

## ● Appendices

# Appendix 11: Environmental figures

### Note

As outlined in the Combined Independent Auditor's Report and assurance report (page 176), this Appendix is part of the assurance scope of EY's assurance procedures over KPN's 2022 sustainability information.

### Scope and calculation methodologies

#### Scope and calculation of reported emissions

The report includes reporting on CO<sub>2</sub>e emissions in the chapter Our performance: Environmental performance and responsible supply chain (p. 50) and this Appendix. Reporting is done in accordance with the guidance and standards of the GHG Protocol and the ISO 14064-1 standard. KPN uses the operational control approach when reporting CO<sub>2</sub> emissions. Carbon dioxide (CO<sub>2</sub>) is the most relevant GHG for KPN. Where available, CH<sub>4</sub> and N<sub>2</sub>O are taken into consideration in the GHG emissions information. KPN applies the CO<sub>2</sub>e emission factors from co2emissiefactoren.nl as published in the year of reporting. The term 'CO<sub>2</sub>e emissions' is used to refer to the GHG emissions reported on. These are stated in CO<sub>2</sub> equivalents.

#### Scope 1 – Direct emissions

- Fuel consumption of the lease vehicle fleet (employees' passenger vehicles and commercial vehicles)
- Heating of buildings (gas)
- Consumption of coolants for air conditioning and/or cooling
- Fuel consumption of emergency power generators

#### Scope 2 – Indirect emissions

- Electricity consumption of the fixed and mobile networks, data centers, offices and shops
- District heating
- District cooling

The accuracy of the electricity consumption data is a key factor in the reliability of the CO<sub>2</sub>e emissions calculations. In the data-collection process, a number of factors affect the accuracy of the collected data. In general, data originating from direct measurements and recordings or invoices, including measurements from third parties, are the most accurate.

The net Scope 2 emissions are market-based and calculated based on the well-to-wheel (WTW) CO<sub>2</sub>e emissions factors for renewable electricity. For renewables (wind, biomass, solar), the WTW values are all zero. The CO<sub>2</sub>e emissions of the well-to-tank (WTT) phase are accounted for in our Scope 3 emissions (category 3 – fuel and energy-related activities). Both the location-based and market-based Scope 2 emissions can

be found in Our performance: Environmental performance and responsible supply chain (p. 50).

Electricity providers estimate the consumption for part of our network operations - as monthly meter readings are not always conducted - so there is some uncertainty around the accuracy and completeness of our energy consumption. To improve the accuracy, transparency and reliability of our energy data, we are migrating to remote readable meters, reviewing administrative processes and updating profiles with our electricity providers.

#### Scope 2 emissions restated

In 2021, the Scope 2 emissions have been calculated using the 2022 emission factors. This has been recalculated using the 2021 emission factors. The impact of the restatement for 2021 amounts to 25kTon.

#### Scope 3 – Other indirect emissions:

- Emissions in the upstream value chain (during the production phase of products, services and equipment at suppliers)
- Emissions in the downstream value chain (during the use phase, including recycling and disposal of the products, services and equipment)

The results are presented in Our performance: Environmental performance and responsible supply chain (p. 50). We have used two main methodologies to calculate Scope 3 emissions: the spend-based method, which takes procurement data and calculates the emissions within an environmentally extended input output (EEIO) model to assess the emissions, and the process-based method, which uses quantity-based data to evaluate the emissions associated with specific activities, e.g. kWh of energy usage or quantity of materials purchased to manufacture goods. In both cases, we used actual data covering January to December.

CO<sub>2</sub>e emissions of CAT5 waste could not be calculated with the spend-based approach. Spend on waste services is integrated with spend of service partners. Hence, the CO<sub>2</sub>e emissions are not disclosed separately, but included in CAT1 and CAT2.

#### Scope 3 emissions restated

Each year, all parameters used in the Scope 3 calculations are checked whether new values are available or not. In 2022, we learned that the previously reported Scope 3 emissions needed to be restated, both due to an error as well as refinements of data used in the calculation method. The error relates to an incorrect calculation of inflation adjustments in the spend-based approach, which had to be corrected. The refinement consisted a.o. of using active TV set-top boxes instead of sold set-top boxes,

## ● Appendices

taking into account Wifi amplifier sales, Solcon modems, fiber customer equipment (ONT) and full year financial figures instead of extrapolating the last month. Accordingly, we recalculated 2019-2021 and baseyear 2014 to make the figures comparable. We determined that the differences with previously reported Scope 3 emissions are considered significant enough to make restatements. For example, the Scope 3 emissions over 2021

are 17% lower than the emissions previously reported. We have restated all three previous years, including the baseline. Please refer to table 7 for the Scope 3 emissions and the effect of the restatement.

The following table describes the calculation of emission methods, coverage and assurance.

Scope CO <sub>2</sub> e	Standard	Scope	Coverage	Approach	Reported	Assurance	Sources and additional information
Scope 1	GHG Protocol Scope 1 Guidance	Netherlands	98% of all KPN business units and subsidiaries (Opex/FTE)	Operational control approach	Gross and Net Scope 1 emissions	Reasonable	co2emissiefactoren.nl January 2022 Gold standard and REDD+ forest compensation projects
Scope 2	GHG Protocol Scope 2 Guidance	Netherlands	98% of all KPN business units and subsidiaries (Opex/FTE)	Operational control approach	Market- and Location-based Scope 2 emissions	Reasonable	co2emissiefactoren.nl January 2022 100% renewable electricity (windfarms)
Scope 3 Cat: 1, 2, 5, 9	GHG Protocol Scope 3 Guidance	Netherlands	98% of all KPN business units and subsidiaries (Opex/FTE)	Spend-based (Environmentally Extended Input Output data (EEIO) approach)	Scope 3 emissions	Limited	UK DEFRA 2011 (Indirect emissions from the supply chain) and CBS Statline The EEIO-factors are corrected for inflation.
Scope 3 Cat: 3, 6, 7, 11, 13	GHG Protocol Scope 3 Guidance	Netherlands	98% of all KPN business units and subsidiaries (Opex/FTE)	Process- and activity-based	Scope 3 emissions	Limited	co2emissiefactoren.nl January 2022 Emissions Cat 11 and 13 of used electricity by customers with location based scope 2 factor (grid mix)
Scope 3 Cat: 4, 8, 10, 12, 14, 15	GHG Protocol Scope 3 Guidance	Netherlands	98% of all KPN business units and subsidiaries (Opex/FTE)	Not applicable for KPN	Not applicable	Not applicable	Not applicable

### Energy consumption and carbon emissions avoided through customers using our IT solutions

The calculation of avoided energy consumption, CO<sub>2</sub>e emissions and cost reduction for customers is based on models per service.

The results are presented in Our performance: Environmental performance and responsible supply chain (p. 50) and in Table 9 in this Appendix.

Avoided energy consumption	Kind of avoidance (most impact)	KPN measurement	Source external information
Teleworking (enabled by KPN connectivity)	Avoided travel	Market share of broadband subscribers	Publicly available statistics and reports from Statistics Netherlands (CBS), Kennisinstituut voor Mobiliteitsbeleid (KIM), ECN, Netbeheer Nederland, Milieu Centraal, RVO, Telecompaper and other sources
KPN hosting	Electricity savings	Volume-hosting services	Statistics Netherlands (CBS)
iTV cloud solution	Energy and raw materials savings	Number of customers, energy consumption KPN Cloud for iTV	Stichting KijkOnderzoek

We used most data covering full year, and data covering January to November in the calculation extrapolated for the full year. The extrapolation was required due to unavailability of full year public and internal data. Examples are average gas prices for consumers, and electricity usage of external datacenters. All parameters are annually checked by KPN for updates. In case of changes or new services are introduced in calculation methods, we involve external consultants. In the teleworking calculation for 2022, we made a more accurate calculation of the car fleet in the Netherlands by including plug-in hybrid, hybrid and electric cars. This is based on share of electric vehicles by RVO. In addition,

we removed dematerialization, audioconferencing and video conferencing in the calculation. These factors were outdated and the services were terminated.

For the parameters saved on office space and the extra electricity and gas consumption at home when working at home (rebound effect), the values used in the teleworking savings calculation are based on averages. We use the average between the lowest and highest reported value in reports and research. Cost savings are based on the average fuel, electricity and gas prices published by Statistics Netherlands (CBS) and Milieu Centraal.

## ● Appendices

### Scope and calculations for KPI % reuse and recycling

The KPI % reuse and recycling covers the outflow of KPN materials and waste destined to be reused, recycled, incinerated or landfilled. This means the scope includes, but is not limited to:

- Regular waste streams from KPN offices and operations
- Obsolete (end-of-use) equipment and inventory coming from KPN operations, offices and shops
- Obsolete (end-of-use) customer-premises equipment and mobile phones that are collected via KPN return programs and processed by KPN or on KPN's behalf

The scope therefore does not include obsolete (end-of-use) customer-premises equipment, mobile phones and related packaging that are not collected via KPN return programs. In this case, the customer is responsible for disposing of this in accordance with the law, regulations and local waste-collection procedures.

The outflow of materials and waste is reported in table 10. The following disposal methods are reported with reference to GRI-306-2: reuse (i), recycling (ii, iii), incineration (iv, v) and landfill (vii). The other disposal methods, i.e. deep well injection (vi), on-site storage (viii) and other (ix), do not apply. The waste disposal method is mostly determined by selected service partners and their waste-disposal contractor, which are challenged on methods and performance. As part of our circular ambitions, we promote reuse over recycling and incineration with energy recovery over landfill to minimize ecological impacts. Service partners report the waste volumes (tons) on a monthly or quarterly basis. These volumes are allocated to the four types of disposal method based on processing rates (%) from direct information or public information. The KPI % reuse and recycling is then calculated by dividing the tons reuse and recycling by the total volume.

### Scope and calculations for Circular Transition Indicator

The scope of the KPN Circularity Indicator for 2022 for consumer market is as follows:

- Residential: KPN owned customer premise equipment for TV (set-top boxes, remote controls, Digitenne) and Internet (modems, routers, media converters)
- Mobile: SIM-cards
- Packaging: KPN specific packaging added to the consumer market products by KPN (logistics partners).

KPN's Circular Transition Indicator is based on the methodology of the Circular Transition Indicator (CTI) framework of the World Business Council for Sustainable Development (WBCSD). The calculations include the inflow, and outflow indicators under the "close the loop" indicator set, and the recovery type indicator under the "optimize the loop" indicator set of the CTI framework. The outflow indicator of the CTI framework is adapted by only using the actual recovery rate to determine the outflow circularity and the aggregated circularity performance. The potential recovery is used for internal reference and used in calculating the aggregate circularity performance.

This metric currently covers approximately 42% of the spend on new products of the consumer market segment in 2022, excluding mobile handsets and one-off promotional products.

### Collected equipment

The return rate for modems, Digitenne tuners and TV set-top boxes is based on the total number of returns (numerator) and the total number send and delivered to customers minus the delta installed base of internet and tv (denominator) in the reporting year.

## ● Appendices

### Environmental figures

Coverage of all figures according to materiality assessment (98% of operational cost).

**Table 1: Energy consumption (in PJ)**

	Target 2030 compared to base year	Target 2023 compared to base year	2022	2021 <sup>1</sup>	2020 <sup>1</sup>	2019 <sup>1</sup>	2010 (base year)
The Netherlands	-	-	2.036	2.156	2.444	2.741	3.662
KPN non-NL Entities	-	-	-	-	-	-	0.217
<b>KPN Group</b>	<b>1.746</b>	<b>1.978</b>	<b>2.036</b>	<b>2.156</b>	<b>2.444</b>	<b>2.741</b>	<b>3.879</b>
Energy directly consumed	-	-	0.207	0.199	0.246	0.386	-
Energy indirectly consumed	-	-	1.829	1.958	2.199	2.355	-
<b>KPN Group</b>			<b>2.036</b>	<b>2.156</b>	<b>2.444</b>	<b>2.741</b>	<b>3.879</b>
<b>% Reduction compared to base year</b>	<b>-55%</b>	<b>-49%</b>	<b>-48%</b>	<b>-44%</b>	<b>-37%</b>	<b>-29%</b>	

<sup>1</sup> 1 2019-2021 figures have been restated as a result of expanding our fuel fleet with compressed natural gas (CNG) and electric charging

**Table 2: Electricity consumption (in GWh)**

	Target 2030 Compared to base year	Target 2023 Compared to base year	2022	2021	2020	2019	2010
Network			456	480	548	580	697
Offices & Shops			22	22	24	37	72
<b>KPN Group</b>	<b>400</b>	<b>462</b>	<b>478</b>	<b>502</b>	<b>573</b>	<b>617</b>	<b>769</b>
<b>% Reduction compared to base year</b>	<b>-48%</b>	<b>-40%</b>	<b>-38%</b>	<b>-35%</b>	<b>-26%</b>	<b>-20%</b>	

**Table 3: Fuel consumption, lease vehicle fleet**

	Unit	Target as from 2025	Target 2023 compared to base year	2022	2021	2020	2019	2010 base year
Petrol, diesel and LPG	1,000 liter			3,110	3,389	4,311	8,457	16,597
<b>% Reduction compared to base year</b>		<b>-98%</b>	<b>-96%</b>	<b>-81%</b>	<b>-80%</b>	<b>-74%</b>	<b>-49%</b>	
CNG	kg			392	312	198	136	0
Electric	MWh			3,847	2,399	1,891	1,756	0

**Table 4: Other Energy consumption**

	Unit	2022	2021	2020	2019
Natural gas	1,000 m3	2,089	2,361	2,746	2,580
Heating purchased	GJ	24,466	28,068	23,531	27,618
Cooling purchased	GJ	84,041	97,711	97,191	92,891
Diesel for emergency power generators	1,000 liter	91	107	140	116

## Appendices

**Table 5: CO<sub>2</sub>e emissions own operations Scope 1 and 2 (in kTon)<sup>1</sup>**

	Target 2023-2050	2022	2021	2020	2019	2010 base year
Scope 1 KPN NL	0	0	0	0	0	58.8
Scope 2 KPN NL	0	0	0	0	0	35.9
KPN non-NL entities	0	0	0	0	0	25.0
<b>KPN Group</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>119.7</b>

<sup>1</sup> The reported emissions in the table are net scope 1 and scope 2 market based. In the table in section CO<sub>2</sub>e emission and energy management (p. 52) both net and gross scope 1 emissions are reported as well as the location and market based scope 2 emissions

**Table 6: Energy efficiency and Carbon intensity indicators target**

	target 2023	2022	2021	2020	2019	2010
Ton CO <sub>2</sub> per Gb/s KPN Netherlands (2010=100)	0	0	0	0	0	100
GW/h per Gb/s Network Netherlands (2010 =100)	3.0	3.2	3.4	3.9	5.4	100

**Table 7: CO<sub>2</sub>e emissions Scope 3 (in kTon) KPN the Netherlands**

	Target 2040 compared to base year	Target 2030 compared to base year	Target 2023 compared to base year	2022	2021 <sup>1</sup>	2020 <sup>1</sup>	2019 <sup>1</sup>	2014 base year <sup>1</sup>
CAT1 Purchased goods and services				295.2	316.1	318.7	340.8	432.8
CAT2 Capital goods				97.7	120.1	137.5	142.5	210.7
CAT3 Fuel and energy related activities				3.2	3.0	3.6	6.7	95.3
CAT4 Upstream transportation and distribution				-	-	-	-	-
CAT5 Waste generated in operations				-	-	-0.0	0.1	0.2
CAT6 Business travel				0.9	0.6	0.9	3.2	3.2
CAT7 Employee commuting				0.8	1.0	2.9	16.5	17.7
CAT8 Leased assets				-	-	-	-	-
CAT9 Downstream transportation and distribution				12.2	14.8	16.6	18.6	21.3
CAT10 Processing of sold products				-	-	-	-	-
CAT11 Use of sold products				23.7	23.0	21.8	13.7	4.1
CAT12 End-of-life				-	-	-	-	-
CAT13 Downstream leased assets				160.2	179.7	180.7	158.7	156.1
CAT14 Franchises				-	-	-	-	-
CAT15 Investments				-	-	-	-	-
<b>Total CO<sub>2</sub>e emissions</b>	<b>0.0</b>	<b>517.7</b>	<b>583.6</b>	<b>593.9</b>	<b>658.2</b>	<b>682.6</b>	<b>700.8</b>	<b>941.3</b>
<b>Total upstream CO<sub>2</sub>e emissions</b>				<b>397.8</b>	<b>440.7</b>	<b>463.6</b>	<b>509.8</b>	<b>759.9</b>
<b>Total downstream CO<sub>2</sub>e emissions</b>				<b>196.1</b>	<b>217.5</b>	<b>219.1</b>	<b>191.0</b>	<b>181.4</b>
<b>% Reduction compared to base year</b>	<b>net-zero</b>	<b>-45%</b>	<b>-38%</b>	<b>-37%</b>	<b>-30%</b>	<b>-27%</b>	<b>-26%</b>	
Impact of restatement compared to previously reported					-17%	-17%	-18%	-8%

<sup>1</sup> Figures 2014 base year and 2019-2021 have been restated, see Appendix 11, page 222

## Appendices

**Table 8: Other environmental impacts KPN Group**

	Unit	Target 2023	2022	2021	2020	2019
<b>Materials usage</b>						
Cable length	1,000 km		~679	~660	~618	~587
Paper consumption	Tons		186	233	201	268
% FSC or PEFC	%		100%	100%	100%	100%
Coolants (e.g. R407C and R417A)	kg		518	538	661	657
<b>Water consumption</b>						
Offices and shops	1,000 m <sup>3</sup>		39.6	38.7	49.2	52.4
Operations	1,000 m <sup>3</sup>		57.3	33.6	34.7	31.7
<b>KPN Group</b>	<b>1,000 m<sup>3</sup></b>	<b>90</b>	<b>96.9</b>	<b>72.3</b>	<b>83.9</b>	<b>84.1</b>

**Table 9: Estimated avoided energy consumption and CO<sub>2</sub>e emissions by usage of KPN**

	Target 2023	Target 2022	2022	2021	2020	2019
<b>Estimated avoided energy consumption (in PJ)</b>						
Teleworking (enabled by KPN connectivity) <sup>1</sup>			3.432	6.345	9.494	3.065
Dematerialisation <sup>2</sup>			0.000	0.202	0.170	0.169
KPN Audioconferencing <sup>3</sup>			0.000	0.009	0.077	0.109
KPN Videoconferencing <sup>3</sup>			0.000	0.001	0.027	0.050
KPN Hosting services			0.009	0.014	0.020	0.032
KPN iTV Cloud solution			0.015	0.016	0.014	0.012
Total estimated avoided energy consumption			<b>3.455</b>	<b>6.588</b>	<b>9.802</b>	<b>3.437</b>
Total energy consumption KPN <sup>4</sup>			2.036	2.156	2.444	2.741
% Avoided energy consumption compared to energy consumption KPN	Discontinued	<b>-200%</b>	<b>170%</b>	<b>306%</b>	<b>401%</b>	<b>125%</b>
<b>Estimated avoided CO<sub>2</sub>e-emissions (in kTon)</b>						
Teleworking (enabled by KPN connectivity) <sup>1</sup>			307.3	499.9	728.0	259.7
Dematerialisation <sup>2</sup>			0.0	13.5	11.9	12.4
KPN Audioconferencing <sup>3</sup>			0.0	0.6	5.3	8.3
KPN Videoconferencing <sup>3</sup>			0.0	0.1	1.8	3.7
KPN Hosting services			1.1	1.7	2.6	4.3
KPN iTV Cloud solution			2.3	2.4	2.4	2.1
Total estimated avoided carbon emissions			<b>310.7</b>	<b>518.2</b>	<b>751.9</b>	<b>290.5</b>
<b>Avoided Particulate matter emissions (PM<sub>10</sub>) in tons</b>						
Total avoided PM10 emissions <sup>1</sup>			964	2,007	2,161	795

1 Impact of Teleworking declined mainly due to decrease in % of Teleworkers, and decrease in share of commuting with the car. Also, we improved the model by calculating the car fleet in the Netherlands more accurate. We included share and emission factors of plug-in hybrid, hybrid and electric cars. This resulted in a smaller impact of teleworking and will continue to be smaller in the future, on account of electrification of cars.

2 The impact of KPN on dematerialisation has been evaluated and deemed outdated. Examples were decrease in usage of newspapers, CD's, and DVD's. The remaining impact of KPN on dematerialisation is minimal, and therefore the amount for 2022 has been set at 0.

3 KPN's audioconferencing and video conferencing services are terminated, due to substitutions. Examples are Microsoft Teams, Zoom, and Skype.

4 2019-2021 figures have been restated as a result of expanding our fuel fleet with compressed natural gas (CNG) and electric charging

## ● Appendices

**Table 10: Circular information on reuse, recycling and disposal**

Total outflow		Target 2023	Target 2022	Result 2022	Result 2021 <sup>1</sup>	Result 2020	Result 2019
<b>Total volume non-hazardous materials &amp; waste</b>	<b>ton</b>			<b>10,134</b>	<b>9,276</b>	<b>7,803</b>	<b>6,863</b>
Reuse	ton			1,000	1,011	1,018	561
Recycling	ton			7,728	6,855	5,263	4,780
Incineration	ton			1,240	1,260	1,397	1,366
Landfill	ton			166	150	125	156
<b>Total volume hazardous materials &amp; waste</b>	<b>ton</b>			<b>759</b>	<b>569</b>	<b>367</b>	<b>190</b>
Reuse	ton			5	10	1	-
Recycling	ton			663	468	295	148
Incineration	ton			67	72	62	39
Landfill	ton			25	19	9	3
<b>Total volume</b>	<b>ton</b>			<b>10,893</b>	<b>9,845</b>	<b>8,170</b>	<b>7,053</b>
% Reuse	%			9%	10%	12%	8%
% Recycling	%			77%	75%	69%	70%
<b>% Reuse and Recycling</b>	<b>%</b>	<b>85%</b>	<b>84%</b>	<b>86%</b>	<b>85%</b>	<b>81%</b>	<b>78%</b>
% Incineration	%			12%	13%	17%	20%
% Landfill	%			2%	2%	2%	2%
<b>Collected equipment</b>							
Modems and TV settop boxes	%		<b>90%</b>	<b>90%</b>	<b>86%</b>	<b>86%</b>	<b>74%</b>
Mobile phones	%			4%	4%	4%	5%

<sup>1</sup> Restated values due to incomplete data received in 2021 from new partners.