

CPC COOPERATIVE PATENT CLASSIFICATION

Y02E REDUCTION OF GREENHOUSE GASES [GHG] EMISSION, RELATED TO ENERGY GENERATION, TRANSMISSION OR DISTRIBUTION

10/00	Energy generation through renewable energy sources	10/58	. . . Maximum power point tracking [MPPT] systems
10/10	. Geothermal energy	10/60	. Thermal-PV hybrids
10/12	. . Earth coil heat exchangers	10/70	. Wind energy
10/125	. . . Compact tube assemblies, e.g. geothermal probes	10/72	. . Wind turbines with rotation axis in wind direction
10/14	. . Systems injecting medium directly into ground, e.g. hot dry rock system, underground water	10/721	. . . Blades or rotors
10/16	. . Systems injecting medium into a closed well	10/722	. . . Components or gearbox
10/18	. . Systems exchanging heat with fluids in pipes, e.g. fresh water or waste water	10/723	. . . Control of turbines
10/20	. Hydro energy	10/725	. . . Generator or configuration
10/22	. . Conventional, e.g. with dams, turbines and waterwheels	10/726	. . . Nacelles
10/223	. . . Turbines or waterwheels, e.g. details of the rotor	10/727	. . . Offshore towers
10/226	. . . Other parts or details	10/728	. . . Onshore towers
10/28	. . Tidal stream or damless hydropower, e.g. sea flood and ebb, river, stream	10/74	. . Wind turbines with rotation axis perpendicular to the wind direction
10/30	. Energy from sea (tidal stream Y02E 10/28) (not used; see subgroups)	10/76	. . Power conversion electric or electronic aspects
10/32	. . Oscillating water column [OWC]	10/763	. . . for grid-connected applications
10/34	. . Ocean thermal energy conversion [OTEC]	10/766	. . . concerning power management inside the plant, e.g. battery charging/discharging, economical operation, hybridisation with other energy sources
10/36	. . Salinity gradient	20/00	Combustion technologies with mitigation potential
10/38	. . Wave energy or tidal swell, e.g. Pelamis-type	20/10	. Combined combustion (not used, see subgroups)
10/40	. Solar thermal energy	20/12	. . Heat utilisation in combustion or incineration of waste
10/41	. . Tower concentrators	20/14	. . Combined heat and power generation [CHP]
10/42	. . Dish collectors	20/16	. . Combined cycle power plant [CCPP], or combined cycle gas turbine [CCGT]
10/43	. . Fresnel lenses	20/18	. . . Integrated gasification combined cycle [IGCC]
10/44	. . Heat exchange systems	20/185 combined with carbon capture and storage [CCS]
10/45	. . Trough concentrators	20/30	. Technologies for a more efficient combustion or heat usage (not used, see subgroups)
10/46	. . Conversion of thermal power into mechanical power, e.g. Rankine, Stirling solar thermal engines	20/32	. . Direct CO ₂ mitigation (not used, see subgroups)
10/465	. . . Thermal updraft	20/322	. . . Use of synair, i.e. a mixture of recycled CO ₂ and pure O ₂
10/47	. . Mountings or tracking	20/324	. . . Use of reactants before or during combustion
10/50	. Photovoltaic [PV] energy	20/326	. . . Segregation from fumes, including use of reactants downstream from combustion or deep cooling
10/52	. . PV systems with concentrators	20/328	. . . Controls of combustion specifically inferring on CO ₂ emissions
10/54	. . Material technologies (not used; see subgroups)	20/34	. . Indirect CO ₂ mitigation, i.e. by acting on non CO ₂ directly related matters of the process, e.g. more efficient use of fuels (not used, see subgroups)
10/541	. . . CuInSe ₂ material PV cells	20/342	. . . Cold flame
10/542	. . . Dye sensitized solar cells	20/344	. . . Oxyfuel combustion
10/543	. . . Solar cells from Group II-VI materials	20/346	. . . Unmixed combustion
10/544	. . . Solar cells from Group III-V materials	20/348	. . . Air pre-heating
10/545	. . . Microcrystalline silicon PV cells	20/36	. . Heat recovery other than air pre-heating
10/546	. . . Polycrystalline silicon PV cells	20/363	. . . at fumes level
10/547	. . . Monocrystalline silicon PV cells	20/366	. . . at burner level
10/548	. . . Amorphous silicon PV cells	30/00	Energy generation of nuclear origin
10/549	. . . organic PV cells	30/10	. Fusion reactors
10/56	. . Power conversion electric or electronic aspects	30/12	. . Magnetic plasma confinement [MPC]
10/563	. . . for grid-connected applications		
10/566	. . . concerning power management inside the plant, e.g. battery charging/discharging, economical operation, hybridisation with other energy sources		

30/122	. . . Tokamaks	40/67	. . Superconducting energy storage for power networks, e.g. SME, superconducting magnetic storage
30/124	. . . Stellarators	40/68	. . Protective or switching arrangements for superconducting elements or equipment
30/126	. . . Other reactors with MPC	40/69	. . Current limitation using superconducting elements, including multifunctional current limiters
30/128	. . . First wall, divertor, blanket	40/70	. Systems integrating technologies related to power network operation and communication or information technologies for improving the carbon footprint of electrical power generation, transmission or distribution, i.e. smart grids as climate change mitigation technology in the energy generation sector (smart grids relating to the energy generation sector in general, including the technologies with no associated climate change mitigation effect Y04S 10/00) {not used, see subgroups}
30/14	. . Inertial plasma confinement	40/72	. . Systems characterised by the monitoring, control or operation of energy generation units, e.g. distributed generation [DER] or load-side generation
30/16	. . . Injection systems and targets	40/74	. . Systems characterised by the monitoring, control or operation of flexible AC transmission systems [FACTS] or power factor or reactive power compensating or correcting units
30/18	. . Low temperature fusion, e.g. "cold fusion"	40/76	. . Computing methods or systems for efficient or low carbon management or operation of electric power systems
30/30	. Nuclear fission reactors	50/00	Technologies for the production of fuel of non-fossil origin
30/31	. . Boiling water reactors	50/10	. Biofuels
30/32	. . Pressurized water reactors	50/11	. . CHP turbines for biofeed
30/33	. . Gas cooled reactors	50/12	. . Gas turbines for biofeed
30/34	. . Fast breeder reactors	50/13	. . Bio-diesel
30/35	. . Liquid metal reactors	50/14	. . Bio-pyrolysis
30/36	. . Pebble bed reactors	50/15	. . Torrefaction of biomass
30/37	. . Accelerator driven reactors	50/16	. . Cellulosic bio-ethanol
30/38	. . Fuel	50/17	. . Grain bio-ethanol
30/39	. . Control of nuclear reactions	50/18	. . Bio-alcohols produced by other means than fermentation
30/40	. . Other aspects relating to nuclear fission	50/30	. Fuel from waste
40/00	Technologies for an efficient electrical power generation, transmission or distribution	50/32	. . Synthesis of alcohols or diesel from waste including a pyrolysis and/or gasification step
40/10	. Flexible AC transmission systems [FACTS]	50/34	. . Methane (not used, see subgroups)
40/12	. . Static VAR compensators [SVC], static VAR generators [SVG] or static VAR systems [SVS], including thyristor-controlled reactors [TCR], thyristor-switched reactors [TSR] or thyristor-switched capacitors [TSC]	50/343	. . . production by fermentation of organic by-products, e.g. sludge
40/14	. . Thyristor-controlled series capacitors [TCSC]	50/346	. . . from landfill gas
40/16	. . Static synchronous compensators [STATCOM]	60/00	Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation
40/18	. . Unified power flow controllers [UPF] or controlled series voltage compensators	60/10	. Energy storage (not used, see subgroups)
40/20	. Active power filtering [APF] (not used, see subgroups)	60/12	. . Battery technology
40/22	. . Non-specified or voltage-fed active power filters	60/122	. . . Lithium-ion batteries
40/24	. . Current-fed active power filters	60/124	. . . Alkaline secondary batteries, e.g. NiCd or NiMH
40/26	. . using a multilevel or multicell converter	60/126	. . . Lead-acid batteries
40/30	. Reactive power compensation (Y02E 40/10 , Y02E 40/20 take precedence)	60/128	. . . Hybrid cells
40/32	. . using synchronous generators	60/13	. . Ultracapacitors, supercapacitors, double-layer capacitors
40/34	. . for voltage regulation	60/14	. . Thermal storage (empty, covered by subgroups)
40/40	. Arrangements for reducing harmonics (Y02E 40/10 - Y02E 40/30 take precedence)	60/142	. . . Sensible heat storage
40/50	. Arrangements for eliminating or reducing asymmetry in polyphase networks		
40/60	. Superconducting electric elements or equipment or power systems integrating superconducting elements or equipment		
40/62	. . Superconducting generators		
40/622	. . . Superconducting synchronous generators		
40/625 with a superconducting rotor		
40/627	. . . Superconducting homopolar generators		
40/64	. . Superconducting transmission lines or power lines or cables or installations thereof		
40/641	. . . characterised by their form		
40/642 Films or wires on bases or cores		
40/644 Multifilaments embedded in normal conductors		
40/645	. . . characterised by the disposition of thermal insulation		
40/647	. . . characterised by cooling		
40/648	. . . Installation of superconducting cables or lines		
40/66	. . Superconducting transformers or inductors		

- 60/145 . . . Latent heat storage
- 60/147 . . . Cold storage
- 60/15 . . Pressurised fluid storage
- 60/16 . . Mechanical energy storage, e.g. flywheels
- 60/17 . . Pumped storage
- 60/30 . Hydrogen technology (not used, see subgroups)
- 60/32 . . Hydrogen storage
- 60/321 . . . Storage of liquefied, solidified, or compressed hydrogen in containers
- 60/322 . . . Storage in caverns
- 60/324 . . . Reversible uptake of hydrogen by an appropriate medium
- 60/325 the medium being carbon
- 60/327 the medium being a metal or rare earth metal, an intermetallic compound or a metal alloy
- 60/328 the medium being an organic compound or a solution thereof
- 60/34 . . Hydrogen distribution
- 60/36 . . Hydrogen production from non-carbon containing sources
- 60/362 . . . by chemical reaction with metal hydrides, e.g. hydrolysis of metal borohydrides
- 60/364 . . . by decomposition of inorganic compounds, e.g. splitting of water other than electrolysis, ammonia borane, ammonia
- 60/366 . . . by electrolysis of water
- 60/368 by photo-electrolysis
- 60/50 . Fuel cells
- 60/52 . . characterised by type or design
- 60/521 . . . Proton Exchange Membrane Fuel Cells [PEMFC]
- 60/522 Direct Alcohol Fuel Cells [DAFC]
- 60/523 Direct Methanol Fuel Cells [DMFC]
- 60/525 . . . Solid Oxide Fuel Cells [SOFC]
- 60/526 . . . Molten Carbamate Fuel Cells [MCFC]
- 60/527 . . . Bio Fuel Cells
- 60/528 . . . Regenerative or indirect fuel cells, e.g. redox flow type batteries
- 60/56 . . integrally combined with other energy production systems
- 60/563 . . . Cogeneration of mechanical energy, e.g. integral combination of fuel cells and electric motors
- 60/566 . . . Production of chemical products inside the fuel cell; incomplete combustion
- 60/60 . Arrangements for transfer of electric power between AC networks via a high-tension DC link, HVDC transmission
- 60/70 . Systems integrating technologies related to power network operation and communication or information technologies mediating in the improvement of the carbon footprint of electrical power generation, transmission or distribution, i.e. smart grids as enabling technology in the energy generation sector (smart grids relating to the energy generation sector in general, including the technologies with no associated climate change mitigation effect Y04S 10/00) {not used, see subgroups}
- 60/72 . . Systems characterised by the monitored, controlled or operated power network elements or equipments {not used, see subgroups}
- 60/721 . . . the elements or equipments being or involving electricity based vehicles, i.e. power aggregation of electric vehicles [EV] or hybrid vehicles [HEV] (remote or cooperative charging Y02T 90/168; details associated with the interoperability in the section of transportation, e.g. vehicle recognition, authentication, identification or billing Y02T 90/169)
- 60/722 . . . the elements or equipments being or involving energy storage units (for systems comprising uninterruptible power supplies or standby generators Y04S 20/12)
- 60/723 . . . the elements or equipments being or involving electric power substations
- 60/724 . . . the elements or equipments being or involving switches, relays or circuit breakers, e.g. intelligent electronic devices [IED]
- 60/725 . . . the elements or equipments being or involving protection elements, arrangements or systems
- 60/726 . . . the elements or equipments being or involving voltage regulating units
- 60/727 . . . the elements or equipments being or involving measuring units
- 60/728 the elements or equipments being or involving phasor measuring units [PMU]
- 60/74 . . Systems characterised by state monitoring, e.g. fault, temperature monitoring, insulator monitoring, corona discharge
- 60/76 . . Computer aided design [CAD]; Simulation; Modelling
- 60/78 . . Communication technology specific aspects (not used, see subgroups)
- 60/7807 . . . 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)
- 60/7815 using the power network as support for the transmission
- 60/7823 using pulsed signals
- 60/783 using modification of a parameter of the network power signal
- 60/7838 using a data transmission bus
- 60/7846 using phone lines
- 60/7853 using wireless data transmission
- 60/7861 By means of mobile telephony
- 60/7869 using Internet
- 60/7876 . . . Aspects related to the treatment or conditioning of data or signals {not used, see subgroups}
- 60/7884 Associated with communication via dedicated transmission supports
- 60/7892 Associated with communication via power transmission network
- 70/00 Other energy conversion or management systems reducing GHG emissions**
- 70/10 . Hydrogen from electrolysis with energy of non-fossil origin, e.g. PV, wind power, nuclear
- 70/20 . Systems combining fuel cells with production of fuel of non-fossil origin
- 70/30 . Systems combining energy storage with energy generation of non-fossil origin

- 70/40
- Energy efficient batteries, ultracapacitors, supercapacitors or double-layer capacitors charging or discharging systems or methods, e.g. auxiliary power consumption reduction, resonant chargers or dischargers, resistive losses minimisation