Green Technologies Influence on KPI

Category	ID	Cat.	Technology Name	Transport Mode	Description	Class of Influence on KPIs					
						CO2	SOx	Cost	Time	Freq.	Rel.
Engines and propulsion systems	EN02	A	Directly driven propeller	Maritime	Slow speed engine directly connected to propeller shaft, 20 year life time, running 5500 h/a.	0	0	0	0	0	0
	EN03	A	Mechanically connected propeller	Maritime	Medium speed engine connected by a reduction gear to the propeller shaft, 20 year life time, running 5500 h/a	-1	-1	-2	0	0	0
	EN07	A	Diesel-mechanic propulsion with high speed engine	Maritime	High speed engine connected by a reduction gear to the propeller shaft, 20 year life time, running 5500 h/a.	-1	-1	-2	0	0	0
	EN16	A	Full/parallel hybrid	Road	Electrical support of engine power by saving and re-use of break-energy; combination of 6 cylinder engine plus electrical engine	1	1	-1	0	0	0
	EN21	A	Exhaust Abatment System	Inland Waterways	It consists of two reactors with a selective-catalytic reduction (SCR)	2	2	0	0	0	0
	EN06	B	Mechanical azimuthing thrusters	Maritime	The engine runs generator. An electric motor is located inside the ship where it runs propeller shaft. 20 year life time, running 5500 h/a.	1	1	-1	0	0	0
	EN 15	C	PG Engine Diesel Locomotives	Railway	A propulsion system for a four-axle, standard-gauge, centre-cab locomotive using a liquefied petroleum gas (LPG) engine instead of conventional diesel	1	2	1	1	0	0
	EN39	A	Gas engines	Inland Waterways	Engines running on natural gas (different solutions available, pure gas engines, gas-diesel engines, dual fuel engines)	1	2	-1	0	0	0
	EN48	B	CCNR III Engine	Inland Waterways	Still under negotiation	1	1	0	0	0	0
	EN51	B	CCNR IV Engine	Inland Waterways	Still under negotiation	1	1	0	0	0	0
	EN42	C	CCNR I Engine	Inland Waterways	Most existing engines comply with CCNR I Standard	1	1	0	0	0	0
	EN45	C	CCNR II Engine	Inland Waterways	Today new engines have to comply with CCNR II standard	1	1	0	0	0	0
	EN54	C	Kaplan propeller in nozzle	Inland Waterways	Nozzle around Kaplan propeller creates additional thrust; highly effective at large propeller loads, Source DST;	1	1	0	0	0	0
	EN57	C	High scew propller	Inland Waterways	Nozzle around high skew propeller creates additional thrust; highly effective at large propeller loads, Source DST;	1	1	0	0	0	0
	EN61	C	Counter rotating propeller	Maritime	Thrust system consisting of a pair of propellers behind each other which rotates in opposite directions, so that the aft propeller recovers some of the rotational energy in the slipstream from the forward propeller	-1	-1	-2	0	0	0
	EN62	C	Diesel turbo compound	Road	Turbocompound systems can be used to affect engine operation using the energy in exhaust gas that is driving the available turbocharger. A first electrical device acts as a generator in response to turbocharger rotation. A second electrical device acts as a motor to put mechanical power into the engine, typically at the crankshaft. Apparatus, systems, steps, and methods are described to control the generator and motor operations to control the amount of power being recovered. This can control engine operation closer to desirable parameters for given engine-related operating conditions compared to actual.	0	0	0	0	0	0
	EN11	B	Diesel-Electric propulsion with dual fuel engine	Maritime	Medium speed engine using LNG (Liquefied Natural Gas) as primary fuel and HFO (Heavy Fuel Oil) or MDO (Marine Diesel Oil) as pilot fuel. The engine runs generator. An electric motor runs propeller shaft. 20 year life time, running 5500 h/a.	1	2	0	0	0	0
	EN18	B	Fuel cell technology	Road	> 3,5 ton transporter running on renewable fuel cell technology	2	2	-2	0	0	0
	EN24	B	Improved Gas Engine	Road	Integrated approach using electronic valve motion management, enhanced cylinder head cooling, near-to-valve port fuel injection system, advanced integrated control	0	2	-1	0	0	0

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Category	ID	Cat.	Technology Name	Transport Mode	Description	Class of Influence on KPIs					
						CO2	SOx	Cost	Time	Freq.	Rel.
Fuels and energy sources	FU02	A	Ethanol and bio-diesel	Maritime	Investigation about using alternative fuels.	2	2	-2	0	0	0
				Road		1	0	-1	0	0	0
	FU03	A	CGN (compressed natural gas)	Multimodal	Cleaner fuel for yard handling equipment (Prime movers)	1	2	-1	0	0	-2
	FU08	A	LNG	Multimodal	Liquefied natural gas	1	2	-1	0	0	0
	FU18	A	Biogas	Multimodal	Biogas is mainly produced from bio-waste, agricultural residues and residues from sewage treatment plants	2	2	-2	0	0	0
	FU05	B	AMP	Maritime	Alternative Maritime Power is a shore-side power source, that transforms the shore-side power voltage to match the vessel power system	2	2	-2	0	0	0
	FU06	B	Wind energy	Maritime	Wind turbines which will generate clean energy to power 14 Container Terminal Quay cranes, reefer containers, repair workshops and other power consumption needs	2	2	-1	0	0	0
				Inland Waterways		2	2	0	0	0	-1
	FU13	B	Electricity	Road	Electricity is today produced from fossil fuels, nuclear energy and renewable energy sources	2	1	-1	0	0	0
				Railway		0	0	0	0	0	0
	FU01	C	Ultra-low sulphur diesel	Maritime	Switch from industrial diesel oil (IDO 0,5% sulphur) to ultra-low sulphur diesel (ULSD 0,005%) for PMs and RTGs.	0	2	-2	0	0	0
				Inland Waterways		2	2	-2	0	0	0
				Railway		0	2	-1	0	0	0
				Road		0	2	-1	0	0	0
	FU04	C	Solar power network	Multimodal	A 6.600 square-meter solar panel able to generate clean energy which will reduce reliance on oil and cut electricity-related greenhouse gas emissions	2	2	-2	0	0	-1
	FU07	C	HFO	Maritime	Heavy fuel oil	0	-2	1	0	0	0
				Railway		-1	-1	0	0	0	0
				Road		0	0	0	0	0	0
	FU14	C	Hydrogen	Road	Hydrogen is today mainly produced from steam reforming of fossil gas - some production from electricity and renewable sources	2	1	-2	0	0	0
				Inland Waterways		2	2	-2	0	0	-2
	FU23	C	Nuclear Power	Inland Waterways	Nuclear Power	1	1	1	0	0	0
				Maritime		2	2	-2	0	0	0
	FU25	A	Sky sails system	Maritime	It uses large towing kites for the propulsion of the ship. The tractive forces are transmitted to the ship via a highly tear proof, synthetic rope.	1	1	1	0	0	0
	FU26	B	Waste heat recovery system	Maritime	It passes exhaust gases from the ship's main engine through a heat exchanger to generate steam for a turbine driven generator the electrical power generated assists ship propulsion or supplies shipboard services.	1	1	-1	0	0	0
	FU29	C	Fuel cell hybrid system	Multimodal	Develop fuel-cell systems that are capable of meeting the demands of heavy-duty transport for road, rail and marine applications. These systems will be:- Highly efficient, above 60%-Power dense,-Powerful units of 200kW plus,- Durable, robust and reliable. The two FC technologies considered are: -Polymer Electrolyte Fuel Cell (PEFC) technology and -Solid Oxide Fuel Cell (SOFC) technology. The scientific and technological approach is based on: -FC CLUSTERING -FC HYBRIDISATION	2	2	-2	-1	0	-1
	FU30	C	Flettner rotor	Maritime	It is a vertical cylinder rotating around its axis that converts prevailing wind into propulsive energy.	1	1	0	-1	-1	-1

Green Technologies Influence on KPI

Category	ID	Cat.	Technology Name	Transport Mode	Description	Class of Influence on KPIs					
						CO2	SOx	Cost	Time	Freq.	Rel.
Cargo Handling and Transfer	HT01	A	Diesel to electric power convertor (RTGs)	Multimodal	RTGs fitted with electrical components in place of traditional hydraulic parts. Conversion will eliminate black emissions and lower noise levels of engines	1	1	-1	0	0	0
	HT03	A	Hybrid hydraulic drive Terminal tractors	Maritime	Storing braking energy into hydraulic system for acceleration and system	1	1	-1	0	0	0
	HT07	A	Low emission engines	Multimodal	Euro III/ IV compliant engines burn diesel more efficiently, reducing emission of CO2 and providing up to 5% reduction on fuel consumption	1	0	1	0	0	0
	HT10	A	Horizontal container (un)loading	Multimodal	Metrocargo is an innovative solution for containers cargo handling in overhead electrified railways, it's a containers horizontal movement system from an automated platform to train wagons. This technology is ready to experimentation. Metrocargo will be tested on new Maersk's Platform in Vado Ligure (SV), Italy.	0	0	1	2	2	2
	HT06	B	MP-RTGs	Multimodal	Mains-powered RTGs transfer the power generation from the engine of the yard crane to a far more efficient power station. Power station can be up to 40% more efficient than equipment engine.	1	0	-2	0	1	0
	HT11	B	Cargo Cassette and Translifter	Maritime	Wheel less cargo cassette is a loading platform which is used together with a translifter in a cassette system. Translifter is a steerable lifting trailer which together with cassettes replaces roll trailers in Ro-Ro and StoRo handling.	0	0	0	1	0	1
	HT20	B	BEX	Inland Waterways	Barge Express is an integrated concept for transport for automated handling of large scale barge container at terminals	0	0	1	0	2	0
	HT24	C	FCT	Maritime	The Floating Container Terminal collects and distributes containers originating from small calls, and bundles these currents with containers	0	0	1	0	0	0
	HT05	C	Timing device for engine start-stop	Multimodal	Applied on yard equipment (Straddle carriers) to shut down the engine after a period of inactivity. This is a timing device that controlls engine shutdown and start-up depending on activity level.	2	2	0	0	0	0
	HT08	B	ZF transmission systems	Multimodal	Installation in the new PM (prime movers) of new transmission system operating based on Automatic-Manual transmission concept. Reduction of fuel consumption by 10% when compared with older exisiting transmission systems	2	2	0	0	0	0
	HT09	B	Green schemes to improve RTGs emissions and noise	Multimodal	Addition of a super-capacitor on RTGs. When RTGs engine is running, it charges the super capacity at the same time, and when super capacitor is fully charged, it will supply electricity to the cranes when it is hoisting a container	2	0	1	0	0	1
	HT28	B	Automatic RoRo cargo unit handling	Multimodal	The concept is based on self (un)loading of units using a roll-on/roll-off system with a special train of platform cars, called a train loader. The performance of a train loader is often limited by the operation of the stockpile and reclaim system and the capacity of the train loader surge bin. While both are separate systems, they operate in concert to achieve a given performance. Poorly designed reclaim systems, or insufficient train loader surge capacity can significantly downgrade train-loading performance.	0	0	0	1	0	0
	HT32_a	C	River-Sea Push Barge System	Maritime	The river-sea push barge is a transport system in which one and the same push barge is used for the sea- and the river leg in a transport chain.	0	0	-2	0	0	0
	HT33	C	Combined Traffic Carrier Ship/Barge (CTCB)	Maritime	A shortsea concept based on a new type of shortsea vessel: the Trans Sea Lifter (TSL). This vessel is able to carry floating unit load carriers, in particular barges generally used in inland navigation, between inland waterways that are separated by the open sea.	0	0	-2	0	0	0
	HT34	C	Intermodal loading unit	Multimodal	New technical solutions for intermodal loading units including containers, dedicated adaptors and mobile internal fixtures in order to shift the main transportation route for goods from the road onto rail and inland waterways in a sustainable way. The technical activities will be focused on the development and design of large ISO containers and ISO compatible roll-off containers with the dimensions of 2 550 x 2 900 x 7 450 mm. These dimensions comply with the recommended directive of the European Commission for intermodal loading units.	1	1	0	1	1	0
	HT36	B	FlexiWaggon	Railway	Flexiwaggon can combine lorries, buses, cars, containers on one and the same waggon. Individual loading and unloading of waggons. Loading and unloading is done horizontally which means no consideration is necessary for overhead contact lines. The emissions will be reduced by 75%, including carbon dioxide emissions	2	2	1	1	0	0
Cargo Preparation	CP1	C	Cardboard pallets	Multimodal	ecological and sustainable being made of recycled materials and completely recyclable, have low weight but good strength	1	1	1	0	0	0
	CP2	C	Modularized Boxes	Multimodal	Containers modularized and standardized worldwide in terms of dimensions, functions and fixtures. Easy to handle, store, transport, interlock, load, unload, construct and dismantle, compose and decompose. Environment friendly materials with minimal off-service footprint.	0	0	0	0	0	0
	CP3	C	Passive controlled atmosphere system	Multimodal	Passive controlled atmosphere system in which the fruit itself creates the desired environment. Lower oxygen levels slow down the respiration process of the fruits.	-1	0	0	0	0	0
	CP4	C	Cargo hold tank coatings	Multimodal	Innovative cargo hold tank coatings to reduce abrasion and corrosion.	0	0	1	0	0	0
	CP5	C	Software for optimal pallet configuration	Multimodal	Software for optimal pallet configuration to reduce shipping costs. The user enters primary package or box dimensions and rapidly assembles optimal pallet configurations.	0	0	2	1	0	0

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Category	ID	Cat.	Technology Name	Transport Mode	Description	Class of Influence on KPIs					
						CO2	SOx	Cost	Time	Freq.	Rel.
Heating and Cooling	HC02	B	Intelligent temprature unit	Multimodal	Current refrigerated boxcars will be built with energy efficient cooling systems, GPS (Global Positioning System) tracking, fresh air exchange and the ability to remote monitoring the systems, sometimes from thousands of km away on a network. RFID (Radio Frequency Identification) for tracking services are the main support in management systems of perishable goods.	1	1	0	1	0	1
				Road		0	0	0	0	0	0
				Inland Waterways		1	1	0	1	0	1
				Maritime		1	1	-1	0	0	0
				Railway		0	0	-2	2	0	0
	HC03	B	Temperature control units	Road	CryoTech: Liquid CO2 modules for temperature for multi temperature control (cooling/heating)	1	1	0	0	0	0
	HC04	B	RFID tag antenna with temperature alarm sensor	Multimodal	RFID tag antenna with ultra-low cost temperature alarm sensors which is capable of detecting temperature violations above a critical temperature threshold.	0	0	1	0	0	0
	HC05	C	Natural refrigerants	Multimodal	Natural refrigerants are chemicals which occur in nature's bio-chemical processes. They do not deplete the ozone layer and make negligible contribution to global warming. Their high efficiency means they make a much lower, indirect contribution to global warming than many synthetic refrigerants.	2	2	0	0	0	0
	HC06	C	Systems to Reduce Heating Costs in Cold Climates	Multimodal	The project will investigate two cooling approaches during the compression process. In one approach, relatively large amounts of oil are injected into the compressor to absorb heat generated throughout the compression stage. In the second approach, a mixture of liquid and vapor refrigerant from the expansion stage is injected at various points during compression to provide cooling. The added steps improve the compression process while also reducing energy losses due to friction in the expansion stage.	1	1	2	0	0	0
	HC07	C	Software program QUEST	Maritime	QUEST is a CO2 emission friendly software with focus on maintaining a constant cargo temperature. It regulates the return air temperature and allows the supply air temperature to fluctuate without exposing the cargo to chill damages.	0	0	0	0	0	1
	HC08	C	Truck Refrigeration Unit TDJS35HP	Road	Truck refrigeration unit enables simultaneous temperature control of two separate cargo compartments with different temperature settings entirely by heat pump.	1	1	0	0	0	0
Vehicles	VE02	A	Electric Locomotive	Railway	NS 999 is an entirely electric locomotive that uses a lead-acid energy storage system without the use of a diesel engine and with zero exhaust emissions.	2	2	-2	0	0	0
	VE03	A	Hybrid Truck	Road	The M2e Hybrid Freightliner; Support engine plus auxiliary drive to operate an elevating platform of the truck; combination of 6 cylinder engine plus electrical engine	1	1	-1	0	0	1
	VE09	A	Electric vehicles	Road	Battery-electric vehicles	2	1	-1	0	0	0
	VE10	A	Euro VI vehicles	Road	Euro VI is compulsory for new trucks from 2013, replacing Euro V	0	0	-1	0	0	0
	VE01	B	Hybrid Locomotive	Railway	Hybrid Locomotive was developed with the goal of creating the cleanest, most fuel-efficient high-horsepower diesel locomotive ever built.	1	1	-1	1	0	0
	VE25	B	Brake energy recovery system	Railway	Reversible DC Substation for recovering of dynamic braking energy and restitution to national grid	2	2	-1	0	0	0
	VE29	B	Aerodynamic drag improvements	Road	Aerodynamic mirrors, cab side extenders, integrated cab roof fairings, aerodynamic front bumper, full fuel tank fairings, trailer side skirt fairings, trailer gap fairing, rear mounted trailer fairing. Ref to the "Reducing heavy -duty long haul combination truck fuel consumption and CO2 emissions report" http://www.nescaum.org/documents/heavy-duty-truck-ghg_report_final-200910.pdf/	1	1	1	0	0	0
	VE33	C	Low rolling resistance tires	Road	Tires which are designed to minimize the energy wasted as heat as the tire rolls down the road	1	1	1	0	0	0
	VE04	C	Fuel Cells	Road	3,5 ton F-Cell Sprinter is a transporter running on renewable fuel cell technology.	2	2	-2	0	0	0
	VE20	C	River-Sea Push Barge System	Inland Waterways	The river-sea push barge is a transport system in which one and the same push barge is used for the sea- and the river leg in a transport chain.	0	0	-1	-1	0	0
	VE21	C	Combined Traffic Carrier Ship/Barge (CTCB)	Maritime	A shortsea concept based on a new type of shortsea vessel: the Trans Sea Lifter (TSL). This vessel is able to carry floating unit load carriers, in particular barges generally used in inland navigation, between inland waterways that are separated by the open sea.	0	0	-2	0	0	0
				Inland Waterways		0	0	-1	-1	0	0
	VE22	B	Road-rail cargo interchange	Railway	The Flexiwagon rail project will allow containers to be moved by road and by train by loading trucks onto railcars.	2	2	1	1	1	0
	VE31	C	Innovative bogie	Railway	New-generation of powered bogie with axles directly driven by synchronous motors is already available for light rail vehicles. Traction, running gear and braking technologies are combined in the bogie in order to form a highly integrated mechatronic system.	0	0	1	0	0	0
	VE32	C	Friction control measure	Railway	Some energy expended by the train is lost to wheel-to-rail friction. Reductions in wheel-to-rail resistance can be made via improved lubrication. Efficient lubrication systems, such as top-of-rail lubrication systems, reduce wheel and rail wear and reduce fuel consumption	1	1	1	0	1	0

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						CO2	SOx	Cost	Time	Freq.	Rel.
	VE35	B	Electrification ofTrucks on Highways	Road	The eHighway concept introduces the idea of diesel-electric hybrid trucks which can work like a electric trolley when overhead electric lines are available and work as a diesel truck when overhead electric lines are not available. This technology can significantly reduce carbon emissions by reducing the use of fossil fuels in trucks.	-2	-2	2	0	0	0

Green Technologies Influence on KPI

Category	ID	Cat.	Technology Name	Transport Mode	Description	Class of Influence on KPIs					
						CO2	SOx	Cost	Time	Freq.	Rel.
Navigation technologies	NA02	A	Automatic Identification System (AIS)	Maritime	Ship-to-ship, ship-to-shore and shore-to-ship system. Main purpose is collision avoidance, ship tracking and tracing. Works on VHF (Very high frequency, 30–300 MHz) radio frequency.	0	0	-1	0	0	1
	NA15	B	WiMax	Maritime	Worldwide Interoperability for Microwave Access. Long range, high bandwidth wireless Internet	0	0	-1	0	1	1
				Road		0	0	0	0	0	0
				Railway		0	0	-2	2	2	0
	NA01	B	Train Control System	Railway	Train control and tracking system based on a special GPRS method.	0	0	-1	2	2	0
	NA05	B	ECDIS	Maritime	An Electronic Chart Display and Information System (ECDIS) is a computer-based navigation information system that can be used as an alternative to paper nautical charts. Integrates position information from GPS and other navigational sensors (radar, AIS). It may also give Sailing Directions and fathometer.	0	0	-1	2	0	2
	NA12	B	GEO satellites	Maritime	Geosynchronous Satellite whose orbital track on the Earth repeats regularly over points on the Earth over time. If such a satellite's orbit lies over the equator and the orbit is circular, it is called a geostationary satellite.	0	0	-1	2	0	2
	NA13	B	LEO satellites	Maritime	A low Earth orbit (LEO) is generally defined as an orbit within the locus extending from the Earth's surface up to an altitude of 2,000 km. Given the rapid orbital decay of objects below approximately 200 km, the commonly accepted definition for LEO is between 160 - 2,000 km (100 - 1,240 miles) above the Earth's surface.	0	0	-1	2	0	2
	NA14	B	Inmarsat	Maritime	British satellite telecommunications company, offering global, mobile services. It provides telephony and data services to users worldwide, via portable or mobile terminals which communicate to ground stations through eleven geosynchronous telecommunications satellites.	0	0	-1	2	0	2
	NA16	B	ATM	Inland Waterways	The advising Tempomaat (ATM) is a computer program advising the skipper on the most economical combination of route and speed, enabling the vessel to arrive on time with a most efficient use of fuel leading to a reduction of fuel consumption and emissions.	1	1	1	1	0	0
	NA07	A	Global Navigation Satellite Systems or GNSS	Maritime	Global Navigation Satellite Systems (GNSS) is the standard generic term for satellite navigation systems ("sat nav") that provide autonomous geo-spatial positioning with global coverage. GNSS allows small electronic receivers to determine their location (longitude, latitude, and altitude) to within a few metres using time signals transmitted along a line-of-sight by radio from satellites.	1	0	-1	1	0	1
				Railway		0	0	-1	2	2	1
				Road		1	1	1	1	1	1
	NA11	C	LRIT	Maritime	The Long Range Identification and Tracking (LRIT) of ships. Consists of the ship borne LRIT information transmitting equipment, Communications Service Providers (CSPs), Application Service Providers (ASPs), LRIT Data Centers, the LRIT Data Distribution Plan and the International LRIT Data Exchange.	0	0	-1	2	0	2
	NA17	B	River Information Services (RIS)	Inland Waterways	River Information Services (RIS) are customized information services for inland waterway transport and make it possible to coordinate logistical processes with actual transport situations on a constant basis. RIS play a key role in making cargo transport and passenger services on waterways more efficient leading to a reduction of fuel consumption by approximately 5 %, while at the same time increasing traffic safety .	0	1	1	2	0	2
	NA18	B	Predictive cruise control (PCC)	Road	The PCC assistance system uses map and satellite-based route previews and saves substantial amounts of fuel. Unlike a conventional cruise control system that tries to maintain a preset speed, regardless of how the terrain changes, the PCC system looks for its route a mile in advance and adjusts engine output to the uphill and downhill gradients ahead. Based on this information, the on-board computer calculates the optimum speed to use the momentum of the truck to maximize fuel economy.	0	0	0	0	0	0
	NA08	C	radar	Maritime	Radar is an object detection system that uses electromagnetic waves to identify the range, altitude, direction, or speed of both moving and fixed objects such as aircraft, ships, motor vehicles, weather formations, and terrain.	0	0	0	0	0	0

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Category	ID	Cat.	Technology Name	Transport Mode	Description	Class of Influence on KPIs					
						CO2	SOx	Cost	Time	Freq.	Rel.
Best practices of technologies integration	BP04	A	Traffic Flow Management	Railway	A system for online optimization of rail traffic flow to have minimum delays and minimum energy consumption, developed by Emkamatik on behalf of SBB	1	1	-1	2	1	1
	BP07	A	Carbon-free rail freight transport	Railway	DB Schenker Rail replaces the electricity required for your freight transport with regenerative energy that comes 100% from renewable sources in Germany. This helps to avoid carbon emissions right from the outset. Even the smallest quantities can be transported in this way without carbon emissions, on a national and international scale.	2	2	-1	1	0	0
	BP02	B	TDS	Railway	Train Control System based on a GPS application method	1	1	-1	2	2	0
	BP03	B	GEKKO	Railway	A system to provide guidance to energy efficiency driving and timetable optimization, developed for Danish State Railways	1	1	1	2	2	0
	BP08	B	Integrated shortsea transport	Maritime	The concept of Coaster Express (CoEx) is a short sea transport concept directed to bundling the transport flows, scaling-up the short sea facilities and standardization and automation of the transition processes.	1	1	1	0	0	0
	BP13	A	EREX (ERESS)	Railway	The Erex system, has been designed by the European Railway Energy Saving Solution (ERESS), to help railways to save money and reduce CO2 emissions by providing exact energy consumption data. It provides an efficient, reliable, and flexible energy settlement process, enabling railway undertakings to understand their use of energy and thereby save energy and costs. Erex has been configured with a virtual platform with almost unlimited capacity.	-2	0	-1	0	0	0
Innovative units and treatment	LU13	B	Braking energy recovery	Railway	Recovery of dynamic braking energy and restitution to national grid / Reversible DB Substaion	2	2	1	0	0	0
	LU14	B	Onboard energy storage systems	Railway	Supercaps, batteries, flywheels, hybrid storage; A flywheel is a mechanical device with a significant moment of inertia used as a storage device for rotational energy.Flywheel energy storage, or the rotational energy of a flywheel, and rechargeable electric traction batteries are also used as storage systems.Batteries are electrochemical energy storage systems.A supercapacitor is a tool offering very high electrical capacitance in a small package.A hybrid train is a locomotive, railcar or train that uses an onboard rechargeable energy storage system (RESS), placed between the power source (often a diesel engine prime mover) and the traction transmission system connected to the wheels	2	2	-2	1	0	0
	LU11	C	APU (Auxiliary Power Unit)	Railway	An auxiliary power unit (APU) is a device on a locomotive whose purpose is to provide energy saving and to reduce the polluting emissions. Locomotive engines cannot use antifreeze in their cooling systems for technical reasons related to reactions of antifreeze chemicals on internal engine parts. Therefore, during cold weather, a locomotive engine must either be working to transport freight or idling to prevent freezing.The APU keeps the main engine warm, reducing fuel consumption and emissions while the main engine is shut down and also APU reduces railway noise levels	2	2	2	2	0	0
	LU02	C	SECU unit	Multimodal	The SECU (Stora Enso Cargo Unit) is ISO certified for 93.5 gross tonnes. The dimensions are 3.6 x 3.6 x 13.8 m	1	0	1	1	1	0
	LU03	C	Loading plate	Maritime	Actiw LoadPlate was developed to meet customer demands for quick loading of standard cargo space: sea containers, trailers. Solution is suitable for loading difficult cargo that is hard to containerise.	0	0	0	0	0	0
	LU04	C	Trailer stand	Maritime	Simple system to lash trailers	0	0	1	0	0	0
	LU05	C	2,5 wide container	Multimodal	Allows two pallets to be loaded side by side	1	1	0	0	0	0