Patent search strategies for the identification of selected environment-related technologies (ENV-TECH), climate change adaptation technologies, and similar technologies relevant for the ocean economy

ENVIRONMENT-RELATED TECHNOLOGIES (groups 1-8):

1. ENVIRONMENTAL MANAGEMENT
   1.1. AIR POLLUTION ABATEMENT
       1.1.1. Emissions abatement from stationary sources (e.g. SOx, NOx, PM emissions from combustion plants)
       1.1.2. Emissions abatement from mobile sources (e.g. NOx, CO, HC, PM emissions from motor vehicles)
       1.1.3. Air pollution abatement - Not elsewhere classified
   1.2. WATER POLLUTION ABATEMENT
       1.2.1. Water and wastewater treatment
       1.2.2. Fertilizers from wastewater
       1.2.3. Oil spill and pollutant clean-up
   1.3. WASTE MANAGEMENT
       1.3.1. Solid waste collection
       1.3.2. Material recovery, recycling and re-use
       1.3.3. Fertilizers from waste
       1.3.4. Incineration and energy recovery
       1.3.5. Landfilling [n.a.]
       1.3.6. Waste management - Not elsewhere classified
   1.4. SOIL REMEDIATION
   1.5. ENVIRONMENTAL MONITORING

CLIMATE CHANGE MITIGATION

2. CLIMATE CHANGE MITIGATION technologies related to ENERGY generation, transmission or distribution
   2.1. RENEWABLE ENERGY GENERATION
       2.1.1. Wind energy
       2.1.2. Solar thermal energy
       2.1.3. Solar photovoltaic (PV) energy
       2.1.4. Solar thermal-PV hybrids
       2.1.5. Geothermal energy
       2.1.6. Marine energy, e.g. using wave energy or salinity gradient
       2.1.7. Hydro energy
   2.2. ENERGY GENERATION FROM FUELS OF NON-FOSSIL ORIGIN
       2.2.1. Biofuels, e.g. bio-diesel
       2.2.2. Fuel from waste, e.g. synthetic alcohol or diesel
   2.3. COMBUSTION TECHNOLOGIES WITH MITIGATION POTENTIAL (e.g. using fossil fuels, biomass, waste, etc.)
       2.3.1. Technologies for improved output efficiency (combined heat and power, combined cycles, etc.)
       2.3.2. Technologies for improved input efficiency (efficient combustion or heat usage)
   2.4. NUCLEAR ENERGY
       2.4.1. Nuclear fusion reactors
       2.4.2. Nuclear fission reactors
   2.5. TECHNOLOGIES FOR AN EFFICIENT ELECTRICAL POWER GENERATION, TRANSMISSION OR DISTRIBUTION
       2.5.1. Superconducting electric elements or equipment
       2.5.2. Smart grids as climate change mitigation technology in the energy generation sector
       2.5.3. Not elsewhere classified
   2.6. ENABLING TECHNOLOGIES (TECHNOLOGIES WITH POTENTIAL OR INDIRECT CONTRIBUTION TO GHG EMISSION MITIGATION)
       2.6.1. Energy storage
       2.6.1.1. Batteries
       2.6.1.2. Capacitors
       2.6.1.3. Thermal energy storage
       2.6.1.4. Mechanical energy storage, e.g. flywheels or pressurised fluids
       2.6.2. Hydrogen technology
       2.6.3. Fuel cells
       2.6.4. High-voltage direct current transmission
   2.7. OTHER ENERGY CONVERSION OR MANAGEMENT SYSTEMS REDUCING GHG EMISSIONS
3. **CAPTURE, STORAGE, SEQUESTRATION OR DISPOSAL OF GREENHOUSE GASES**
   3.1. Capture or disposal of nitrous oxide (N₂O)
   3.2. Capture or disposal of methane (CH₄)
   3.3. Capture or disposal of perfluorocarbons [PFC], hydrofluorocarbons [HFC] or sulfur hexafluoride [SF₆]
   3.4. Capture or disposal of carbon dioxide (CO₂)

4. **CLIMATE CHANGE MITIGATION technologies related to TRANSPORTATION**
   4.1. **ROAD TRANSPORT**
      4.1.1. Conventional vehicles (based on internal combustion engine)
      4.1.2. Hybrid vehicles
      4.1.3. Electric vehicles
      4.1.4. Fuel efficiency-improving vehicle design (common to all road vehicles)
   4.2. **RAIL TRANSPORT**
   4.3. **AERONAUTICS OR AIR TRANSPORT**
   4.4. **MARITIME OR WATERWAYS TRANSPORT**
   4.5. **ENABLING TECHNOLOGIES IN TRANSPORT**¹
      4.5.1. Electric vehicle charging
      4.5.2. Application of hydrogen technology to transportation, e.g. using fuel cells

5. **CLIMATE CHANGE MITIGATION technologies related to BUILDINGS**
   5.1. **INTEGRATION OF RENEWABLE ENERGY SOURCES IN BUILDINGS**
   5.2. **ENERGY EFFICIENCY IN BUILDINGS**
      5.2.1. Energy efficiency lighting
      5.2.2. Energy efficiency heating, ventilation or air conditioning [HVAC]
      5.2.3. Energy efficiency in home appliances
      5.2.4. Energy efficient elevators, escalators and moving walkways, e.g. energy saving or recuperation technologies
      5.2.5. End-user side
   5.3. **ARCHITECTURAL OR CONSTRUCTIONAL ELEMENTS IMPROVING THE THERMAL PERFORMANCE OF BUILDINGS**
   5.4. **ENABLING TECHNOLOGIES IN BUILDINGS**¹

6. **CLIMATE CHANGE MITIGATION technologies related to WASTEWATER TREATMENT OR WASTE MANAGEMENT**
   6.1. **WASTEWATER TREATMENT**
   6.2. **SOLID WASTE MANAGEMENT**
      6.2.1. Waste collection, transportation, transfer or storage
      6.2.2. Waste processing or separation
      6.2.3. Landfill technologies aiming to mitigate methane emissions
      6.2.4. Bio-organic fraction processing; Production of fertilisers from the organic fraction of waste or refuse
      6.2.5. Reuse, recycling or recovery technologies
         6.2.5.1. Mechanical processing of waste for the recovery of materials, e.g. crushing, shredding, separation or disassembly
         6.2.5.2. Waste management of vehicles
         6.2.5.3. Construction or demolition [C&D] waste
         6.2.5.4. Glass recycling
         6.2.5.5. Plastics and rubber recycling
         6.2.5.6. Paper recycling
         6.2.5.7. Disintegrating fibre-containing textile articles to obtain fibres for re-use
         6.2.5.8. Recovery of fats, fatty oils, fatty acids or other fatty substances, e.g. lanolin or waxes
         6.2.5.9. Recycling of wood or furniture waste
         6.2.5.10. Packaging reuse or recycling, e.g. of multilayer packaging
         6.2.5.11. Recycling of waste of electrical or electronic equipment (WEEE)
         6.2.5.12. Recycling of batteries or fuel cells
         6.2.5.13. Use of waste materials as fillers for mortars or concrete
   6.3. **ENABLING TECHNOLOGIES**¹

7. **CLIMATE CHANGE MITIGATION technologies in the PRODUCTION OR PROCESSING OF GOODS**
   7.1. **TECHNOLOGIES RELATED TO METAL PROCESSING**
      7.1.1. Reduction of greenhouse gas [GHG] emissions
      7.1.2. Process efficiency
   7.2. **TECHNOLOGIES RELATING TO CHEMICAL INDUSTRY**
      7.2.1. Process efficiency in chemical industry
      7.2.2. Feedstock
      7.2.3. Reduction of greenhouse gas emissions [GHG], e.g. CO₂
7.2.4. Improvements relating to chlorine production
7.2.5. Improvements relating to adipic acid or caprolactam production
7.2.6. Improvements relating to fluorochloro hydrocarbon, e.g. chlorodifluoromethane [HCFC-22] production
7.2.7. Improvements relating to the production of bulk chemicals

7.3. TECHNOLOGIES RELATING TO OIL REFINING AND PETROCHEMICAL INDUSTRY
7.3.1. Bio-feedstock
7.3.2. Ethylene production

7.4. TECHNOLOGIES RELATING TO THE PROCESSING OF MINERALS
7.4.1. Production of cement
7.4.2. Production or processing of lime
7.4.3. Glass production
7.4.4. Production of ceramic materials or ceramic elements

7.5. TECHNOLOGIES RELATING TO AGRICULTURE, LIVESTOCK OR AGROALIMENTARY INDUSTRIES
7.5.1. Using renewable energies, e.g. solar water pumping
7.5.2. Measures for saving energy, e.g. in greenhouses
7.5.3. Reduction of greenhouse gases [GHG] emissions in agriculture
7.5.4. Land use policy measures
7.5.5. Afforestation or reforestation
7.5.6. Livestock or poultry management
7.5.7. Fishing; Aquaculture; Aquafarming
7.5.8. Food processing, e.g. use of renewable energies or variable speed drives in handling, conveying or stacking

7.6. TECHNOLOGIES IN THE PRODUCTION PROCESS FOR FINAL INDUSTRIAL OR CONSUMER PRODUCTS

7.7. CLIMATE CHANGE MITIGATION TECHNOLOGIES FOR SECTOR-WIDE APPLICATIONS

7.8. ENABLING TECHNOLOGIES ¹

8. CLIMATE CHANGE MITIGATION in INFORMATION AND COMMUNICATION TECHNOLOGIES [ICT]
8.1. Energy efficient computing
8.2. Energy efficiency in communication networks

¹ Enabling technologies or technologies with potential or indirect contribution to GHG emissions mitigation
CLIMATE CHANGE ADAPTATION TECHNOLOGIES:

9. CLIMATE CHANGE ADAPTATION TECHNOLOGIES

9.1. ADAPTATION AT COASTAL ZONES OR RIVER BASINS

9.1.1. Hard structures, e.g. dams, dykes or breakwaters

9.1.2. Dune restoration or creation; cliff stabilisation

9.1.3. Artificial reefs or seaweed; restoration or protection of coral reefs

9.1.4. Flood prevention; flood or storm water management

9.1.5. Controlling, monitoring or forecasting

9.2. WATER RESOURCE MANAGEMENT

9.2.1. Demand-side technologies (water conservation)

9.2.1.1 Indoor water conservation

9.2.1.2 Irrigation water conservation

9.2.1.3 Water conservation in thermoelectric power production

9.2.2. Supply-side technologies (water availability)

9.2.2.1 Water collection (rain, surface and ground-water)

9.2.2.2. Water desalination

9.2.2.3 Water storage and distribution

9.2.2.4 Water filtration; Water and wastewater treatment

9.2.2.5 Protecting water resources

9.3. ADAPTING OR PROTECTING INFRASTRUCTURE OR THEIR OPERATION

9.3.1. Extreme weather resilient electric power supply systems

9.3.2. Structural elements or technology for improving thermal insulation

9.3.3. Relating to heating, ventilation or air conditioning [HVAC] technologies

9.3.4. In transportation

9.3.5. Planning or developing urban green infrastructure

9.4. ADAPTATION TECHNOLOGIES IN AGRICULTURE, FORESTRY, LIVESTOCK OR AGROALIMENTARY PRODUCTION

9.4.1. In agriculture

9.4.2. Ecological corridors or buffer zones

9.4.3. In livestock or poultry

9.4.4. In fisheries management

9.4.5. In food processing or handling, e.g. food conservation

9.5. ADAPTATION TECHNOLOGIES IN HUMAN HEALTH PROTECTION, E.G. AGAINST EXTREME WEATHER

9.5.1. Air quality improvement or preservation

9.5.2. Against vector-borne diseases whose impact is exacerbated by climate change

9.6. TECHNOLOGIES HAVING AN INDIRECT CONTRIBUTION TO ADAPTATION TO CLIMATE CHANGE

9.6.1. Information and communication technologies [ICT] supporting adaptation to climate change, e.g. for weather forecasting or climate simulation

9.6.2. Assessment of water resources

9.6.3. Monitoring or fighting invasive species
ENVIRONMENT-RELATED AND ADAPTATION TECHNOLOGIES RELEVANT TO THE OCEAN ECONOMY:

10. SUSTAINABLE OCEAN ECONOMY
   10.1. OCEAN RENEWABLE ENERGY GENERATION
       10.1.1. Offshore wind energy
       10.1.2. Offshore solar energy
       10.1.3. Tide, wave, current and other marine energy
   10.2. OCEAN POLLUTION ABATEMENT
       10.2.1. Ballast water treatment
       10.2.2. Oil spill (and other floating debris) prevention and clean-up
   10.3. CLIMATE CHANGE MITIGATION IN MARITIME TRANSPORT
       10.3.1. Improved vessel design
       10.3.2. Fuel-efficient propulsion or fuel substitution
   10.4. CLIMATE CHANGE MITIGATION & ADAPTATION IN FISHING, AQUACULTURE AND AQUAFARMING
   10.5. DESALINATION OF SEA WATER
   10.6. CLIMATE CHANGE ADAPTATION IN COASTAL ZONES
# ENVIRONMENT-RELATED TECHNOLOGIES

## 1. ENVIRONMENTAL MANAGEMENT

### 1.1. AIR POLLUTION ABATEMENT

#### 1.1.1. Emissions abatement from stationary sources (e.g. SOx, NOx, PM emissions from combustion plants)

**Post-combustion technologies**

- Chemical or biological purification of waste gases (e.g. engine exhaust gases, smoke, fumes, flue gases or aerosols; removing sulphur oxides, nitrogen oxides, etc.)
  - IPC or CPC class: B01D53/34-965
- Incinerators or other apparatus specially adapted for consuming waste gases or noxious gases
  - IPC or CPC class: F23G7/06
- Arrangements of devices for treating smoke or fumes
  - IPC or CPC class: F23J15
- Shaft or like vertical or substantially vertical furnaces; Arrangements of dust collectors
  - IPC or CPC class: F27B1/18

**Integrated technologies**

- Blast furnaces; Dust arresters
  - IPC or CPC class: C21B7/22
- Manufacture of carbon steel, e.g. plain mild steel, medium carbon steel, or cast-steel; Removal of waste gases or dust
  - IPC or CPC class: C21C5/08
- Combustion apparatus characterised by means creating a distinct flow path for flue gases or for non-combusted gases given off by the fuel
  - IPC or CPC class: F23B80
- Combustion apparatus characterised by arrangements for returning combustion products or flue gases to the combustion chamber
  - IPC or CPC class: F23C9
- Fluidised bed combustion apparatus
  - IPC or CPC class: F23C10

#### 1.1.2. Emissions abatement from mobile sources (e.g. NOx, CO, HC, PM emissions from motor vehicles)

**Post-combustion technologies**

- Processes, apparatus or devices specially adapted for purification of engine exhaust gases
  - IPC or CPC class: B01D53/92
- ... by catalytic processes
  - IPC or CPC class: B01D53/94
- Regeneration, reactivation or recycling of reactants
  - IPC or CPC class: B01D53/96
- Catalysts comprising metals or metal oxides or hydroxides; of noble metals; of the platinum group metals
  - IPC or CPC class: B01J23/38-468
- Crankcase ventilating or breathing
  - IPC or CPC class: F01M13 - F01M2013
- Methods of operating engines involving adding non-fuel substances or anti-knock agents to combustion air, fuel, or fuel-air mixtures of engines; the substances including exhaust gas; circulation of exhaust gas in closed or semi-closed circuits.
  - IPC or CPC class: F02B47/08-10
- Controlling engines characterised by their being supplied with non-fuel gas added to combustion-air, such as the exhaust gas of engine, or having secondary air added to fuel-air mixture
  - IPC or CPC class: F02D21/06-10
- Engine-pertinent apparatus for adding exhaust gases to combustion-air, main fuel or fuel-air mixture, e.g. by exhaust gas recirculation [EGR] systems
  - IPC or CPC class: F02M26 - F02M2026
- Testing of internal-combustion engines by monitoring exhaust gases (or combustion flame)
  - IPC or CPC class: G01M15/10

**Integrated technologies**

- Methods of operating engines involving adding non-fuel substances or anti-knock agents to combustion air, fuel, or fuel-air mixtures of engines; the substances including non-airborne oxygen
  - IPC or CPC class: F02B47/06
- Electrical control of supply of combustible mixture or its constituents
  - IPC or CPC class: F02D41
- Conjoint electrical control of two or more functions, e.g. ignition, fuel-air mixture, recirculation, supercharging, exhaust-gas treatment
  - IPC or CPC class: F02D43
- Electrical control of combustion engines not provided for in F02D41-43
  - IPC or CPC class: F02D45
- Idling devices for preventing flow of idling fuel
  - IPC or CPC class: F02M302-055
- Apparatus for adding secondary air to fuel-air mixture
  - IPC or CPC class: F02M23
- Engine-pertinent apparatus for adding non-fuel substances or small quantities of secondary fuel to combustion-air, main fuel, or fuel-air mixture
  - IPC or CPC class: F02M25
- Apparatus for treating combustion-air, fuel, or fuel-air mixture, by catalysts, electric means, magnetism, rays, sonic waves, etc.
  - IPC or CPC class: F02M27
- Apparatus for thermally treating combustion-air, fuel, or fuel-air mixture
  - IPC or CPC class: F02M31/02-186
- Fuel-injection apparatus
  - IPC or CPC class: F02M39-71
- Advancing or retarding ignition; Control therefore
  - IPC or CPC class: F02P5
### 1.1.3. Air pollution abatement - Not elsewhere classified

**Post-combustion technologies**

- Filters or filtering processes specially modified for separating dispersed particles from gases or vapours [B01D46](#)
- Separating dispersed particles from gases, air or vapours by liquid as separating agent [B01D47](#)
- Separating dispersed particles from gases, air or vapours by other methods [B01D49](#)
- Combinations of devices for separating particles from gases or vapours [B01D50](#)
- Auxiliary pre-treatment of gases or vapours to be cleaned [B01D51](#)
- Separating dispersed particles from gases or vapour, e.g. air, by electrostatic effect [B03C3](#)
- Exhaust or silencing apparatus having means for purifying or rendering innocuous, or otherwise treating exhaust [F01N3](#)
- Exhaust or silencing apparatus combined or associated with devices profiting by exhaust energy [F01N5](#)
- Exhaust or silencing apparatus characterised by constructional features [F01N13](#)
- Electrical control of exhaust gas treating apparatus [F01N9](#)
- Monitoring or diagnostic devices for exhaust-gas treatment apparatus [F01N11](#)

**Integrated technologies**

- Use of additives to fuels or fires for particular purposes for reducing smoke development [C10L10/02](#)
- Use of additives to fuels or fires for particular purposes for facilitating soot removal [C10L10/06](#)

**1.2. WATER POLLUTION ABATEMENT**

All classes from 1.2.1 to 1.2.3

1.2.1. Water and wastewater treatment

- Arrangements of vessels' installations for treating waste-water or sewage, or for preventing environmental pollution not otherwise provided for [B63J4](#)
- Treatment of water, waste water, sewage or sludge [C02F](#)
- Materials for absorbing liquids to remove pollution, e.g. oil, gasoline, fat [C09K3/32](#)
- Plumbing installations for waste water [E03C1/12](#)
- Sewers – Cesspools [E03F](#)

1.2.2. Fertilizers from wastewater

- Fertilisers from waste water, sewage sludge, sea slime, ooze or similar masses [C05F7](#)

1.2.3. Oil spill and pollutant clean-up

- Devices for cleaning or keeping clear the surface of open water from oil or like floating materials by separating or removing these materials [E02B15/04-10](#)
- Tent-like structures for dealing with pollutant emissions below the water surface [E02B2015/005](#)
- Vessels or like floating structures adapted for special purposes - for collecting pollution from open water [B63B35/32](#)
- Materials for absorbing liquids to remove pollution, e.g. oil, gasoline, fat [C09K3/32](#)

1.3. WASTE MANAGEMENT

All classes from 1.3.1 to 1.3.6

1.3.1. Solid waste collection

- Removing undesirable matter, e.g. rubbish, from the land, not otherwise provided for [E01H15](#)
- Transporting; Gathering or removal of domestic or like refuse [B65F](#)

1.3.2. Material recovery, recycling and re-use

- Animal feeding-stuffs from waste material such as feathers, bones or skin; waste dairy products; hydrolysates of wood or straw; molasses; distillers' or brewers' waste [A23K10/26-28](#) [A23K10/32-33](#) [A23K10/37-38](#)
- Footwear made of rubber waste [A43B1/12](#)
- Separating solid materials; General arrangement of separating plant specially adapted for refuse [B03B9/06](#)
- Manufacture of articles from scrap or waste metal particles [B22F8](#)
- Preparing material; Recycling the material [B29B7/66](#)
- Recovery of plastics or other constituents of waste material containing plastics [B29B17](#)
- Presses specially adapted for consolidating scrap metal or for compacting used cars [B30B8/32](#)

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2 including technologies potentially applicable to both stationary and mobile sources.
<table>
<thead>
<tr>
<th>Patent Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B62D67</td>
<td>Systematic disassembly of vehicles for recovery of salvageable components, e.g. for recycling</td>
</tr>
<tr>
<td>B65H73</td>
<td>Stripping waste material from cores or formers of thin or filamentary material, e.g. to permit their re-use</td>
</tr>
<tr>
<td>B65D65/46</td>
<td>Applications of disintegrable, dissolvable or edible materials. Packaging material.</td>
</tr>
<tr>
<td>C03B1/02</td>
<td>Compacting the glass batches, e.g. pelletizing</td>
</tr>
<tr>
<td>C04B7/24-30</td>
<td>Hydraulic cements from oil shales, residues or waste other than slag</td>
</tr>
<tr>
<td>C04B11/26</td>
<td>Calcium sulfate cements starting from phosphogypsum or from waste, e.g. purification products of smoke</td>
</tr>
<tr>
<td>C04B18/04-305</td>
<td>Use of agglomerated or waste materials or refuse as fillers for mortars, concrete or artificial stone; Waste materials or Refuse</td>
</tr>
<tr>
<td>C04B33/132</td>
<td>Clay-wares; Waste materials or Refuse</td>
</tr>
<tr>
<td>C04B11/01</td>
<td>Recovery or working-up of waste materials (plastics)</td>
</tr>
<tr>
<td>C09K11/01</td>
<td>Luminescent, e.g. electroluminescent, chemiluminescent, materials; Recovery of luminescent materials</td>
</tr>
<tr>
<td>C10M175</td>
<td>Working-up used lubricants to recover useful products</td>
</tr>
<tr>
<td>C22B7</td>
<td>Working-up raw materials other than ores, e.g. scrap, to produce non-ferrous metals or compounds thereof</td>
</tr>
<tr>
<td>C22B19/28-30</td>
<td>Obtaining zinc or zinc oxide; From muffle furnace residues; From metallic residues or scraps</td>
</tr>
<tr>
<td>C22B25/06</td>
<td>Obtaining tin; From scrap, especially tin scrap</td>
</tr>
<tr>
<td>D01G11</td>
<td>Textiles; Disintegrating fibre-containing articles to obtain fibres for re-use</td>
</tr>
<tr>
<td>D21B1/08-10</td>
<td>Paper-making; Fibrous raw materials or their mechanical treatment - using waste paper</td>
</tr>
<tr>
<td>D21B1/32</td>
<td>Paper-making; Fibrous raw materials or their mechanical treatment; Delfibrating by other means - of waste paper</td>
</tr>
<tr>
<td>D21C5/02</td>
<td>Paper-making; Other processes for obtaining cellulose; Working-up waste paper</td>
</tr>
<tr>
<td>D21H17/01</td>
<td>Paper-making; Pulping; Non-fibrous material added to the pulp; Waste products</td>
</tr>
<tr>
<td>H01B15/00</td>
<td>Apparatus or processes for salvaging material from electric cables</td>
</tr>
<tr>
<td>H01J9/52</td>
<td>Recovery of material from discharge tubes or lamps</td>
</tr>
<tr>
<td>H01M6/52</td>
<td>Reclaming serviceable parts of waste cells or batteries</td>
</tr>
<tr>
<td>H01M10/54</td>
<td>Reclaming serviceable parts of waste accumulators</td>
</tr>
</tbody>
</table>

### 1.3.3. Fertilizers from waste

Organic fertilisers from waste or refuse, e.g. manure, from distillery wastes, molasses, waste water, sewage sludge, household or town refuse

### 1.3.4. Incineration and energy recovery

- Solid fuels essentially based on materials of non-mineral origin; on sewage, house, or town refuse; on industrial residues or waste materials
- Cremation furnaces; Incineration of waste; Incinerator constructions; Details, accessories or control therefor
- Cremation furnaces, incinerators or other apparatus for consuming industrial waste, e.g. chemicals

### 1.3.5. Landfilling

Note: Landfilling patents are largely covered by the CPC class B09B. However, this class also covers many aspects of recycling and incineration. Therefore, B09B is only used to generate aggregate 'waste management' counts.

### 1.3.6. Waste management – Not elsewhere classified

- Disposal of solid waste
- Production of liquid hydrocarbon mixtures from rubber or rubber waste
- Medical or veterinary science; Disinfection or sterilising methods specially adapted for refuse
- Disintegrating medical waste

### 1.4. SOIL REMEDIATION

- Reclamation of contaminated soil

### 1.5. ENVIRONMENTAL MONITORING

- Monitoring or diagnostic devices for exhaust-gas treatment apparatus
- Alarms responsive to a single specified undesired or abnormal condition and not otherwise provided for, e.g. pollution alarms; toxics

Note: This search strategy is under development, the counts generated are most likely incomplete.
### 2. CLIMATE CHANGE MITIGATION technologies related to ENERGY GENERATION, TRANSMISSION OR DISTRIBUTION  

**2.1. RENEWABLE ENERGY GENERATION**  

**2.1.1. Wind energy**  
- Wind turbines with rotation axis in wind direction
- Offshore wind turbines
- Onshore wind turbines
- Wind turbines with rotation axis perpendicular to the wind direction
- Power conversion electric or electronic aspects

**2.1.2. Solar thermal energy**  
- Heat exchange systems
- Conversion of thermal power into mechanical power, e.g. Rankine, Stirling or solar thermal engines
- Mountings or tracking

**2.1.3. Solar photovoltaic (PV) energy**

**2.1.4. Solar thermal-PV hybrids**

**2.1.5. Geothermal energy**

**2.1.6. Marine energy, e.g. using wave energy or salinity gradient**

**2.1.7. Hydro energy**

**2.2. ENERGY GENERATION FROM FUELS OF NON-FOSSIL ORIGIN**

**2.2.1. Biofuels, e.g. bio-diesel**

**2.2.2. Fuel from waste, e.g. synthetic alcohol or diesel**

**2.3. COMBUSTION TECHNOLOGIES WITH MITIGATION POTENTIAL (e.g. using fossil fuels, biomass, waste, etc.)**

**2.3.1. Technologies for improved output efficiency (combined heat and power, combined cycles, etc.)**  
- Heat utilisation in combustion or incineration of waste
- Combined heat and power generation [CHP]
- Combined cycle power plant [CCPP] or combined cycle gas turbine [CCGT]; Integrated gasification combined cycle [IGCC]; IGCC combined with carbon capture and storage [CCS]

**2.3.2. Technologies for improved input efficiency (efficient combustion or heat usage)**  
- Technologies for a more efficient combustion or heat usage
- Direct CO₂ mitigation
- Indirect CO₂ mitigation, i.e. by acting on non CO₂ directly related matters of the process, e.g. pre-heating or heat recovery

**2.4. NUCLEAR ENERGY**

**2.4.1. Nuclear fusion reactors**

**2.4.2. Nuclear fission reactors**

**2.5. TECHNOLOGIES FOR AN EFFICIENT ELECTRICAL POWER GENERATION, TRANSMISSION OR DISTRIBUTION**

**2.5.1. Superconducting electric elements or equipment**

**2.5.2. Smart grids as climate change mitigation technology in the energy generation sector**

**2.5.3. Not elsewhere classified**  
- Flexible AC transmission systems [FACTS]
- Active power filtering [APF]
- Reactive power compensation
- Arrangements for reducing harmonics
- Arrangements for eliminating or reducing asymmetry in polyphase networks

**2.6. ENABLING TECHNOLOGIES (Technologies with potential or indirect contribution to GHG emission mitigation)**
### 2.6.1. Energy storage

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries</td>
<td>Y02E60/10</td>
</tr>
<tr>
<td>Capacitors</td>
<td>Y02E60/13</td>
</tr>
<tr>
<td>Thermal energy storage</td>
<td>Y02E60/14</td>
</tr>
<tr>
<td>Mechanical energy storage, e.g. flywheels or pressurised fluids</td>
<td>Y02E60/16</td>
</tr>
</tbody>
</table>

### 2.6.2. Hydrogen technology

- Hydrogen storage
- Hydrogen distribution
- Hydrogen production from non-carbon containing sources, e.g. by water electrolysis

### 2.6.3. Fuel cells

<table>
<thead>
<tr>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y02E60/50</td>
</tr>
</tbody>
</table>

### 2.6.4. High-voltage direct current transmission

<table>
<thead>
<tr>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y02E60/60</td>
</tr>
</tbody>
</table>

### 2.6.5. Other energy conversion or management systems reducing GHG emissions

- Systems combining energy storage with energy generation of non-fossil origin

### 3. Capture, Storage, Sequestration or Disposal of Greenhouse Gases

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture or disposal of nitrous oxide (N₂O)</td>
<td>Y02C20/10</td>
</tr>
<tr>
<td>Capture or disposal of methane (CH₄)</td>
<td>Y02C20/20</td>
</tr>
<tr>
<td>Capture or disposal of perfluorocarbons (PFC), hydrofluorocarbons (HFC) or sulfur hexafluoride (SF₆)</td>
<td>Y02C20/30</td>
</tr>
<tr>
<td>Capture or disposal of carbon dioxide (CO₂)</td>
<td>Y02C20/40</td>
</tr>
</tbody>
</table>

### 4. Climate Change Mitigation technologies related to Transportation

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1. Road Transport</td>
<td>Y02T10</td>
</tr>
<tr>
<td>4.1.1. Conventional vehicles (based on internal combustion engine)</td>
<td>Y02T10/10-40</td>
</tr>
<tr>
<td>Improving ICE (internal combustion engine) efficiencies</td>
<td></td>
</tr>
<tr>
<td>Use of alternative fuels, e.g. biofuels</td>
<td></td>
</tr>
<tr>
<td>Engine management systems</td>
<td></td>
</tr>
<tr>
<td>4.1.2. Hybrid vehicles</td>
<td>Y02T10/62</td>
</tr>
<tr>
<td>Electric machine technologies in electromobility</td>
<td></td>
</tr>
<tr>
<td>Energy storage systems for electromobility, e.g. batteries</td>
<td></td>
</tr>
<tr>
<td>Electromobility specific charging systems or methods for batteries, ultracapacitors, supercapacitors or double-layer capacitors</td>
<td></td>
</tr>
<tr>
<td>Electric energy management in electromobility</td>
<td></td>
</tr>
<tr>
<td>4.1.4. Fuel efficiency-improving vehicle design (common to all road vehicles)</td>
<td>Y02T10/80</td>
</tr>
<tr>
<td>Technologies aiming to reduce greenhouse gas (GHG) emissions common to all road transportation technologies</td>
<td>Y02T10/80-92</td>
</tr>
<tr>
<td>Elements for improving aerodynamics</td>
<td></td>
</tr>
<tr>
<td>Data processing systems or methods, management, administration</td>
<td></td>
</tr>
<tr>
<td>Optimisation of rolling resistance, e.g. weight reduction; Tyres, e.g. materials; Bearings</td>
<td></td>
</tr>
<tr>
<td>Optimized components or subsystems e.g. lighting, actively controlled glasses</td>
<td></td>
</tr>
<tr>
<td>Energy harvesting concepts as power supply for auxiliaries' energy consumption e.g. photovoltaic sun-roof</td>
<td></td>
</tr>
<tr>
<td>Energy efficient charging or discharging systems for batteries, ultracapacitors, supercapacitors or double-layer capacitors specially adapted for vehicles</td>
<td></td>
</tr>
</tbody>
</table>

| 4.2. Rail Transport | Y02T30/00 |
| Transportation of goods or passengers via railways, e.g. energy recovery or reducing air resistance | |

---
### 4.3. Aeronautics or Air Transport

- Drag reduction
- Wing lift efficiency
- Weight reduction
- On board measures aiming to increase energy efficiency
- Efficient propulsion technologies and use of fuels of non-fossil origin
- Energy efficient operational measures, e.g. ground operations or mission management

### 4.4. Maritime or Waterways Transport

- Measures concerning design or construction of watercraft hulls
- Measures to reduce GHG emissions related to the propulsion system; Less carbon-intensive fuels, e.g. natural gas, biofuels, Renewable or hybrid-electric solutions

### 4.5. Enabling Technologies in Transport

#### 4.5.1. Electric vehicle charging

- Electric charging stations
- Plug-in electric vehicles
- Information or communication technologies [ICT] improving the operation of electric vehicles
- Systems integrating technologies related to power network operation and communication or information technologies for supporting the interoperability of electric or hybrid vehicles, i.e. smart-grids as interface for battery charging of electric vehicles [EV] or hybrid vehicles [HEV]

#### 4.5.2. Application of hydrogen technology to transportation, e.g. using fuel cells

### 5. Climate Change Mitigation Technologies Related to Buildings

#### 5.1. Integration of Renewable Energy Sources in Buildings

- Photovoltaic [PV]
- Solar thermal
- Wind power
- Geothermal heat-pumps
- Hydropower in dwellings
- Hybrid systems; Uninterruptible or back-up power supplies integrating renewable energies

#### 5.2. Energy Efficiency in Buildings

##### 5.2.1. Energy efficient lighting

- Semiconductor lamps, e.g. solid state lamps [SSL], light emitting diodes [LED], or organic LED [OLED]
- Control techniques providing energy savings, e.g. smart controllers or presence detection
- In street lighting

##### 5.2.2. Energy efficient heating, ventilation or air conditioning [HVAC]

- Hot water central heating systems using heat pumps
- Hot air central heating systems using heat pumps
- District heating
- Domestic hot-water supply systems using recuperated or waste heat
- 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
- Free-cooling systems
- Heat recovery units
- Absorption based systems, e.g. combined with heat or power generation [CHP], e.g. trigeneration
- Efficient control or regulation technologies, e.g. for control of refrigerant flow, motor or heating
- Passive houses; Double facade technology

##### 5.2.3. Energy efficiency in home appliances

- Technologies aiming at improving the efficiency of home appliances, e.g. induction cooking or efficient technologies for refrigerators, freezers or dish washers using renewables, e.g. solar cooking stoves, furnaces or solar heating
<table>
<thead>
<tr>
<th>5.2.4. Energy efficient elevators, escalators and moving walkways, e.g. energy saving or recuperation technologies</th>
<th>Y02B50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.2.5. End-user side</strong></td>
<td>Y02B70</td>
</tr>
<tr>
<td>Technologies for an efficient end-user side electric power management and consumption:</td>
<td></td>
</tr>
<tr>
<td>– Technologies improving the efficiency by using switched-mode power supplies, i.e. efficient power electronics conversion</td>
<td></td>
</tr>
<tr>
<td>– Systems integrating technologies related to power network operation and ICT for improving the carbon footprint, i.e. smart grids supporting the management or operation of end-user stationary applications</td>
<td></td>
</tr>
<tr>
<td>– Demand response systems, e.g. load shedding, peak shaving</td>
<td></td>
</tr>
<tr>
<td>– Smart metering supporting the carbon neutral operation of end-user applications in buildings</td>
<td></td>
</tr>
<tr>
<td><strong>5.3. ARCHITECTURAL OR CONSTRUCTIONAL ELEMENTS IMPROVING THE THERMAL PERFORMANCE OF BUILDINGS</strong></td>
<td>Y02B80</td>
</tr>
<tr>
<td>Architectural or constructional elements improving the thermal performance of buildings:</td>
<td></td>
</tr>
<tr>
<td>– Insulation (e.g. vacuum insulation, aerogel insulation)</td>
<td></td>
</tr>
<tr>
<td>– Glazing, e.g. vacuum glazing</td>
<td></td>
</tr>
<tr>
<td>– Roof garden systems</td>
<td></td>
</tr>
<tr>
<td><strong>5.4. ENABLING TECHNOLOGIES IN BUILDINGS</strong></td>
<td>Y02B90</td>
</tr>
<tr>
<td>Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation:</td>
<td></td>
</tr>
<tr>
<td>– Applications of fuel cells in buildings</td>
<td></td>
</tr>
<tr>
<td>– Smart grids as enabling technology in buildings sector (smart grids supporting the management or operation of end-user stationary applications in general, or like technologies with no associated climate change mitigation effect)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. CLIMATE CHANGE MITIGATION TECHNOLOGIES related to WASTEWATER TREATMENT OR WASTE MANAGEMENT</th>
<th>Y02W</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.1. WASTEWATER TREATMENT</strong></td>
<td>Y02W10</td>
</tr>
<tr>
<td>– Biological treatment of water, waste water, or sewage</td>
<td></td>
</tr>
<tr>
<td>– Sludge processing</td>
<td></td>
</tr>
<tr>
<td>– Wastewater or sewage treatment systems using renewable energies</td>
<td></td>
</tr>
<tr>
<td>– Valorisation of by-products of wastewater, sewage or sludge processing</td>
<td></td>
</tr>
<tr>
<td><strong>6.2. SOLID WASTE MANAGEMENT</strong></td>
<td>Y02W30</td>
</tr>
<tr>
<td>6.2.1. Waste collection, transportation, transfer or storage</td>
<td>Y02W30/10</td>
</tr>
<tr>
<td>– e.g. segregated refuse collecting, electric or hybrid propulsion</td>
<td></td>
</tr>
<tr>
<td>6.2.2. Waste processing or separation</td>
<td>Y02W30/20</td>
</tr>
<tr>
<td>6.2.3. Landfill technologies aiming to mitigate methane emissions</td>
<td>Y02W30/30</td>
</tr>
<tr>
<td>6.2.4. Bio-organic fraction processing; Production of fertilisers from the organic fraction of waste or refuse</td>
<td>Y02W30/40</td>
</tr>
<tr>
<td>6.2.5. Reuse, recycling or recovery technologies</td>
<td>Y02W30/50-91</td>
</tr>
<tr>
<td>6.2.5.1. Mechanical processing of waste for the recovery of materials, e.g. crushing, shredding, separation or disassembly</td>
<td>Y02W30/52</td>
</tr>
<tr>
<td>6.2.5.2. Waste management of vehicles</td>
<td>Y02W30/56</td>
</tr>
<tr>
<td>6.2.5.3. Construction or demolition (C&amp;D) waste</td>
<td>Y02W30/58</td>
</tr>
<tr>
<td>6.2.5.4. Glass recycling</td>
<td>Y02W30/60</td>
</tr>
<tr>
<td>6.2.5.5. Plastics and rubber recycling</td>
<td>Y02W30/62</td>
</tr>
<tr>
<td>6.2.5.6. Paper recycling</td>
<td>Y02W30/64</td>
</tr>
<tr>
<td>6.2.5.7. Disintegrating fibre-containing textile articles to obtain fibres for re-use</td>
<td>Y02W30/66</td>
</tr>
<tr>
<td>6.2.5.8. Recovery of fats, fatty oils, fatty acids or other fatty substances, e.g. tallow or waxes</td>
<td>Y02W30/74</td>
</tr>
<tr>
<td>6.2.5.9. Recycling of wood or furniture waste</td>
<td>Y02W30/78</td>
</tr>
<tr>
<td>6.2.5.10. Packaging reuse or recycling, e.g. of multilayer packaging</td>
<td>Y02W30/80</td>
</tr>
<tr>
<td>6.2.5.11. Recycling of waste of electrical or electronic equipment [WEEE]</td>
<td>Y02W30/82</td>
</tr>
<tr>
<td>6.2.5.12. Recycling of batteries or fuel cells</td>
<td>Y02W30/84</td>
</tr>
<tr>
<td>6.2.5.13. Use of waste materials as fillers for mortars or concrete</td>
<td>Y02W30/86</td>
</tr>
<tr>
<td><strong>6.3. ENABLING TECHNOLOGIES OR TECHNOLOGIES WITH A POTENTIAL OR INDIRECT CONTRIBUTION TO GHG MITIGATION</strong></td>
<td>Y02W90</td>
</tr>
<tr>
<td>– Bio-packaging (e.g. packaging containers made from renewable resources e.g. bio-plastics)</td>
<td></td>
</tr>
<tr>
<td><strong>7. CLIMATE CHANGE MITIGATION TECHNOLOGIES IN THE PRODUCTION OR PROCESSING OF GOODS</strong></td>
<td>Y02P</td>
</tr>
</tbody>
</table>
7.1. TECHNOLOGIES RELATED TO METAL PROCESSING

7.1.1. Reduction of greenhouse gas [GHG] emissions
- by capturing or storing CO₂
- by avoiding CO₂, e.g. using hydrogen
- of methane [CH₄]
- Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Sulfur hexafluoride [SF₆]

7.1.2. Process efficiency
- Recycling
- Process efficiency
- Using renewable energy sources

7.2. TECHNOLOGIES RELATING TO CHEMICAL INDUSTRY

7.2.1. Process efficiency in chemical industry
- Energy recovery, e.g. by cogeneration, recovery or pressure recovery turbines
- Renewable energy sources, e.g. sunlight

7.2.2. Feedstock
- the feedstock being recycled material, e.g. plastics
- the feedstock being materials of biological origin

7.2.3. Reduction of greenhouse gas [GHG] emissions, e.g. CO₂
- Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Hydrochlorofluorocarbons [HCFC]; Chlorofluorocarbons [CFC]
- Methane [CH₄]

7.2.4 Improvements relating to chlorine production

7.2.5 Improvements relating to adipic acid or caprolactam production

7.2.6 Improvements relating to fluorochlorohydrocarbon, e.g. chlorodifluoromethane [HCFC-22] production

7.2.7 Improvements relating to the production of bulk chemicals
- using catalysts, e.g. selective catalysts
- using solvents, e.g. supercritical solvents or ionic liquids
- Design of synthesis routes, e.g. reducing the use of auxiliary or protecting groups
- Recycling of unreacted starting or intermediate materials
- Recycling of catalysts
- Biological synthesis; Biological purification

9.3. TECHNOLOGIES RELATING TO OIL REFINING AND PETROCHEMICAL INDUSTRY

7.3.1. Bio-feedstock

7.3.2. Ethylene production

7.4. TECHNOLOGIES RELATING TO THE PROCESSING OF MINERALS

7.4.1. Production of cement
- Energy efficiency measures, e.g. improving or optimising the production methods
- Fuels from renewable energy sources, e.g. waste or biomass
- Carbon capture and storage [CCS]

7.4.2. Production or processing of lime
- e.g. limestone regeneration of lime in pulp and sugar mills
- using fuels from renewable energy sources

7.4.3. Glass production
- e.g. reusing waste heat during processing or shaping
- Improving the yield, e.g. reduction of reject rates

7.4.4. Production of ceramic materials or ceramic elements
- e.g. substitution of clay or shale by alternative raw materials, e.g. ashes

7.5. TECHNOLOGIES RELATING TO AGRICULTURE, LIVESTOCK OR AGROALIMENTARY INDUSTRIES

7.5.1. Using renewable energies, e.g. solar water pumping

7.5.2. Measures for saving energy, e.g. in green houses

7.5.3. Reduction of greenhouse gas [GHG] emissions in agriculture
- e.g. CO₂
- Dinitrogen oxide [N₂O], e.g. using aquaponics, hydroponics or efficiency measures
- Methane [CH₄], e.g. from rice paddies

7.5.4. Land use policy measures

7.5.5. Afforestation or reforestation

7.5.6. Livestock or poultry management
- use of renewable energies

7.5.7. Fishing; Aquaculture; Aquafarming

7.5.8. Food processing, e.g. use of renewable energies or variable speed drives in handling, conveying or stacking
7.6. TECHNOLOGIES IN THE PRODUCTION PROCESS FOR FINAL INDUSTRIAL OR CONSUMER PRODUCTS

- Food storage or conservation, e.g. cooling or drying
- Re-use of by-products of food processing for fodder production

7.7. CLIMATE CHANGE MITIGATION TECHNOLOGIES FOR SECTOR-WIDE APPLICATIONS

- Greenhouse gas (GHG) capture, material saving, heat recovery or other energy efficient measures, e.g. motor control, characterised by manufacturing processes, e.g. for rolling metal or metal working
- Manufacturing or production processes characterised by the final manufactured product; …related technologies for production or treatment of textile or flexible materials or products thereof, including footwear

7.8. ENABLING TECHNOLOGIES WITH A POTENTIAL CONTRIBUTION TO GHG EMISSIONS MITIGATION

- Total factory control (e.g. smart factories, flexible manufacturing systems, integrated manufacturing systems)
- Computing systems specially adapted for manufacturing
- Fuel cell technologies
- Hydrogen technologies
- Energy storage in industry with an added climate change mitigation effect
- Electric or hybrid propulsion for production processes
- Combining sequestration of CO\textsubscript{2} and exploitation of hydrocarbons by injecting CO\textsubscript{2} or carbonated water in oil wells
- Management or planning
- Financial instruments for climate change mitigation (e.g. environmental taxes, subsidies or financing; CO\textsubscript{2} emissions certificates or credits trading)

8. CLIMATE CHANGE MITIGATION IN INFORMATION AND COMMUNICATION TECHNOLOGIES [ICT] \(^3\)

8.1. Energy efficient computing

- e.g. low power processors, power management or thermal management

8.2. Energy efficiency in communication networks

- Reducing energy consumption in wire-line communication networks, e.g. low power modes or reduced link rate
- Reducing energy consumption in wireless communication networks

\(^3\) ICT technologies aiming at the reduction of their own energy use
<table>
<thead>
<tr>
<th>9. CLIMATE CHANGE ADAPTATION TECHNOLOGIES</th>
<th>IPC or CPC codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1. ADAPTATION AT COASTAL ZONES OR RIVER BASINS</td>
<td>Y02A10</td>
</tr>
<tr>
<td>9.1.1. Hard structures, e.g. dams, dykes or breakwaters</td>
<td>Y02A10/11</td>
</tr>
<tr>
<td>9.1.2. Dune restoration or creation; cliff stabilisation</td>
<td>Y02A10/23</td>
</tr>
<tr>
<td>9.1.3. Artificial reefs or seaweed; restoration or protection of coral reefs</td>
<td>Y02A10/26</td>
</tr>
<tr>
<td>9.1.4. Flood prevention; flood or storm water management</td>
<td>Y02A10/30</td>
</tr>
<tr>
<td>9.1.5. Controlling; monitoring or forecasting</td>
<td>Y02A10/40</td>
</tr>
<tr>
<td>9.2. WATER RESOURCE MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>9.2.1. Demand-side technologies (water conservation)</td>
<td></td>
</tr>
<tr>
<td>9.2.1.1 Indoor water conservation</td>
<td></td>
</tr>
<tr>
<td>Faucets and showers</td>
<td></td>
</tr>
<tr>
<td>- Self-closing valves, i.e. closing automatically after operation, in which the closing movement, either retarded or not, starts immediately after opening</td>
<td>F16K21/06-12 F16K 21/16-20</td>
</tr>
<tr>
<td>- Self-closing valves, i.e. closing automatically after operation, closing after a predetermined quantity of fluid has been delivered</td>
<td></td>
</tr>
<tr>
<td>Aeration of water</td>
<td></td>
</tr>
<tr>
<td>- Arrangement or mounting of devices, e.g. valves, for venting or aerating or draining</td>
<td>F16L55/07 E03C1/084</td>
</tr>
<tr>
<td>Sanitation (dual-flush toilets, dry toilets, closed-circuit toilets)</td>
<td></td>
</tr>
<tr>
<td>- Flushing devices discharging variable quantities of water</td>
<td>E03D3/12 E03D1/14 A47K11/12 A47K11/02 E03D13/007 E03D5/016</td>
</tr>
<tr>
<td>- Cisterns discharging variable quantities of water</td>
<td></td>
</tr>
<tr>
<td>- Urinals without flushing</td>
<td></td>
</tr>
<tr>
<td>- Dry closets</td>
<td></td>
</tr>
<tr>
<td>- Waterless or low-flush urinals</td>
<td></td>
</tr>
<tr>
<td>- Special constructions of flushing devices with recirculation of bowl-cleaning fluid</td>
<td></td>
</tr>
<tr>
<td>Greywater</td>
<td></td>
</tr>
<tr>
<td>- Greywater supply systems</td>
<td>E03B1/04</td>
</tr>
<tr>
<td>- Using grey water; using household water from wash basins or showers</td>
<td>Y02A20/146-148</td>
</tr>
<tr>
<td>9.2.1.2 Irrigation water conservation</td>
<td></td>
</tr>
<tr>
<td>Drip irrigation</td>
<td></td>
</tr>
<tr>
<td>- Watering arrangements located above the soil which make use of perforated pipe-lines or pipe-lines with dispensing fittings, e.g. for drip irrigation</td>
<td>A01G25/02 A01G25/06</td>
</tr>
<tr>
<td>- Watering arrangements making use of perforated pipe-lines located in the soil</td>
<td></td>
</tr>
<tr>
<td>Control of watering</td>
<td>A01G 25/16</td>
</tr>
<tr>
<td>Drought-resistant crops</td>
<td></td>
</tr>
<tr>
<td>- Mutation or genetic engineering; DNA or RNA concerning genetic engineering, vectors, e.g. plasmids, or their isolation, preparation or purification; for drought, cold, salt resistance</td>
<td>C12N15/8273</td>
</tr>
<tr>
<td>9.2.1.3 Water conservation in thermoelectric power production</td>
<td></td>
</tr>
<tr>
<td>- Combustion heat from one cycle heating the fluid in another cycle</td>
<td>F01K23/06-108 F01D11 Y02A20/30</td>
</tr>
<tr>
<td>- Non-positive-displacement machines or engines, e.g. steam turbines; preventing or minimizing internal leakage of working fluid, e.g. between stages</td>
<td></td>
</tr>
<tr>
<td>- Relating to industrial water supply, e.g. used for cooling</td>
<td></td>
</tr>
<tr>
<td>9.2.2. Supply-side technologies (water availability)</td>
<td></td>
</tr>
<tr>
<td>9.2.2.1 Water collection (rain, surface and ground-water)</td>
<td></td>
</tr>
<tr>
<td>Rainwater collection</td>
<td></td>
</tr>
<tr>
<td>- Methods or installations for obtaining or collecting drinking water or tap water from rainwater</td>
<td>E03B3/02 E03B3/03 Y02A20/108</td>
</tr>
<tr>
<td>- Special vessels for collecting or storing rain-water for use in the household, e.g. water-butts</td>
<td></td>
</tr>
<tr>
<td>- Rainwater harvesting</td>
<td></td>
</tr>
<tr>
<td>Surface water collection</td>
<td></td>
</tr>
<tr>
<td>- Methods or installations for drawing-off water</td>
<td>E03B9 E03B3/04; 30,36</td>
</tr>
<tr>
<td>- Methods or installations for obtaining or collecting drinking water or tap water from surface water</td>
<td></td>
</tr>
<tr>
<td>Underground water collection</td>
<td></td>
</tr>
<tr>
<td>- Use of pumping plants or installations for water supply</td>
<td>E03B5 E03B3/06-26</td>
</tr>
<tr>
<td>- Methods or installations for obtaining or collecting drinking water or tap water from underground sources</td>
<td></td>
</tr>
<tr>
<td>Not elsewhere classified</td>
<td></td>
</tr>
<tr>
<td>- Methods or installations for obtaining or collecting drinking water or tap water; rainwater, surface water, or groundwater</td>
<td>E03B3/28, 32-34, 38-40</td>
</tr>
<tr>
<td>9.2.2.2. Water desalination</td>
<td></td>
</tr>
<tr>
<td>- Reverse osmosis</td>
<td>Y02A20/124-144</td>
</tr>
</tbody>
</table>
9.2.2.3 Water storage and distribution

- Arrangements or adaptations of tanks for water supply
  - Leakage reduction or detection in water storage or distribution
  - Pipe-line systems / Protection or supervision of installations / Preventing, monitoring, or locating loss
  - Devices for covering leaks in pipes or hoses, e.g. hose-menders
  - Investigating fluid tightness of structures, by detecting the presence of fluid at the leakage point

- Water filtration: Water and wastewater treatment
  - Water filtration
  - Keeping clear the surface of open water from oil spills
  - Off-grid powered water treatment; Solar-powered water purification; Solar-powered wastewater sewage treatment, e.g. spray evaporation

9.2.2.5 Protecting water resources

- River restoration
  - Salterwater intrusion barriers
  - Aquifer recharge

9.3. ADAPTING OR PROTECTING INFRASTRUCTURE OR THEIR OPERATION

9.3.1 Extreme weather resilient electric power supply systems

9.3.2 Structural elements or technology for improving thermal insulation

9.3.3 Relating to heating, ventilation or air conditioning [HVAC] technologies

9.3.4 In transportation

9.3.5 Planning or developing urban green infrastructure

9.4. ADAPTATION TECHNOLOGIES IN AGRICULTURE, FORESTRY, LIVESTOCK OR AGROALIMENTARY PRODUCTION

9.4.1 In agriculture

- Abiotic stress: Plants tolerant to drought, salinity or heat
- Genetically modified [GMO] plants
- Fertilizer of biological origin
- Improving land use; Improving water use or availability; controlling erosion
- Greenhouse technology, e.g. cooling systems thereof
  - Specially adapted for farming or for storing agricultural or horticultural products; Using renewable energies

9.4.2 Ecological corridors or buffer zones

9.4.3 In livestock or poultry

9.4.4 In fisheries management

9.4.5 In food processing or handling, e.g. food conservation

9.5. ADAPTATION TECHNOLOGIES IN HUMAN HEALTH PROTECTION, E.G. AGAINST EXTREME WEATHER

9.5.1 Air quality improvement or preservation

9.5.2 Against vector-borne diseases whose impact is exacerbated by climate change

9.6. TECHNOLOGIES HAVING AN INDIRECT CONTRIBUTION TO ADAPTATION TO CLIMATE CHANGE

9.6.1 Information and communication technologies [ICT] supporting adaptation to climate change, e.g. for weather forecasting or climate simulation

9.6.2 Assessment of water resources

9.6.3 Monitoring or fighting invasive species
### 10.1 OCEAN RENEWABLE ENERGY GENERATION

<table>
<thead>
<tr>
<th>CPC or IPC codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10.1.1 Offshore wind energy</strong></td>
</tr>
<tr>
<td>Offshore wind turbines</td>
</tr>
<tr>
<td>Assembly, mounting or commissioning of wind motors, specially adapted for offshore installation</td>
</tr>
<tr>
<td>Components; Mounting on supporting structures or systems, offshore</td>
</tr>
<tr>
<td>Vessels or similar floating structures for converting wind energy into electric energy</td>
</tr>
<tr>
<td><strong>10.1.2 Offshore solar energy</strong></td>
</tr>
<tr>
<td>Vessels or similar floating structures for converting solar energy into electric energy</td>
</tr>
<tr>
<td><strong>10.1.3 Tide, wave, current and other marine energy</strong></td>
</tr>
<tr>
<td>Tide or wave power plants</td>
</tr>
<tr>
<td>Power stations or aggregates using wave or tide energy</td>
</tr>
<tr>
<td>Vessels or similar floating structures for converting water energy into electric energy, e.g. from tidal flows, waves or currents</td>
</tr>
<tr>
<td>Energy from the sea, e.g. using wave energy or salinity gradient</td>
</tr>
<tr>
<td>Ocean thermal energy conversion [OTEC]</td>
</tr>
</tbody>
</table>

### 10.2 OCEAN POLLUTION ABATEMENT

<table>
<thead>
<tr>
<th>CPC or IPC codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10.2.1 Ballast water treatment</strong></td>
</tr>
<tr>
<td>Treatment of wastewater, sewage or sludge originating from marine vessels, ships and boats, e.g. bilge water or ballast water</td>
</tr>
<tr>
<td>Arrangements of installations for treating ballast water, waste water, sewage, sludge, or for preventing environmental pollution from vessels</td>
</tr>
<tr>
<td>Conduits for emptying or ballasting; Self-bailing equipment; Scuppers</td>
</tr>
<tr>
<td><strong>10.2.2 Oil spill (and other floating debris) prevention and cleanup</strong></td>
</tr>
<tr>
<td>Arrangements for minimizing pollution by accidents of cargo tanks (e.g. oil leakage)</td>
</tr>
<tr>
<td>Arrangements for minimizing pollution by accidents associated with tanks for fuel or the like not forming bunkers</td>
</tr>
<tr>
<td>Arrangement of ship-based loading or unloading equipment for transfer at sea between ships or between ships and offshore structures using pipe-lines</td>
</tr>
<tr>
<td>Vessels or like floating structures adapted for collecting pollution from open water</td>
</tr>
<tr>
<td>Materials for absorbing liquids to remove pollution, e.g. oil, gasoline, fat</td>
</tr>
<tr>
<td>Collecting oil or the like from a submerged leakage</td>
</tr>
<tr>
<td>Devices for cleaning or keeping clear the surface of open water from oil or like floating materials by separating or removing these materials</td>
</tr>
<tr>
<td>Water pollution control technologies for keeping clear the surface of open water from oil spills</td>
</tr>
</tbody>
</table>

### 10.3 CLIMATE CHANGE MITIGATION IN MARITIME TRANSPORT

<table>
<thead>
<tr>
<th>CPC or IPC codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10.3.1 Improved vessel design</strong></td>
</tr>
<tr>
<td>Measures concerning design or construction of watercraft hulls</td>
</tr>
<tr>
<td><strong>10.3.2 Fuel-efficient propulsion or fuel substitution</strong></td>
</tr>
<tr>
<td>Measures to reduce GHG emissions related to the propulsion system</td>
</tr>
<tr>
<td>Less carbon-intensive fuels, e.g. natural gas, biofuels</td>
</tr>
<tr>
<td>Renewable or hybrid-electric solutions</td>
</tr>
</tbody>
</table>

### 10.4 CLIMATE CHANGE MITIGATION & ADAPTATION IN FISHING, AQUACULTURE AND AQUAFARMING

<table>
<thead>
<tr>
<th>CPC or IPC codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC mitigation technologies in fishing, aquaculture and aquafarming</td>
</tr>
<tr>
<td>CC adaptation technologies in fisheries management</td>
</tr>
<tr>
<td>Aquaculture, e.g. of fish</td>
</tr>
<tr>
<td>Alternative feeds for fish, e.g. in aquacultures</td>
</tr>
</tbody>
</table>

### 10.5 DESALINATION OF SEA WATER

<table>
<thead>
<tr>
<th>CPC or IPC codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water desalination technologies</td>
</tr>
<tr>
<td>Reverse-osmosis</td>
</tr>
<tr>
<td>Powered by a renewable energy source (e.g., wind power, solar thermal or photovoltaics, wave energy)</td>
</tr>
<tr>
<td>Desalination</td>
</tr>
</tbody>
</table>

### 10.6 CLIMATE CHANGE ADAPTATION IN COASTAL ZONES

<table>
<thead>
<tr>
<th>CPC or IPC codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technologies for adaptation to climate change at coastal zones or river basins</td>
</tr>
<tr>
<td>Hard structures, e.g. dams, dykes or breakwaters</td>
</tr>
<tr>
<td>Dune restoration or creation; Cliff stabilisation</td>
</tr>
<tr>
<td>Artificial reefs or seaweed; Restoration or protection of coral reefs</td>
</tr>
<tr>
<td>Flood prevention; Flood or storm water management, e.g. using flood barriers</td>
</tr>
<tr>
<td>Coastal water resources</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Coastal infrastructure</td>
</tr>
</tbody>
</table>