	70/343	. . . Systems which determine the environmental impact of user behavior
70/1441	. . . . in DC/AC or AC/DC converters	70/346	. . . Systems which monitor the performance of renewable electricity generating systems, e.g. of solar panels
70/145	. . . . in AC/AC converters		
70/1458	. . . Synchronous rectification (not used, see subgroups)	<b>80/00</b>	<b>Architectural or constructional elements improving the thermal performance of buildings</b>
70/1466	. . . . in non-galvanically isolated DC/DC converters	80/10	. Insulation
70/1475	. . . . in galvanically isolated DC/DC converters	80/12	. . Slab shaped vacuum insulation
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	80/14	. . Slab shaped aerogel insulation
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	80/20	. Windows or doors
70/16	. . Efficient standby or energy saving modes, e.g. detecting absence of load or auto-off	80/22	. . Glazing
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)	80/24	. . . Vacuum glazing
70/32	. . End-user application control systems (not used, see subgroups)	80/26	. . . Other special glazing, e.g. aerogel
70/3208	. . . characterised by the aim of the control (not used, see subgroups)	80/28	. . Wooden or plastic frames with extra insulation
70/3216	. . . . General power management systems	80/30	. Roofs
70/3225	. . . . Demand response systems, e.g. load shedding, peak shaving	80/32	. . Roof garden systems
70/3233	. . . . The system entering an energy saving mode, i.e. sleep, low-power or standby modes	80/34	. . Roof coverings with high solar reflectance
70/3241	. . . . Domotics or building automation systems	80/40	. Floors specially adapted for storing heat or cold
70/325	. . . . . involving home automation communication networks	80/50	. Light dependent control systems for sun shading
70/3258	. . . characterised by the end-user application (not used, see subgroups)	<b>90/00</b>	<b>Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation</b>
70/3266	. . . . The end-user application being or involving home appliances	90/10	. Applications of fuel cells in buildings
70/3275	. . . . . The home appliances being or involving heating ventilating or air conditioning [HVAC] units	90/12	. . Cogeneration of electricity with other electric generators
70/3283	. . . . . The system involving the remote operation of lamps or lighting equipment	90/14	. . Emergency, uninterruptible or back-up power supplies integrating fuel cells
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) (not used, see subgroups)	90/16	. . Cogeneration or combined heat and power generation, e.g. for domestic hot water
70/34	. . Smart metering supporting the carbon neutral operation of end-user applications in buildings (not used, see subgroups)	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