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IPC Green Inventory

1. The “IPC Green Inventory” was developed by the IPC Committee of Experts in order to facilitate searches for patent information relating to so-called Environmentally Sound Technologies (ESTs), as listed by the [United Nations Framework Convention on Climate Change \(UNFCCC\)](#).
2. ESTs are currently scattered widely across the IPC in numerous technical fields. The Inventory attempts to collect ESTs in one place, although it should be noted that the Inventory does not purport to be fully exhaustive in its coverage.
3. ESTs are presented in a hierarchical structure. Clicking on the  sign opens the hierarchy of the relevant technology. For each technology, the links in the IPC column direct the user to the corresponding place in the scheme.
4. It should be noted that each EST and its corresponding IPC place(s) do not necessarily coincide and that the EST may represent a subset of the corresponding IPC place.
5. The links in the PATENTSCOPE column allow the user to automatically search and display all international patent applications available through PATENTSCOPE which are classified in the relevant IPC place. In view of paragraph 4, above, search results may additionally include irrelevant results not relating to ESTs.
6. For IPC place ranges (e.g. Fuel cells H01M 4/86-4/98), the search result is limited to the first symbol of the range (e.g. H01M 4/86). If searching additional symbols falling in the range is desirable, this can be done either manually in PATENTSCOPE or via the IPC scheme by using the “bridge” function (“magnifying lens ” button).

TOPIC	IPC	PATENTSCOPE
 ALTERNATIVE ENERGY PRODUCTION		
 Bio-fuels		

<input type="checkbox"/> .. Solid fuels	C10L 5/00, 5/40-5/48	C10L 5/00, 5/40-5/48
... Torrefaction of biomass	C10B 53/02 C10L 5/40, 9/00	C10B 53/02 C10L 5/40, 9/00
<input type="checkbox"/> .. Liquid fuels	C10L 1/00, 1/02, 1/14	C10L 1/00, 1/02, 1/14
... Vegetable oils	C10L 1/02, 1/19	C10L 1/02, 1/19
... Biodiesel	C07C 67/00, 69/00 C10G C10L 1/02, 1/19 C11C 3/10 C12P 7/64	C07C 67/00, 69/00 C10G C10L 1/02, 1/19 C11C 3/10 C12P 7/64
... Bioethanol	C10L 1/02, 1/182 C12N 9/24 C12P 7/06-7/14	C10L 1/02, 1/182 C12N 9/24 C12P 7/06-7/14
.. Biogas	C02F 3/28, 11/04 C10L 3/00 C12M 1/107 C12P 5/02	C02F 3/28, 11/04 C10L 3/00 C12M 1/107 C12P 5/02
.. From genetically engineered organisms	C12N 1/13, 1/15, 1/21, 5/10, 15/00 A01H	C12N 1/13, 1/15, 1/21, 5/10, 15/00 A01H
. Integrated gasification combined cycle (IGCC)	C10L 3/00 F02C 3/28	C10L 3/00 F02C 3/28
<input type="checkbox"/> . Fuel cells	H01M 4/86-4/98, 8/00-8/24, 12/00-12/08	H01M 4/86-4/98, 8/00-8/24, 12/00-12/08
<input type="checkbox"/> .. Electrodes	H01M 4/86-4/98	H01M 4/86-4/98
... Inert electrodes with catalytic activity	H01M 4/86-4/98	H01M 4/86-4/98
.. Non-active parts	H01M 2/00-2/04, 8/00-8/24	H01M 2/00-2/04, 8/00-8/24
.. Within hybrid cells	H01M 12/00-12/08	H01M 12/00-12/08
. Pyrolysis or gasification of biomass	C10B 53/00 C10J	C10B 53/00 C10J
<input type="checkbox"/> . Harnessing energy from manmade waste		
<input type="checkbox"/> .. Agricultural waste	C10L 5/00	C10L 5/00

...	Fuel from animal waste and crop residues	C10L 5/42, 5/44	C10L 5/42, 5/44
...	Incinerators for field, garden or wood waste	F23G 7/00, 7/10	F23G 7/00, 7/10
..	Gasification	C10J 3/02, 3/46 F23B 90/00 F23G 5/027	C10J 3/02, 3/46 F23B 90/00 F23G 5/027
..	Chemical waste	B09B 3/00 F23G 7/00	B09B 3/00 F23G 7/00
<input type="checkbox"/>	Industrial waste	C10L 5/48 F23G 5/00, 7/00	C10L 5/48 F23G 5/00, 7/00
...	Using top gas in blast furnaces to power pig-iron production	C21B 5/06	C21B 5/06
...	Pulp liquors	D21C 11/00	D21C 11/00
...	Anaerobic digestion of industrial waste	A62D 3/02 C02F 11/04, 11/14	A62D 3/02 C02F 11/04, 11/14
...	Industrial wood waste	F23G 7/00, 7/10	F23G 7/00, 7/10
..	Hospital waste	B09B 3/00 F23G 5/00	B09B 3/00 F23G 5/00
<input type="checkbox"/>	Landfill gas	B09B	B09B
...	Separation of components	B01D 53/02, 53/04, 53/047, 53/14, 53/22, 53/24	B01D 53/02, 53/04, 53/047, 53/14, 53/22, 53/24
..	Municipal waste	C10L 5/46 F23G 5/00	C10L 5/46 F23G 5/00
<input type="checkbox"/>	Hydro energy		
<input type="checkbox"/>	Water-power plants	E02B 9/00-9/06	E02B 9/00-9/06
...	Tide or wave power plants	E02B 9/08	E02B 9/08
<input type="checkbox"/>	Machines or engines for liquids	F03B F03C	F03B F03C
...	Using wave or tide energy	F03B 13/12-13/26	F03B 13/12-13/26
..	Regulating, controlling or safety means of machines or engines	F03B 15/00-15/22	F03B 15/00-15/22

.. Propulsion of marine vessels using energy derived from water movement	B63H 19/02, 19/04	B63H 19/02, 19/04
. Ocean thermal energy conversion (OTEC)	F03G 7/05	F03G 7/05
<input type="checkbox"/> . Wind energy	F03D	F03D
.. Structural association of electric generator with mechanical driving motor	H02K 7/18	H02K 7/18
.. Structural aspects of wind turbines	B63B 35/00 E04H 12/00 F03D 11/04	B63B 35/00 E04H 12/00 F03D 11/04
<input type="checkbox"/> .. Propulsion of vehicles using wind power	B60K 16/00	B60K 16/00
... Electric propulsion of vehicles using wind power	B60L 8/00	B60L 8/00
.. Propulsion of marine vessels by wind-powered motors	B63H 13/00	B63H 13/00
<input type="checkbox"/> . Solar energy		
<input type="checkbox"/> .. Photovoltaics (PV)		
<input type="checkbox"/> ... Devices adapted for the conversion of radiation energy into electrical energy	H01L 27/142, 31/00-31/078 H01G 9/20 H02N 6/00	H01L 27/142, 31/00-31/078 H01G 9/20 H02N 6/00
.... Using organic materials as the active part	H01L 27/30, 51/42-51/48	H01L 27/30, 51/42-51/48
... Assemblies of a plurality of solar cells	H01L 25/00, 25/03, 25/16, 25/18, 31/042	H01L 25/00, 25/03, 25/16, 25/18,
... Silicon; single-crystal growth	C01B 33/02 C23C 14/14, 16/24 C30B 29/06	C01B 33/02 C23C 14/14, 16/24 C30B 29/06
... Regulating to the maximum power available from solar cells	G05F 1/67	G05F 1/67
... Electric lighting devices with, or rechargeable with, solar cells	F21L 4/00 F21S 9/03	F21L 4/00 F21S 9/03
... Charging batteries	H02J 7/35	H02J 7/35
... Dye-sensitised solar cells (DSSC)	H01G 9/20 H01M 14/00	H01G 9/20 H01M 14/00

<input type="checkbox"/> .. Use of solar heat	F24J 2/00-2/54	F24J 2/00-2/54
... For domestic hot water systems	F24D 17/00	F24D 17/00
... For space heating	F24D 3/00, 5/00, 11/00, 19/00	F24D 3/00, 5/00, 11/00, 19/00
... For swimming pools	F24J 2/42	F24J 2/42
... Solar updraft towers	F03D 1/04, 9/00, 11/04 F03G 6/00	F03D 1/04, 9/00, 11/04 F03G 6/00
... For treatment of water, waste water or sludge	C02F 1/14	C02F 1/14
... Gas turbine power plants using solar heat source	F02C 1/05	F02C 1/05
.. Hybrid solar thermal-PV systems	H01L 31/058	H01L 31/058
<input type="checkbox"/> .. Propulsion of vehicles using solar power	B60K 16/00	B60K 16/00
... Electric propulsion of vehicles using solar power	B60L 8/00	B60L 8/00
.. Producing mechanical power from solar energy	F03G 6/00-6/06	F03G 6/00-6/06
.. Roof covering aspects of energy collecting devices	E04D 13/00, 13/18	E04D 13/00, 13/18
.. Steam generation using solar heat	F22B 1/00 F24J 1/00	F22B 1/00 F24J 1/00
.. Refrigeration or heat pump systems using solar energy	F25B 27/00	F25B 27/00
.. Use of solar energy for drying materials or objects	F26B 3/00, 3/28	F26B 3/00, 3/28
.. Solar concentrators	F24J 2/06 G02B 7/183	F24J 2/06 G02B 7/183
.. Solar ponds	F24J 2/04	F24J 2/04
<input type="checkbox"/> . Geothermal energy		
.. Use of geothermal heat	F01K F24F 5/00 F24J 3/08 H02N 10/00 F25B 30/06	F01K F24F 5/00 F24J 3/08 H02N 10/00 F25B 30/06

.. Production of mechanical power from geothermal energy	F03G 4/00-4/06, 7/04	F03G 4/00-4/06, 7/04
<input type="checkbox"/> . Other production or use of heat, not derived from combustion, e.g. natural heat	F24J 1/00, 3/00, 3/06	F24J 1/00, 3/00, 3/06
.. Heat pumps in central heating systems using heat accumulated in storage masses	F24D 11/02	F24D 11/02
.. Heat pumps in other domestic- or space-heating systems	F24D 15/04	F24D 15/04
.. Heat pumps in domestic hot-water supply systems	F24D 17/02	F24D 17/02
.. Air or water heaters using heat pumps	F24H 4/00	F24H 4/00
.. Heat pumps	F25B 30/00	F25B 30/00
<input type="checkbox"/> . Using waste heat		
.. To produce mechanical energy	F01K 27/00	F01K 27/00
.. Of combustion engines	F01K 23/06-23/10 F01N 5/00 F02G 5/00-5/04 F25B 27/02	F01K 23/06-23/10 F01N 5/00 F02G 5/00-5/04 F25B 27/02
.. Of steam engine plants	F01K 17/00, 23/04	F01K 17/00, 23/04
.. Of gas-turbine plants	F02C 6/18	F02C 6/18
.. As source of energy for refrigeration plants	F25B 27/02	F25B 27/02
.. For treatment of water, waste water or sewage	C02F 1/16	C02F 1/16
.. Recovery of waste heat in paper production	D21F 5/20	D21F 5/20
.. For steam generation by exploitation of the heat content of hot heat carriers	F22B 1/02	F22B 1/02
.. Recuperation of heat energy from waste incineration	F23G 5/46	F23G 5/46
.. Energy recovery in air conditioning	F24F 12/00	F24F 12/00
.. Arrangements for using waste heat from furnaces, kilns, ovens or retorts	F27D 17/00	F27D 17/00

..	Regenerative heat-exchange apparatus	F28D 17/00-20/00	F28D 17/00-20/00
..	Of gasification plants	C10J 3/86	C10J 3/86
.	Devices for producing mechanical power from muscle energy	F03G 5/00-5/08	F03G 5/00-5/08
▣ TRANSPORTATION			
▣ . Vehicles in general			
▣ ..	Hybrid vehicles, e.g. Hybrid Electric Vehicles (HEVs)	B60K 6/00, 6/20	B60K 6/00, 6/20
...	Control systems	B60W 20/00	B60W 20/00
...	Gearings therefor	F16H 3/00-3/78, 48/00-48/30	F16H 3/00-3/78, 48/00-48/30
..	Brushless motors	H02K 29/08	H02K 29/08
..	Electromagnetic clutches	H02K 49/10	H02K 49/10
..	Regenerative braking systems	B60L 7/10-7/22	B60L 7/10-7/22
..	Electric propulsion with power supply from force of nature, e.g. sun, wind	B60L 8/00	B60L 8/00
▣ ..	Electric propulsion with power supply external to vehicle	B60L 9/00	B60L 9/00
...	With power supply from fuel cells, e.g. for hydrogen vehicles	B60L 11/18	B60L 11/18
..	Combustion engines operating on gaseous fuels, e.g. hydrogen	F02B 43/00 F02M 21/02, 27/02	F02B 43/00 F02M 21/02, 27/02
..	Power supply from force of nature, e.g. sun, wind	B60K 16/00	B60K 16/00
..	Charging stations for electric vehicles	H02J 7/00	H02J 7/00
▣ . Vehicles other than rail vehicles			
..	Drag reduction	B62D 35/00, 35/02 B63B 1/34-1/40	B62D 35/00, 35/02 B63B 1/34-1/40

.. Human-powered vehicle	B62K B62M 1/00, 3/00, 5/00, 6/00	B62K B62M 1/00, 3/00, 5/00, 6/00
<input type="checkbox"/> . Rail vehicles	B61	B61
.. Drag reduction	B61D 17/02	B61D 17/02
<input type="checkbox"/> . Marine vessel propulsion		
.. Propulsive devices directly acted on by wind	B63H 9/00	B63H 9/00
.. Propulsion by wind-powered motors	B63H 13/00	B63H 13/00
.. Propulsion using energy derived from water movement	B63H 19/02, 19/04	B63H 19/02, 19/04
.. Propulsion by muscle power	B63H 16/00	B63H 16/00
.. Propulsion derived from nuclear energy	B63H 21/18	B63H 21/18
. Cosmonautic vehicles using solar energy	B64G 1/44	B64G 1/44
<input type="checkbox"/> ENERGY CONSERVATION		
. Storage of electrical energy	B60K 6/28 B60W 10/26 H01M 10/44-10/46 H01G 9/155 H02J 3/28, 7/00, 15/00	B60K 6/28 B60W 10/26 H01M 10/44-10/46 H01G 9/155 H02J 3/28, 7/00, 15/00
<input type="checkbox"/> . Power supply circuitry	H02J	H02J
.. With power saving modes	H02J 9/00	H02J 9/00
. Measurement of electricity consumption	B60L 3/00 G01R	B60L 3/00 G01R
. Storage of thermal energy	C09K 5/00 F24H 7/00 F28D 20/00, 20/02	C09K 5/00 F24H 7/00 F28D 20/00, 20/02
<input type="checkbox"/> . Low energy lighting		
.. Electroluminescent light sources (e.g. LEDs, OLEDs, PLEDs)	F21K 99/00 F21L 4/02 H01L 33/00-33/64, 51/50 H05B 33/00	F21K 99/00 F21L 4/02 H01L 33/00-33/64, 51/50 H05B 33/00

<input type="checkbox"/> . Thermal building insulation, in general	E04B 1/62, 1/74-1/80, 1/88, 1/90	E04B 1/62, 1/74-1/80, 1/88, 1/90
<input type="checkbox"/> . . Insulating building elements	E04C 1/40, 1/41, 2/284-2/296	E04C 1/40, 1/41, 2/284-2/296
... For door or window openings	E06B 3/263	E06B 3/263
... For walls	E04B 2/00 E04F 13/08	E04B 2/00 E04F 13/08
... For floors	E04B 5/00 E04F 15/18	E04B 5/00 E04F 15/18
... For roofs	E04B 7/00 E04D 1/28, 3/35, 13/16	E04B 7/00 E04D 1/28, 3/35, 13/16
... For ceilings	E04B 9/00 E04F 13/08	E04B 9/00 E04F 13/08
<input type="checkbox"/> . Recovering mechanical energy	F03G 7/08	F03G 7/08
.. Chargeable mechanical accumulators in vehicles	B60K 6/10, 6/30 B60L 11/16	B60K 6/10, 6/30 B60L 11/16
<input type="checkbox"/> WASTE MANAGEMENT		
. Waste disposal	B09B B65F	B09B B65F
<input type="checkbox"/> . Treatment of waste		
.. Disinfection or sterilisation	A61L 11/00	A61L 11/00
.. Treatment of hazardous or toxic waste	A62D 3/00, 101/00	A62D 3/00, 101/00
.. Treating radioactively contaminated material; decontamination arrangements therefor	G21F 9/00	G21F 9/00
.. Refuse separation	B03B 9/06	B03B 9/06
.. Reclamation of contaminated soil	B09C	B09C
.. Mechanical treatment of waste paper	D21B 1/08, 1/32	D21B 1/08, 1/32
. Consuming waste by combustion	F23G	F23G

<input type="checkbox"/> . Reuse of waste materials		
.. Use of rubber waste in footwear	A43B 1/12, 21/14	A43B 1/12, 21/14
.. Manufacture of articles from waste metal particles	B22F 8/00	B22F 8/00
.. Production of hydraulic cements from waste materials	C04B 7/24-7/30	C04B 7/24-7/30
.. Use of waste materials as fillers for mortars, concrete	C04B 18/04-18/10	C04B 18/04-18/10
.. Production of fertilisers from waste or refuse	C05F	C05F
<input type="checkbox"/> .. Recovery or working-up of waste materials	C08J 11/00-11/28 C09K 11/01 C11B 11/00, 13/00-13/04 C14C 3/32 C21B 3/04 C25C 1/00 D01F 13/00-13/04	C08J 11/00-11/28 C09K 11/01 C11B 11/00, 13/00-13/04 C14C 3/32 C21B 3/04 C25C 1/00 D01F 13/00-13/04
... Recovery of plastics materials from waste	B29B 17/00	B29B 17/00
... Disassembly of vehicles for recovery of salvageable parts	B62D 67/00	B62D 67/00
... Of polymers	C08J 11/04-11/28	C08J 11/04-11/28
... Production of liquid hydrocarbons from rubber waste	C10G 1/10	C10G 1/10
... Solid fuels derived from waste	C10L 5/46, 5/48	C10L 5/46, 5/48
... Obtaining metals from scrap	C22B 7/00-7/04, 19/30, 25/06	C22B 7/00-7/04, 19/30, 25/06
... Disintegrating fibrous materials for reuse	D01G 11/00	D01G 11/00
... Working-up waste paper to obtain cellulose	D21C 5/02	D21C 5/02
... Reclaiming salvageable components or material from electric discharge tubes or lamps	H01J 9/50, 9/52	H01J 9/50, 9/52
... Reclaiming serviceable parts of waste cells, batteries or accumulators	H01M 6/52, 10/54	H01M 6/52, 10/54
<input type="checkbox"/> . Pollution control		

.. Carbon capture and storage	B01D 53/14, 53/22, 53/62 B65G 5/00 C01B 31/20 E21B 41/00, 43/16 E21F 17/16 F25J 3/02	B01D 53/14, 53/22, 53/62 B65G 5/00 C01B 31/20 E21B 41/00, 43/16 E21F 17/16 F25J 3/02
<input type="checkbox"/> .. Air quality management		
<input type="checkbox"/> ... Treatment of waste gases	B01D 53/00-53/96	B01D 53/00-53/96
.... Exhaust apparatus for combustion engines with means for treating exhaust	F01N 3/00-3/38	F01N 3/00-3/38
.... Rendering exhaust gases innocuous	B01D 53/92 F02B 75/10	B01D 53/92 F02B 75/10
.... Removal of waste gases or dust in steel production	C21C 5/38	C21C 5/38
.... Combustion apparatus using recirculation of flue gases	C10B 21/18 F23B 80/02 F23C 9/00	C10B 21/18 F23B 80/02 F23C 9/00
.... Combustion of waste gases or noxious gases	F23G 7/06	F23G 7/06
.... Electrical control of exhaust gas treating apparatus	F01N 9/00	F01N 9/00
<input type="checkbox"/> ... Separating dispersed particles from gases or vapours	B01D 45/00-51/00 B03C 3/00	B01D 45/00-51/00 B03C 3/00
.... Dust removal from furnaces	C21B 7/22 C21C 5/38 F27B 1/18 F27B 15/12	C21B 7/22 C21C 5/38 F27B 1/18 F27B 15/12
... Use of additives in fuels or fires to reduce smoke or facilitate soot removal	C10L 10/02, 10/06 F23J 7/00	C10L 10/02, 10/06 F23J 7/00
... Arrangements of devices for treating smoke or fumes from combustion apparatus	F23J 15/00	F23J 15/00
... Dust-laying or dust-absorbing materials	C09K 3/22	C09K 3/22
... Pollution alarms	G08B 21/12	G08B 21/12
<input type="checkbox"/> .. Control of water pollution		

<input type="checkbox"/> ... Treating waste-water or sewage	B63J 4/00 C02F	B63J 4/00 C02F
.... To produce fertilisers	C05F 7/00	C05F 7/00
... Materials for treating liquid pollutants	C09K 3/32	C09K 3/32
... Removing pollutants from open water	B63B 35/32 E02B 15/04	B63B 35/32 E02B 15/04
... Plumbing installations for waste water	E03C 1/12	E03C 1/12
... Management of sewage	C02F 1/00, 3/00, 9/00 E03F	C02F 1/00, 3/00, 9/00 E03F
.. Means for preventing radioactive contamination in the event of reactor leakage	G21C 13/10	G21C 13/10
<input type="checkbox"/> AGRICULTURE / FORESTRY		
. Forestry techniques	A01G 23/00	A01G 23/00
. Alternative irrigation techniques	A01G 25/00	A01G 25/00
. Pesticide alternatives	A01N 25/00-65/00	A01N 25/00-65/00
<input type="checkbox"/> . Soil improvement	C09K 17/00 E02D 3/00	C09K 17/00 E02D 3/00
.. Organic fertilisers derived from waste	C05F	C05F
<input type="checkbox"/> ADMINISTRATIVE, REGULATORY OR DESIGN ASPECTS		
. Commuting, e.g., HOV, teleworking, etc.	G06Q G08G	G06Q G08G
. Carbon/emissions trading, e.g. pollution credits	G06Q	G06Q
. Static structure design	E04H 1/00	E04H 1/00
<input type="checkbox"/> NUCLEAR POWER GENERATION		
<input type="checkbox"/> . Nuclear engineering	G21	G21
.. Fusion reactors	G21B	G21B

. . Nuclear (fission) reactors	<u>G21C</u>	<u>G21C</u>
. . Nuclear power plant	<u>G21D</u>	<u>G21D</u>
. Gas turbine power plants using heat source of nuclear origin	<u>F02C 1/05</u>	<u>F02C 1/05</u>