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 . . CO_2
10/122 . . . by capturing CO_2
10/124 . . . . Recycling of CO_2-rich gas
10/126 . . . . Recycling of CO_2-lean gas
10/128 . . . . Oxycombustion
10/13 . . . . Post-combustion
10/132 . . . . CO_2 storage
10/134 . . . by CO_2 avoidance
10/136 . . . . using hydrogen, e.g. H_2
10/138 . . . . Electrolysis
10/14 . . Greenhouse gases [GHG] other than CO_2
10/143 . . . Methane [CH_4]
10/146 . . . Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Sulfur hexafluoride [SF_6]
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 . . . . H_2 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 CO_2
20/143 . . . . the feedstock being recycled plastics
20/144 . . . . . to generate syngas, i.e. H_2 + 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 . . . . CO_2
20/153 . . . . N_2O
20/154 . . . . Halogenated hydrocarbons
20/155 . . . . . Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Hydrochlorofluorocarbons [HCFC]; Chlorofluorocarbons [CFC]
20/156 . . . . Methane [CH_4]

20/20 . Improvements relating to chlorine production
20/22 . . Optimization of Deacon process
20/224 . . . by process design
20/228 . . . by improving the materials, e.g. gauze composition or structure
20/30 . Improvements relating to adipic acid or caprolactam production
20/32 . . Technologies aiming at reducing N_2O emissions
20/324 . . . by thermal destruction of N_2O
20/328 . . . by catalytic reduction of N_2O
20/40 . Improvements relating to chlorodifluoromethane [HCFC-22] production
20/42 . . Reducing fluoroform [HFC-23] emissions
20/424 . . . by capture and subsequent thermal oxidation
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
20/51 . . Bulk chemicals
20/514 . . . Aldehydes; Alcohols
20/518 . . . Hydrocyanation products, e.g. adipodinitrile
20/52 . . using catalysts, e.g. selective catalysts
20/54 . . characterised by the solvent
20/542 . . . the solvent being an ionic liquid
20/544 . . . Supercritical solvents, e.g. supercritical H_2O or CO_2
20/546 . . . Mixtures of ionic liquids and supercritical solvents
20/55 . . Synthetic design, e.g. reducing the use of auxiliary or protecting groups
20/57 . . Efficient separation techniques
20/572 . . . Membranes
20/58 . . Recycling
20/582 . . . of unreacted starting or intermediate materials
20/584 . . . of catalysts
20/586 . . . of reagents, e.g. co-catalysts, adjuvants
20/588 . . . involving immobilised starting materials, reagents or catalysts
20/59 . . Biological synthesis; Biological purification

30/00 Technologies relating to oil refining and petrochemical industry

30/10 . Reduction of greenhouse gas [GHG] emissions during production processes
30/20 . Bio-feedstock
30/30 . Carbon capture or storage [CCS] specific to hydrogen production
30/40 . Ethylene production
30/42 . . using bio-feedstock
30/44 . . Cracking, e.g. steam cracking
30/442 . . . Furnace or cracking tube materials, e.g. chemical composition of the tubes; Controlling or regulating the tube furnaces
30/444 . . . Cogeneration using furnace exhaust
30/446 . . . Catalytic cracking
30/46 . . Separation
30/462 . . . using low temperature distillation
30/464 . . . using absorption or adsorption techniques
30/48 . . Compression

40/00 Technologies relating to the processing of minerals

40/10 . Production of cement
40/12 . . Clinker production
40/121 . . . Energy efficiency measures, e.g. improving or optimising the production methods
40/123 . . . . Integrated production plants
40/125 . . . Fuels from renewable energy sources
40/126 . . . . Waste
40/128 . . . . Biomass
40/14 . . Reduction of clinker content in cement
40/141 . . . Blended cements
40/143 . . . . Clinker replacement by slag
40/145 . . . . Clinker replacement by combustion residues
40/146 . . . . Clinker replacement by ground limestone
40/148 . . . Belite cements
40/16 . . Non-limestone based cements, e.g. alkali-activated cements
40/165 . . . Geopolymers
40/18 . . Carbon capture and storage [CCS]
40/20 . Cement grinding
40/30 . Manufacturing or processing of sand or stone
40/40 . Production or processing of lime
40/42 . . Limestone calcination
40/44 . . Regeneration of lime in pulp and sugar mills
40/45 . . using fuels from renewable energy sources
40/47 . . Reduction of lime consumption, e.g. in sugar industry
40/49 . . . Limestone grinding
40/50 . Glass production
40/51 . . Producing or shaping of glass
40/52 . . Use of cullet or other waste
40/53 . . Reusing waste heat during processing or shaping
40/535 . . . Regenerative heating
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
40/615 . . . Bricks made from lime and sand
40/63 . . Improving processing, storage or transport systems
40/65 . . Improving kilns
40/67 . . Fuels from renewable energy sources
40/69 . . Substitution of clay or shale by alternative raw materials, e.g. ashes

60/00 Technologies relating to agriculture, livestock or agroalimentary industries

60/10 . Agricultural machinery or equipment
60/12 . . using renewable energies
60/122 . . . for irrigation, e.g. solar water pumping
60/124 . . . Collecting solar energy in greenhouses
60/14 . . Measures for saving energy
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
60/16 . . Machines for direct seeding, i.e. sod or grassland seeding
60/18 . . Activities not otherwise provided for, e.g. storage
60/20 . Reduction of greenhouse gas [GHG] emissions in agriculture
60/21 . . N_2O
60/212 . . . Reducing the use of fertilizers
60/214 . . . . Efficient applying machines
60/215 . . . . Efficient spraying methods
60/216 . . . . Aquaponics or hydroponics
60/218 . . . use of additives, e.g. nitrification inhibitors, biochar
60/22 . . Reducing methane [CH_4] emissions from agricultural lands, e.g. from rice paddies
60/23 . . Reduction of CO_2 emissions from biota and soils
60/24 . . Enhancing carbon sequestration in biota and soils
60/242 . . . Roof greening
60/244 . . . Wall greening
60/246 . . . Use of plant growth regulators to improve carbon dioxide up-take by crop plants
60/247 . . . Plants with high carbon sequestration potential
60/25 . . Biomass with low greenhouse gas [GHG] emissions
60/30 . Land use policy measures
60/40 . Afforestation or reforestation
60/50 . Livestock or poultry management
60/52 . . use of renewable energies
60/521 . . . Solar lighting, e.g. for poultry
60/524 . . . for pumping or supplying water to livestock
60/526 . . . for electric energy supply
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
60/62 . . Fishing equipment
60/64 . . Aquaculture; Aquafarming
60/642 . . . combined with aquaponics or hydroponics
60/70 . Apiculture
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

70/00 Climate change mitigation technologies in the production process for final industrial or consumer products

70/10 . Greenhouse gas [GHG] capture, material saving, heat recovery or other energy efficient measures, e.g. motor control, characterised by manufacturing processes
70/12 . . related technologies for improving processes or machines for shaping products
70/121 . . . Machines for rolling metal, e.g. rolling mills
70/123 . . . . Motor control
70/125 . . . . Removing fumes from rolling mills
70/127 . . . . using heat shields
70/129 . . . . Heat recovery during rolling
70/131 . . . . using liquid recovering devices
70/133 . . . . . for recovering coolants
70/135 . . . . . for recovering lubricants
70/137 . . . relating to forging, hammering, pressing or riveting
70/139 . . . relating to the manufacture or working of metal sheets or profiles
70/141 . . . relating to pressing processes or machines therefore
70/143 . . . . Optimisation of energy consumption
70/145 . . . . . by control of drive motors
70/16 . . related technologies for metal working by removing or adding material
70/161 . . . Power management, e.g. limiting power to tools
70/163 . . . Power down for energy saving
70/167 . . . relating to the design or operation of machining centres or machine tools
70/169 . . . . using minimal quantities of coolants or lubricants
70/171 . . . . Devices or processes for removing and reusing chips
70/173 . . . . Machine centres provided for turning, boring or milling
70/175 . . . relating to the design or operation of machines for dry cutting gears or toothed racks
70/177 . . . Grinding or polishing
70/179 . . . . Treatment of used abrasive materials aiming at a further reuse
70/181 . . . relating to the design or operation of machines for soldering, welding or cutting by applying heat locally
70/183 . . . relating to the design or operation of machines for machines for sawing, cutting, perforating, punching or severing
70/185 . . . relating to the operation of machines combining different processes for working of metal
70/187 . . . relating to the design or operation of machines for working metal not otherwise provided for
70/20 . . related technologies for printing, lining or stamping machines
70/22 . . Technologies for working on wood, veneer or plywood
70/24 . . related technologies for saving energy and raw materials during the production of paper or paper articles
70/26 . . related technologies for working on or processing of plastics

70/261 . . . recovering energy or power from drive motors in injection moulding
70/263 . . . recovering energy or reusing materials in extrusion moulding
70/265 . . . relating to blow moulding
70/267 . . . . Means for recycling or reusing auxiliaries or materials
70/269 . . . . reducing blowing fluid consumption
70/271 . . . . . by recycling blow fluid
70/273 . . . . recycling reactive gas
70/275 . . . . reusing heat
70/277 . . . relating to thermoforming
70/279 . . . . Recycling or reuse of materials
70/281 . . . . Reuse of pressure or vacuum
70/30 . . related to technologies for conveying, packing or storing of goods or handling thin or filamentary material
70/32 . . relating to mixing
70/34 . . relating to separation, flotation or differential sedimentation
70/36 . . Recycling or reuse of a liquid sprayed or atomised
70/38 . . Apparatus or processes for applying liquids or other fluent materials
70/40 . . Drying by removing liquid
70/405 . . . Drying with heating arrangements using waste heat
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
70/58 . . Greenhouse gas [GHG] capture, heat recovery or other energy efficient measures relating to manufacturing or assembling of vehicles, e.g. motor control
70/585 . . . Aircraft Eco design, i.e. taking into account the full life cycle of the aircraft including re-use, recyclability and disposal
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
70/601 . . . the product being a basic electric component or element, i.e. cables, resistors, capacitors, switches, connectors, relays or protections
70/603 . . . the product being a lighting component
70/605 . . . the product being a semiconductor or solid state device or parts thereof
70/607 . . . . Manufacturing of electronic silicon based components
70/609 . . . the product being a dynamo-electric machine, i.e. electrical generators or motors
70/611 . . . the product being a printed circuit board [PCB]
70/613 . . . involving the assembly of several electronic elements
70/62 . . related technologies for production or treatment of textile or flexible materials or products thereof, including footwear
70/621 . . . Production or treatment of artificial filaments or the like
70/623 . . . . Energy efficient measures, e.g. motor control or heat recovery
70/625 . . . . Recovery of starting material, waste material or solvents during the manufacturing process
70/627 . . . . . of cellulose, cellulose derivatives or proteins
70/629 . . . . . of synthetic polymers
70/631 . . . Production or treatment of lace, e.g. knitting or braiding
70/633 . . . . Saving materials
70/635 . . . . Saving energy by reducing inertia of moving parts
70/637 . . . Treatment of textiles
70/639 . . . . Energy efficient measures, e.g. motor control or heat recovery
70/641 . . . . Recovery of solvents
70/643 . . . . Treatment of textiles using a short bath ratio
70/645 . . . Manufacturing of wall or floor covering materials or the like
70/647 . . . . Energy efficient measures, e.g. motor control or heat recovery
70/649 . . . . using scraps or recycled materials
70/651 . . . . . the materials being particles
70/653 . . . Footwear made at least partially of recyclable material
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

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
80/114 . . . Control systems or methods for efficient use of energy
80/116 . . . . Electronic drive motor controls
80/12 . . using compressed air as energy carrier, e.g. for pneumatic systems
80/13 . . using pressurized fluid as energy carrier, e.g. for hydraulic systems
80/14 . . District level solutions, i.e. local energy networks
80/15 . . On-site combined power, heat or cool generation or distribution, e.g. combined heat and power [CHP] supply
80/152 . . . for heat recovery
80/154 . . . for steam generation or distribution
80/156 . . in fluid distribution systems
80/158 . . . Solar or wind-powered water pumping not specially adapted for irrigation
80/20 . Sector-wide applications using renewable energy
80/21 . . Biomass as fuel
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 CO_2 and exploitation of hydrocarbons by injecting CO_2 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 . . CO_2 emission certificates or credits trading