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COVER NOTE

From:	Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director
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To:	Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union
No. Cion doc.:	C(2025) 2901 final - ANNEX
Subject:	ANNEX to the COMMISSION DELEGATED REGULATION (EU) …/... amending Regulation (EU) 2024/1735 of the European Parliament and of the Council as regards the identification of sub-categories within net-zero technologies and the list of specific components used for those technologies.

Delegations will find attached document C(2025) 2901 final - ANNEX.

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ANNEX

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COMMISSION DELEGATED REGULATION (EU) …/...

amending Regulation (EU) 2024/1735 of the European Parliament and of the Council as regards the identification of sub-categories within net-zero technologies and the list of specific components used for those technologies.

{SWD(2025) 932 final}

ANNEX

List of final products and specific components considered to be primarily used for the production of net-zero technologies.

	Sub-categories of net-zero technologies	**Final products**	**Components that are primarily used for net-zero technologies**
Solar technologies	Photovoltaic (PV) technologies	– Solar PV systems	– PV grade polysilicon – PV grade silicon ingots or equivalent[1] – PV wafers or equivalent[1] – PV cells or equivalent[1] – Solar glass – PV encapsulants – PV ribbons – PV backsheets – PV connectors – PV junction boxes – PV modules – PV inverters – PV trackers and their mounting structures
	Solar thermal electric technologies	– Concentrated solar power (CSP) plants	– CSP reflectors – CSP trackers and their mounting structures – CSP receivers (point or line)
	Solar thermal technologies	– Solar thermal systems	– Solar thermal collectors (including flat-plate, evacuated tube, concentrating systems and air collectors) – Solar thermal absorbers – Solar glass – Solar thermal trackers and their mounting structures

[1] The term 'equivalent' refers to similar steps or key enabling technologies needed for thin-film, organic, tandem or other PV technologies.

	Other solar technologies	– PV-thermal collectors (PVT)	
Onshore wind and offshore renewable technologies	Onshore wind technologies	– Onshore wind turbines	– Nacelles (assembly) – Yaw systems – Pitch systems – Rotor hubs – Main, yaw and pitch bearings – Yaw brakes – Rotor brakes – Direct drive drivetrains (including generator) and/or gearbox drivetrains (including generator) – Permanent magnets of wind turbines – Gearboxes of wind turbines – Blades – Towers
	Offshore wind technologies	– Offshore wind turbines	– Nacelles (assembly) – Yaw systems – Pitch systems – Rotor hubs – Main, yaw and pitch bearings – Yaw brakes – Rotor brakes – Direct drive drivetrains (including generator) and/or gearbox drivetrains (including generators) – Permanent magnets of wind turbines – Gearboxes of wind turbines – Blades – Towers – Foundations / floaters

	Other offshore renewable technologies	– Tidal stream energy technologies – Wave energy technologies	
Battery and energy storage technologies	Battery technologies	– Batteries[2]	– Battery packs – Battery modules – Battery cells – Cathode active materials – Anode active materials – Electrolytes – Separators – Binders – Current collectors (including thin copper, aluminium, nickel and carbon foils) – Battery management systems (BMS) – Battery thermal management systems (BTMS)
	Electrochemical storage technologies	– Ultracapacitors / supercapacitors – Redox flow energy storage	– Electrolytes – Separators – Collectors – Electrode plates
	Gravitational storage technologies	– Pumped hydro storage	– Reversible hydro turbines and pump runners – Distributors with guide vanes – Large hydro butterfly valves – Large hydro spherical valves – Large hydro hollow-jet discharge valves

[2] Batteries as defined in Article 3(13), (14) and (15) of Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries.

	Thermal energy storage technologies	– Thermal energy storage systems	– Sensible heat storage and latent heat storage mediums (including phase-change materials and molten salts) – Thermochemical storage materials
	Compressed / liquefied gas energy storage technologies	– Compressed air energy storage – Liquid air energy storage	
	Other energy storage technologies	– Flywheel energy storage	– Flywheel rotors
Heat pumps and geothermal energy technologies	Heat pump technologies	– Heat pumps	– Heat pumps – Four-way valves – Scroll compressors / heat pump rotary compressors
	Geothermal energy technologies	– Geothermal power plants – Geothermal direct use systems	– Heat exchangers resistant to geothermal corrosive operating conditions – Submersible pumps resistant to geothermal corrosive operating conditions – Brine re-injection pumps
Hydrogen technologies	Electrolysers	– Alkaline electrolysers (AEL)	– Stacks – Separators (diaphragm or membranes tailored for water electrolysis) – Bipolar plates and end plates – Electrodes – Electrocatalysts optimised for electrolysers – Frames and casing for electrolyser stacks assembly – Gaskets / sealants

		– Proton exchange membrane electrolysers (PEMEL)	– Stacks – Membrane electrode assemblies (3-layer) / catalyst-coated membranes – Porous transport layers / gas diffusion layers – Bipolar plates and end plates – Electrocatalysts optimised for electrolysers – Frames and casing for electrolyser stacks assembly – Gaskets / sealants
		– Anion exchange membrane electrolysers (AEMEL)	– Stacks – Membrane electrode assemblies (3-layer) / catalyst-coated membranes – Porous transport layers / gas diffusion layers – Bipolar plates and end plates – Electrocatalysts optimised for electrolysers – Gaskets / sealants – Frames and casing necessary for electrolyser stacks assembly
		– Solid-oxide electrolysers (SOEL)	– Stacks – Electrolytes and electrodes – High-temperature gaskets / sealings – Interconnectors /meshes and end plates – Electrocatalysts optimised for electrolysers – Contact layers – Frames and casing necessary for electrolyser stacks assembly

	Hydrogen fuel cells	– Proton exchange membrane fuel cells (PEMFC)	– Stacks – Membrane electrode assemblies (3-layer) / catalyst-coated membranes – Porous transport layers / gas diffusion layers – Bipolar plates and end plates – Gaskets / sealants – Electrocatalysts optimised for fuel cells – Frames and casing necessary for fuel cell stacks assembly
		– Solid-oxide fuel cells (SOFC)	– Stacks – Electrolytes and electrodes – High-temperature gaskets / sealants – Interconnectors /meshes and end plates – Contact layers – Electrocatalysts optimised for fuel cells – Frames and casing necessary for fuel cell stacks assembly
	Other hydrogen technologies	– Hydrogen transmission and distribution networks	– Hydrogen compressors – Hydrogen refuelling stations – Pipelines for hydrogen transmission and distribution – Hydrogen sensors – Hydrogen valves
		– Hydrogen storage facilities	– Onboard hydrogen storage tanks – Hydrogen on-tank valves – Hydrogen stationary storage tanks
		– Plants for the conversion and extraction of hydrogen into and from ammonia	– Ammonia crackers

Sustainable biogas and biomethane technologies	Sustainable biogas technologies	– Sustainable biogas plants	– Anaerobic digesters / fermentation tanks – Enzymes and microorganisms for sustainable biogas production – Catalysts for sustainable biogas production
	Sustainable biomethane technologies	– Sustainable biomethane plants	– Anaerobic digesters / fermentation tanks – Enzymes and microorganisms for sustainable biomethane production – Biomethane upgrading units – Catalysts for sustainable biomethane production
CCS technologies	Carbon capture technologies	– Absorption capture – Adsorption capture – Membranes capture – Solid cycles capture – Cryogenics capture – Direct air capture	– Solvents optimised for carbon capture – Sorbents optimised for carbon capture – CO_2 compressors
	Carbon storage technologies		

Electricity grid technologies	Electricity grid technologies	– Onshore substations – Offshore substations	– Cables and lines for electricity transmission and distribution, and cables connecting net-zero technologies to the electricity grid (overhead lines, underground and undersea cables, including HVDC and HVAC) – Switchgears – Circuit breakers – Protection relays – Power transformers – Disconnectors – Insulators – Surge arrestors – Capacitors – Reactors – Busbar systems – Electric cabinets – Offshore substations – Inverters – Converters
		– Electricity transmission and distribution towers	– Electricity transmission and distribution towers – Electrical conductors (including advanced conductors and high-temperature superconductors) – Insulators – Surge arrestors – Busbar systems

		– Cables, lines, and associated accessories, for electricity transmission and distribution, and cables connecting net-zero technologies to the electricity grid (overhead lines, underground and undersea cables, including HVDC and HVAC)	– Cables and lines for electricity transmission and distribution, and cables connecting net-zero technologies to the electricity grid (overhead lines, underground and undersea cables, including HVDC and HVAC) – Cable accessories, including cable joints, cable terminations and connectors – Electrical conductors (including advanced conductors and high-temperature superconductors) – Insulators
		– Power transformers	– Power transformers – Transformer cores – Transformer windings – Transformer tap changers
	Electric charging technologies for transport	– Electric vehicle supply equipment – Electric road systems[3] – Shore-side electricity supply equipment – Overhead contact lines – Electric air transport supply equipment	– Electric vehicle supply equipment – Electric vehicle charging connectors – Shore-side electricity supply equipment – Electric air transport supply equipment – Electric air transport charging connectors

[3] The term 'electric road system' (also known as dynamic charging) refers to equipment along the road that supplies power to vehicles while they are in motion. That final product includes both conductive and inductive charging.

	Technologies to digitalise the grid and other electricity grid technologies	– High- and medium-voltage power electronics equipment and components (including DC technology) – Flexible alternating current transmission system (FACTS) technologies – Smart meters / advanced metering and control infrastructures	– High- and medium-voltage power electronics equipment and components (including DC technology) – Flexible alternating current transmission system (FACTS) technologies – Substation automation systems – Smart meters / advanced metering and control infrastructures

Nuclear fission energy technologies	Nuclear fission energy technologies	– Nuclear fission power plants	– Control rods and other neutron poison systems – Core catcher – Control rod drive mechanisms – Fuel elements – Reactor vessels – Reactor internals – Coolant/moderator and related purification systems – Pressurisers – Reactor coolant pumps / gas circulators – Primary piping and valves – Steam turbines – Steam generators – Nuclear heat exchangers – Secondary system components – Safety systems – Monitoring, instrumentation and control systems – Refuelling machines – Nuclear measurement and detection systems – Other components subject to the nuclear safety codes and standards

	Nuclear fuel cycle technologies	– Nuclear fuel cycles	– Centrifuges – Gas handling and flow control systems – Chemical processing equipment – Waste vitrification equipment – Transportation, storage and disposal cylinders, containers and casks – Heavy water – Safety systems – Monitoring, instrumentation and control systems – Other components subject to the nuclear safety codes and standards
Sustainable alternative fuels technologies	Sustainable alternative fuels technologies	– Sustainable alternative fuels plants	– Catalysts for sustainable alternative fuels production – Enzymes and microorganisms for sustainable alternative fuels production – Thermochemical, electrochemical, chemical, and biochemical / biological reactors to convert biomass, recycled carbon fuels into bio-intermediates and/or syngas – Reactors and post-treatment units to convert bio-intermediates and/or syngas and recycled carbon fuels into sustainable alternative fuels

Hydropower technologies	Hydropower technologies	– Hydro turbine systems	– Hydro turbine runners – Distributor with guide vanes – Large hydro butterfly valves – Large hydrospherical valves – Large hydro hollow-jet discharge valves
Other renewable energy technologies	Osmotic energy technologies		
	Ambient energy technologies (other than heat pumps)		
	Biomass technologies	– Pellet mills – Briquetting presses	– Pellet dies – Briquetting compaction chambers
	Landfill gas technologies		
	Sewage treatment plant gas technologies		
	Other renewable energy technologies		

Energy system-related energy efficiency technologies	Energy system-related energy efficiency technologies	– Energy management systems (EMS) – Building automation systems (BAS) – Automated demand response (ADR) – Variable speed drives – Organic Rankine cycle (ORC) power systems	– EMS – BAS – ADR – Variable speed drives – ORC turbines
	Heat and cold grid technologies	– Heating and cooling distribution system pipework	– Pipe fitters and couplers
	Other energy system-related energy efficiency technologies		
Renewable fuels of non-biological origin	Renewable fuels of non-biological origin (RFNBO) technologies	– RFNBO plants	– Reactors to convert H_2 and CO_2 or N_2 into syngas or alcohols – Reactors to convert syngas or alcohols into RFNBO – Catalysts, enzymes and microorganisms for RFNBO production

Biotech climate and energy solutions	Biotech climate and energy solutions	– Microorganisms and microbial strains (including but not limited to bacteria, yeasts, microalgae, fungi, and archaea) that are used to pretreat and convert feedstock into biofuels, recycled carbon fuels and renewable fuels, bio-based and recycled carbon chemicals, biopolymers bio-based materials and bio-based products – Enzymes (including but not limited to amylase and cellulase) that are used to pretreat and convert feedstock into biofuels, bio-based chemicals, bio-based materials and bio-based products, or that are used to catalyse reactions in chemical processes – Biopolymers	– Microorganisms and microbial strains (including but not limited to bacteria, yeasts, microalgae, fungi, and archaea) that are used to pretreat and convert feedstock into biofuels, recycled carbon fuels and renewable fuels, bio-based and recycled carbon chemicals, biopolymers bio-based materials and bio-based products – Enzymes (including but not limited to amylase and cellulase) that are used to pretreat and convert feedstock into biofuels, bio-based chemicals, bio-based materials and bio-based products, or that are used to catalyse reactions in chemical processes – Biopolymers

Transformative industrial technologies for decarbonisation	Transformative industrial technologies for decarbonisation	– Electric arc furnaces – Hydrogen-ready direct-reduced iron reactors – Submerged arc furnaces – Open slag bath furnaces – Flash calciners – Industrial electric boilers – Industrial induction heaters / furnaces[4] – Industrial infrared heaters / furnaces – Industrial microwave heaters / furnaces – Industrial radio-wave heaters / furnaces – Industrial resistive heaters / furnaces	– Graphite or carbon electrodes for electric furnaces – Flash calciners – Industrial electric boilers – Industrial induction heaters / furnaces – Industrial induction coils – Industrial infrared heaters / furnaces – Industrial infrared emitters – Industrial microwave heaters / furnaces – Industrial magnetrons – Industrial radio-wave heaters / furnaces – Radio frequency generators – Industrial resistive heaters / furnaces – Molybdenum electrodes for electric furnaces
CO_2 transport and utilisation technologies	CO_2 transport technologies	– CO_2 transport infrastructure	– CO_2 compressors
	CO_2 utilisation technologies	– Thermochemical utilisation – Electrochemical utilisation	– Catalysts tailored for CO_2 conversion processes – CO_2 electrolysers

[4] The term 'heater' refers to low (up to 200 °C) and medium (200 to 500 °C) temperature applications. The term 'furnace' refers to high (500 to 1 000 °C) and very high (above 1 000 °C) temperature applications.

Wind and electric propulsion technologies for transport	Wind propulsion technologies	– Flettner rotors – Suction wing sails – Towing kites – Rigid and semi-rigid wing sails	
	Electric propulsion technologies	– Electric propulsion systems for road and off-road transport – Electric propulsion systems for rail transport – Electric propulsion systems for waterborne transport – Electric propulsion systems for air transport	– Transport propulsion electric motors – Permanent magnets of transport electric motors – Transport battery packs – Transport fuel cells – Transport inverters – Electric propulsion high voltage power distribution units – Onboard chargers – Charge ports – Onboard hydrogen storages tanks – Current collectors (including pantographs)
Other nuclear technologies	Other nuclear technologies (such as nuclear fusion technologies)		