

Work packages			Variable	Unit	Definition
WP2+3	WP5	Diagnostics			
			Population	million	Total population
			GDP MER	billion US\$2005/yr	GDP at market exchange rate
			GDP PPP	billion US\$2005/yr	GDP converted to US \$ using purchasing power parity
			Primary Energy	EJ/yr	total primary energy consumption (direct equivalent)
			Primary Energy Fossil	EJ/yr	coal, gas, conventional and unconventional oil primary energy consumption
			Primary Energy Fossil w/ CCS	EJ/yr	coal, gas, conventional and unconventional oil primary energy consumption used in combination with CCS
			Primary Energy Fossil w/o CCS	EJ/yr	coal, gas, conventional and unconventional oil primary energy consumption without CCS
			Primary Energy Coal	EJ/yr	coal primary energy consumption
			Primary Energy Coal w/ CCS	EJ/yr	coal primary energy consumption used in combination with CCS
			Primary Energy Coal w/o CCS	EJ/yr	coal primary energy consumption without CCS
			Primary Energy Oil	EJ/yr	conventional & unconventional oil primary energy consumption
			Primary Energy Oil w/ CCS	EJ/yr	conventional & unconventional oil primary energy consumption used in combination with CCS
			Primary Energy Oil w/o CCS	EJ/yr	conventional & unconventional oil primary energy consumption without CCS
			Primary Energy Gas	EJ/yr	gas primary energy consumption
			Primary Energy Gas w/ CCS	EJ/yr	gas primary energy consumption used in combination with CCS
			Primary Energy Gas w/o CCS	EJ/yr	gas primary energy consumption without CCS
			Primary Energy Biomass	EJ/yr	purpose-grown bioenergy crops, crop and forestry residue bioenergy, municipal solid waste bioenergy, traditional biomass primary energy consumption
			Primary Energy Biomass w/ CCS	EJ/yr	purpose-grown bioenergy crops, crop and forestry residue bioenergy, municipal solid waste bioenergy, traditional biomass primary energy consumption used in combination with CCS
			Primary Energy Biomass w/o CCS	EJ/yr	purpose-grown bioenergy crops, crop and forestry residue bioenergy, municipal solid waste bioenergy, traditional biomass primary energy consumption without CCS
			Primary Energy Biomass Modern	EJ/yr	modern biomass primary energy consumption, including purpose-grown bioenergy crops, crop and forestry residue bioenergy and municipal solid waste bioenergy
			Primary Energy Biomass Traditional	EJ/yr	traditional biomass primary energy consumption
			Primary Energy Nuclear	EJ/yr	nuclear primary energy consumption (direct equivalent, includes electricity, heat and hydrogen production from nuclear energy)
			Primary Energy Non-Biomass Renewables	EJ/yr	non-biomass renewable energy consumption (direct equivalent, includes hydro electricity, wind electricity, geothermal electricity and heat, solar electricity, heat and hydrogen, ocean energy)
			Primary Energy Hydro	EJ/yr	total hydro primary energy consumption
			Primary Energy Wind	EJ/yr	total wind primary energy consumption
			Primary Energy Solar	EJ/yr	total solar primary energy consumption
			Primary Energy Geothermal	EJ/yr	total geothermal primary energy consumption
			Primary Energy Ocean	EJ/yr	total ocean primary energy consumption
			Primary Energy Secondary Energy Trade	EJ/yr	trade in secondary energy carriers (e.g. electricity, hydrogen, fossil syngases, negative means net exports)
			Primary Energy Other	EJ/yr	primary energy consumption from sources that do not fit to any other category (direct equivalent)
			Primary Energy Coal Electricity	EJ/yr	coal primary energy consumption in the electricity sector
			Primary Energy Gas Electricity	EJ/yr	gas primary energy consumption in the electricity sector
			Secondary Energy	EJ/yr	total secondary energy - the sum of all secondary energy carrier production
			Secondary Energy Electricity	EJ/yr	total net electricity production
			Secondary Energy Electricity Coal	EJ/yr	net electricity production from coal
			Secondary Energy Electricity Coal w/ CCS	EJ/yr	net electricity production from coal with a CO2 capture component
			Secondary Energy Electricity Coal w/o CCS	EJ/yr	net electricity production from coal with freely vented CO2 emissions
			Secondary Energy Electricity Oil	EJ/yr	net electricity production from refined liquids
			Secondary Energy Electricity Oil w/ CCS	EJ/yr	net electricity production from refined liquids with a CO2 capture component
			Secondary Energy Electricity Oil w/o CCS	EJ/yr	net electricity production from refined liquids with freely vented CO2 emissions
			Secondary Energy Electricity Gas	EJ/yr	net electricity production from natural gas
			Secondary Energy Electricity Gas w/ CCS	EJ/yr	net electricity production from natural gas with a CO2 capture component
			Secondary Energy Electricity Gas w/o CCS	EJ/yr	net electricity production from natural gas with freely vented CO2 emissions
			Secondary Energy Electricity Biomass	EJ/yr	net electricity production from municipal solid waste, purpose-grown biomass, crop residues, forest industry waste, biogas
			Secondary Energy Electricity Biomass w/ CCS	EJ/yr	net electricity production from municipal solid waste, purpose-grown biomass, crop residues, forest industry waste with a CO2 capture component
			Secondary Energy Electricity Biomass w/o CCS	EJ/yr	net electricity production from municipal solid waste, purpose-grown biomass, crop residues, forest industry waste with freely vented CO2 emissions
			Secondary Energy Electricity Nuclear	EJ/yr	net electricity production from nuclear energy
			Secondary Energy Electricity Non-Biomass Renewables	EJ/yr	net electricity production from hydro, wind, solar, geothermal, ocean, and other renewable sources (excluding bioenergy). This is a summary category for all the non-biomass renewables.
			Secondary Energy Electricity Hydro	EJ/yr	net hydroelectric production
			Secondary Energy Electricity Solar	EJ/yr	net electricity production from all sources of solar energy (e.g., PV and concentrating solar power)
			Secondary Energy Electricity Solar CSP	EJ/yr	net electricity production from concentrating solar power (CSP)
			Secondary Energy Electricity Solar PV	EJ/yr	net electricity production from solar photovoltaics (PV)
			Secondary Energy Electricity Wind	EJ/yr	net electricity production from wind energy (on- and offshore)
			Secondary Energy Electricity Geothermal	EJ/yr	net electricity production from all sources of geothermal energy (e.g., hydrothermal, enhanced geothermal systems)
			Secondary Energy Electricity Ocean	EJ/yr	net electricity production from all sources of ocean energy (e.g., tidal, wave, ocean thermal electricity generation)
			Secondary Energy Electricity Other	EJ/yr	net electricity production from sources that do not fit to any other category
			Secondary Energy Liquids	EJ/yr	Total final energy
			Secondary Energy Liquids Biomass	EJ/yr	total liquid biofuels production
			Secondary Energy Liquids Biomass w/ CCS	EJ/yr	total production of liquid biofuels from facilities with CCS
			Secondary Energy Liquids Biomass w/o CCS	EJ/yr	total production of liquid biofuels from facilities without CCS
			Secondary Energy Liquids Fossil	EJ/yr	total production of fossil liquid syngases
			Secondary Energy Liquids Fossil w/ CCS	EJ/yr	total production of fossil liquid syngases from facilities with CCS
			Secondary Energy Liquids Fossil w/o CCS	EJ/yr	total production of fossil liquid syngases from facilities without CCS
			Secondary Energy Liquids Coal	EJ/yr	total production of fossil liquid syngases from coal-to-liquids (CTL) technologies
			Secondary Energy Liquids Gas	EJ/yr	total production of fossil liquid syngases from gas-to-liquids (GTL) technologies
			Secondary Energy Liquids Oil	EJ/yr	total production of liquid fuels from petroleum, including both conventional and unconventional sources
			Secondary Energy Gases	EJ/yr	total production of gaseous fuels, including natural gas
			Secondary Energy Gases Biomass	EJ/yr	total production of biogas
			Secondary Energy Gases Natural Gas	EJ/yr	total production of natural gas
			Secondary Energy Gases Coal	EJ/yr	total production of coal gas from coal gasification
			Secondary Energy Gases Other	EJ/yr	total production of gases from sources that do not fit any other category
			Secondary Energy Solids	EJ/yr	solid secondary energy carriers (e.g., briquettes, coke, wood chips, wood pellets)
			Secondary Energy Solids Coal	EJ/yr	solid secondary energy carriers produced from coal (e.g., briquettes, coke)
			Secondary Energy Solids Biomass	EJ/yr	solid secondary energy carriers produced from biomass (e.g., commercial charcoal, wood chips, wood pellets)
			Secondary Energy Heat	EJ/yr	secondary energy used for heat purposes
			Secondary Energy Heat Geothermal	EJ/yr	secondary energy used for heat purposes coming from geothermal
			Secondary Energy Hydrogen	EJ/yr	total hydrogen production
			Secondary Energy Hydrogen Biomass	EJ/yr	hydrogen production from biomass
			Secondary Energy Hydrogen Electricity	EJ/yr	hydrogen production from electricity via electrolyzes
			Secondary Energy Hydrogen Fossil	EJ/yr	hydrogen production from fossil fuels
			Secondary Energy Hydrogen Other	EJ/yr	hydrogen production from other sources (e.g., thermochemical production from nuclear or solar heat)
			Secondary Energy Other Carrier	EJ/yr	generation of other secondary energy carriers that do not fit any other category
			Final Energy	EJ/yr	final final energy consumed by end-use sectors, excluding transmission/distribution losses
			Final Energy Industry	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing
			Final Energy Industry Solids	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing coming from solids
			Final Energy Industry Solids Coal	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing coming from coal
			Final Energy Industry Solids Biomass	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing coming from biomass
			Final Energy Industry Liquids	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing coming from liquids
			Final Energy Industry Gases	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing coming from gases
			Final Energy Industry Electricity	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing coming from electricity
			Final Energy Industry Other	EJ/yr	final energy consumed by the industrial sector, including non-energy use (e.g. feedstocks in the petrochemical industry), including agriculture and fishing coming from other sources
			Final Energy Residential and Commercial	EJ/yr	final energy consumed in the residential & commercial sector
			Final Energy Residential and Commercial Solids Coal	EJ/yr	final energy consumed in the residential & commercial sector coming from coal
			Final Energy Residential and Commercial Solids Biomass	EJ/yr	final energy consumed in the residential & commercial sector coming from biomass
			Final Energy Residential and Commercial Solids Biomass Traditional	EJ/yr	final energy consumed in the residential & commercial sector coming from biomass (traditional)
			Final Energy Residential and Commercial Liquids	EJ/yr	final energy consumed in the resi sector coming from liquids
			Final Energy Residential and Commercial Gases	EJ/yr	final energy consumed in the residential & commercial sector coming from gases
			Final Energy Residential and Commercial Electricity	EJ/yr	final energy consumed in the residential & commercial sector coming from electricity
			Final Energy Residential and Commercial Space Heating	EJ/yr	final energy consumed for space heating in residential and commercial buildings
			Final Energy Residential and Commercial Other	EJ/yr	final energy consumed in the residential & commercial sector coming from other sources
			Final Energy Transportation	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines)
			Final Energy Transportation Freight	EJ/yr	final energy consumed for freight transportation
			Final Energy Transportation Passenger	EJ/yr	final energy consumed for passenger transportation
			Final Energy Transportation Liquids	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from liquids
			Final Energy Transportation Liquids Oil	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from petroleum products
			Final Energy Transportation Liquids Biomass	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from biofuels

Final Energy Transportation Liquids Coal	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from liquified coal
Final Energy Transportation Gases	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from gases
Final Energy Transportation Electricity	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from electricity
Final Energy Transportation Hydrogen	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from hydrogen
Final Energy Transportation Other	EJ/yr	final energy consumed in the transportation, bunker fuels (excluding pipelines) coming from other sources
Final Energy Solids	EJ/yr	final energy solid fuel consumption (including coal and solid biomass)
Final Energy Solids Coal	EJ/yr	final energy coal consumption
Final Energy Solids Biomass	EJ/yr	final energy consumption of solid biomass (modern and traditional), excluding final energy consumption of bioliquids which are reported in the liquids category
Final Energy Solids Biomass Traditional	EJ/yr	final energy consumption of traditional biomass
Final Energy Liquids	EJ/yr	final energy consumption of refined liquids (conventional & unconventional oil, biofuels, coal-to-liquids, gas-to-liquids) consumption
Final Energy Gases	EJ/yr	final energy consumption of gases (natural gas, biogas, coal-gas) consumption, excluding transmission/distribution losses
Final Energy Electricity	EJ/yr	final energy consumption of electricity (including on-site solar PV) consumption, excluding transmission/distribution losses
Final Energy Hydrogen	EJ/yr	final energy consumption of hydrogen
Final Energy Heat	EJ/yr	final energy consumption of heat (e.g., district heat, process heat, solar heating and warm water), excluding transmission/distribution losses
Final Energy Other	EJ/yr	final energy consumption of other sources that do not fit to any other category
Final Energy Other Sector	EJ/yr	final energy consumed by other sectors than industry, transportation, residential and commercial
Energy Service Transportation Freight	bn tkm/yr	energy service demand for freight transport
Energy Service Transportation Passenger	bn pkm/yr	energy service demand for passenger transport
Emissions CO2	Mt CO2/yr	total carbon dioxide emissions, including emissions from fossil fuel combustion, industrial processes and land-use change
Emissions CO2 Fossil Fuels and Industry	Mt CO2/yr	carbon dioxide emissions from fossil fuel combustion and industrial processes
Emissions CO2 Fossil Fuels and Industry Energy Supply	Mt CO2/yr	carbon dioxide emissions from power and heat generation, other energy conversion (e.g. refineries, synfuel production), resource extration and energy transmission and distribution (e.g. gas pipelines)
Emissions CO2 Fossil Fuels and Industry Energy Supply Electricity	Mt CO2/yr	carbon dioxide emissions from electric power generation
Emissions CO2 Fossil Fuels and Industry Energy Demand	Mt CO2/yr	carbon dioxide emissions from all energy end-use sectors
Emissions CO2 Fossil Fuels and Industry Energy Demand Industry	Mt CO2/yr	carbon dioxide emissions from the industrial sector, including feedstocks, including agriculture and fishing
Emissions CO2 Fossil Fuels and Industry Energy Demand Residential and Commercial	Mt CO2/yr	carbon dioxide emissions from the residential & commercial sector
Emissions CO2 Fossil Fuels and Industry Energy Demand Transportation	Mt CO2/yr	carbon dioxide emissions from the transportation sector and bunker fuels (excluding pipelines)
Emissions CO2 Fossil Fuels and Industry Energy Demand Other Sector	Mt CO2/yr	carbon dioxide emissions from other energy end-use sectors that do not fit to any other category
Emissions CO2 Land Use	Mt CO2/yr	net carbon dioxide emissions from all categories of land use and land-use change (e.g., pasture conversion, deforestation, afforestation, reforestation, soil management, etc.)
Emissions CO2 Carbon Capture and Storage	Mt CO2/yr	total carbon dioxide emissions captured and stored in geological deposits (e.g. in depleted oil and gas fields, unmined coal seams, saline aquifers) and the deep ocean, stored amounts should be reported as positive numbers
Emissions CO2 Carbon Capture and Storage Biomass	Mt CO2/yr	total carbon dioxide emissions from biomass combustion captured and stored in geological deposits (e.g. in depleted oil and gas fields, unmined coal seams, saline aquifers) and the deep ocean, stored amounts should be reported as positive numbers
Emissions N2O	kt N2O/yr	total nitrous oxide emissions
Emissions CH4	Mt CH4/yr	total methane emissions
Emissions F-Gases	Mt CO2-equiv/yr	total F-gas emissions, including sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), others?
Emissions Kyoto Gases	Mt CO2-equiv/yr	total Kyoto gas emissions, including CO2, CH4, N2O and F-Gases. Equivalent emissions calculated based on 100 yr GWP from IPCC AR4, Chap. 2 of WGI report
Emissions Sulfur	Mt SO2/yr	total sulfur emissions
Emissions BC	Mt BC/yr	total black carbon emissions
Emissions OC	Mt OC/yr	total organic carbon emissions
Emissions NOx	Mt NO2/yr	total nitrogen oxide emissions
Forcing	W/m2	radiative forcing from all greenhouse gases and forcing agents, including contributions from albedo, nitrate, and mineral dust
Forcing AN3A	W/m2	radiative forcing from all greenhouse gases and forcing agents, excluding contributions from albedo, nitrate, and mineral dust
Forcing Kyoto Gases	W/m2	radiative forcing of the six Kyoto gases (CO2, CH4, N2O, SF6, HFCs, PFCs)
Temperature Global Mean	°C	change in global mean temperature relative to pre-industrial
Price Carbon	US\$2005/t CO2	marginal cost of abatement (for regional aggregates a weighted sum by subregion emissions should be used)
Price Primary Energy Oil	US\$2005/GJ	crude oil price at the primary level (i.e. the spot price at the global or regional market)
Price Primary Energy Gas	US\$2005/GJ	natural gas price at the primary level (i.e. the spot price at the global or regional market)
Price Primary Energy Coal	US\$2005/GJ	coal price at the primary level (i.e. the spot price at the global or regional market)
Consumption	billion US\$2005/yr	total consumption of all goods, by all consumers in a region
Policy Cost Area under MAC Curve	billion US\$2005/yr	total costs of the policy, i.e. the area under the Marginal Abatement Cost (MAC) curve
Policy Cost GDP Loss	billion US\$2005/yr	GDP loss in a policy scenario compared to the corresponding baseline (losses should be reported as positive numbers)
Policy Cost Consumption Loss	billion US\$2005/yr	consumption loss in a policy scenario compared to the corresponding baseline (losses should be reported as positive numbers)
Policy Cost Equivalent Variation	billion US\$2005/yr	equivalent variation associated with the given policy
Policy Cost Additional Total Energy System Cost	billion US\$2005/yr	additional energy system cost associated with the policy
Policy Cost Other	billion US\$2005/yr	any other indicator of policy cost (e.g., compensated variation)
Trade All Value	billion US\$2005/yr	net exports of all goods, at the global level these should add up to the trade losses only
Trade Primary Energy Coal Volume	EJ/yr	net exports of coal, at the global level these should add up to the trade losses only
Trade Primary Energy Gas Volume	EJ/yr	net exports of natural gas, at the global level these should add up to the trade losses only
Trade Primary Energy Oil Volume	EJ/yr	net exports of crude oil, at the global level these should add up to the trade losses only
Trade Primary Energy Biomass Volume	EJ/yr	net exports of solid, unprocessed biomass, at the global level these should add up to the trade losses only
Trade Secondary Energy Electricity Volume	EJ/yr	net exports of electricity, at the global level these should add up to the trade losses only
Investment All	billion US\$2005/yr	Total investments (macroeconomic capital stock, energy system, R&D, ...)
Investment Energy Supply	billion US\$2005/yr	Investments into energy supply
Investment Energy Supply Electricity	billion US\$2005/yr	Investments into electricity (energy supply)
Capital Cost Electricity Coal GCC w/o CCS	\$/kW	capital cost of a new IGCC facility without CCS
Efficiency Electricity Coal GCC w/o CCS	%	efficiency of a new IGCC facility without CCS
Capital Cost Electricity Coal GCC w/ CCS	\$/kW	capital cost of new IGCC facilities with CCS
Capital Cost Electricity Gas CC w/o CCS	\$/kW	capital cost of a new gas combined cycle (CC) facility without CCS
Efficiency Electricity Gas CC w/o CCS	%	efficiency of a new gas combined cycle (CC) facility without CCS
Capital Cost Electricity Gas CC w/ CCS	\$/kW	capital cost of a new gas combined cycle (CC) facility without CCS
Capital Cost Electricity Solar CSP	\$/kW	capital cost of a new solar CSP facility
Capital Cost Electricity Solar PV	\$/kW	capital cost of new solar PV cells
Capital Cost Electricity Nuclear	\$/kW	capital cost of a new nuclear power plant
Capital Cost Electricity Wind	\$/kW	capital cost of a new wind turbine
Capacity Electricity Coal w/ CCS	GW	total installed capacity of operating coal power plants with CCS
Capacity Electricity Coal w/o CCS	GW	total installed capacity of operating coal power plants without CCS
Capacity Electricity Gas w/ CCS	GW	total installed capacity of operating gas power plants with CCS
Capacity Electricity Gas w/o CCS	GW	total installed capacity of operating gas power plants without CCS
Capacity Electricity Gas CC w/ CCS	GW	total installed capacity of operating gas combined cycle (CC) facilities with CCS
Capacity Electricity Gas CC w/o CCS	GW	total installed capacity of operating gas combined cycle (CC) facilities without CCS
Capacity Electricity Nuclear	GW	operating nuclear power plants
Capacity Electricity Solar	GW	total installed capacity of operating solar power plants (including CSP and PV)
Capacity Electricity Solar CSP	GW	total installed capacity of operating solar CSP facilities
Capacity Electricity Solar PV	GW	total installed capacity of operating solar PV systems
Capacity Electricity Wind	GW	total installed capacity of operating wind plants
Cumulative Capacity Electricity	GW	Cumulative installed total electricity generation capacity since the year 2005
Cumulative Capacity Electricity Biomass	GW	Cumulative installed biomass electricity generation capacity since the year 2005
Cumulative Capacity Electricity Coal	GW	Cumulative installed coal electricity generation capacity since the year 2005
Cumulative Capacity Electricity Gas	GW	Cumulative installed gas electricity generation capacity since the year 2005
Cumulative Capacity Electricity Nuclear	GW	Cumulative installed nuclear electricity generation capacity since the year 2005
Cumulative Capacity Electricity Solar	GW	Cumulative installed solar electricity generation capacity since the year 2005
Cumulative Capacity Electricity Solar CSP	GW	Cumulative installed solar photovoltaic (PV) electricity generation capacity since the year 2005
Cumulative Capacity Electricity Solar PV	GW	Cumulative installed concentrating solar power (CSP) electricity generation capacity since the year 2005
Cumulative Capacity Electricity Wind	GW	Cumulative installed wind electricity generation capacity since the year 2005
Cumulative Capacity Electricity Wind Onshore	GW	Cumulative installed onshore wind electricity generation capacity since the year 2005
Cumulative Capacity Electricity Wind Offshore	GW	Cumulative installed offshore wind electricity generation capacity since the year 2005
Interest Rate Real	%	Real interest rate or return on capital that is relevant for energy system investments
Resource Cumulative Extraction Coal	EJ	Cumulative coal extraction
Resource Cumulative Extraction Gas	EJ	Cumulative gas extraction
Resource Cumulative Extraction Oil	EJ	Cumulative oil extraction