**Guide for analyzing databases CORDIS-FP7PROJECTS.XLSX and CORDIS-H2020PROJECTS.XLSX after mitigation technologies have been filtered**

The overall goal is to identify how much funding goes to technologies of climate change mitigation.

***Mitigation of climate change*** means here a human intervention to reduce the sources or enhance the sinks (= storage places) of greenhouse gases, such as carbon dioxide (CO2) or methane (CH4). Examples: increase of energy efficiency, afforestation.

***Technology*** means here a configuration of devices, processes and knowledge that fulfils a function. Examples: wind turbine blade, heat pump, electric bicycle, power plant.

1. Read project objective (column L).
2. Mark which technology from the table below the project most aligns with (copy-paste technology name from table).
3. If you are sure there is no alignment, then mark the project as “other”.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IPCC sectoral category** | **Technology group** | **Technology** | **Short description** | **Source** |
| Energy | Solar energy sources | solar PV | Also “solar photovoltaic”; technology of using solar cells to convert solar radiation directly into electricity. | https://www.ctc-n.org/technologies/solar-pv |
| concentrated solar power (CSP) | Technology of producing electricity by concentrating the sun’s rays to heat a medium (usually a liquid or gas) that is then used in a heat engine process (steam or gas turbine) to drive an electrical generator. Four main CSP technologies can be distinguished: parabolic troughs (PT), solar towers with central receivers (CR), linear Fresnel reflectors (LF) and parabolic dishes (PD). | https://setis.ec.europa.eu/technologies/concentrated-solar-energy |
| solar heating | Technology of capturing the sun's radiation and it use for heating water. | https://www.ctc-n.org/technologies/solar-heating |
| solar dryer | Technology of drying substances, especially food, using solar energy. | https://www.ctc-n.org/technologies/solar-dryer |
| solar water pump | Technology of powering electrical water pumps with solar panels. | https://www.ctc-n.org/technologies/solar-water-pumps |
| Hydro energy sources | tidal energy | A hydropower technology that converts the energy of tides into electricity or other useful forms of energy. | https://www.ctc-n.org/technologies/tidal-energy |
| wave energy | Technology of capturing energy found in ocean surface waves. Several wave energy technologies can be distinguished: attenuators, point absorbers, surge converters, oscillating water columns, overtopping devices and submerged pressure differentials. | https://www.ctc-n.org/technologies/wave-energy |
| ocean thermal energy conversion (OTEC) | Technology of using the temperature difference between cooler deep and warmer shallow/surface ocean waters to run a heat engine and produce useful work, usually in the form of electricity. | https://www.ctc-n.org/technologies/ocean-thermal-energy-conversion |
| Other renewable energy sources | geothermal | Technology of heating buildings and/or producing electricity by using natural reservoirs with hot water inside the Earth's crust. | https://www.ctc-n.org/technologies/geothermal-electricity |
| osmotic | Also, “osmotic power”, “salinity gradient power” or “blue energy”; technology of producing energy from the difference in the salt concentration between seawater and river water. | https://www.ctc-n.org/technologies/osmotic-power |
| downdraft | Also, “downdraft” or “energy tower”; technology of producing energy using the flow of air at the bottom of a tall hollow tower to rotate wind turbines. The air flow is achieved through spraying water at the top of the tower. | https://www.ctc-n.org/technologies/energy-tower-downdraft |
| updraft | Also, “solar tower”; technology of producing energy using air heated by solar radiation under glass or plastic roof. This heat is then forced upwards through a chimney creating a wind force, which is caught by wind turbines. | https://www.ctc-n.org/technologies/solar-towers-updraft |
| System innovation | grid management | Here also “smart grid”; technology of controlling the production and distribution of electricity in electricity grids with connected electronic measurement and control mechanisms (such as smart meters and smart appliances). Here also includes vehicle-to-grid services. | https://www.ctc-n.org/technologies/smart-grid |
| low GHG transmission | Technology of long distance, ultra-low cost, high efficiency electric power transmission, including high-voltage direct current. | http://www.b-t.energy/landscape/electricity/ultra-low-cost-transmission/ |
| combined cycle power plant | In power plants, technology of fuel-switching, or the replacement of fossil fuels with low-carbon fuels (e.g. replacing coal with natural gas). | https://www.ctc-n.org/technologies/natural-gas-combined-cycle-plants |
| Storage | energy storage | Technology of energy storage, such as batteries, pump systems or flywheels. Here does not mean energy storage in vehicles. | http://www.b-t.energy/landscape/electricity/ultra-low-cost-electricity-storage/ |
| thermal storage | Technology of storage of heat energy, usually using molten salt. | http://www.b-t.energy/landscape/electricity/ultra-low-cost-thermal-storage/ |
| compressed air energy storage (CAES) | Technology of energy storage using compressed air. In times of excess electricity in the grid (e.g. due to the high power delivery at times when demand is low), a CAES plant can compress air and store the compressed air in a cavern underground. When demand is high, the stored air can be released and the energy can be reused. | https://www.ctc-n.org/technologies/compressed-air-energy-storage-caes |
| Nuclear energy sources | nuclear fission | Also simply “nuclear power”; technology of producing electricity by controlled splitting of atomic nuclei. | http://www.b-t.energy/landscape/electricity/next-generation-nuclear-fission/ |
| nuclear fusion | Technology of controlled nuclear fusion: the fusing of two atomic nuclei to produce electricity. | http://www.b-t.energy/landscape/electricity/nuclear-fusion/ |
| Wind | onshore wind | Technology of converting the kinetic energy of the wind into electrical power, achieved with wind turbines. Onshore wind parks are placed on land. | https://www.ctc-n.org/technologies/shore-wind |
| offshore wind | Technology of converting the kinetic energy of the wind into electrical power, achieved with wind turbines. Offshore wind parks are placed in the sea or ocean. | https://www.ctc-n.org/technologies/offshore-wind |
| Transport | Fuel | biofuel | Technology of producing or using biofuel, or vegetable oil- or animal fat-based fuel consisting of long-chain alkyl (methyl, ethyl, or propyl) esters. | https://www.ctc-n.org/technologies/biodiesel-0 |
| fuel cell | Technology of producing or using hydrogen or certain alcohols such as methanol as transportation fuel. | https://www.ctc-n.org/technologies/fuel-cells-mobile-applications |
| electric battery | Technology of using electrochemical batteries as storage media in which reversible electrochemical reactions enable storage of electrical energy as chemical potential and release of that energy on demand. | https://www.ctc-n.org/technologies/batteries |
| liquefied natural gas (LNG) | Technology of producing or using LNG, alternative natural gas-based fuel, for heavy duty trucks. | https://www.ctc-n.org/technologies/liquefied-natural-gas-trucks-and-cars |
| compressed/converted natural gas | Technology of producing or using natural gas-based fuel for passenger vehicles. | https://www.ctc-n.org/technologies/compressed-natural-gas-cng-fuel |
| Vehicle design | electric vehicle design | Technology of vehicle propelling using solely electric motors. | https://www.ctc-n.org/technologies/electric-vehicles |
| low GHG aircraft design | Technology of more efficient engines, improved aerodynamics, advanced lightweight materials and structures, improved navigation and other, directed at reducing emissions form aircraft travel. | http://www.b-t.energy/landscape/transportation/low-ghg-air-transport/ |
| low GHG freight design | Any technology of low-emission road, rail, water, air, pipeline or non-motorised transportation. | https://www.ctc-n.org/technologies/modal-shift-freight-transport |
| lightweight transport design | Technology of lightweight, but strong materials, such as carbon-fibre-reinforced plastics or metals. | http://www.b-t.energy/landscape/transportation/lightweight-materials-and-structures/ |
| non-motorised transport design | Technology related to cycling and other non-motorised transport. | https://www.ctc-n.org/technologies/promotion-non-motorised-transport-0 |
| low GHG public transport / rapid transit design | Technology of reducing emissions in three modes of public transport: trains, light rail (or trams) and buses. | https://www.ctc-n.org/technologies/public-transport |
| System innovation | low GHG logistics | Technology of reducing emissions in transport logistics, which is the transport of goods to customers. | CORDIS |
| traffic management | Technology of ensuring smooth and efficient road traffic flow, fair access for different transport modes, safety of roads and streets for all users, minimisation of congestion, local pollution and noise, reduced greenhouse gas emissions, and other traffic management measures. | https://www.ctc-n.org/technologies/traffic-management |
| reduced need for travel | Technologies of reducing the need to travel, such as advanced telepresence, virtual reality, virtual collaboration platforms (to conduct meetings or collaborate). | http://www.b-t.energy/landscape/transportation/technology-solutions-that-eliminate-the-need-for-travel/ |
| regenerative braking | Technology of reversing the electric current in the electric motors (e.g. of trains) slowing down the train and also causing the motors to generate electricity. | https://www.ctc-n.org/technologies/regenerative-braking-trains |
| Behavioural change | modal shift | Technology that helps motivate people to switch from using cars to using public transport or bicycles more, and from flying with airplanes to travelling by train. | CORDIS |
| demand management | Technology that encourages or enables people to travel less. | https://www.ctc-n.org/technologies/transport-demand-management |
| Buildings | Building design | passive house | Also, “low carbon house/building” or “zero emissions house/building”. Here, an energy efficient building includes two or more of these technologies: well-insulated and highly air-tight building, strict design and construction standards, mainly heated by passive solar heat or other natural heat, and equipped with an energy recovery ventilator for a constant and balanced fresh air supply. Optionally, can be also integrated with onsite renewable energy technologies (wind, solar, etc.). | https://www.ctc-n.org/technologies/passive-house-design |
| low GHG envelope | New materials, insulation or design that help reduce total energy use in walls and windows of buildings. | http://www.b-t.energy/landscape/buildings/high-efficiency-envelope-windows-and-insulation/ |
| daylight harnessing | Technologies of bringing diffused daylight into the building interior. Three types of technology can be distinguished: light shelves, light pipes and skylights. | https://www.ctc-n.org/technologies/daylight-harnessing |
| cool roof | Technology of reflecting sunlight and heat, thus reducing the temperature of the roofs. This provides passive cooling to enhance energy performance of the building. | https://www.ctc-n.org/technologies/cool-roofs |
| innovative construction | Technology of energy- or material-efficient construction, such as augmented reality, 3D-printing, construction robots, and other. | CORDIS |
| Interior appliance design | combined heat and power (CHP) | Technology of an integrated system that combines electricity production and recovery of waste heat. | https://www.ctc-n.org/technologies/large-scale-combined-heat-and-power |
| low GHG lighting | Technology of new high efficiency lighting including, and not limited to LED. | http://www.b-t.energy/landscape/buildings/high-efficiency-lighting/ |
| Decreased energy consumption design or practices | demand-side energy management | Technology inside buildings that help ensure that the energy system performance meets the design intentions; helps monitor, evaluate and manage the energy performance to optimise occupants’ comfort and the building’s functions, while maintaining or improving the energy efficiency of the building. | https://www.ctc-n.org/technologies/energy-management-and-performance-improvement |
| low GHG air conditioning | Technology of cooling the interior of buildings, such as air conditioners. | https://www.ctc-n.org/technologies/efficient-air-conditioning-systems |
| low GHG refrigeration | Technology of energy-efficient food storage at cool temperatures (e.g. 3 to 5 °C). Here does not refer to emission reductions caused by the refrigerant. | https://www.ctc-n.org/technologies/energy-efficient-refrigerators |
| low GHG appliances | Here means reduced emissions and/or energy use of appliances, such as refrigerators, clothes dryers, ovens, dishwashers, televisions, and electronics. | http://www.b-t.energy/landscape/buildings/high-efficiency-appliances-and-plug-loads/ |
| Building management | building management | Technology of monitoring and controlling a building's energy needs. | https://www.ctc-n.org/technologies/building-energy-management-systems-bems |
| Industry | Manufacturing innovation | low GHG steel | In iron and steel industry, technology of significant emissions reductions from iron and steel production, such as replacement of coal with plant-based charcoal and reduction of iron oxide. Here does not include carbon capture and storage, waste heat reuse, introduction of gas turbines or of renewable energy sources. | http://www.b-t.energy/landscape/manufacturing/low-ghg-steel/ |
| low GHG cement | In cement and cement-replacement industry, technology of low-emission substitutes for cement/concrete, such as such as coal fly ash, blast furnace slag or novel materials. | http://www.b-t.energy/landscape/manufacturing/lownegative-ghg-cement/ |
| low GHG coolant/refrigerant | Technology of producing or using low-emission refrigerants (substances that can be used in the refrigeration cycle of air conditioning and refrigeration equipment because of their thermodynamic properties). | https://www.ctc-n.org/technologies/shift-coolants-and-refrigerants-lower-gwp |
| low GHG chemicals | In chemical industry, technology of low-emission production of chemicals. Here does not refer to methane capture or carbon capture. | http://www.b-t.energy/landscape/manufacturing/low-ghg-chemicals/ |
| methane capture | Technology of reducing fugitive methane emissions, including the development of advanced remote leak monitoring technologies. | http://www.b-t.energy/landscape/manufacturing/fugitive-methane-emissions-from-industry/ |
| biorefinery design | Technology of sustainable processing of biomass into marketable products and energy. | https://www.ctc-n.org/technologies/biorefinery |
| pulp and paper drying | In pulp and paper industry, technology of (Condebelt) drying process that improves strength and other quality characteristics, increases drying rates and possibly saves energy. | https://www.ctc-n.org/technologies/condebelt-drying-pulp-and-paper-industry |
| wet/dry quenching | In iron and steel industry, technology of preventing the coke (fuel) from burning up in the air (wet quenching), or, in addition, allowing recovery of thermal energy (dry quenching). | https://www.ctc-n.org/technologies/coke-dry-quenching-iron-and-steel-sector |
| reuse of material | Technology of reusing material such as waste or residue in industry, for example slag granulation. | https://www.ctc-n.org/technologies/blast-furnace-slag-granulation |
| distributed manufacturing | Also, “distributed production”, “cloud producing” or “local manufacturing”; technology of producing goods that are partly assembled by consumers (e.g. Ikea or 3D-printing). | CORDIS |
| CCS | carbon capture and storage | Also, “CCS” or “carbon sequestration”; technology of separating CO2 emissions generated through conventional power generation and industrial production processes, after which the compressed CO2 is transported to a suitable geological storage location. | https://www.ctc-n.org/technologies/co2-storage-technologies |
| carbon use | Technologies of using CO2 that was stored with carbon capture and storage (CCS) technology (when carbon capture technology separates CO2 emissions generated through conventional power generation and industrial production processes, after which the compressed CO2 is transported to a suitable geological storage location). | CORDIS |
| Energy use innovation | gas turbine | Also, “combustion turbine”; technology of converting natural gas or other liquid fuels into mechanical energy. Here does not include gas turbine for transportation (e.g. in airplanes). | CORDIS |
| low GHG data centers | Technology that helps to decrease the emissions from data centers. Can include efficient power electronic conversion, data center cooling technologies, technologies that increase server utilization rates above 5–10% range (e.g., virtualization), and next generation semiconductor chips. | http://www.b-t.energy/landscape/manufacturing/extreme-efficiency-in-itdata-centers/ |
| smelt reduction | In iron and steel industry, technology of combining the gasification of coal with the melt reduction of iron ore. | https://www.ctc-n.org/technologies/smelt-reduction-iron-and-steel-sector |
| inert anode | Technology of introducing inert anode in aluminium smelters. | https://www.ctc-n.org/technologies/inert-anode-technology-aluminium-smelters |
| direct casting | In iron and steel industry, technology of integrating casting and hot-rolling of steel into one step, thereby reducing the need to reheat the steel before rolling it. | https://www.ctc-n.org/technologies/direct-casting-iron-and-steel-sector |
| waste heat reuse | Technology of waste heat capture, conversion and reuse, including for scrap preheating. | http://www.b-t.energy/landscape/manufacturing/waste-heat-captureconversion/ |
| energy-from-waste | Also “waste-to-energy”; technology of generating energy in the form of electricity, heat or fuel from the primary treatment (e.g. incineration) of waste. | https://www.ctc-n.org/technologies/energy-supply-waste |
| Use of innovative materials | nanomaterial | Technology of improving the strength of existing materials with nanomaterials. Possible uses include solar panels, batteries, sorbents, insulation, etc. | CORDIS |
| bioplastics | Technology of using renewable biomass materials in the manufacture of bioplastics, including biodegradable or compostable bioplastics. | https://www.ctc-n.org/technologies/bioplastics |
| biopolymer | Technology of replacing fossil-based polymers with renewable biomass-based biopolymers. | https://www.ctc-n.org/technologies/biopolymer-production-petro-chemical-sector |
| Improved durability | improved durability | Technology of producing (energy-intensive) products and materials with improved durability. | http://www.b-t.energy/landscape/manufacturing/extreme-durability-for-energy-intensive-products-and-materials/ |
| Human settlements | Energy management | district heating and/or cooling | Pipe network that supplies heating/cooling and hot/cold water for connected consumers from a central power plant. | https://www.ctc-n.org/technologies/district-heating-and-cooling |
| heat pumps | Heat pumps deliver heating, cooling and hot water to buildings. Three main types: ground source, ground water source, and air source. | https://www.ctc-n.org/technologies/heat-pumps |
| micro-grids | A group of interconnected loads and distributed energy resources (DERs) within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode. | https://www.ctc-n.org/technologies/micro-grid |
| off-grid systems | A stand-alone power system (SAPS or SPS), also known as remote area power supply (RAPS), is an off-the-grid electricity system for locations that are not fitted with an electricity distribution system. Typical SAPS include one or more methods of electricity generation, energy storage, and regulation. | https://www.ctc-n.org/technologies/grid-systems |
| Waste management | recycling | Technology of recycling product components and materials that are considered waste. Here does not include reuse of material in manufacturing processes. | https://www.ctc-n.org/technologies/product-component-and-materials-recycling |
| waste management | Technology of maximising efficiency of resource use in waste generation, segregation, transfer, sorting, treatment, recovery and disposal in an integrated manner. E.g. implementation of the 3R (reduce, reuse and recycle) principle. | https://www.ctc-n.org/technologies/integrated-solid-waste-management |
| landfill composting | Technology of landfill aerobic biological treatment (composting) which is used to stabilize wastewater solids prior to their use as a solid amendment or mulch in landscaping, horticulture and agriculture. Here also includes landfill aeration. | https://www.ctc-n.org/technologies/landfill-composting |
| gasification of waste | Also, “thermal gasification of municipal solid waste” (MSW); technology of generating a gaseous, fuel-rich product out of municipal solid waste. This product can then be combusted in a boiler, producing steam for power generation. | https://www.ctc-n.org/technologies/gasification-waste |
| landfill biocover | Here refers to technology of spraying landfill areas with special substances or covering landfills with special films to achieve microbial methane oxidation (which greatly reduces landfill methane emissions). | https://www.ctc-n.org/technologies/biocovers-landfills |
| Urban forestry | urban forestry | Technology of caring and managing tree populations in urban settings for the purpose of improving the urban environment. | https://www.ctc-n.org/technologies/urban-forestry |
| Agriculture | Emissions and pollution reduction | direct seeding | In rice growing, technology of shortening the flooding period and decreasing soil disturbance. | https://www.ctc-n.org/technologies/direct-seeding-rice |
| straw ammoniation and silage | Ammoniation is technology of adding liquid ammonia, urea, or ammonium bicarbonate to low-value forage such as corn stalks, rice straw, wheat straw, and straw of other crops to increase the digestibility of forage. And silage is technology of fermenting fresh green fodder, forage grass, and other vines or materials by lactobacillus in the anaerobic conditions of an airproof silage container (tower or silo). | https://www.ctc-n.org/technologies/straw-ammoniation-and-silage |
| conservation tillage | Technology of cultivating soil in a way that leaves the previous year’s crop residue (such as corn stalks or wheat stubble) on fields before and after planting the next crop to reduce soil erosion and carbon emissions. | https://www.ctc-n.org/technologies/conservation-tillage |
| cover crop | Technology of planting fast-growing crops, such as winter rye and clovers, between periods of regular crop cultivation. | https://www.ctc-n.org/technologies/cover-crop-technology |
| livestock management | Technology of improving feeding practices of livestock, using special agents or dietary additives, or longer management changes and animal breeding. | https://www.ctc-n.org/technologies/livestock-management |
| nutrient management | Technology of integrating the use of natural and man-made soil nutrients to increase crop productivity and preserve soil productivity for future generations. | https://www.ctc-n.org/technologies/integrated-nutrient-management |
| low GHG food-delivery chain | Technology of reducing food spoilage across the whole food production and delivery chain from harvest to meal time. | http://www.b-t.energy/landscape/agriculture/eliminating-spoilageloss-in-the-food-delivery-chain/ |
| electron acceptor | In rice growing, technology of reducing methane emissions from rice fields by the addition of electron acceptors to stimulate microbial populations that compete with methanogens. | https://www.ctc-n.org/technologies/electron-acceptors-rice |
| mid-season drainage | In rice growing, technology of mid-season drainage of rice fields which involves the removal of surface flood water from the rice crop for about seven days towards the end of tillering, interrupting methane production. | https://www.ctc-n.org/technologies/mid-season-drainage-rice |
| methane reduction | Here means advanced nutritional additives and lower-emission replacements for the food products allowing significant reductions in methane emissions from livestock. | http://www.b-t.energy/landscape/agriculture/reducing-methane-emissions-from-ruminant-animals/ |
| low GHG fertiliser | Technology of producing fertiliser with significant reductions of ammonia emissions. | CORDIS |
| manure management | Technology of decreasing methane emissions from manure stored in lagoons or tanks if manure is cooled, covered with solid covers, mechanically separated into solids and slurry, or if the emitted methane is captured. | https://www.ctc-n.org/technologies/manure-management |
| Resource saving | straw management | In rice growing, technology of removing straw from the fields to be used for mushroom growing, energy production, cattle feed, or other purposes. | https://www.researchgate.net/publication/228850474\_Rice\_straw\_management |
| alternate wetting and drying | In rice growing, technology of saving water and mitigating methane emissions in lowland (paddy) rice growing. | https://www.ctc-n.org/technologies/alternate-wetting-and-drying-rice |
| soil management | Operations, practices and treatments used to protect soil and enhance its performance, such as leaving last season’s crop residue on the ground, planting cover crops, and controlling erosion. | http://www.b-t.energy/landscape/agriculture/soil-management-solutions-for-ghg-reduction-and-co2-storage/ |
| Forest protection | forest management | Technology of increasing carbon stocks of standing forests, including maintaining forest cover, minimising losses of dead organic matter (including slash) or of soil carbon by reducing soil erosion, and avoiding burning slash and other high-emission substances. | https://www.ctc-n.org/technologies/forest-management-techniques-mitigation-redd |
| agroforestry | Also, “agro-sylviculture”; technology of managing land use when trees or shrubs are grown around or among crops or pastureland. | https://www.ctc-n.org/technologies/agroforestry |
| afforestation | Also, “reforestation”; technology of direct conversion of non-forest land to forest land through planting, seeding, and/or promotion of natural seed sources. | https://www.ctc-n.org/technologies/forest-management-techniques-mitigation-redd |
| Cleaner product | new sources of protein | Technology of producing alternatives to meat as a source of protein in human and animal food, such as insects, microalgae, bacteria, mycoprotein, and synthetic or lab-grown meat. | http://www.b-t.energy/landscape/agriculture/developing-low-cost-low-ghg-new-sources-of-protein/ |
| biochar | Technology of producing and using biochar – a charcoal-like substance produced from agriculture and forest wastes which contains 70% carbon. It is used as soil enhancer to increase fertility, prevent soil degradation and to sequester carbon in the soil. Here does not mean carbon capture and storage. | https://www.ctc-n.org/technologies/biochar |