Chapter 10.1 - Point Sources

Background

Germany, alongside with the European Union (EU) and EU Member States, has signed the *UN-ECE PRTR Protocol*, whereby Germany commits to establish and operate a national Pollutant Release and Transfer Register (PRTR) for public information. *The E-PRTR Regulation (European Regulation (EC) No 166/2006)* and the *German PRTR Act (SchadRegProtAG)* provide the legal basis for this fact. If pollutant threshold values or waste quantities specified in the E-PRTR Ordinance are exceeded, releases of pollutants to air, water and soil, shipments with wastewater, and disposal of hazardous and non-hazardous wastes from certain industrial activities have to be reported annually for the PRTR. [1)]

Since December 31, 2016, the new *NEC Directive (2016/2284/EU)* on the reduction of the national emissions of certain atmospheric pollutants came into force, replacing the *Directive (2001/81/EC)* on National Emission Ceilings. The new *NEC Directive (2016/2284/EU)* requires EU Member States to achieve new reduction targets from 2030, which in addition to the previously regulated air pollutants SO_2, NO_x, NMVOC and NH_3, also include reduction targets for particulate matter ($PM_{2.5}$) for the first time. This means that the new directive imposes significantly extended reporting obligations on the EU Member States. For the first time, EU Member States are required to create emission inventories for particulate matter, heavy metals and POPs. The inventories must also include emission projections. Furthermore, emissions from large point sources must be reported and emission data must be spatially itemized. For the first time in 2017 and then every four years, EU Member States must report spatially distributed emissions (raster data) with a resolution of 0.1° x 0.1° (longitude-latitude). Large point sources (LPS) must be reported every 4 years, starting in 2017. Reporting is mandatory for agro-industrial and industrial activities whose annual emissions exceed certain thresholds, which correspond to those for emissions reporting under *the E-PRTR Regulation (European Regulation (EC) No 166/2006)*. [2)]

Annex IV of the Directive indicates, that the Member States shall prepare emission inventories “in accordance with the methodologies recognized by the Parties to the *LRTAP Convention (EMEP reporting guidelines)*” and “shall base their reporting on the *Air Pollutant Emissions Inventory (EMEP/EUA Guidelines)* referred to in the Convention.” *The reporting guidelines (UNECE 2015)* define large point sources as follows:

> “Large point sources (LPS) are defined as facilities whose combined emissions, within the limited identifiable area of the site premises, exceed the pollutant emission thresholds identified in table 1 below.”[3)]
>
> The associated Table 1 identifies thresholds, consistent with those identified in the E-PRTR Regulation (2016), for the following pollutants:
>
> - Sulfur dioxide (SO_2)
> - Nitrogen Oxide (NO_x)
> - Carbon Monoxide (CO)
> - Non-Methane Volatile Organic Compounds (NMVOC)
> - Ammonia (NH_3)
> - Fine Particulate Matter ($PM_{2.5}$)
> - Fine Particulate Matter (PM_{10})
> - Lead and compounds (Pb)
> - Cadmium and compounds (Cd)
> - Mercury and compounds (Hg)
> - Polycyclic aromatic hydrocarbons (PAHs)
> - PCDD + PCDF (dioxins + furans)(as Teq)
> - Hexachlorobenzene (HCB)
> - Polychlorinated biphenyls (PCB)

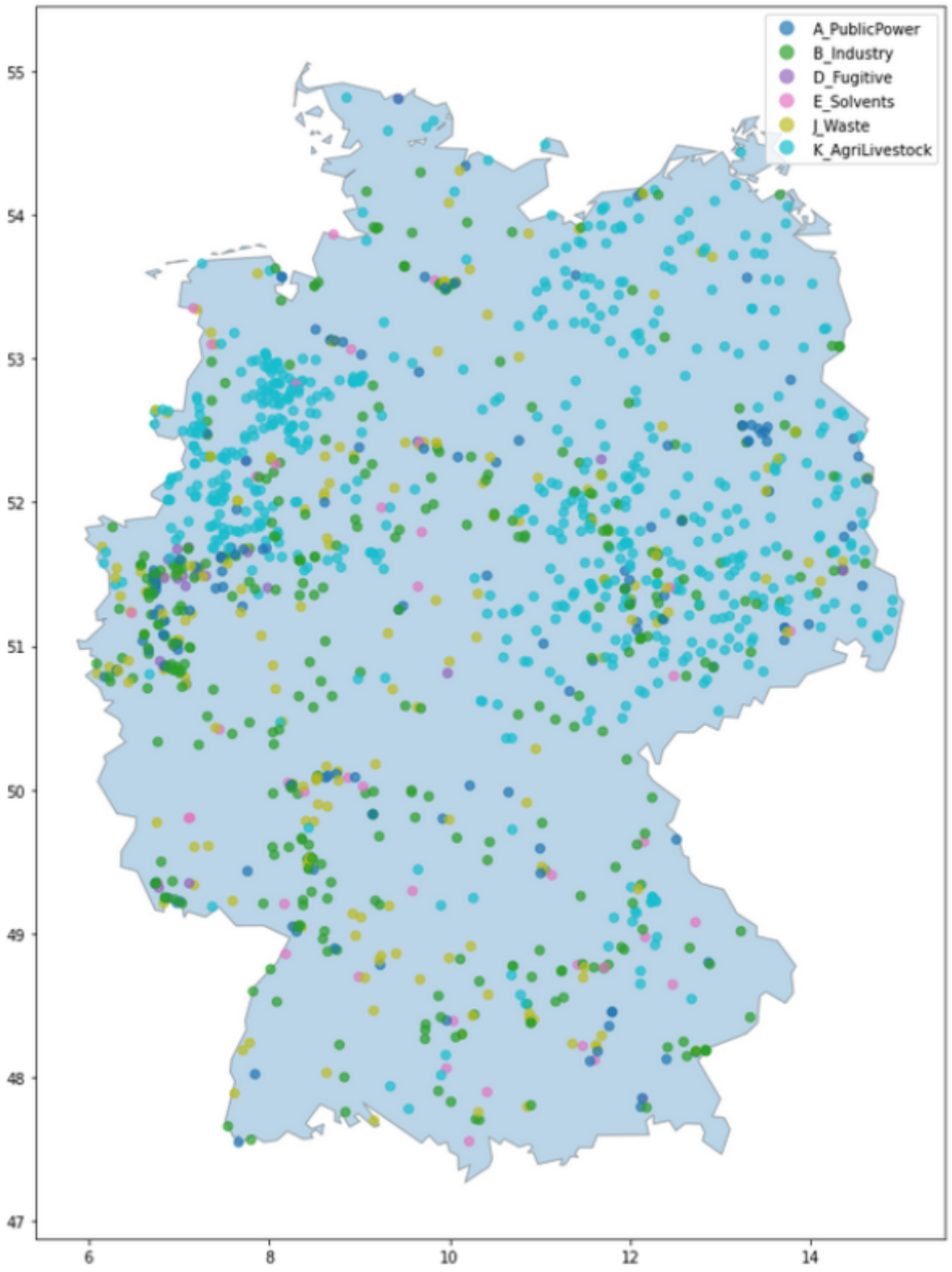
Reporting

Germany provided its point source data under the LRTAP convention for the first time in 2017. In principle, the German LPS data submission is mainly a copy of the ePRTR data available on both the national and European websites. However, as some additional information is missing in the ePRTR dataset, such as stack heights, which are not available at the federal

level, some gap filling is needed and explained below.

Please note that the most recent provision of large point source data, submitted in 2021, is based on the 2018 dataset, as ePRTR data for 2019 are not yet available.

Figure 1: **Large point sources for different GNFR sectors for Germany for the year 2018**



Source of data: https://cdr.eionet.europa.eu/de/un/clrtap/lps/envyikmeq/

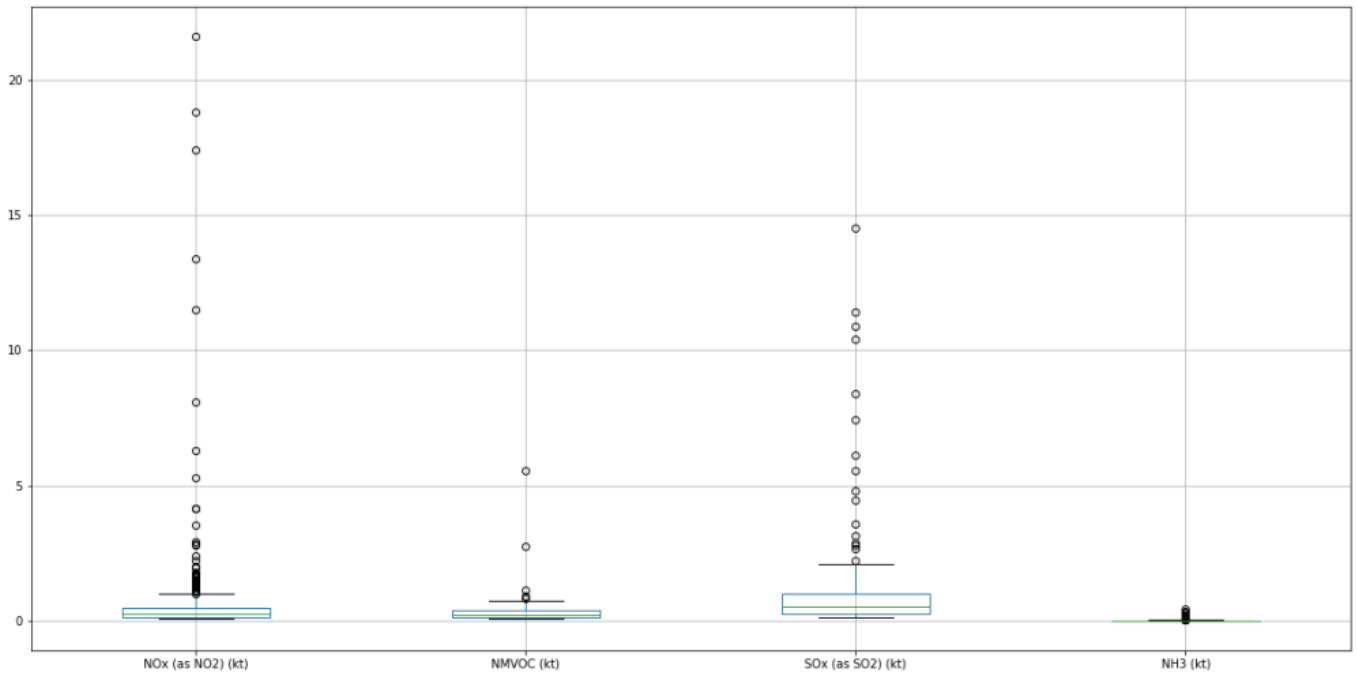
Methodology

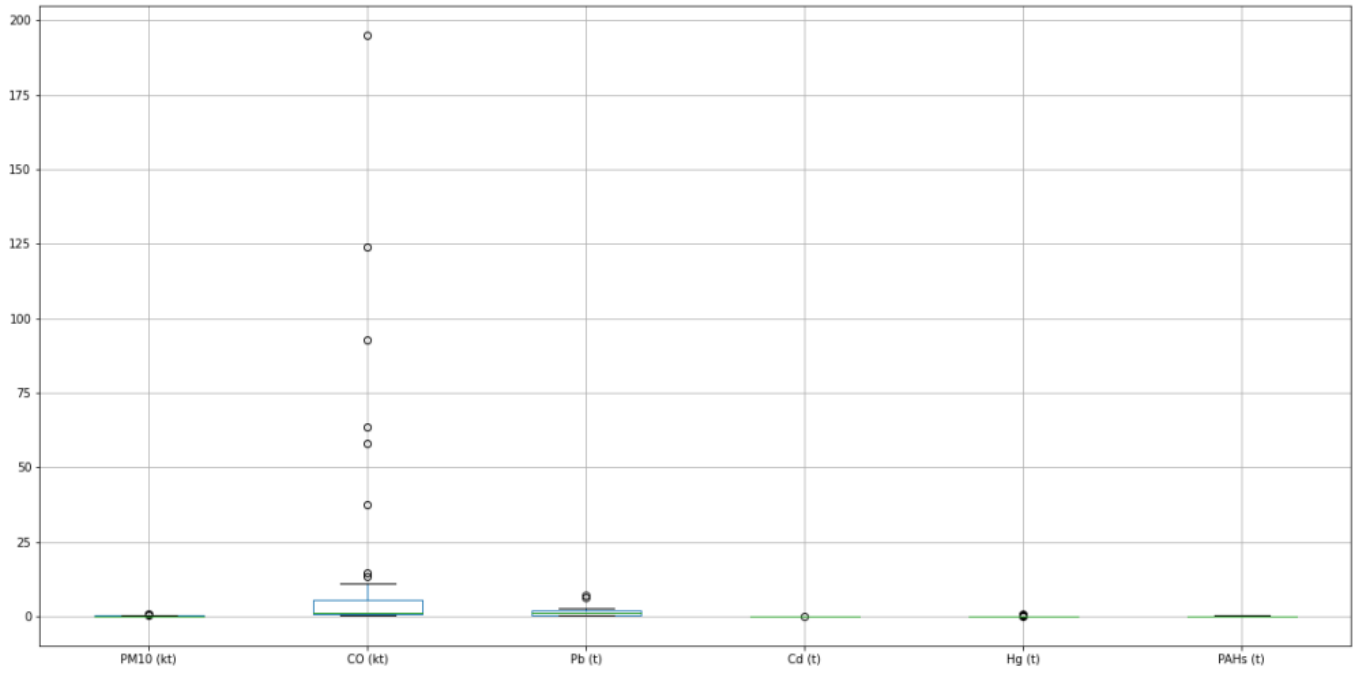
Quality checks

Various quality checks of the data were carried out before submission. The data from the ePRTR database was cleaned, processed and missing data was added. Then, the data was transferred into a suitable format (Excel template under LRTAP convention). Before the data could be transformed into the appropriate format for submission, several data preconditions were determined. Furthermore, data quality checks were performed. Below is a list of the quality checks that have been performed.

- Calculation of the sum of LPS emissions and comparison with the NFR tables
- Unit mistakes checks
- Outlier checks
- Verification of missing information in the data (such as ID's, stack heights, GNFR, coordinates, etc.)
- Checking whether the coordinates are within Germany
- Checking whether there are duplicates in the coordinates

For example, all point sources identified as outliers in the box plots below were checked individually to be correct:





GNFR codes and stack heights

The ePRTR dataset includes most of the information needed for LPS reporting. However, both GNFR sectors and stack heights are not included. These point source meta data are instead derived from the PRTR activities given and by researching some important point sources individually. In general, GNFR membership and stack height class have been added according to Table 1 below (mainly based on the Environmental Research Plan of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety) [4)].

Table 1: **Stack heights and further information related to the GNFR sectors **

Activity code from ePRTR	ePRTR description	GNFR	Stack height class
1.a	Mineral oil and gas refineries	B_Industry	4
1.b	Installations for gasification and liquefaction	B_Industry	4
1.c	Thermal power stations and other combustion installations (>50 MW)	A_PublicPower	5
1.d	Coke ovens	B_Industry	5
1.e	Coal rolling mills	B_Industry	5
1.f	Installations for the manufacture of coal products and solid smokeless fuel	D_Fugitive	4
2	Production and processing of metals	B_Industry	5
2.a	Metal ore roasting or sintering installations	B_Industry	5
2.b	Installations for the production of pig iron or steel inc. continuous casting	B_Industry	5
2.c	Installations for the processing of ferrous metals	B_Industry	5
2.c.i	Installations for the processing of ferrous metals: (i) hot-rolling mills	B_Industry	5
2.c.ii	Installations for the production of pig iron or steel and processing of ferrous metals (hot-rolling mills and smitheries with hammers)	B_Industry	5
2.d	Ferrous metal foundries	B_Industry	2
2.e	Installations for non-ferrous metals	B_Industry	2
2.e.i	Installations for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes	B_Industry	2
2.e.ii	Installations for the smelting, including the alloying, of non-ferrous metals, including recovered products (refining, foundry casting, etc.)	B_Industry	2
2.f	Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process	B_Industry	1
3.a	Underground mining and related operations; Opencast mining and quarring	D_Fugitive	1
3.b	Opencast mining and quarrying	D_Fugitive	1
3.c	Installations for the production (see below)	B_Industry	2
3.c.i	Installations for the production of: (i) cement clinker in rotary kilns, (iii) cement clinker or lime in other furnaces	B_Industry	2
3.c.ii	Installations for the production of: (ii) lime in rotary kilns, (iii) cement clinker or lime in other furnaces	B_Industry	2
3.c.iii	Installations for the production of: (i) cement clinker in rotary kilns, (iii) cement clinker or lime in other furnaces	B_Industry	2
3.d	Installations for the production of asbestos and the manufacture of asbestos-based products	B_Industry	2
3.e	Installations for the manufacture of glass, incl. glass fibre	B_Industry	2
3.f	Installations for melting mineral substances, incl. the production of mineral fibres	B_Industry	2
3.g	Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain	B_Industry	2
4.a	Chemical installations for the production on an industrial scale of basic organic chemicals	B_Industry	1
4.a.i	Chemical installations for the production on an industrial scale of basic organic chemicals: simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic)	B_Industry	1
4.a.ii	Chemical installations for the production on an industrial scale of basic organic chemicals: oxygen-containing hydrocarbons	B_Industry	1
4.a.iii	Chemical installations for the production on an industrial scale of basic organic chemicals: sulphurous hydrocarbons	B_Industry	1
4.a.iv	Chemical installations for the production on an industrial scale of basic organic chemicals: nitrogenous hydrocarbons	B_Industry	1

Activity code from ePRTR	ePRTR description	GNFR	Stack height class
4.a.ix	Chemical installations for the production on an industrial scale of basic organic chemicals: synthetic rubbers	B_Industry	1
4.a.vi	Chemical installations for the production on an industrial scale of basic organic chemicals: halogenic hydrocarbons	B_Industry	1
4.a.vii	Chemical installations for the production on an industrial scale of basic organic chemicals: organometallic compounds	B_Industry	1
4.a.viii	Chemical installations for the production on an industrial scale of basic organic chemicals: basic plastic material (polymers, syntetic fibers and cellulose-based fibers)	B_Industry	1
4.a.x	Chemical installations for the production on an industrial scale of basic organic chemicals: dyes and pigments	B_Industry	1
4.a.xi	Chemical installations for the production on an industrial scale of basic organic chemicals: surface-active agents and surfactants	B_Industry	1
4.b	Chemical installations for the production on an industrial scale of basic inorganic chemicals	B_Industry	1
4.b.i	Chemical installations for the production on an industrial scale of basic inorganic chemicals: gases	B_Industry	1
4.b.ii	Chemical installations for the production on an industrial scale of basic inorganic chemicals: acids	B_Industry	1
4.b.iii	Chemical installations for the production on an industrial scale of basic inorganic chemicals: bases	B_Industry	1
4.b.iv	Chemical installations for the production on an industrial scale of basic inorganic chemicals: salts	B_Industry	1
4.b.v	Chemical installations for the production on an industrial scale of basic inorganic chemicals: non-metals, metal-oxides or other inorganic compounds	B_Industry	1
4.c	Chemical installations for the production on an industrial scale of fertilisers	B_Industry	1
4.d	Installations using a chemical or biological process for the production on an industrial scale of basic plant health products and of biocides	B_Industry	1
4.e	Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products	B_Industry	1
4.f	Installations for the production on an industrial scale of explosives and pyrotechnic products	B_Industry	1
5.a	Installations for the disposal or recovery of hazardous waste	J_Waste	3
5.b	Installations for the incineration of non-hazardous waste	J_Waste	2
5.c	Installations for the disposal of non-hazardous waste	J_Waste	1
5.d	Landfills	J_Waste	1
5.e	Installations for the disposal or recycling of animal carcasses and animal waste	J_Waste	2
5.f	Urban waste-water treatment plants	J_Waste	1
5.g	Independently operated industrial wastewater treatment plants	J_Waste	1
6	Paper and wood producing plants	B_Industry	2
6.a	Industrial plants for the production of pulp from timber or similar fibrous materials	B_Industry	2
6.b	Industrial plants for the production of paper and board and other primary wood products	B_Industry	2
6.c	Industrial plants for the preservation of wood and wood products with chemicals	E_Solvents	2
7.a	Installations for the intensive rearing of poultry or pigs	K_AgriLivestock	1
7.a.i	Installations for the intensive rearing of poultry or pigs: with 40 000 places for poultry	K_AgriLivestock	1
7.a.ii	Installations for the intensive rearing of poultry or pigs: with 2 000 places for production pigs (over 30 kg)	K_AgriLivestock	1
7.a.iii	Installations for the intensive rearing of poultry or pigs: with 750 places for sows	K_AgriLivestock	1
8.a	Slaughterhouses	B_Industry	1
8.b	Treatment and processing intended for the production of food and beverage products	B_Industry	1
8.b.i	Treatment and processesing intended for the production of food and beverage products from: animal raw materials other than milk	B_Industry	1
8.b.ii	Treatment and processesing intended for the production of food and beverage products from: vegetable raw materials	B_Industry	1
8.c	Treatment and processing of milk	B_Industry	1

Activity code from ePRTR	ePRTR description	GNFR	Stack height class
9.a	Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles	E_Solvents	1
9.b	Plants for the tanning of hides and skins	E_Solvents	1
9.c	Installations for the surface treatment of substances, objects or products using organic solvents	E_Solvents	1
9.d	Installations for the production of carbon (hard-burnt coal) or electrographite by means of incineration or graphitisation	B_Industry	2
9.e	Installations for the building of, and painting or removal of paint from ships	E_Solvents	1

References

[1)] Schadstoffe im PRTR - Situation in Deutschland - Berichtsjahre 2007 - 2018, Umweltbundesamt, 2020 External Link

[2), 3), 4)] Analyse der novellierten NEC-Richtlinie bezüglich der erweiterten Anforderungen an die Berichterstattung von Schadstoffemissionen in die Luft - Umweltforschungsplan des Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit, im Auftrag des Umweltbundesamtes, 2019 External Link