

# ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 for:  
District cooling grid in Lund  
from Kraftringen



Programme:	The International EPD® System, <a href="http://www.environdec.com">www.environdec.com</a>
Programme operator:	EPD International AB
EPD registration number:	S-P-07523
Publication date:	2023-03-17
Valid until:	2028-02-20

# PROGRAMME INFORMATION

## **PROGRAMME: The International EPD® System**

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## **Accountabilities for PCR, LCA and independent, third-party verification**

### **Product Category Rules (PCR)**

PCR: 2007:08, version 4.2, Electricity, steam and hot/cold water generation and distribution, UN CPC 171, 173.

**PCR review was conducted by:** The Technical Committee of the International EPD® System.  
A full list of members available on [www.environdec.com](http://www.environdec.com). The review panel may be contacted via [info@environdec.com](mailto:info@environdec.com).

### **Third-party verification**

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

**Third-party verifier:** Daniel Böckin ([Daniel@miljogiraff.se](mailto:Daniel@miljogiraff.se)), under the guidance of Pär Lindman, Miljögiraff AB.

**Approved by:** The International EPD® System

Procedure for follow-up of data during EPD validity involves third-party verifier:

Yes  No

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# Company information

**Owner of the EPD:**

Kraftringen Energi AB  
Box 25  
221 00 Lund  
Sweden

**Company number:** 556100-9852

**Contact information:** Martin Gierow,  
+46702767794, martin.gierow@kraftringen.se

**Description of the organisation:**

Kraftringen is a regional energy company in the south of Sweden, owned by the municipalities of Lund, Eslöv, Hörby and Lomma, headquartered in Lund.

Our vision is “Energy for future generations”. We strive to deliver electricity, heat, cooling, communications and other services with minimal impact on the environment. Work on a district heating grid in the city started in the early 1960’s,

replacing local boilers and thereby lowering overall emissions. Over the years, a gradual move away from fossil fuels have meant that the citizens of Lund, Lomma and Eslöv have kept warm in an ever more sustainable fashion. Waste incineration, electric boilers, heat pumps producing heat from sewage water are some examples. In 1985, a unique geothermal system was brought online, supplying 25 % of the overall heating need in the cities. In 2018, the last fraction of fossil fuels was removed from the mix. Contributing to the fact that the City of Lund reached its climate goals for 2020 a full two years early.

Kraftringen implements a certified environmental management system. The system is based on the standard ISO 14001:2015.

**Name and location of production site:**

The following production site located in the municipality of Lund have been included in the EPD:

- Ångkraftverket

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# Product information

**Product name:** District cooling grid in Lund

**Product identification:****Product description:**

Chilled water is generated using a heat pump, cooling machine, accumulator, and absorption chiller and distributed through the district cooling grid in northern Lund.

The production equipment has an estimated technical lifetime of 20 years (heat pump and absorption chiller), 30 years (cooling machine),

and 50+ years (accumulator). The infrastructure consisting of district cooling pipes has an estimated lifetime of 75-100 years.

In addition to the technical service lifetime, the specific reinvestment rates of the various materials and components are included in the assessment.

**UN CPC code:** 173 – Steam and hot water.

**Geographical scope:** Sweden

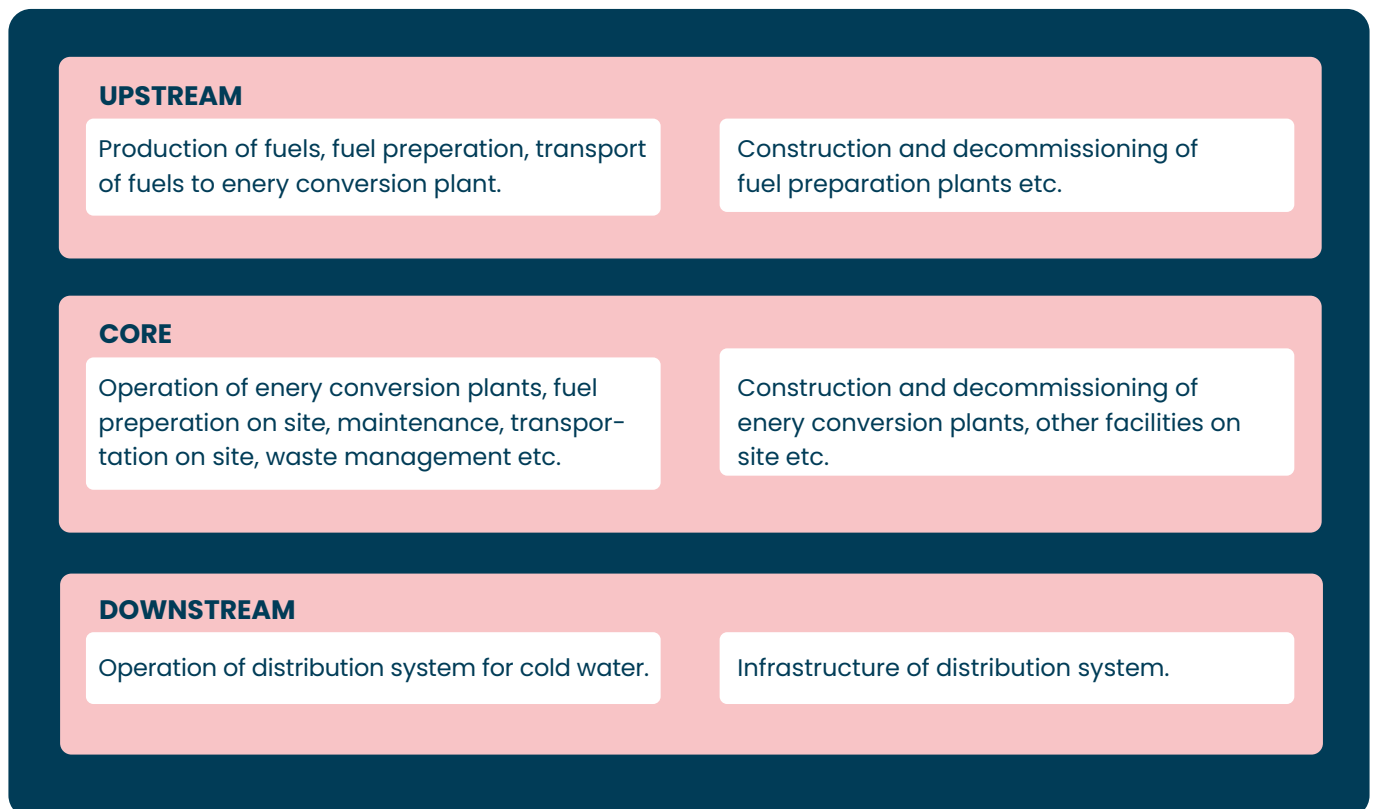
# LCA information

**Functional unit / declared unit:** 1 kWh of district cooling generated and thereafter distributed to a customer meter.

**Time representativeness:** Production data is based on year 2020.

**Database(s) and LCA software used:** GaBi software and database, also Ecoinvent database.

**System diagram:** See figure below.



**Upstream:**

Includes production and transports of fuels and purchased materials used in the core process.

**Core:**

Includes the operation of a heat pump, an absorption chiller and a cooling machine. Construction and decommissioning of the infrastructure are also included here.

**Downstream:**

Includes distribution of district cooling to a customer meter. Infrastructure is also included. Distribution losses are 7% according to Krafringen.

# Environmental performance

## Potential environmental impact

District cooling Lund (1 kWh cold water)								
Parameter	Unit	UPSTREAM OPERATION	UPSTREAM INFRASTRUCTURE	CORE OPERATION	CORE INFRASTRUCTURE	DOWNSTREAM OPERATION	DOWNSTREAM INFRASTRUCTURE	TOTAL
GWP-fossil	kg CO2 eq.	0,00E+00	0,00E+00	6,44E-03	1,70E-04	5,36E-04	6,37E-04	7,79E-03
GWP-biogenic	kg CO2 eq.	0,00E+00	0,00E+00	2,26E-04	3,38E-08	1,71E-05	2,53E-07	2,43E-04
GWP-luluc	kg CO2 eq.	0,00E+00	0,00E+00	3,59E-05	2,93E-07	2,97E-06	2,43E-07	3,94E-05
GWP-total	kg CO2 eq.	0,00E+00	0,00E+00	6,71E-03	1,71E-04	5,57E-04	6,37E-04	8,08E-03
AP	mol H+ eq.	0,00E+00	0,00E+00	9,39E-05	5,07E-07	6,98E-06	1,50E-06	1,03E-04
EP-freshwater	kg P eq.	0,00E+00	0,00E+00	2,25E-06	2,84E-10	1,58E-07	4,35E-10	2,41E-06
EP-marine	kg N eq.	0,00E+00	0,00E+00	3,22E-05	1,14E-07	2,42E-06	3,02E-07	3,50E-05
EP-terrestrial	mol N eq.	0,00E+00	0,00E+00	3,30E-04	1,25E-06	2,51E-05	3,23E-06	3,60E-04
POCP	kg NMVOC eq.	0,00E+00	0,00E+00	7,77E-05	3,95E-07	5,83E-06	1,09E-06	8,50E-05
ODP	kg CFC 11 eq.	0,00E+00	0,00E+00	3,84E-11	2,41E-14	2,69E-12	1,02E-13	4,12E-11
ADP-elements*	kg NMVOC eq.	0,00E+00	0,00E+00	5,75E-07	6,35E-10	4,03E-08	5,66E-10	6,16E-07
ADP-fossil*	kg CFC 11 eq.	0,00E+00	0,00E+00	5,71E-02	1,86E-03	5,25E-03	7,97E-03	7,22E-02
WDP*	m3 world eq.	0,00E+00	0,00E+00	5,06E-03	2,67E-04	3,78E-04	4,75E-04	6,18E-03

\* The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and as there is limited experience with the indicator.

## Use of resources

District cooling Lund (1 kWh cold water)								
Parameter	Unit	UPSTREAM OPERATION	UPSTREAM INFRASTRUCTURE	CORE OPERATION	CORE INFRASTRUCTURE	DOWNSTREAM OPERATION	DOWNSTREAM INFRASTRUCTURE	TOTAL
PERE	MJ	0,00E+00	0,00E+00	4,29E+00	1,78E-04	3,01E-01	1,78E-04	4,59E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,00E-90	1,00E-90
PERT	MJ	0,00E+00	0,00E+00	4,29E+00	1,78E-04	3,01E-01	1,78E-04	4,59E+00
PENRE	MJ	0,00E+00	0,00E+00	5,96E-02	1,93E-03	5,44E-03	8,16E-03	7,51E-02
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,00E-90	1,00E-90
PENRT	MJ	0,00E+00	0,00E+00	5,96E-02	1,93E-03	5,44E-03	8,16E-03	7,51E-02
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	0,00E+00	0,00E+00	4,64E-04	9,39E-07	3,28E-05	2,76E-06	5,01E-04

## Waste production and output flows

### Waste production

District cooling Lund (1 kWh cold water)								
Parameter	Unit	UPSTREAM OPERATION	UPSTREAM INFRASTRUCTURE	CORE OPERATION	CORE INFRASTRUCTURE	DOWNSTREAM OPERATION	DOWNSTREAM INFRASTRUCTURE	TOTAL
HWD	kg	0,00E+00	0,00E+00	2,44E-08	1,88E-09	1,84E-09	2,21E-11	2,82E-08
NHWD	kg	0,00E+00	0,00E+00	6,59E-03	4,01E-04	4,90E-04	2,15E-05	7,50E-03
RWD	kg	0,00E+00	0,00E+00	6,85E-07	2,32E-08	5,86E-08	1,05E-08	7,78E-07

### Output flows

District cooling Lund (1 kWh cold water)								
Parameter	Unit	UPSTREAM OPERATION	UPSTREAM INFRASTRUCTURE	CORE OPERATION	CORE INFRASTRUCTURE	DOWNSTREAM OPERATION	DOWNSTREAM INFRASTRUCTURE	TOTAL
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,08E-02	2,50E-04	1,10E-02
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## References

General Programme Instructions of the International EPD® System. Version 3.1.

PCR 2007:08. Electricity, steam and hot/cold water generation and distribution. Version 4.2.

GaBi LCA software (10.6) and database version 2022.2.

Ecoinvent database version 3.8, 2022.

Johansson, K. (2023). LCA methodology report for district cooling in Lund delivered by Kraftringen. IVL, Stockholm, 2023.

