



COMPANY PRESENTATION AND SOCIAL RESPONSIBILITY REPORT 2022

VISION

We are building the future of water, energy and resource efficiency services

– for our customers, employees and partners.

Electricity



Easy everyday life

Heat



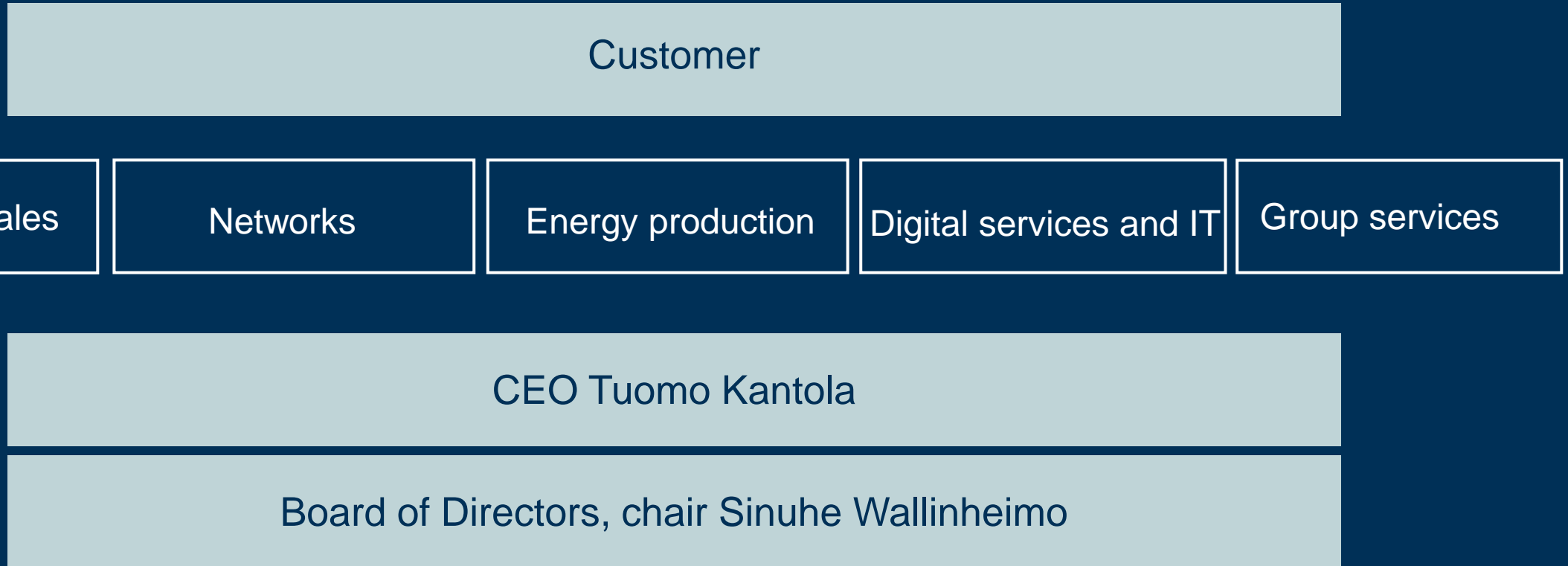
Right temperature
year round

Water

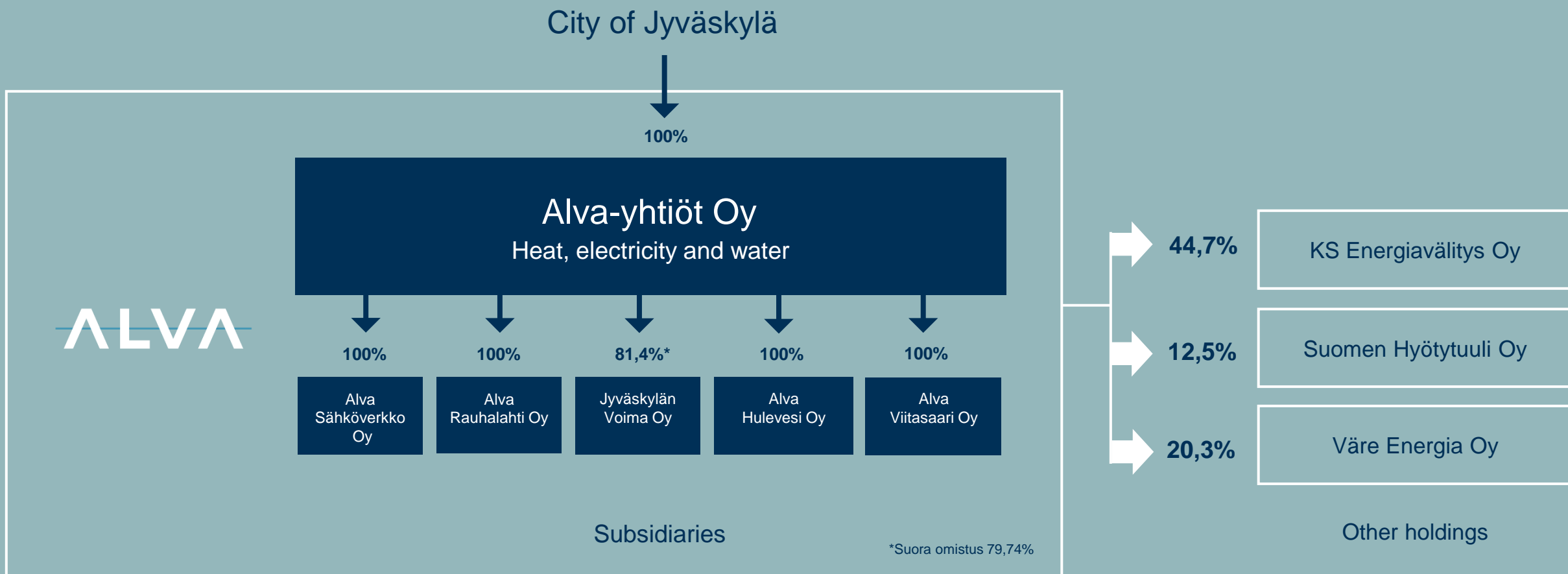


Fresh and pure

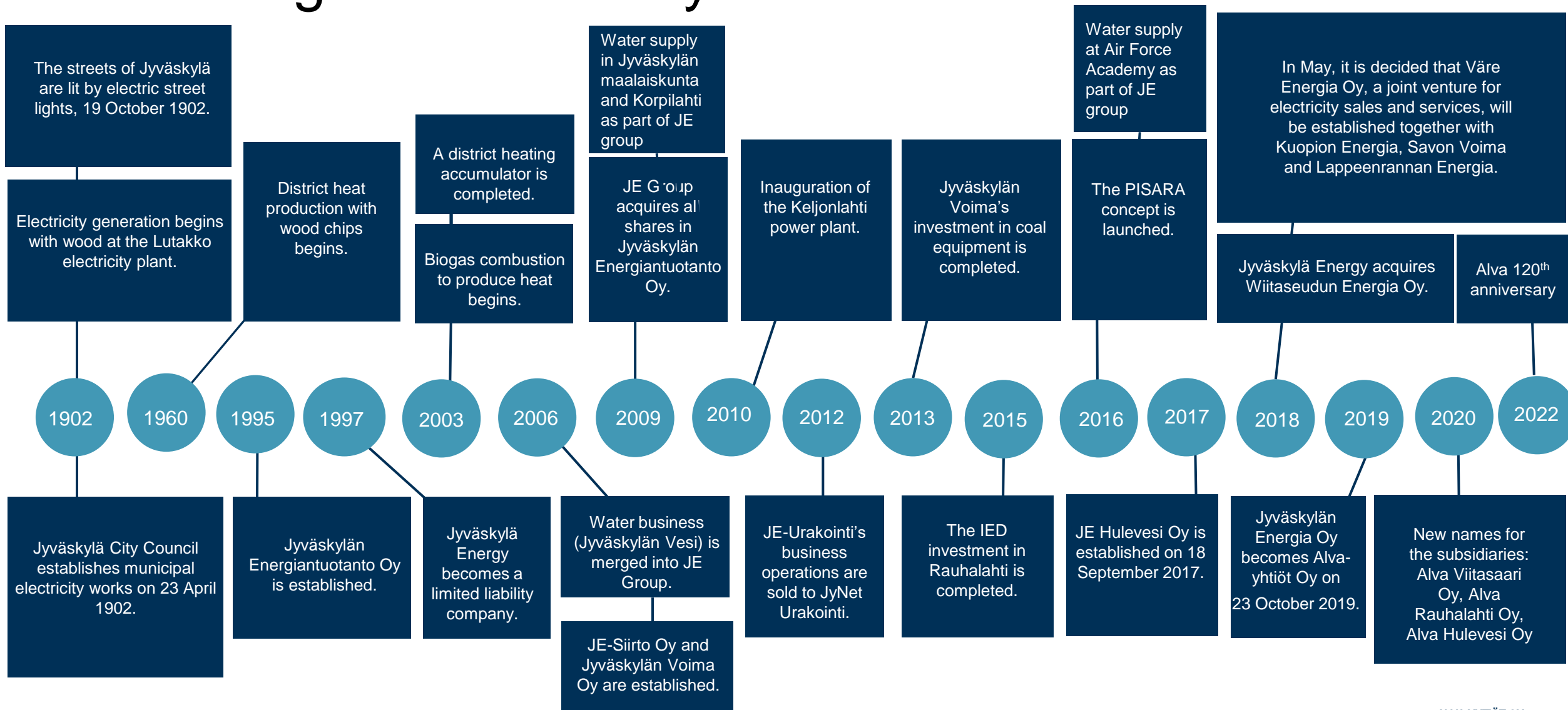
Our organisation



Company ownership structure



Alva throughout its history



EMPLOYEES

WE EMPLOY

230

PEOPLE

We take care of your basic needs.
We ensure that water comes from your tap,
electricity from your wall socket and your
toes stay warm. Every single day.

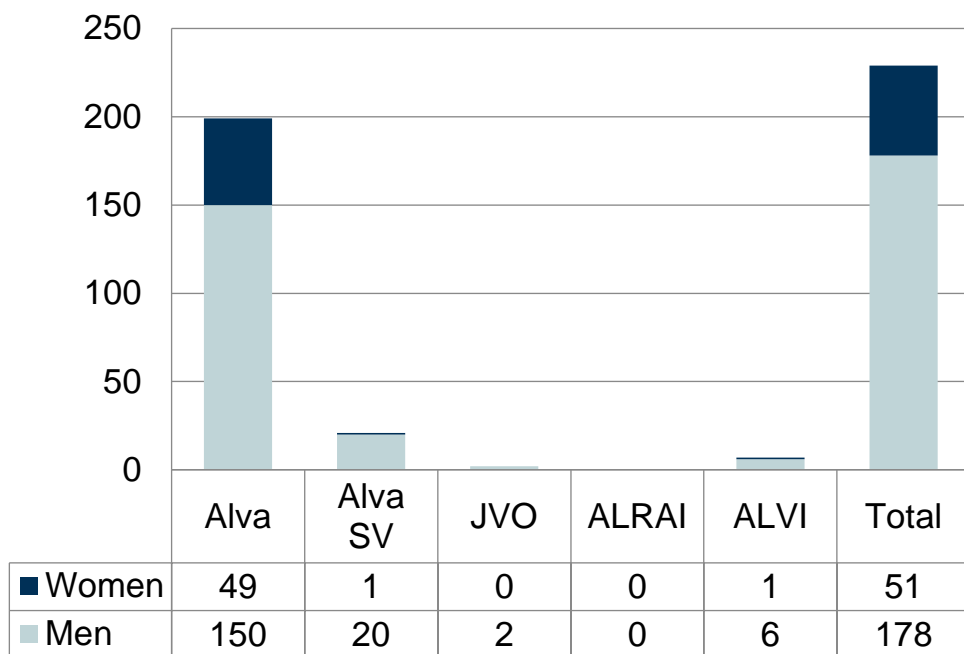
Our whole supply chain employs
approximately 1,000 person-years a
year.

Cooperation with us provides tens of
millions of euros for Finnish companies,
transport entrepreneurs and machine
entrepreneurs.

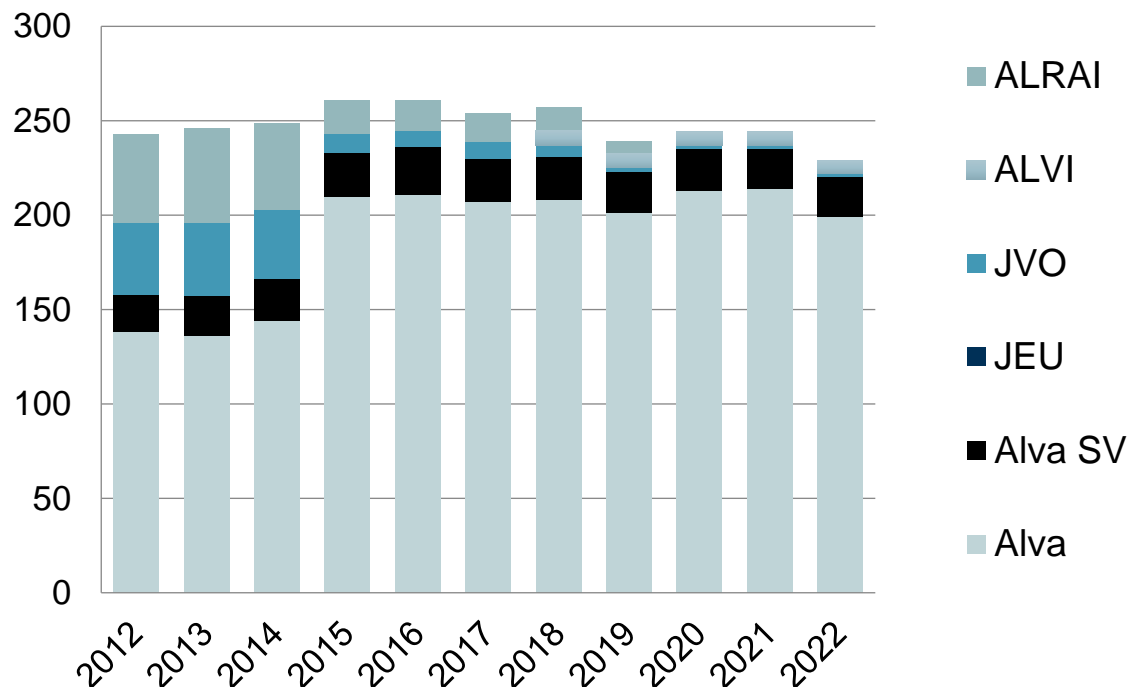
EMPLOYEES

Employees by group company

Employees by company



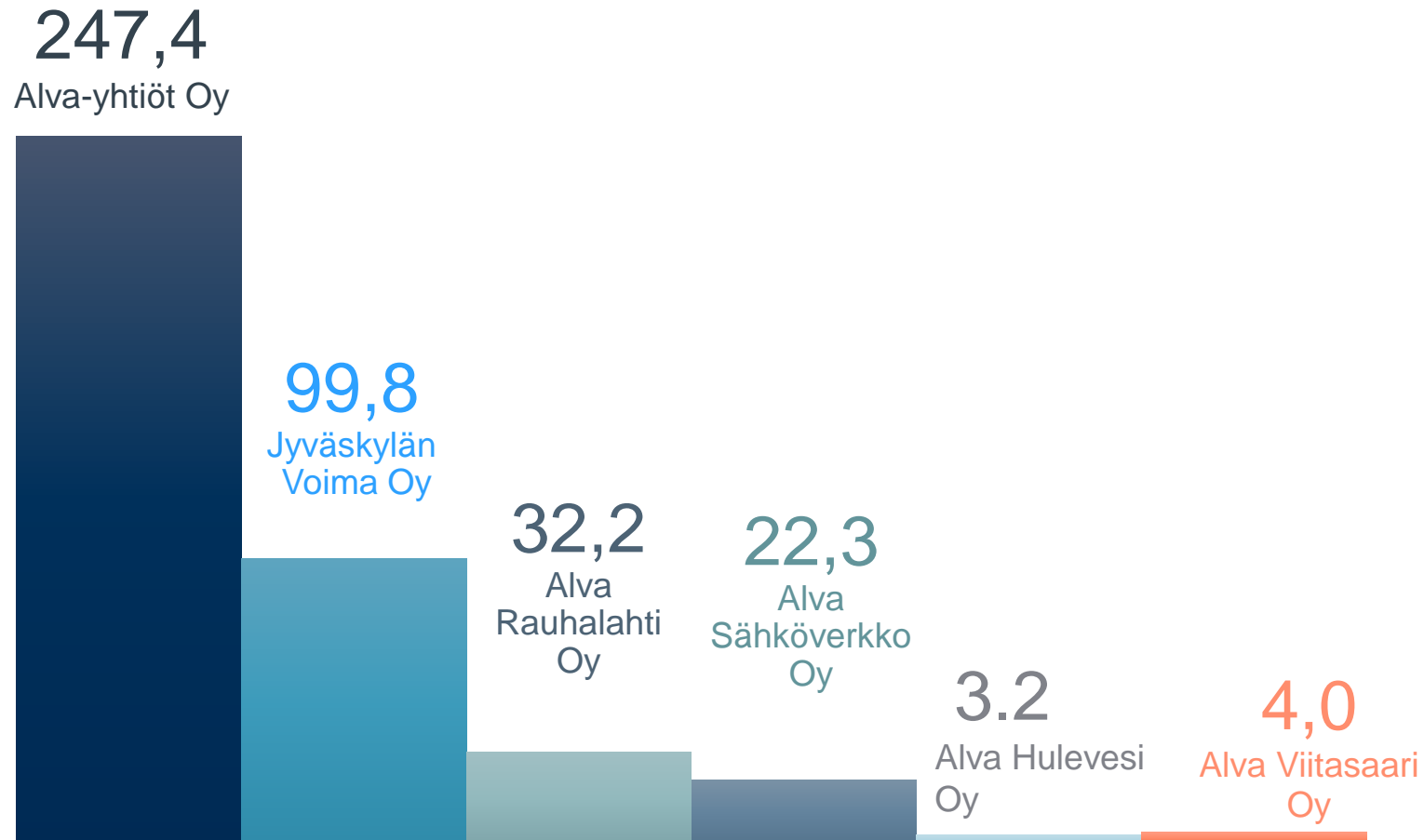
Change in the number of employees



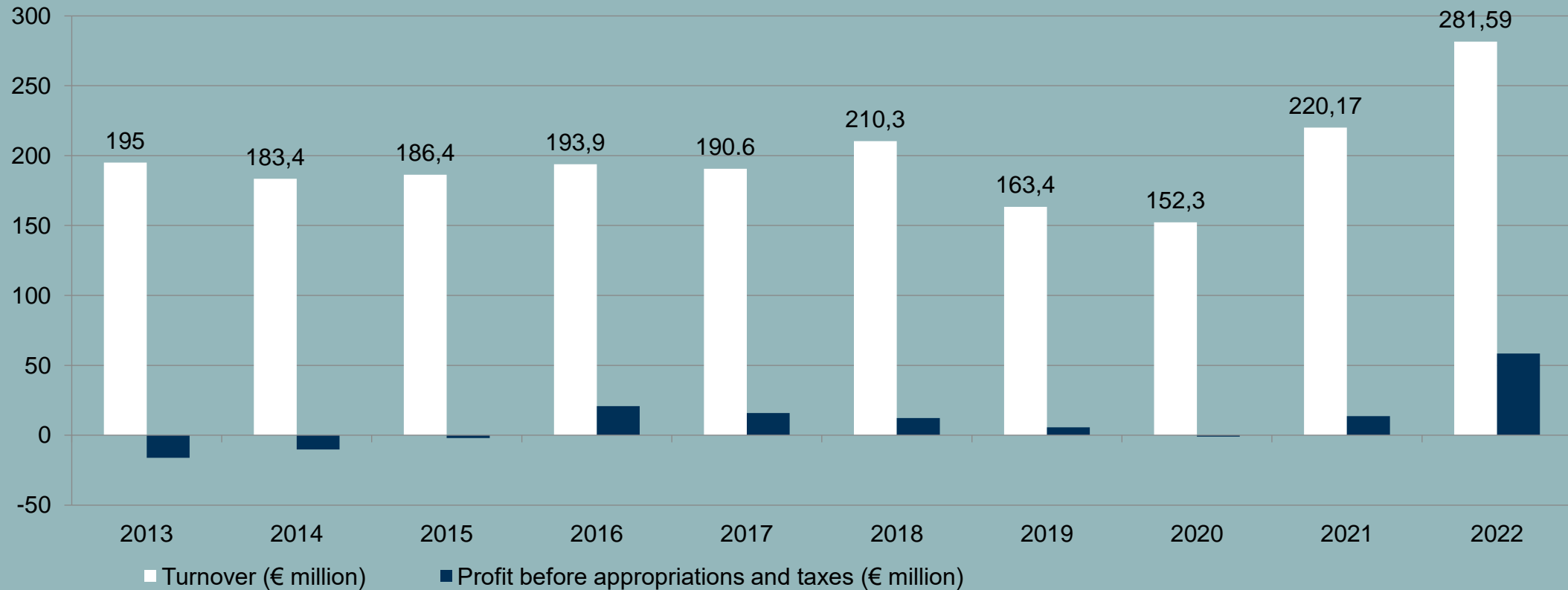
- All JE-Urakointi (JEU) employees transferred to JyNet Urakointi Oy in an acquisition on 1 March 2012.
- At the beginning of 2015, operating employees of JVO and JYT transferred to Jyväskylän Energia.
- Eight employees from Wiitaseudun Energia transferred to Jyväskylän Energia Group on 1 December 2018.
- Alva SV = Alva Sähköverkko, ALRAI = Alva Rauhalampi, ALVI = Alva Viitasaari

FINANCES

Turnover of group companies in 2022 (€ million)



Group's turnover and result in 2013–2022



NETWORKS

Electricity, heat, water

NETWORKS

Electricity network

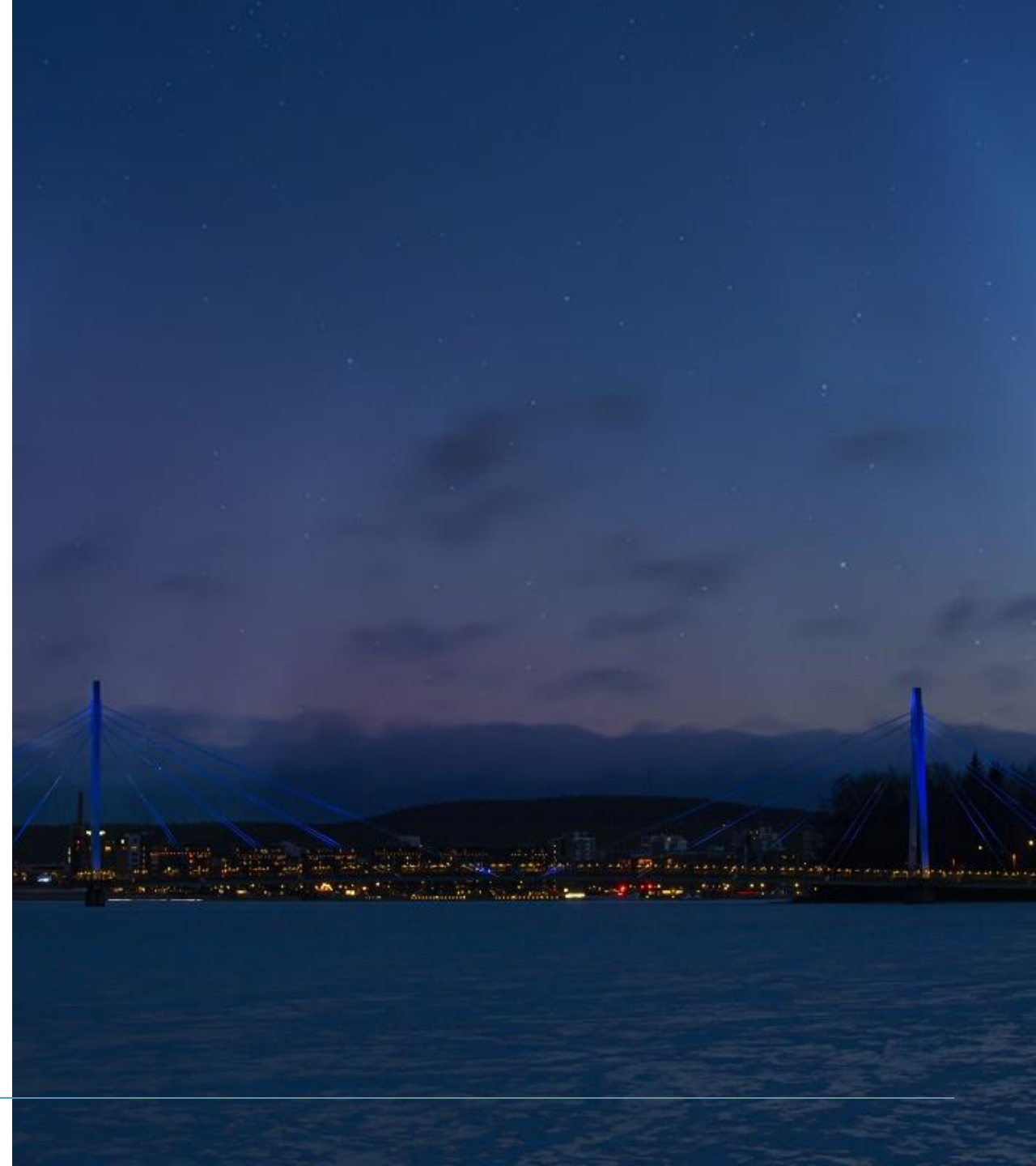
Alva Sähköverkko Oy, a company wholly owned by Alva, is responsible for the electricity network in the city of Jyväskylä. It designs, builds, maintains and operates the electricity network, connects customers to it and carries out electricity measurements.

Alva Sähköverkko maintains a network of 1,400 kilometres in total. In 2022, some 650 GWh of electricity was transmitted to more than 10,500 connections and some 61,000 customers.

Electrical network investments totalled €4.1 million in 2022. Roughly 26 % of these investments were allocated to the construction of the distribution network, and the remaining 74 % to improving the delivery reliability and making repair investments.

On a national scale, Alva Sähköverkko is among the electricity network companies with the lowest rates.

More information: alva.fi/sahkoverkko



NETWORKS

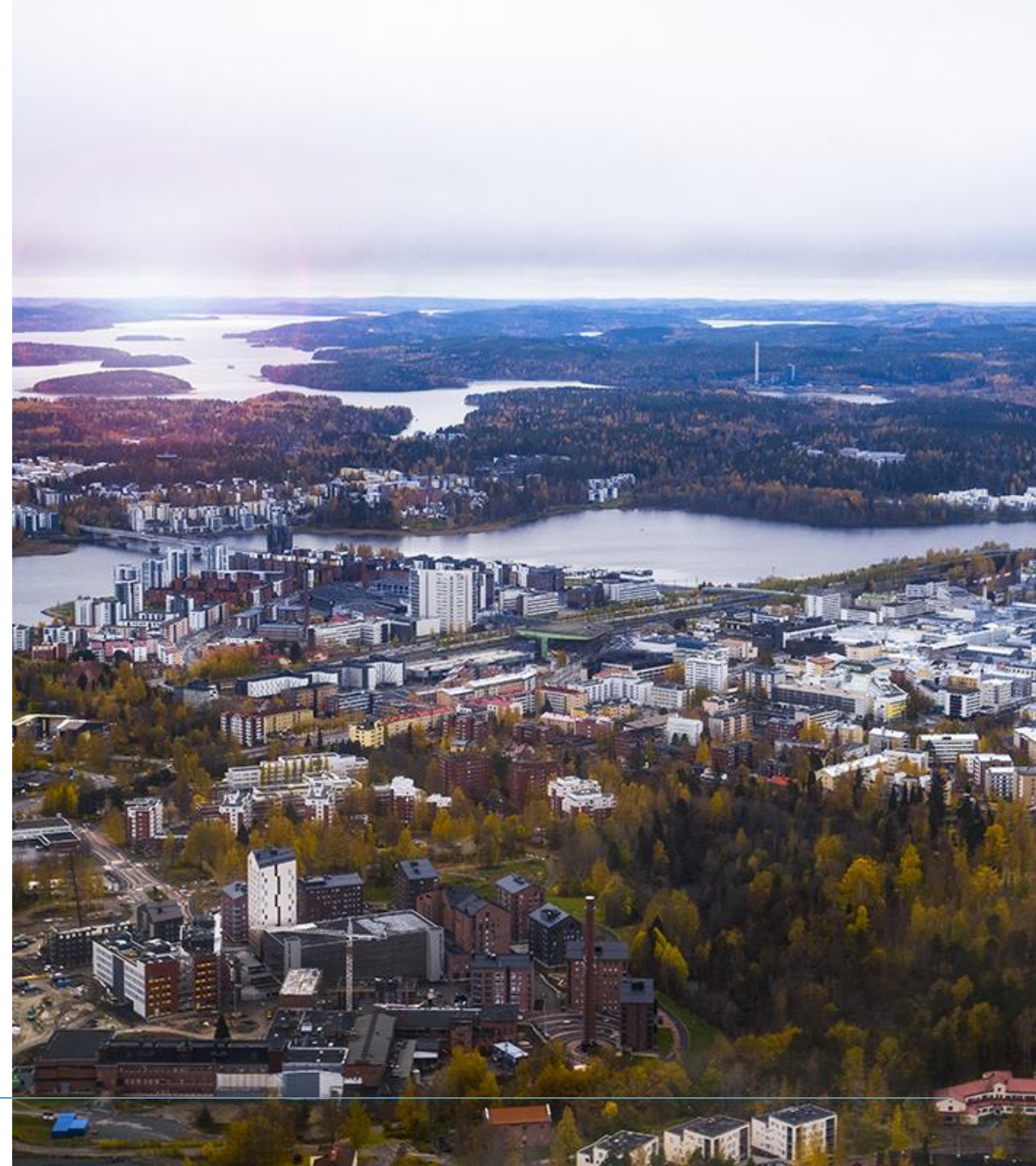
Heat network

Alva generates district heating at power plants, from where it is transmitted to customers via a heat network. The same network can also be used for district cooling.

Alva's heat network is in a good condition, which has also helped to keep the prices of district heating reasonable.

Maintaining the heat network is important, as many homes and workplaces in Jyväskylä are heated using district heating. Heat generated in Jyväskylä is also transmitted to most Jyväskylä-based schools, daycare centres, hospitals and health centres. Alva is also responsible for the district heating network in Viitasaari.

Alva's district heating network totals 492 kilometres in the Jyväskylä region and 44 kilometres in Viitasaari.



NETWORKS

Water supply networks, Jyväskylä

Our obligation and responsibility is to distribute clean and safe tap water to our customers via our well-functioning supply network.

During the financial period, €14 million was invested in water supply networks, equipment stations and other infrastructure, of which new investments accounted for €4.6 million, and renovation and development investments for €9.4 million.

The most significant investments were made in the additional construction of wells for raw water supply at various production plants and the renovations of water supply areas in Väinölä and Kortemäki.

In 2022, Alva received the ISO 55001 asset management certification as the first water supply company in Finland.

Key figures in 2022:

- Turnover €42 million
- Invoiced wastewater 9.5 million m³
- 19,000 connections
- Tap water production volume 9 million m³ per year
- 8 tap water production plants
- Network length more than 2,200 km
- 320 equipment stations



VERKOT

Water supply networks, Viitasaari

Our mission and obligation is to produce and distribute clean and safe drinking water to our customers and ensure the transfer and treatment of wastewater.

Investments in water supply networks, equipment stations and other infrastructure in Viitasaari totalled €206,000 during the financial period, of which water production accounted for €62,000, the water supply network for €108,000, and the wastewater network for €36,000.

In Viitasaari, we have 101 kilometres of water supply networks and two elevated reservoirs.

Viitasaari has a wastewater network of 77 km with 56 pumping stations.

Key figures in 2022:

- Turnover €1.11 million
- Invoiced tap water 201,000 m³
- Invoiced wastewater 180,000 m³



PRODUCTION

Our annual production 2022

1.5

TWh of heat

0.8

Twh of electricity

8,5

Mm³ of water

ENERGY PRODUCTION

Heat and electricity

Our ecological energy production

- Both our power plants in Jyväskylä, Keljonlahti and Rauhalahti, are combined heat and power plants. Combined production saves one third of fuel compared with separate production.
 - Our target is carbon neutral energy production by 2030. The share of wood in fuels will be increased, while the share of peat will be reduced. We are also exploring and testing non-combustion-based production methods (alva.fi/hiilineutraaliksi-2030).
 - Bio-based emission-free fuels account for approximately 99 % of the fuels used in district heat production at Viitasaari. Most fuels are sourced from the local wood product industry and forest entrepreneurs.
- We also invest in the conservation of energy by developing solutions to utilise waste heat and balance the consumption of heat (energy optimisation).
 - As a result of our holdings in Suomen Hyötytuuli Oy, the use of wind power in our electricity production has significantly increased in recent years.
 - We can provide our heating customers with green heat, produced wholly from renewable and emission-free energy sources. Our green heat is certified by Energiavirasto.
 - The reuse of ash is already high – nearly 100% of the ash generated at our plants is currently being reused.

Keljonlahti power plant

- Main fuels: wood, peat as a backup fuel source
- Coal and oil as auxiliary fuels when necessary
- Two operating principles:
 - combined heat and power production (CHP)
 - condensing power production
- Boiler power: 495 MW
- Electric output in condensing power production: 215 MW
- Electric output in combined production: 163 MW
- District heating output: 260 MW
- Year of commissioning: 2010



Rauhalahti power plant

- Main fuels: peat and wood (since spring 2022 100 % wood)
- Oil as an auxiliary fuel when necessary
- Operating principle: combined heat and power production (CHP)
- Electric output: 85 MW
- District heating output: 200 MW
- New flue gas scrubber and electric filter installed in 2015
- 2021-2022 urea injection equipment (Nox)
- Year of commissioning: 1986



ENERGY PRODUCTION (VIITASAARI)

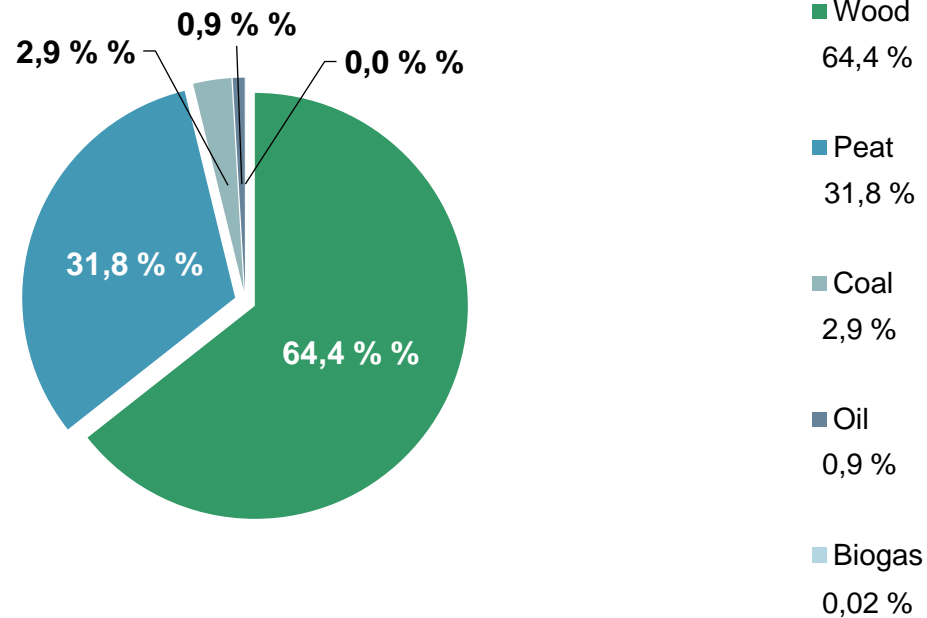
Kokkila heat plant

- Main fuels: wood
- Wood used as fuel is bought from the local wood industry and forest entrepreneurs
- Boiler power: 16 MW
- Annual production approx. 55.000 MWh



Energy production / fuels 2022

In 2022 the share of biofuels was 64,4 % of all the used fuels.



In Alva Viitasaari's heat production fuels are 99 % biofuels (wood).

WATER PRODUCTION

Safe high-quality water

We make sure that everyone living in the area covered by our water supply network has access to clean high-quality water.

The quality of the tap water we produce is monitored constantly. In addition to self-monitoring in our laboratories, the quality is monitored regularly by the health protection authorities.

The quality of water is not only monitored at water treatment plants, but water samples are regularly taken from different parts of the network.

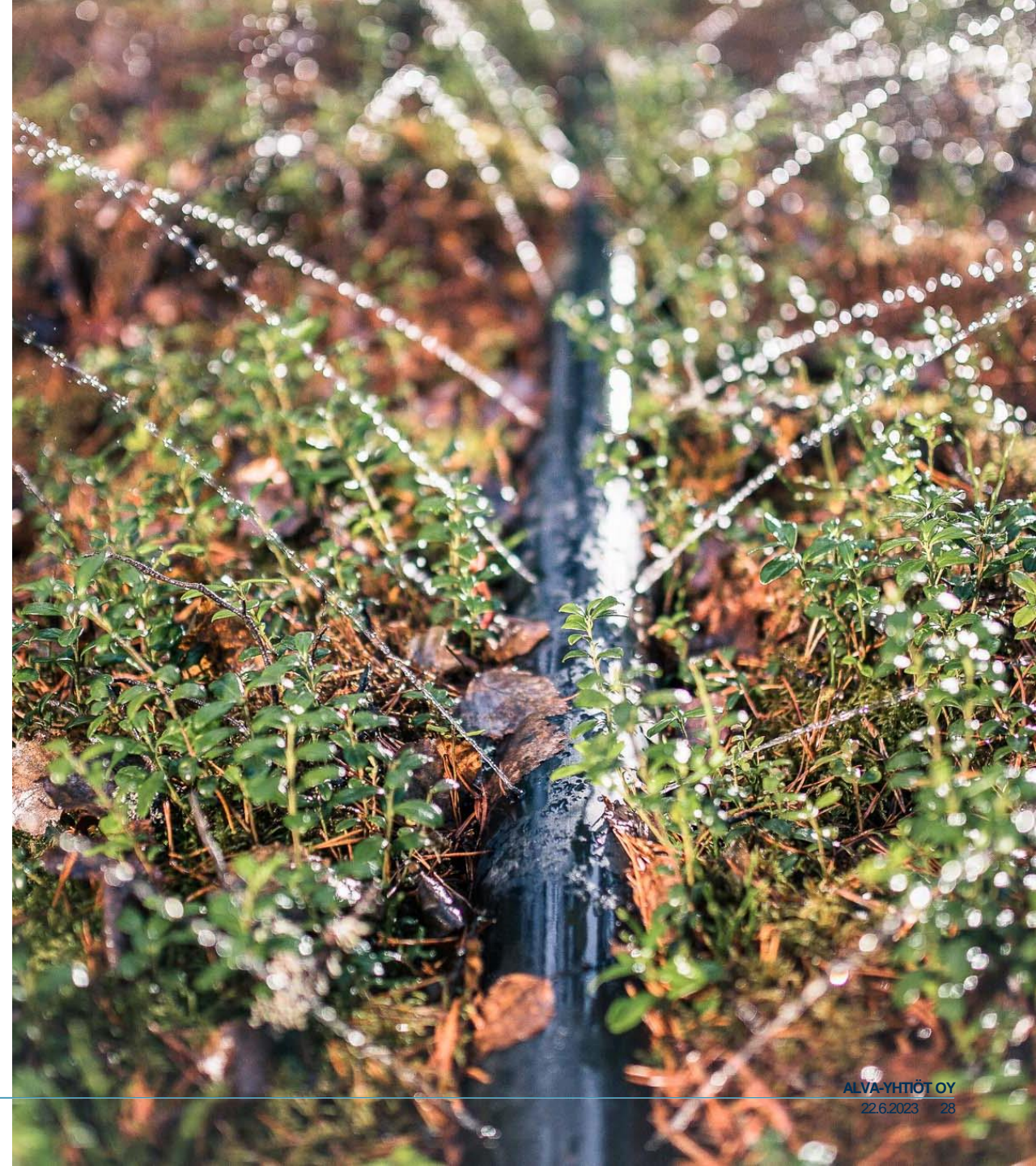


Tap water produced at several plants

Our most important tap water production plants are:

- Viitaniemi surface water treatment plant
- Vuontee artificial groundwater recharge plant in Laukaa
- Janakka–Kaivovesi water supply plant in Vaajakoski

We also produce water at Vihtakangas (Korpilahti), Liinalampi and Köntyslampi (Tikkakoski), Pekonniemi (Keljonkangas) and Vesanka groundwater intake plants, and in Viitasaari at Kokkolanniemi and Luukkaanniemi groundwater intake plants.



SOCIAL RESPONSIBILITY

Our ecological, social and financial responsibilities steer our operations. Our goal is to operate in line with the principles of sustainable development, addressing our relationship with nation, people and life as a whole.

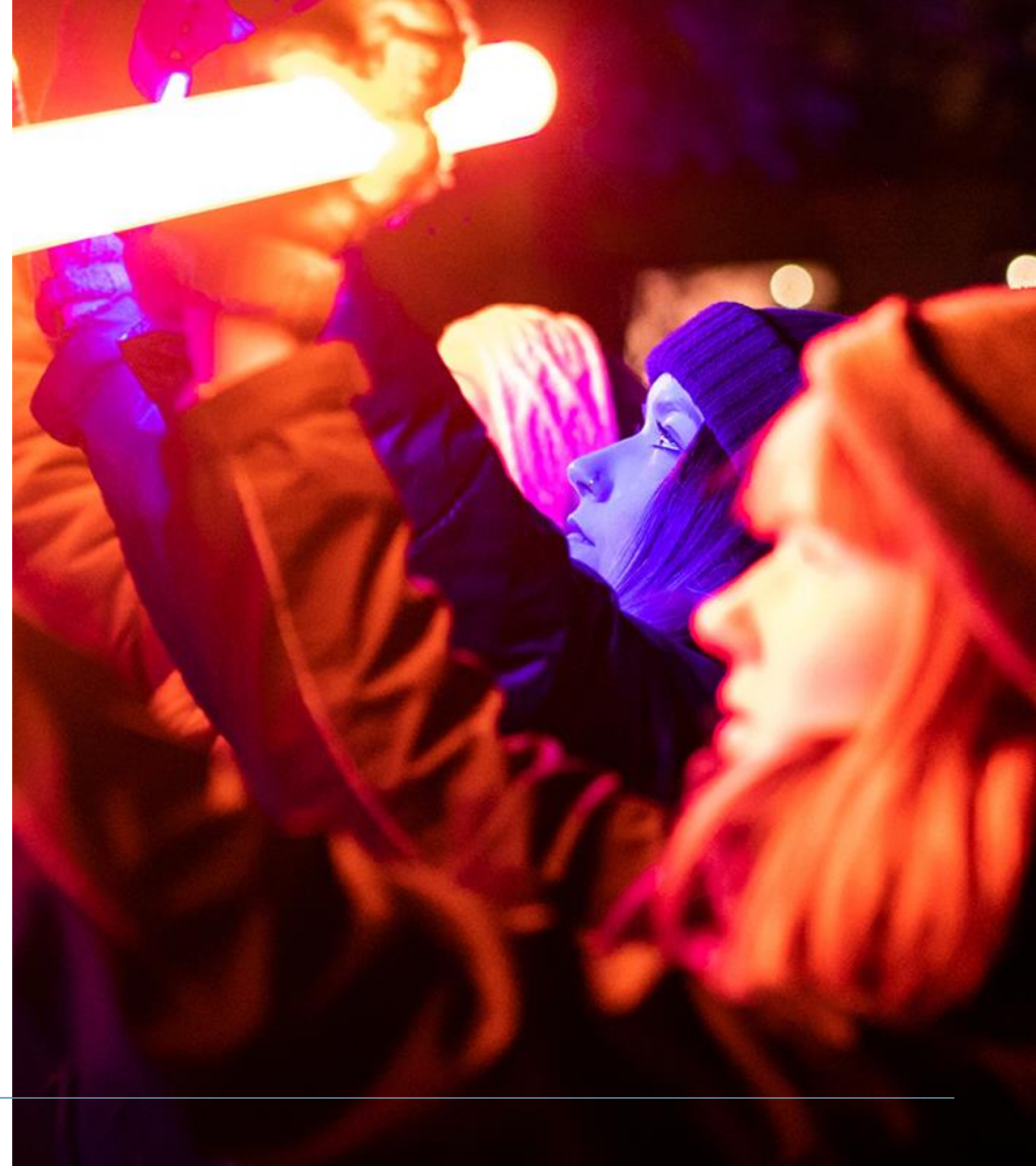
ECOLOGICAL RESPONSIBILITY

Carbon neutral by 2030

Our aim is to produce carbon neutral energy by 2030. Therefore we:

- Make our power plants more efficient
- Develop and offer sustainable heating solutions, such as
 - hybrid solutions that combine both district and geothermal heating
 - our green heat -product, produced wholly using renewable and emission-free energy sources (regional wood fuels and biogas from Mustankorkea)
- Investigate many new ways of producing energy without burning
- Increase the use of biofuels and use less and less peat

More information (in Finnish): [Hiilineutraaliksi 2030](#) and [Alva hiilineutraaliustiekartta](#)



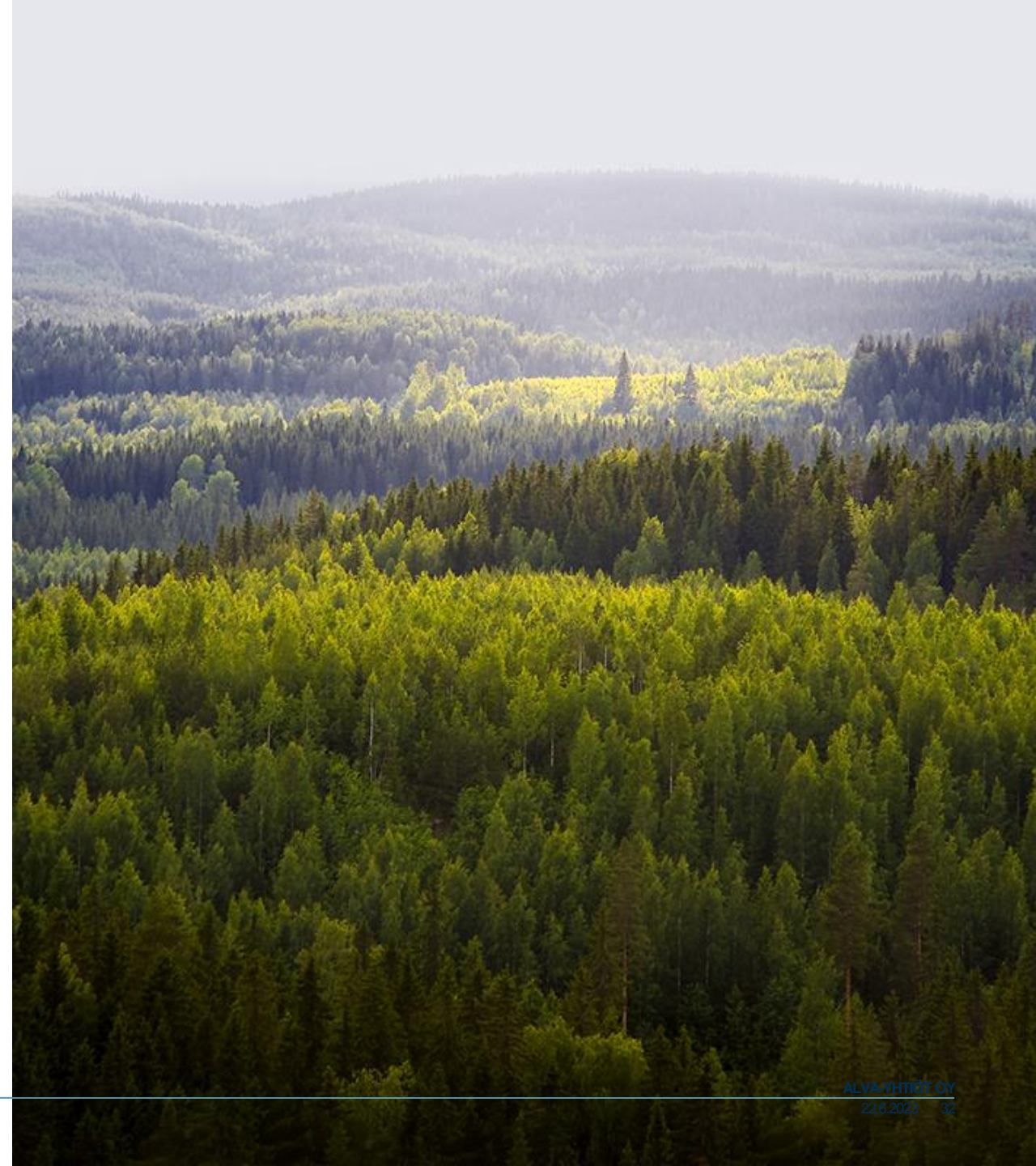
Carbon footprint calculation

We have started carbon footprinting of the entire Group's operations. You will find the calculation results on our website alva.fi/hiilijalanjalki

Although our carbon footprint is mostly made up of energy production, we also want to transparently consider our other emission sources in the calculation. Recognising the overall climate impact of our operations takes us closer to carbon neutrality both in production and other operations.

Through our energy efficiency activities, we aim to reduce emissions from operations other than energy production. In 2022, we received the ETJ+ energy efficiency certificate.

Recognising the overall climate impact of our operations takes us closer to carbon neutrality both in production and other operations.



Certified environmental system

Our group's environmental responsibilities are fulfilled in compliance with the certified ISO 14001 environmental management system.

Our environmental policy is guided by the principles approved by Alva's Board of Directors:

- We aim to reduce and prevent the adverse environmental impact of our operations.
- We aim to promote the sensible use of energy and water resources.
- In line with the principles of sustainable development, our energy sourcing is primarily based on regional renewable fuels and the combined production of power and heat.

[Environmental and energy policy at Alva](#)



Wastewater treatment while respecting nature

Wastewater treatment is an integral part of water supply. Our responsibility is to ensure that the wastewater we receive from our customers is conducted to wastewater treatment plants. We also monitor the quality of the wastewater.

We have some 250 wastewater pumping stations in the Jyväskylä network area. In 2022, the overflow rate (wastewater network) was 27.7 %. Jyväskylän Seudun Puhdistamo Oy, a limited company owned by the City of Jyväskylä and the municipalities of Laukaa and Muurame, is responsible for wastewater treatment processes in Jyväskylä area. Our wastewater treatment plants are located in Nenäinniemi and Korpilahti.

In Viitasaari Alva Viitasaari Oy takes care of the wastewater in Mustasuo wastewater treatment plant. We have some 56 wastewater pumping stations in the Viitasaari network area. In 2022, there were no wastewater overflows or bypasses at the treatment plant or in the network.

The treatment plants serve to ensure that water can be safely recirculated, while respecting nature and in line with the principles of sustainable development.



SPECIFIC EMISSIONS 2022

114,9

CO₂ g / produced district heating energy kWh

Driven by Alva's carbon neutrality goal, specific emissions will show a downward trend in the next few years.

The benefit-sharing method* has been used in the calculation of the specific emission factor.

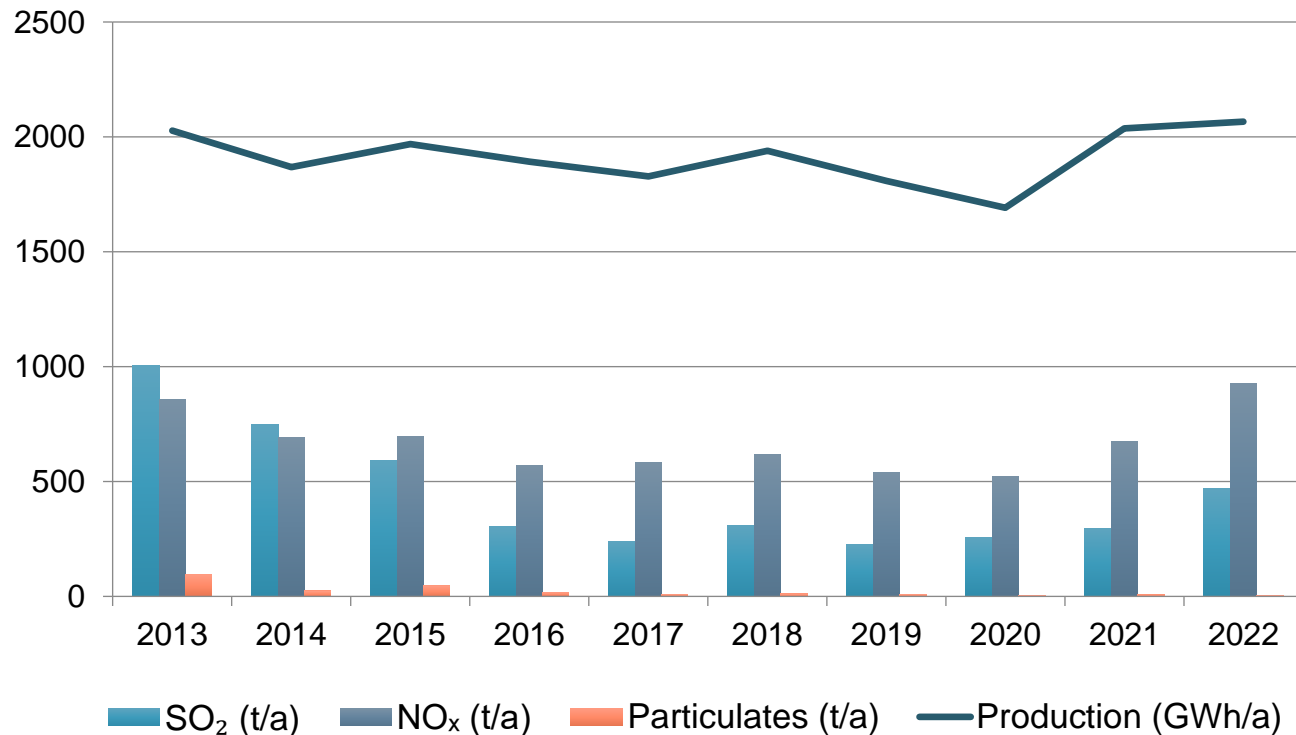
*The benefit sharing method refers to the sharing of the fuels of and emissions from combined electricity and heat production in proportion to the fuel consumption of alternative production methods. As alternatives, condensing power production is used for electricity and boiler heat for heat. When the benefit-sharing method is used, the benefits of combined electricity and heat production are shared equally between the two products. (Source: Motiva.)

ENERGY PRODUCTION

Emissions: Sulphur dioxide, nitrogen oxides, particulates

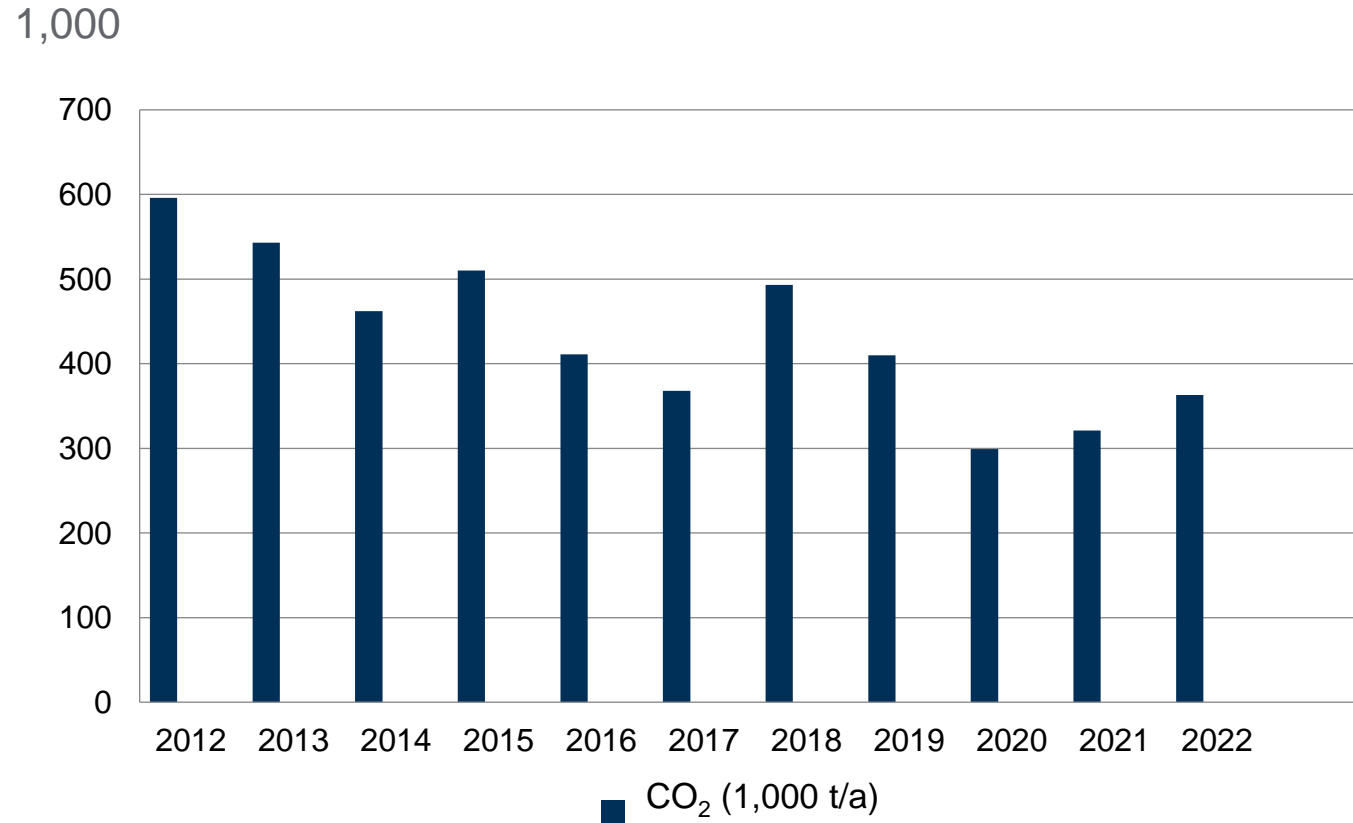
SO₂ = Sulphur
dioxide

NO_x = Nitrogen
oxides



The Rauhalahhti flue gas scrubber has significantly reduced sulphur dioxide and particulate emissions since 2016.

Emissions: Carbon dioxide CO₂



CO₂ emissions from fossil fuels, such as peat, coal and oil, have decreased, while the amount of wood fuels at power plants has increased.

Ecological responsibility: key figures

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Share of green heat from electricity sold (%)	8,2	6,9	5,16	4,33	3,96	3,94	1,25	*	*	*
Share of green electricity from electricity sold (%)	**	**	**	**	48,0	44,8	36,5	32,7	32,0	2,3
Network losses, electricity (%)	2,24	2,09	2,18	2,28	2,15	2,08	2,2	2,4	2,5	2,7
Network losses, district heating (%)	9,2	8,8	8,9	6,5	8,0	8,4	8,3	7,9	8,6	7,1
Make-up water in district heating (m ³)	7 019	15 700	19 422	10 500	9 990	9 292	11 110	6 690	9 960	3 673
Consumption of pumping electricity, district heating (MWh)	7 576	7 715	9 067	9 608	7 946	7 442	7 378	7 221	8 531	8 395
Waste water leaks to waterways/soll (m ³)	218	219	171	390	280	657	1 442	543	248	874
Water water leaks to waterways/soll (percentage of wastewater)	0,002%	0,002%	0,001%	0,003%	0,002%	0,005%	0,011%	0,004%	0,002%	0,006%
Repaired leaks in water mains (quantity)	21	31	23	27	31	37	29	25	31	42
Share of biofuels from all fuels (%)	64,4	66,8	58,9	47,8	49,3	53,8	51,9	51,7	50,9	44,8

* The amount of green heat was not reported at the time.

** Electricity sales transferred to Väre on 1 January 2019.

SOCIAL RESPONSIBILITY

When employees feel well, the company feels well

- We take care of the occupational safety and health of our employees.
- We encourage our employees to develop their professional skills and provide them with opportunities for development.
- We want to build an open working community and an innovative work culture, where everyone values their own work and that of others.
- Equality and non-discrimination are basic values for us.
- The development of wellbeing at work and employee experiences is an integral part of our personnel strategy.



Smoother living for every customer

We work hard every day to ensure that our networks and services operate to the maximum and our customers can enjoy their everyday life. Furthermore, we ensure that any interruptions due to improvements and repairs cause the minimum of inconvenience for our customers. Similarly, we aim to solve different disturbances as quickly as possible.

Using up-to-date fault notifications, customers obtain information about planned interruptions in their area beforehand and about any disturbances via email or text messages. More information (in Finnish):

alva.fi/asiakaspalvelu

We are also constantly developing our services to meet our customers' needs and wishes.



Annual support

We provide various support every year. We select the recipients of our support so that they are in line with our goals and values. During Alva's 120th anniversary year, we gave "Good Energy" scholarships to junior athletes and teams.

For example, in addition to sports, we have supported the following through different projects and parties:

- young people, student associations and the elderly
- children with diseases and low-income families
- nature conservation projects
- culture.



Social responsibility: key figures

	2022	2021	2020	2019	2018	2017	2016	2015	2014
Personnel									
Average number of employees	230	244	240	239	257	254	261	261	249
of which those on fixed-term contracts	4	14	16	18	23	25	31	28	24
Average age of employees	46	45	45	45	45	45	44,4	43,9	44
LTI1*	5,1	10,2							
Customers									
Electricity transmission, SAIDI ¹⁾ (h/customer)	0,05	0,074	0,036	0,21	0,08	0,05	0,14	0,06	0,25
Electricity transmission, SAIFI ²⁾ (quantity/customer)	0,19	0,302	0,158	0,73	0,39	0,24	0,39	0,23	0,58
Interruption time experienced by the customer: district heating (h)	2,4	2,6	2,4	2,3	2,1	1,58	1,12	1,44	1,08
Disruptions in water supply (h/customer)	0,05	0,23	0,17	0,38	0,36	0,14	0,35	0,23	0,08
Yhteisöt / Tukikohteet									
Support for associations (M€)	0,02	0,01	0,02	0,02	0,02	0,023	0,02	0,012	0,008

* Lost Time Incident, the number of occupational accidents per million hours worked

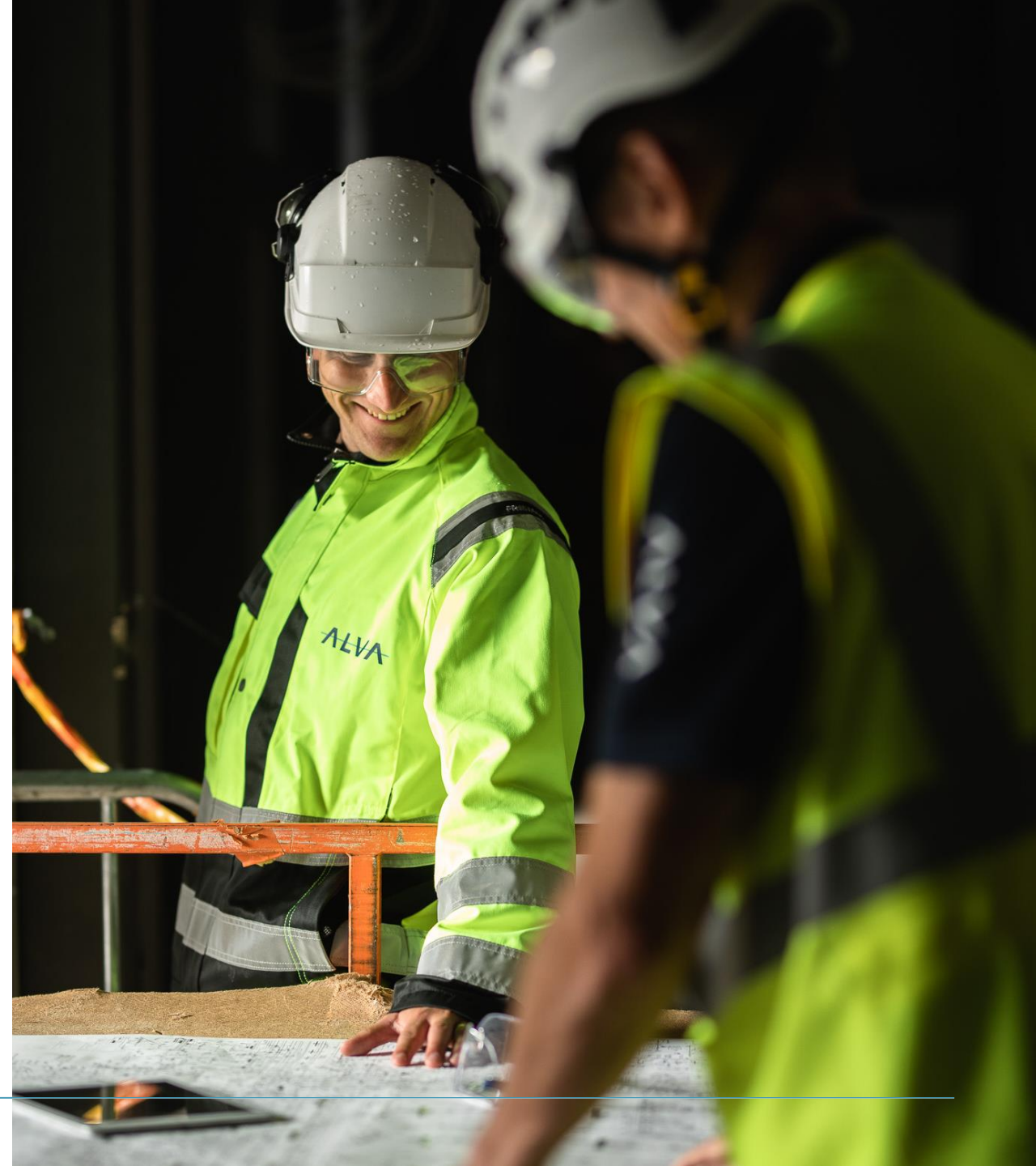
¹⁾ SAIDI = total average interruption duration, h/customer

²⁾ SAIFI = average number of interruptions per customer

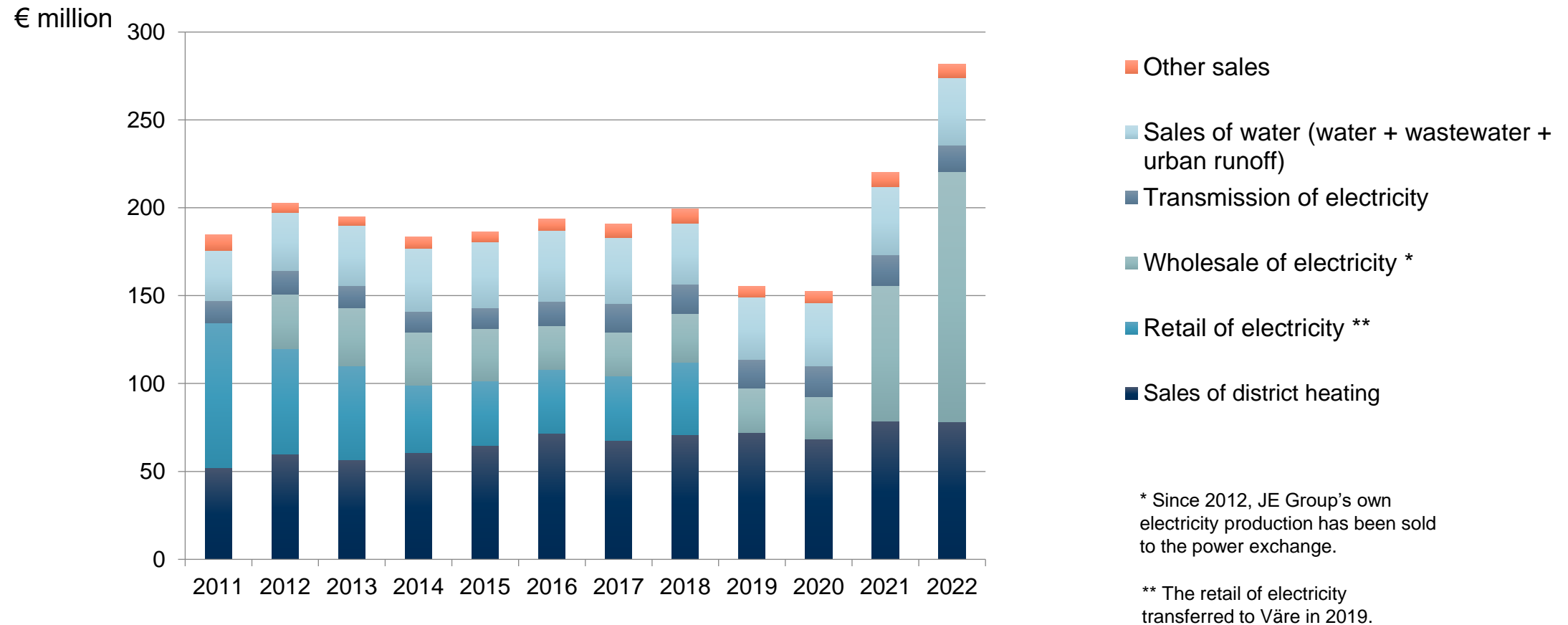
FINANCIAL RESPONSIBILITY

Development and more efficiency

- We are working constantly to improve the efficiency of all our operations.
- We are developing new competitive energy and water solutions that help our customers to improve the efficiency of their operations and that also materialise through savings.
- Our pricing is based, for example, on general price levels and any restrictions and requirements set by laws and our owner.
- Our operations produce value for different stakeholders, including our customers and our owner, the City of Jyväskylä.



Sales trend



Financial responsibility: key figures

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Turnover (€ million)	281,6	220,2	152,3	163,4	210,3	190,6	193,9	186,4	183,4	195
Operating profit (€ million)	66,6	26,2	12,8	20,2	26,8	31,8	36,4	17,7	8,7	6,2
Income tax (€ million)	10,27	3,88	0	1,26	0,74	2,11	3,19	0	1,03	0
Dividends (€ million)	2,0	4,0	4,0	4,0	4,0	4,0	1,6	0	0	0
The owner's interest expenses (€ million)	6,1	6,1	8,9	8,9	8,9	8,9	9,1	12,9	13,1	16,5
Investments (€ million)	30	113,7	23,4	28,2	32,2	27,6	26,1	28,2	29,9	37,9
Return on equity (%)	31	7,5	-1,4	3,3	7,7	10,3	15,3	neg	neg	neg
Equity ratio (%)	24,5	18,6	21,7	22,7	22,4	22,1	20,0	17,0	6,5	8,4
Wages and salaries ¹⁾ (€ million)	14,58	15,38	13,9	14,1	13,9	14,1	13,8	13,7	13,3	13,1
Purchases from suppliers (€ million)	176	156,9	97,8	101	136	107	105	119	138	139

¹⁾ The wage and salary costs include capitalised wages and salaries

2022

Positive and negative aspects

Alva Group's pros in 2022

- Financial performance was at a record level, driven by the steep increase in the market price of electricity and the successful use of the Group's significant electricity production capacity in blocking the energy shortage that threatened Finland.
- The determined development of carbon neutral energy production methods continued by increasing the use of wood fuels in energy production and planning steps to achieve carbon neutrality (alva.fi/hiilineutraaliustiekartta).
- The Rauhalahti power plant operated with 100% biofuels throughout the summer of 2022. The first 100% biofuel tests were completed successfully at the Keljonlahti power plant.
- The geopolitical situation and problems with the availability of raw materials and supplies did not cause any problems in operations.
- The construction of the first industrial-scale heat pump project was started at the Woodspin fibre plant.
- Alva is a shareholder in Väre Oy, which sells electricity and energy services to consumers. The Group received €2.24 million in profits from Väre.
- Water supply and urban runoff operations in Jyväskylä were given the ISO 55001 asset management certificate as the first water supply company in Finland.
- Through energy efficiency activities, the aim is to reduce emissions from operations other than energy production. In 2022, Alva received the ETJ+ energy efficiency certificate.
- Alva's electricity transmission customer prices remain among the lowest in Finland, and they were reduced on 1 January 2022. In district heating, Alva was the third most affordable provider in a comparison of the ten largest Finnish towns by Finnish Energy.
- The performance of electricity, heat, water, wastewater and urban runoff networks remained at a high Finnish level. .
- The market share of district heating in large new properties was 95%.

Alva Group's cons in 2022

- The prices of emission allowances, fuels, chemicals, network and plant components, and pumping electricity increased significantly and caused considerable added costs for the Group.
- The rising prices increased the costs of energy production, due to which a slight increase was made in the sales price of district heating on 1 February 2022 for the first time in six years.

Water supply customer prices were increased at the end of the year.

- Legal disputes with certain minority shareholders of Jyväskylän Voima Oy continued. The parties reached a settlement in December.

- An exceptionally large disruption took place at the Keljonlahti power plant in February, causing an extensive interruption in district heating throughout the city. The interruption could not have been prevented through preventive maintenance or another technical means. Its root cause was in the plant's design, and the possibility of a similar disruption has since been eliminated.

Research and development activities in 2022

- The SER PreCom project launched with Tapojärvi Oy and Elker Oy to use waste electrical and electronic equipment was completed. The project produced a specified process plan for a pre-commercial plant, including investment and operating costs, and an earning model with its business plans and agreements to start operations.
- As part of a consortium, Alva participated in VTT Technical Research Centre of Finland's "carbon forestry" project to investigate the impact of carbon sinks and the pricing of bio-based carbon dioxide on forestry and the profitability of more carbon-efficient solutions.
- As part of a consortium, Alva participated in the "production through data" project of Jamk University of Applied Sciences. Its starting point and purpose is to support companies operating in the region of Central Finland in the use of digitalisation through modern AI solutions and cybersecurity.
- The construction of the first industrial-scale heat pump project to produce district heating was started at the Woodspin fibre plant. The heat pumps supply the plant with process and plant heating and process cooling and recirculate any waste heat from the plant back to the district heating network.
- The Group's power plants developed production processes towards the discontinued use of fossil fuels. The technical modifications required for the full transition to renewable fuels were completed at the Rauhalahti power plant in the spring of 2022, and only wood fuels were burned at the plant throughout the summer. In 2022, a test period was completed at the Keljonlahti power plant, during which only wood fuels were burned.
- The development of Smart Water Cycle IoT, a concept with an international market potential, continued in cooperation with subcontractors using smaller inputs than in the previous years. At the same time, a new distribution partner was sought for a possible international trade.
- The development of Alva's data services continued by analysing the consumption readings of technology-independent meters and sending them for invoicing in a project to replace remotely read water meters in water supply operations.
- The national project for the digitalisation of water supply networks was completed. Supported by the Centre for Economic Development, Transport and the Environment of Central Finland, Alva built a new network information system for water supply plants that meets modern standards and serves to cost-effectively document location and characteristics data about water supply networks while minimising risks.

The ALVA logo is centered on the page. It features the word "ALVA" in a bold, white, sans-serif font. A thin, light blue horizontal line passes through the middle of the letters, extending slightly beyond the left and right edges of the text.

ALVA