

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)

Y02P CLIMATE CHANGE MITIGATION TECHNOLOGIES IN THE PRODUCTION OR PROCESSING OF GOODS

NOTE

This subclass covers climate change mitigation technologies in any kind of industrial processing or production activity, including the agroalimentary industry, agriculture, fishing, ranching and the like.

10/00	Technologies related to metal processing	10/259	. . . . in electric arc furnaces
10/10	. Reduction of greenhouse gas [GHG] emissions	10/262	. . . . in electrolytic cells
10/12	. . CO ₂	10/265	. . . by heat recovery
10/122	. . . by capturing CO ₂	10/268	. . . . with by-product gas in energy cycle
10/124	. . . . Recycling of CO ₂ -rich gas	10/271	. . . . . low temperature heat recovery
10/126	. . . . Recycling of CO ₂ -lean gas	10/274	. . . . . medium temperature heat recovery
10/128	. . . . Oxycombustion	10/277	. . . . . high temperature heat recovery
10/13	. . . . Post-combustion	10/28	. . . . using by-product gases
10/132	. . . . CO ₂ storage	10/283	. . . . using water, e.g. for cooling
10/134	. . . by CO ₂ avoidance	10/286	. . . by process control or by modelling
10/136	. . . . using hydrogen, e.g. H ₂	10/29	. . . Additive manufacturing
10/138	. . . . Electrolysis	10/292	. . . . of casting moulds
10/14	. . Greenhouse gases [GHG] other than CO ₂	10/295	. . . . of metals
10/143	. . . Methane [CH ₄]	10/30	. . characterised by the energy source
10/146	. . . Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Sulfur hexafluoride [SF ₆]	10/32	. . . the energy source being renewable
		10/34	. . . Cogeneration with other industries
10/20	. Process efficiency	20/00	Technologies relating to chemical industry
10/21	. . by recovering materials	20/10	. General improvement of production processes causing greenhouse gases [GHG] emissions
10/212	. . . Recovering metals from waste	20/12	. . Energy input
10/214	. . . . by pyro metallurgy	20/121	. . . Energy efficiency measures, e.g. energy management
10/216	. . . . . of Fe	20/122	. . . . characterised by the type of apparatus
10/218	. . . . . of Al	20/123	. . . . . Motor systems
10/22	. . . . . of Cu	20/124	. . . . . Boilers, furnaces, lighting or vacuum systems
10/224	. . . . . of Co or Ni	20/125	. . . . Process integration
10/226	. . . . . of Mg	20/126	. . . . Membrane separation
10/228	. . . . . of Sn	20/127	. . . . Reactive distillation
10/23	. . . . . of refractory metals	20/128	. . . Alternative fuel sources, e.g. for process heat or steam
10/232	. . . . . of Zn or ZnO	20/129	. . . Energy recovery
10/234	. . . . by hydro metallurgy	20/13	. . . . Cogeneration
10/236	. . . . . of Cu	20/131	. . . . Pressure recovery turbines
10/238	. . . . by means other than pyro metallurgy or hydro metallurgy	20/132	. . . . H ₂ recovery
10/24	. . . . . powder metallurgy	20/133	. . . Renewable energy sources
10/242	. . . Slag reuse in metallurgical processes	20/134	. . . . Sunlight
10/25	. . by increasing the energy efficiency of the process	20/135	. . . . . Photoelectrochemical processes
10/253	. . . using induction furnaces		
10/256	. . . Design or operational measures for increasing the efficiency of electric conversion		

20/136	. . . . of biological origin, e.g. biomass, biofuels, biogas	20/59	. . Biological synthesis; Biological purification
20/14	. . Reagents; Educts; Products	30/00	Technologies relating to oil refining and petrochemical industry
20/141	. . . Feedstock	30/10	. Reduction of greenhouse gas [GHG] emissions during production processes
20/142	. . . . the feedstock being CO ₂	30/20	. Bio-feedstock
20/143	. . . . the feedstock being recycled plastics	30/30	. Carbon capture or storage [CCS] specific to hydrogen production
20/144	. . . . . to generate syngas, i.e. H ₂ + CO	30/40	. Ethylene production
20/145	. . . . the feedstock being materials of biological origin	30/42	. . using bio-feedstock
20/146	. . . Changing the product type or product distribution	30/44	. . Cracking, e.g. steam cracking
20/147	. . . Using materials efficiently	30/442	. . . Furnace or cracking tube materials, e.g. chemical composition of the tubes; Controlling or regulating the tube furnaces
20/148	. . . . Recycling	30/444	. . . Cogeneration using furnace exhaust
20/149	. . . . Reduced process losses	30/446	. . . Catalytic cracking
20/15	. . . . Reduced transportation losses	30/46	. . Separation
20/151	. . . Reduction of greenhouse gas [GHG] emissions	30/462	. . . using low temperature distillation
20/152	. . . . CO ₂	30/464	. . . using absorption or adsorption techniques
20/153	. . . . N ₂ O	30/48	. . Compression
20/154	. . . . Halogenated hydrocarbons	40/00	Technologies relating to the processing of minerals
20/155	. . . . . Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Hydrochlorofluorocarbons [HCFC]; Chlorofluorocarbons [CFC]	40/10	. Production of cement
20/156	. . . . Methane [CH ₄]	40/12	. . Clinker production
20/20	. Improvements relating to chlorine production	40/121	. . . Energy efficiency measures, e.g. improving or optimising the production methods
20/22	. . Optimization of Deacon process	40/123	. . . . Integrated production plants
20/224	. . . by process design	40/125	. . . Fuels from renewable energy sources
20/228	. . . by improving the materials, e.g. gauze composition or structure	40/126	. . . . Waste
20/30	. Improvements relating to adipic acid or caprolactam production	40/128	. . . . Biomass
20/32	. . Technologies aiming at reducing N ₂ O emissions	40/14	. . Reduction of clinker content in cement
20/324	. . . by thermal destruction of N ₂ O	40/141	. . . Blended cements
20/328	. . . by catalytic reduction of N ₂ O	40/143	. . . . Clinker replacement by slag
20/40	. Improvements relating to chlorodifluoromethane [HCFC-22] production	40/145	. . . . Clinker replacement by combustion residues
20/42	. . Reducing fluoroform [HFC-23] emissions	40/146	. . . . Clinker replacement by ground limestone
20/424	. . . by capture and subsequent thermal oxidation	40/148	. . . Belite cements
20/50	. Improvements relating to the production of products other than chlorine, adipic acid, caprolactam, or chlorodifluoromethane, e.g. bulk or fine chemicals or pharmaceuticals	40/16	. . Non-limestone based cements, e.g. alkali-activated cements
20/51	. . Bulk chemicals	40/165	. . . Geopolymers
20/514	. . . Aldehydes; Alcohols	40/18	. . Carbon capture and storage [CCS]
20/518	. . . Hydrocyanation products, e.g. adipodinitrile	40/20	. Cement grinding
20/52	. . using catalysts, e.g. selective catalysts	40/30	. Manufacturing or processing of sand or stone
20/54	. . characterised by the solvent	40/40	. Production or processing of lime
20/542	. . . the solvent being an ionic liquid	40/42	. . Limestone calcination
20/544	. . . Supercritical solvents, e.g. supercritical H ₂ O or CO ₂	40/44	. . Regeneration of lime in pulp and sugar mills
20/546	. . . Mixtures of ionic liquids and supercritical solvents	40/45	. . using fuels from renewable energy sources
20/55	. . Synthetic design, e.g. reducing the use of auxiliary or protecting groups	40/47	. . Reduction of lime consumption, e.g. in sugar industry
20/57	. . Efficient separation techniques	40/49	. . . Limestone grinding
20/572	. . . Membranes	40/50	. Glass production
20/58	. . Recycling	40/51	. . Producing or shaping of glass
20/582	. . . of unreacted starting or intermediate materials	40/52	. . Use of cullet or other waste
20/584	. . . of catalysts	40/53	. . Reusing waste heat during processing or shaping
20/586	. . . of reagents, e.g. co-catalysts, adjuvants	40/535	. . . Regenerative heating
20/588	. . . involving immobilised starting materials, reagents or catalysts	40/55	. . Oxy-fuel
		40/56	. . Batch or cullet pre-heating
		40/57	. . Reduction of reject rates; Improving the yield
		40/58	. . Fuels from renewable energy sources
		40/59	. . CO ₂ capture, e.g. for large oxy-fuel furnaces
		40/60	. Production of ceramic materials or ceramic elements

40/61	. . Manufacturing of materials for construction, e.g. beams, bricks or tiles	60/62	. . Fishing equipment
40/615	. . . Bricks made from lime and sand	60/64	. . Aquaculture; Aquafarming
40/63	. . Improving processing, storage or transport systems	60/642	. . . combined with aquaponics or hydroponics
40/65	. . Improving kilns	60/70	. Apiculture
40/67	. . Fuels from renewable energy sources	60/80	. Food processing
40/69	. . Substitution of clay or shale by alternative raw materials, e.g. ashes	60/81	. . Use of renewable energies or variable speed drives in handling, conveying or stacking
60/00	Technologies relating to agriculture, livestock or agroalimentary industries	60/83	. . Warming or cooking
60/10	. Agricultural machinery or equipment	60/831	. . . using steam
60/12	. . using renewable energies	60/833	. . . using microwave ovens
60/122	. . . for irrigation, e.g. solar water pumping	60/835	. . . by boiling
60/124	. . . Collecting solar energy in greenhouses	. . Food storage or conservation	
60/14	. . Measures for saving energy	60/851	. . . Cooling, refrigeration or freezing
60/141	. . . in irrigation, i.e. motor control	60/853	. . . Drying
60/142	. . . Reduction of fuel consumption	60/855	. . . Ice production, e.g. for conservation purposes
60/144	. . . Combined machines, e.g. seeder combined with fertilizers	60/87	. . Re-use of by-products of food processing for fodder production
60/146	. . . in greenhouses	60/871	. . . from molasses
60/147	. . . . Heating, ventilation or air conditioning	60/873	. . . from distillers' or brewers' waste
60/148	. . . . Constructive measures, e.g. light structures or improved insulation	60/875	. . . from waste products of dairy plants
60/149	. . . . Efficient lighting, e.g. LED lighting	60/877	. . . from by-products of vegetal origin
60/15	. . . in preparing or milling grain	60/89	. . characterised by the product
60/16	. . Machines for direct seeding, i.e. sod or grassland seeding	60/891	. . . Dairy products
60/18	. . Activities not otherwise provided for, e.g. storage	70/00	Climate change mitigation technologies in the production process for final industrial or consumer products
60/20	. Reduction of greenhouse gas [GHG] emissions in agriculture	70/10	. Greenhouse gas [GHG] capture, material saving, heat recovery or other energy efficient measures, e.g. motor control, characterised by manufacturing processes
60/21	. . N ₂ O	70/12	. . related technologies for improving processes or machines for shaping products
60/212	. . . Reducing the use of fertilizers	70/121	. . . Machines for rolling metal, e.g. rolling mills
60/214	. . . . Efficient applying machines	70/123	. . . . Motor control
60/215	. . . . Efficient spraying methods	70/125	. . . . Removing fumes from rolling mills
60/216	. . . . Aquaponics or hydroponics	70/127	. . . . using heat shields
60/218	. . . use of additives, e.g. nitrification inhibitors, biochar	70/129	. . . . Heat recovery during rolling
60/22	. . Reducing methane [CH ₄] emissions from agricultural lands, e.g. from rice paddies	70/131	. . . . using liquid recovering devices
60/23	. . Reduction of CO ₂ emissions from biota and soils	70/133	. . . . . for recovering coolants
60/24	. . Enhancing carbon sequestration in biota and soils	70/135	. . . . . for recovering lubricants
60/242	. . . Roof greening	70/137	. . . relating to forging, hammering, pressing or riveting
60/244	. . . Wall greening	70/139	. . . relating to the manufacture or working of metal sheets or profiles
60/246	. . . Use of plant growth regulators to improve carbon dioxide up-take by crop plants	70/141	. . . relating to pressing processes or machines therefore
60/247	. . . Plants with high carbon sequestration potential	70/143	. . . . Optimisation of energy consumption
60/25	. . Biomass with low greenhouse gas [GHG] emissions	70/145	. . . . . by control of drive motors
60/30	. Land use policy measures	70/16	. . related technologies for metal working by removing or adding material
60/40	. Afforestation or reforestation	70/161	. . . Power management, e.g. limiting power to tools
60/50	. Livestock or poultry management	70/163	. . . Power down for energy saving
60/52	. . use of renewable energies	70/167	. . . relating to the design or operation of machining centres or machine tools
60/521	. . . Solar lighting, e.g. for poultry	70/169	. . . . using minimal quantities of coolants or lubricants
60/524	. . . for pumping or supplying water to livestock	70/171	. . . . Devices or processes for removing and reusing chips
60/526	. . . for electric energy supply	70/173	. . . . Machine centres provided for turning, boring or milling
60/528	. . . . for electric livestock fences		
60/54	. . Environmental control in livestock or poultry housing		
60/542	. . . using renewable energy		
60/56	. . Methane [CH ₄] capture		
60/60	. Fishing		

70/175	. . . relating to the design or operation of machines for dry cutting gears or toothed racks	70/58	. . Greenhouse gas [GHG] capture, heat recovery or other energy efficient measures relating to manufacturing or assembling of vehicles, e.g. motor control
70/177	. . . Grinding or polishing	70/585	. . . Aircraft Eco design, i.e. taking into account the full life cycle of the aircraft including re-use, recyclability and disposal
70/179	. . . . Treatment of used abrasive materials aiming at a further reuse	70/60	. . Greenhouse gas [GHG] capture, heat recovery or other energy efficient measures relating to production or assembly of electric or electronic components or products, e.g. motor control
70/181	. . . relating to the design or operation of machines for soldering, welding or cutting by applying heat locally	70/601	. . . the product being a basic electric component or element, i.e. cables, resistors, capacitors, switches, connectors, relays or protections
70/183	. . . relating to the design or operation of machines for machines for sawing, cutting, perforating, punching or severing	70/603	. . . the product being a lighting component
70/185	. . . relating to the operation of machines combining different processes for working of metal	70/605	. . . the product being a semiconductor or solid state device or parts thereof
70/187	. . . relating to the design or operation of machines for working metal not otherwise provided for	70/607	. . . . Manufacturing of electronic silicon based components
70/20	. . related technologies for printing, lining or stamping machines	70/609	. . . the product being a dynamo-electric machine, i.e. electrical generators or motors
70/22	. . Technologies for working on wood, veneer or plywood	70/611	. . . the product being a printed circuit board [PCB]
70/24	. . related technologies for saving energy and raw materials during the production of paper or paper articles	70/613	. . . involving the assembly of several electronic elements
70/26	. . related technologies for working on or processing of plastics	70/62	. . related technologies for production or treatment of textile or flexible materials or products thereof, including footwear
70/261	. . . recovering energy or power from drive motors in injection moulding	70/621	. . . Production or treatment of artificial filaments or the like
70/263	. . . recovering energy or reusing materials in extrusion moulding	70/623	. . . . Energy efficient measures, e.g. motor control or heat recovery
70/265	. . . relating to blow moulding	70/625	. . . . Recovery of starting material, waste material or solvents during the manufacturing process
70/267	. . . . Means for recycling or reusing auxiliaries or materials	70/627	. . . . . of cellulose, cellulose derivatives or proteins
70/269	. . . . reducing blowing fluid consumption	70/629	. . . . . of synthetic polymers
70/271	. . . . . by recycling blow fluid	70/631	. . . Production or treatment of lace, e.g. knitting or braiding
70/273	. . . . . recycling reactive gas	70/633	. . . . Saving materials
70/275	. . . . . reusing heat	70/635	. . . . Saving energy by reducing inertia of moving parts
70/277	. . . relating to thermoforming	70/637	. . . Treatment of textiles
70/279	. . . . Recycling or reuse of materials	70/639	. . . . Energy efficient measures, e.g. motor control or heat recovery
70/281	. . . . Reuse of pressure or vacuum	70/641	. . . . . Recovery of solvents
70/30	. . related to technologies for conveying, packing or storing of goods or handling thin or filamentary material	70/643	. . . . . Treatment of textiles using a short bath ratio
70/32	. . relating to mixing	70/645	. . . Manufacturing of wall or floor covering materials or the like
70/34	. . relating to separation, flotation or differential sedimentation	70/647	. . . . Energy efficient measures, e.g. motor control or heat recovery
70/36	. . Recycling or reuse of a liquid sprayed or atomised	70/649	. . . . using scraps or recycled materials
70/38	. . Apparatus or processes for applying liquids or other fluent materials	70/651	. . . . . the materials being particles
70/40	. . Drying by removing liquid	70/653	. . . Footwear made at least partially of recyclable material
70/405	. . . Drying with heating arrangements using waste heat	70/66	. . Greenhouse gas [GHG] capture, use of renewable energies, heat recovery or other energy efficient measures for manufacturing or preparation of tobacco products, e.g. motor control
70/50	. Manufacturing or production processes characterised by the final manufactured product		
70/52	. . Manufacturing of products or systems for producing renewable energy		
70/521	. . . Photovoltaic generators		
70/523	. . . Wind turbines		
70/525	. . . Hydropower turbines		
70/527	. . . . for tidal streams or dam-less hydropower, e.g. sea flood and ebb or stream current		
70/54	. . Manufacturing of lithium-ion, lead-acid or alkaline secondary batteries		
70/56	. . Manufacturing of fuel cells		

80/00 Climate change mitigation technologies for sector-wide applications

- 80/10 . Efficient use of energy
- 80/11 . . of electric energy

80/112	. . . Power supplies with power electronics for efficient use of energy, e.g. power factor correction [PFC] or resonant converters	90/30	. Computing systems specially adapted for manufacturing
80/114	. . . Control systems or methods for efficient use of energy	90/40	. Fuel cell technologies in production processes
80/116	. . . . Electronic drive motor controls	90/45	. Hydrogen technologies in production processes
80/12	. . using compressed air as energy carrier, e.g. for pneumatic systems	90/50	. Energy storage in industry with an added climate change mitigation effect
80/13	. . using pressurized fluid as energy carrier, e.g. for hydraulic systems	90/60	. Electric or hybrid propulsion means for production processes
80/14	. . District level solutions, i.e. local energy networks	90/70	. Combining sequestration of CO ₂ and exploitation of hydrocarbons by injecting CO ₂ or carbonated water in oil wells
80/15	. . On-site combined power, heat or cool generation or distribution, e.g. combined heat and power [CHP] supply	90/80	. Management or planning
80/152	. . . for heat recovery	90/82	. . Energy audits or management systems therefor
80/154	. . . for steam generation or distribution	90/84	. . Greenhouse gas [GHG] management systems
80/156	. . in fluid distribution systems	90/845	. . . Inventory and reporting systems for greenhouse gases [GHG]
80/158	. . . Solar or wind-powered water pumping not specially adapted for irrigation	90/86	. . Maintenance planning
80/20	. Sector-wide applications using renewable energy	90/90	. Financial instruments for climate change mitigation, e.g. environmental taxes, subsidies or financing
80/21	. . Biomass as fuel	90/95	. . CO ₂ emission certificates or credits trading
80/22	. . Wind energy		
80/23	. . Solar energy		
80/24	. . . Solar thermal energy		
80/25	. . . Photovoltaic energy		
80/30	. Reducing waste in manufacturing processes; Calculations of released waste quantities		
80/40	. Minimising material used in manufacturing processes		
90/00	Enabling technologies with a potential contribution to greenhouse gas [GHG] emissions mitigation		
90/02	. Total factory control, e.g. smart factories, flexible manufacturing systems [FMS] or integrated manufacturing systems [IMS]		
90/04	. . characterised by the assembly processes		
90/06	. . characterised by direct numerical control [DNC]		
90/08	. . characterised by the cooperation between machine tools, manipulators or work piece supply systems		
90/083	. . . Manipulators cooperating with conveyors		
90/087	. . . Manipulators cooperating with machine tools		
90/10	. . characterised by identification, e.g. of work pieces or equipment		
90/12	. . characterised by programme execution		
90/14	. . characterised by fault tolerance, reliability of production system		
90/16	. . characterised by system universality, i.e. configurability or modularity of production units		
90/18	. . characterised by the network communication		
90/185	. . . using local area networks [LAN]		
90/20	. . characterised by job scheduling, process planning or material flow		
90/205	. . . Tool management		
90/22	. . characterised by quality surveillance of production		
90/24	. . characterised by computer integrated manufacturing [CIM], planning or realisation		
90/26	. . characterised by modelling or simulation of the manufacturing system		
90/265	. . . Product design therefor		
90/28	. . characterised by transport systems		
90/285	. . . using automatic guided vehicles [AGV]		