

CPC COOPERATIVE PATENT CLASSIFICATION

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

- 10/10 . Reduction of greenhouse gas [GHG] emissions
- 10/12 . . CO₂
- 10/122 . . . by capturing CO₂
- 10/124 Recycling of CO₂-rich gas
- 10/126 Recycling of CO₂-lean gas
- 10/128 Oxycombustion
- 10/13 Post-combustion
- 10/132 CO₂ storage
- 10/134 . . . by CO₂ avoidance
- 10/136 using hydrogen, e.g. H₂
- 10/138 Electrolysis
- 10/14 . . Greenhouse gases [GHG] other than CO₂
- 10/143 . . . Methane [CH₄]
- 10/146 . . . Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Sulfur hexafluoride [SF₆]
- 10/20 . Process efficiency
- 10/21 . . by recovering materials
- 10/212 . . . Recovering metals from waste
- 10/214 by pyro metallurgy
- 10/216 of Fe
- 10/218 of Al
- 10/22 of Cu
- 10/224 of Co or Ni
- 10/226 of Mg
- 10/228 of Sn
- 10/23 of refractory metals
- 10/232 of Zn or ZnO
- 10/234 by hydro metallurgy
- 10/236 of Cu
- 10/238 by means other than pyro metallurgy or hydro metallurgy
- 10/24 powder metallurgy
- 10/242 . . . Slag reuse in metallurgical processes
- 10/25 . . by increasing the energy efficiency of the process
- 10/253 . . . using induction furnaces
- 10/256 . . . Design or operational measures for increasing the efficiency of electric conversion
- 10/259 in electric arc furnaces
- 10/262 in electrolytic cells
- 10/265 . . . by heat recovery
- 10/268 with by-product gas in energy cycle
- 10/271 low temperature heat recovery
- 10/274 medium temperature heat recovery
- 10/277 high temperature heat recovery
- 10/28 using by-product gases
- 10/283 using water, e.g. for cooling
- 10/286 . . . by process control or by modelling
- 10/29 . . . Additive manufacturing
- 10/292 of casting moulds

- 10/295 of metals
- 10/30 . . characterised by the energy source
- 10/32 . . . the energy source being renewable
- 10/34 . . . Cogeneration with other industries

20/00 Technologies relating to chemical industry

- 20/10 . General improvement of production processes causing greenhouse gases [GHG] emissions
- 20/12 . . Energy input
- 20/121 . . . Energy efficiency measures, e.g. energy management
- 20/122 characterised by the type of apparatus
- 20/123 Motor systems
- 20/124 Boilers, furnaces, lighting or vacuum systems
- 20/125 Process integration
- 20/126 Membrane separation
- 20/127 Reactive distillation
- 20/128 . . . Alternative fuel sources, e.g. for process heat or steam
- 20/129 . . . Energy recovery
- 20/13 Cogeneration
- 20/131 Pressure recovery turbines
- 20/132 H₂ recovery
- 20/133 . . . Renewable energy sources
- 20/134 Sunlight
- 20/135 Photoelectrochemical processes
- 20/136 of biological origin, e.g. biomass, biofuels, biogas
- 20/14 . . Reagents; Educts; Products
- 20/141 . . . Feedstock
- 20/142 the feedstock being CO₂
- 20/143 the feedstock being recycled plastics
- 20/144 to generate syngas, i.e. H₂ + CO
- 20/145 the feedstock being materials of biological origin
- 20/146 . . . Changing the product type or product distribution
- 20/147 . . . Using materials efficiently
- 20/148 Recycling
- 20/149 Reduced process losses
- 20/15 Reduced transportation losses
- 20/151 . . . Reduction of greenhouse gas [GHG] emissions
- 20/152 CO₂
- 20/153 N₂O
- 20/154 Halogenated hydrocarbons
- 20/155 Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Hydrochlorofluorocarbons [HCFC]; Chlorofluorocarbons [CFC]
- 20/156 Methane [CH₄]

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
20/59	. . Biological synthesis; Biological purification	40/56	. . Batch or cullet pre-heating
30/00	Technologies relating to oil refining and petrochemical industry	40/57	. . Reduction of reject rates; Improving the yield
30/10	. Reduction of greenhouse gas [GHG] emissions during production processes	40/58	. . Fuels from renewable energy sources
30/20	. Bio-feedstock	40/59	. . CO ₂ capture, e.g. for large oxy-fuel furnaces
30/30	. Carbon capture or storage [CCS] specific to hydrogen production	40/60	. Production of ceramic materials or ceramic elements
30/40	. Ethylene production	40/61	. . Manufacturing of materials for construction, e.g. beams, bricks or tiles
30/42	. . using bio-feedstock	40/615	. . . Bricks made from lime and sand
30/44	. . Cracking, e.g. steam cracking	40/63	. . Improving processing, storage or transport systems
30/442	. . . Furnace or cracking tube materials, e.g. chemical composition of the tubes; Controlling or regulating the tube furnaces	40/65	. . Improving kilns
30/444	. . . Cogeneration using furnace exhaust	40/67	. . Fuels from renewable energy sources
30/446	. . . Catalytic cracking	40/69	. . Substitution of clay or shale by alternative raw materials, e.g. ashes
30/46	. . Separation	60/00	Technologies relating to agriculture, livestock or agroalimentary industries
30/462	. . . using low temperature distillation	60/10	. Agricultural machinery or equipment
30/464	. . . using absorption or adsorption techniques	60/12	. . using renewable energies
30/48	. . Compression	60/122	. . . for irrigation, e.g. solar water pumping
40/00	Technologies relating to the processing of minerals	60/124	. . . Collecting solar energy in greenhouses
40/10	. Production of cement	60/14	. . Measures for saving energy
40/12	. . Clinker production	60/141	. . . in irrigation, i.e. motor control
		60/142	. . . Reduction of fuel consumption
		60/144	. . . Combined machines, e.g. seeder combined with fertilizers
		60/146	. . . in greenhouses
		60/147	. . . . Heating, ventilation or air conditioning
		60/148	. . . . Constructive measures, e.g. light structures or improved insulation
		60/149	. . . . Efficient lighting, e.g. LED lighting

60/15	. . . in preparing or milling grain	70/00	Climate change mitigation technologies in the production process for final industrial or consumer products
60/16	. . Machines for direct seeding, i.e. sod or grassland seeding	70/10	. Greenhouse gas [GHG] capture, material saving, heat recovery or other energy efficient measures, e.g. motor control, characterised by manufacturing processes
60/18	. . Activities not otherwise provided for, e.g. storage	70/12	. . related technologies for improving processes or machines for shaping products
60/20	. Reduction of greenhouse gas [GHG] emissions in agriculture	70/121	. . . Machines for rolling metal, e.g. rolling mills
60/21	. . N ₂ O	70/123	. . . . Motor control
60/212	. . . Reducing the use of fertilizers	70/125	. . . . Removing fumes from rolling mills
60/214	. . . . Efficient applying machines	70/127	. . . . using heat shields
60/215	. . . . Efficient spraying methods	70/129	. . . . Heat recovery during rolling
60/216	. . . . Aquaponics or hydroponics	70/131	. . . . using liquid recovering devices
60/218	. . . use of additives, e.g. nitrification inhibitors, biochar	70/133	. . . . . for recovering coolants
60/22	. . Reducing methane [CH ₄] emissions from agricultural lands, e.g. from rice paddies	70/135	. . . . . for recovering lubricants
60/23	. . Reduction of CO ₂ emissions from biota and soils	70/137	. . . relating to forging, hammering, pressing or riveting
60/24	. . Enhancing carbon sequestration in biota and soils	70/139	. . . relating to the manufacture or working of metal sheets or profiles
60/242	. . . Roof greening	70/141	. . . relating to pressing processes or machines therefore
60/244	. . . Wall greening	70/143	. . . . Optimisation of energy consumption
60/246	. . . Use of plant growth regulators to improve carbon dioxide up-take by crop plants	70/145	. . . . . by control of drive motors
60/247	. . . Plants with high carbon sequestration potential	70/16	. . related technologies for metal working by removing or adding material
60/25	. . Biomass with low greenhouse gas [GHG] emissions	70/161	. . . Power management, e.g. limiting power to tools
60/30	. Land use policy measures	70/163	. . . Power down for energy saving
60/40	. Afforestation or reforestation	70/167	. . . relating to the design or operation of machining centres or machine tools
60/50	. Livestock or poultry management	70/169	. . . . using minimal quantities of coolants or lubricants
60/52	. . use of renewable energies	70/171	. . . . Devices or processes for removing and reusing chips
60/521	. . . Solar lighting, e.g. for poultry	70/173	. . . . Machine centres provided for turning, boring or milling
60/524	. . . for pumping or supplying water to livestock	70/175	. . . relating to the design or operation of machines for dry cutting gears or toothed racks
60/526	. . . for electric energy supply	70/177	. . . Grinding or polishing
60/528	. . . . for electric livestock fences	70/179	. . . . Treatment of used abrasive materials aiming at a further reuse
60/54	. . Environmental control in livestock or poultry housing	70/181	. . . relating to the design or operation of machines for soldering, welding or cutting by applying heat locally
60/542	. . . using renewable energy	70/183	. . . relating to the design or operation of machines for machines for sawing, cutting, perforating, punching or severing
60/56	. . Methane [CH ₄] capture	70/185	. . . relating to the operation of machines combining different processes for working of metal
60/60	. Fishing	70/187	. . . relating to the design or operation of machines for working metal not otherwise provided for
60/62	. . Fishing equipment	70/20	. . related technologies for printing, lining or stamping machines
60/64	. . Aquaculture; Aquafarming	70/22	. . Technologies for working on wood, veneer or plywood
60/642	. . . combined with aquaponics or hydroponics	70/24	. . related technologies for saving energy and raw materials during the production of paper or paper articles
60/70	. Apiculture	70/26	. . related technologies for working on or processing of plastics
60/80	. Food processing		
60/81	. . Use of renewable energies or variable speed drives in handling, conveying or stacking		
60/83	. . Warming or cooking		
60/831	. . . using steam		
60/833	. . . using microwave ovens		
60/835	. . . by boiling		
60/85	. . Food storage or conservation		
60/851	. . . Cooling, refrigeration or freezing		
60/853	. . . Drying		
60/855	. . . Ice production, e.g. for conservation purposes		
60/87	. . Re-use of by-products of food processing for fodder production		
60/871	. . . from molasses		
60/873	. . . from distillers' or brewers' waste		
60/875	. . . from waste products of dairy plants		
60/877	. . . from by-products of vegetal origin		
60/89	. . characterised by the product		
60/891	. . . Dairy products		

70/261	. . . recovering energy or power from drive motors in injection moulding	70/62	. . related technologies for production or treatment of textile or flexible materials or products thereof, including footwear
70/263	. . . recovering energy or reusing materials in extrusion moulding	70/621	. . . Production or treatment of artificial filaments or the like
70/265	. . . relating to blow moulding	70/623	. . . . Energy efficient measures, e.g. motor control or heat recovery
70/267	. . . . Means for recycling or reusing auxiliaries or materials	70/625	. . . . Recovery of starting material, waste material or solvents during the manufacturing process
70/269	. . . . reducing blowing fluid consumption	70/627	. . . . . of cellulose, cellulose derivatives or proteins
70/271	. . . . . by recycling blow fluid	70/629	. . . . . of synthetic polymers
70/273	. . . . recycling reactive gas	70/631	. . . Production or treatment of lace, e.g. knitting or braiding
70/275	. . . . reusing heat	70/633	. . . . Saving materials
70/277	. . . relating to thermoforming	70/635	. . . . Saving energy by reducing inertia of moving parts
70/279	. . . . Recycling or reuse of materials	70/637	. . . Treatment of textiles
70/281	. . . . Reuse of pressure or vacuum	70/639	. . . . Energy efficient measures, e.g. motor control or heat recovery
70/30	. . related to technologies for conveying, packing or storing of goods or handling thin or filamentary material	70/641	. . . . Recovery of solvents
70/32	. . relating to mixing	70/643	. . . . Treatment of textiles using a short bath ratio
70/34	. . relating to separation, flotation or differential sedimentation	70/645	. . . Manufacturing of wall or floor covering materials or the like
70/36	. . Recycling or reuse of a liquid sprayed or atomised	70/647	. . . . Energy efficient measures, e.g. motor control or heat recovery
70/38	. . Apparatus or processes for applying liquids or other fluent materials	70/649	. . . . using scraps or recycled materials
70/40	. . Drying by removing liquid	70/651	. . . . . the materials being particles
70/405	. . . Drying with heating arrangements using waste heat	70/653	. . . Footwear made at least partially of recyclable material
70/50	. Manufacturing or production processes characterised by the final manufactured product	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
70/52	. . Manufacturing of products or systems for producing renewable energy	80/00	Climate change mitigation technologies for sector-wide applications
70/521	. . . Photovoltaic generators	80/10	. Efficient use of energy
70/523	. . . Wind turbines	80/11	. . of electric energy
70/525	. . . Hydropower turbines	80/112	. . . Power supplies with power electronics for efficient use of energy, e.g. power factor correction [PFC] or resonant converters
70/527	. . . . for tidal streams or dam-less hydropower, e.g. sea flood and ebb or stream current	80/114	. . . Control systems or methods for efficient use of energy
70/54	. . Manufacturing of lithium-ion, lead-acid or alkaline secondary batteries	80/116	. . . . Electronic drive motor controls
70/56	. . Manufacturing of fuel cells	80/12	. . using compressed air as energy carrier, e.g. for pneumatic systems
70/58	. . Greenhouse gas [GHG] capture, heat recovery or other energy efficient measures relating to manufacturing or assembling of vehicles, e.g. motor control	80/13	. . using pressurized fluid as energy carrier, e.g. for hydraulic systems
70/585	. . . Aircraft Eco design, i.e. taking into account the full life cycle of the aircraft including re-use, recyclability and disposal	80/14	. . District level solutions, i.e. local energy networks
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	80/15	. . On-site combined power, heat or cool generation or distribution, e.g. combined heat and power [CHP] supply
70/601	. . . the product being a basic electric component or element, i.e. cables, resistors, capacitors, switches, connectors, relays or protections	80/152	. . . for heat recovery
70/603	. . . the product being a lighting component	80/154	. . . for steam generation or distribution
70/605	. . . the product being a semiconductor or solid state device or parts thereof	80/156	. . in fluid distribution systems
70/607	. . . . Manufacturing of electronic silicon based components	80/158	. . . Solar or wind-powered water pumping not specially adapted for irrigation
70/609	. . . the product being a dynamo-electric machine, i.e. electrical generators or motors	80/20	. Sector-wide applications using renewable energy
70/611	. . . the product being a printed circuit board [PCB]	80/21	. . Biomass as fuel
70/613	. . . involving the assembly of several electronic elements	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]
- 90/30 . Computing systems specially adapted for manufacturing
- 90/40 . Fuel cell technologies in production processes
- 90/45 . Hydrogen technologies in production processes
- 90/50 . Energy storage in industry with an added climate change mitigation effect
- 90/60 . Electric or hybrid propulsion means for production processes
- 90/70 . Combining sequestration of CO₂ and exploitation of hydrocarbons by injecting CO₂ or carbonated water in oil wells
- 90/80 . Management or planning
- 90/82 . . Energy audits or management systems therefor
- 90/84 . . Greenhouse gas [GHG] management systems
- 90/845 . . . Inventory and reporting systems for greenhouse gases [GHG]
- 90/86 . . Maintenance planning
- 90/90 . Financial instruments for climate change mitigation, e.g. environmental taxes, subsidies or financing
- 90/95 . . CO₂ emission certificates or credits trading