



COMPANY PRESENTATION AND SOCIAL RESPONSIBILITY REPORT 2021

VISION

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

– for our customers, employees and partners.

Electricity



Easy everyday life

Heat



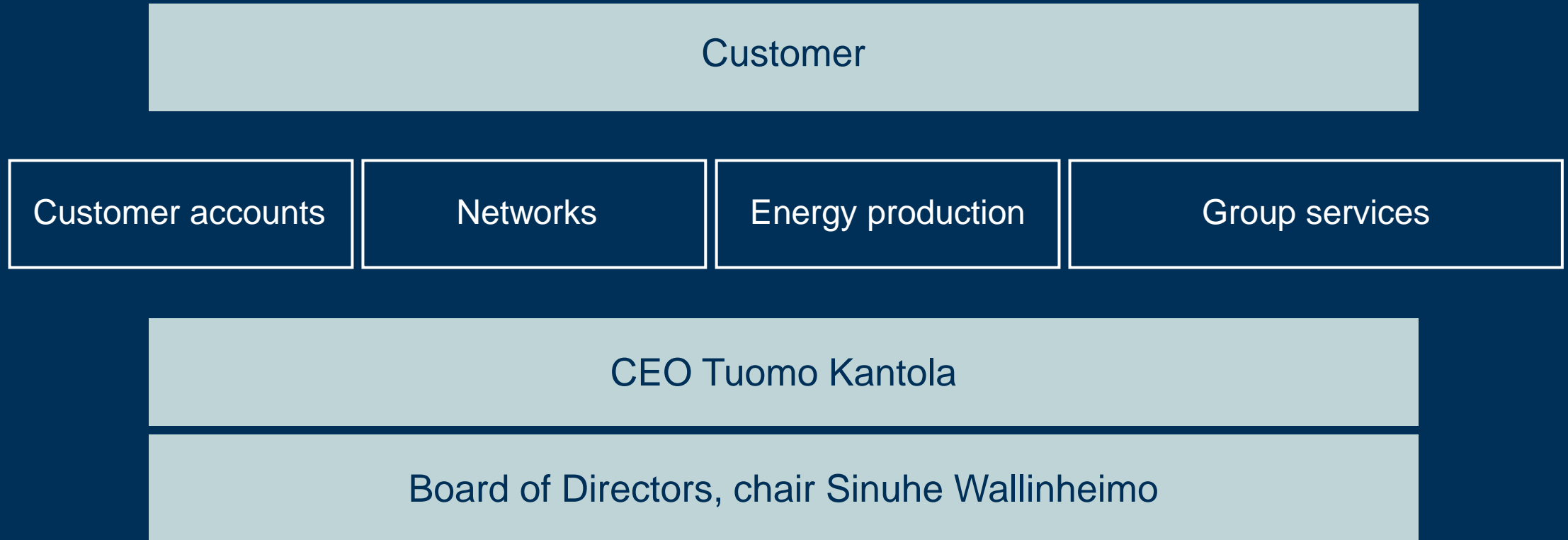
Right temperature
year round

Water

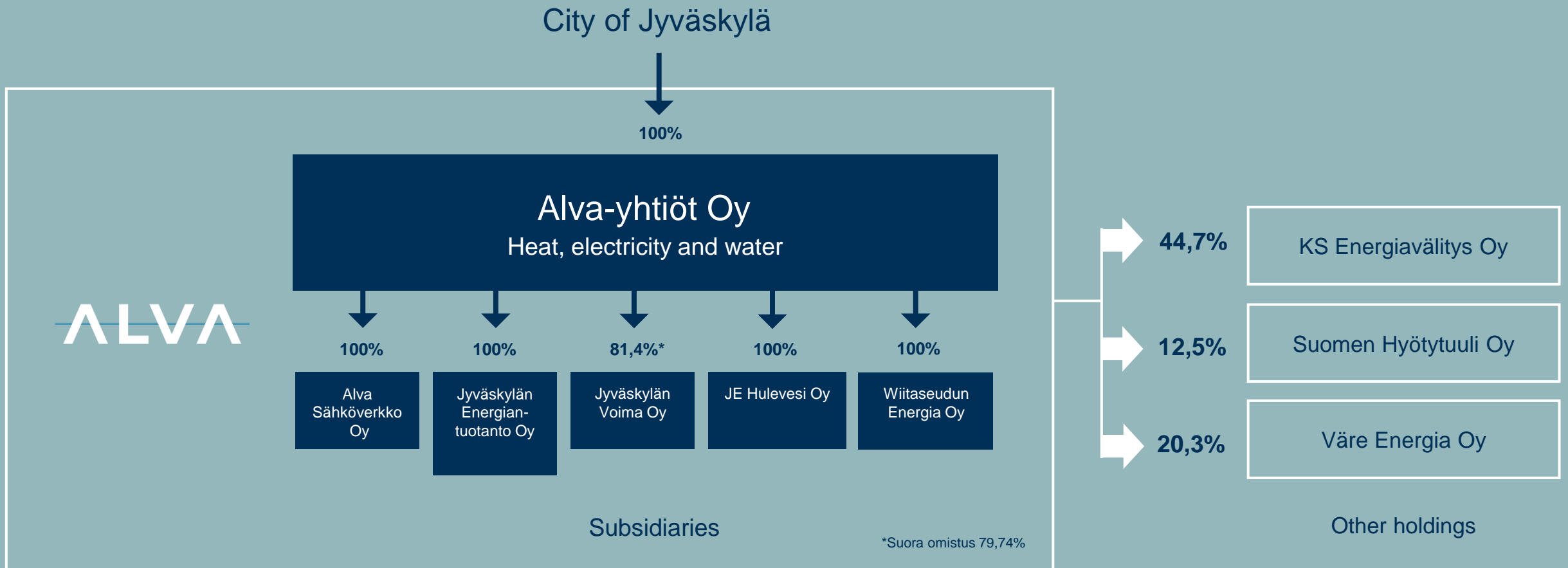


Fresh and pure

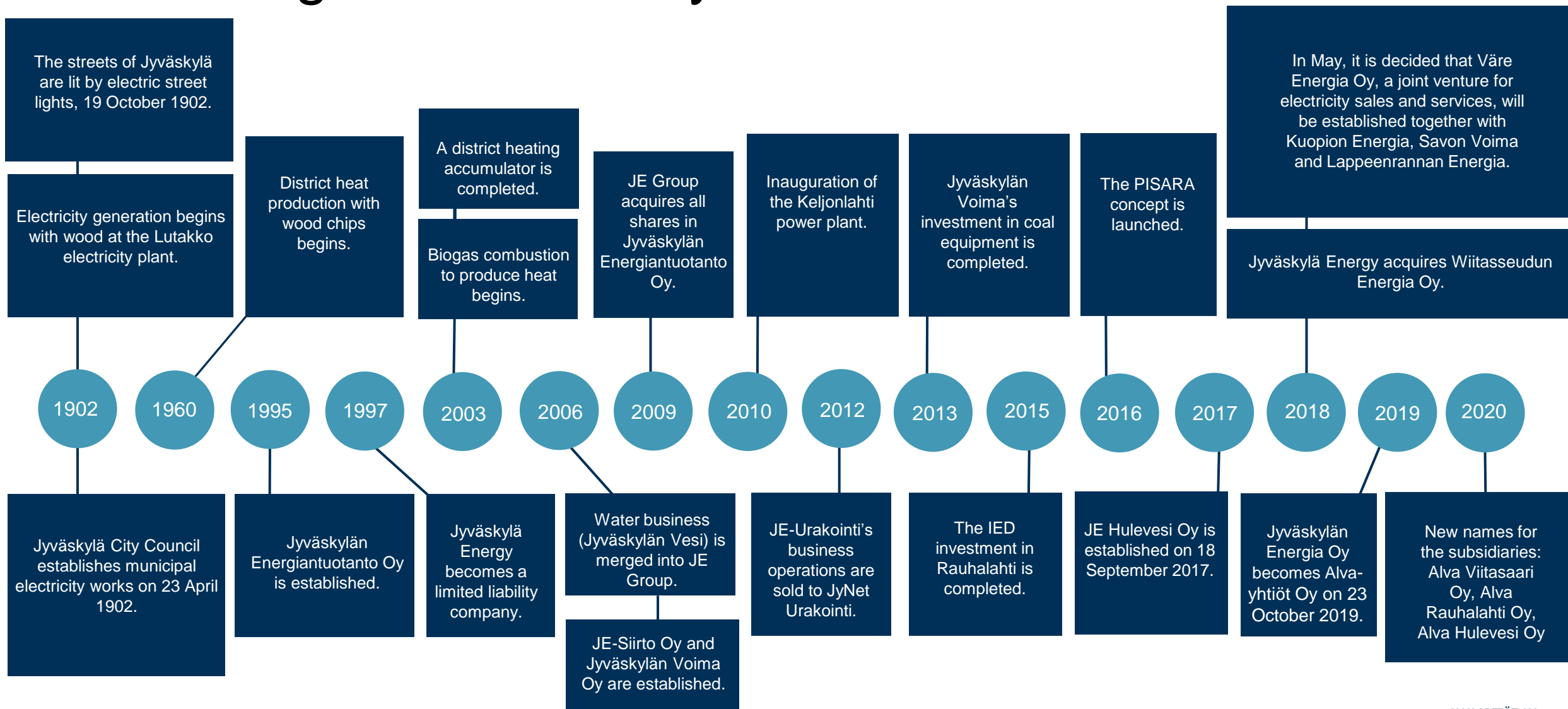
Our organisation



Company ownership structure



Alva throughout its history



EMPLOYEES



We 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.

WE EMPLOY

244

PEOPLE

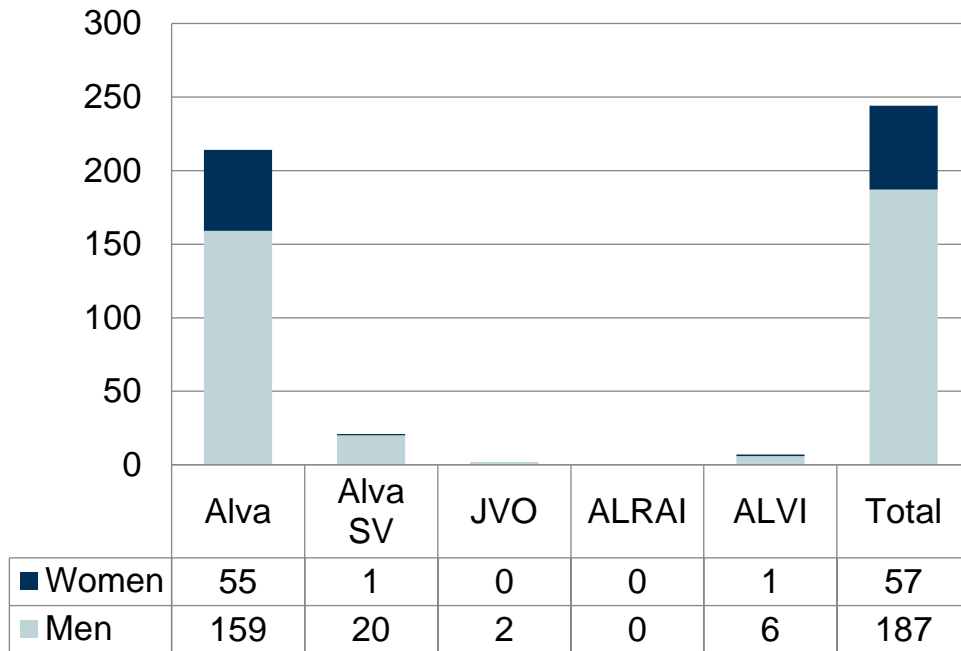
Our whole supply chain employs approximately 1,000 person-years a year.

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

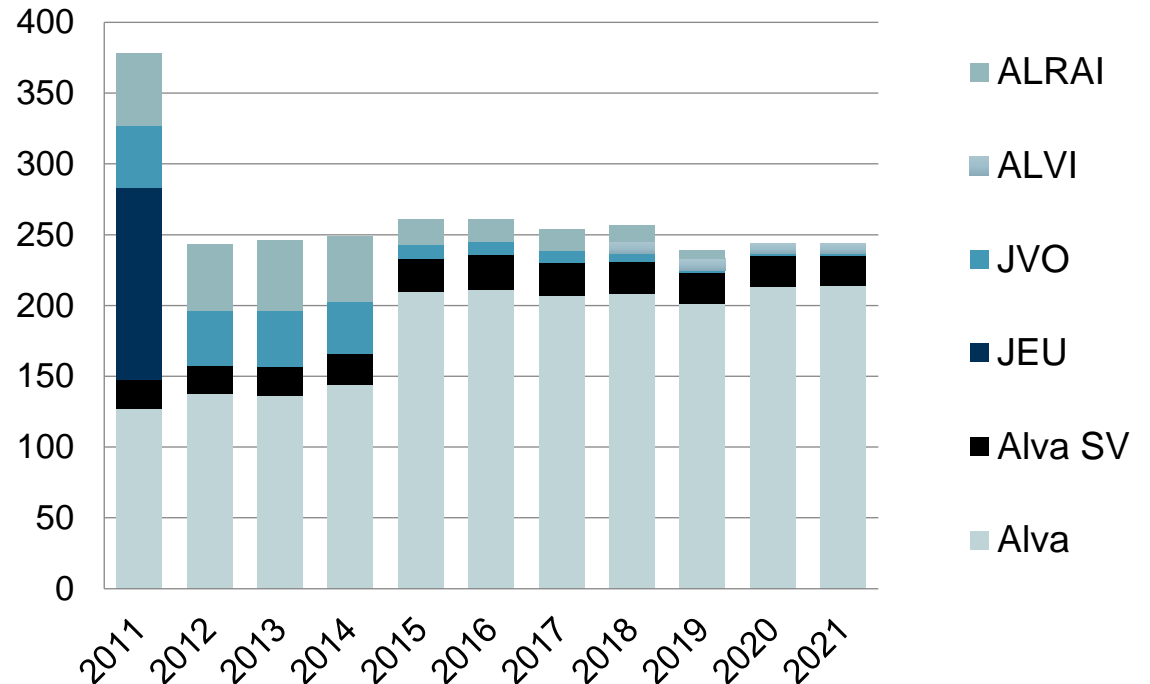
EMPLOYEES

Employees by group company

Employees by company



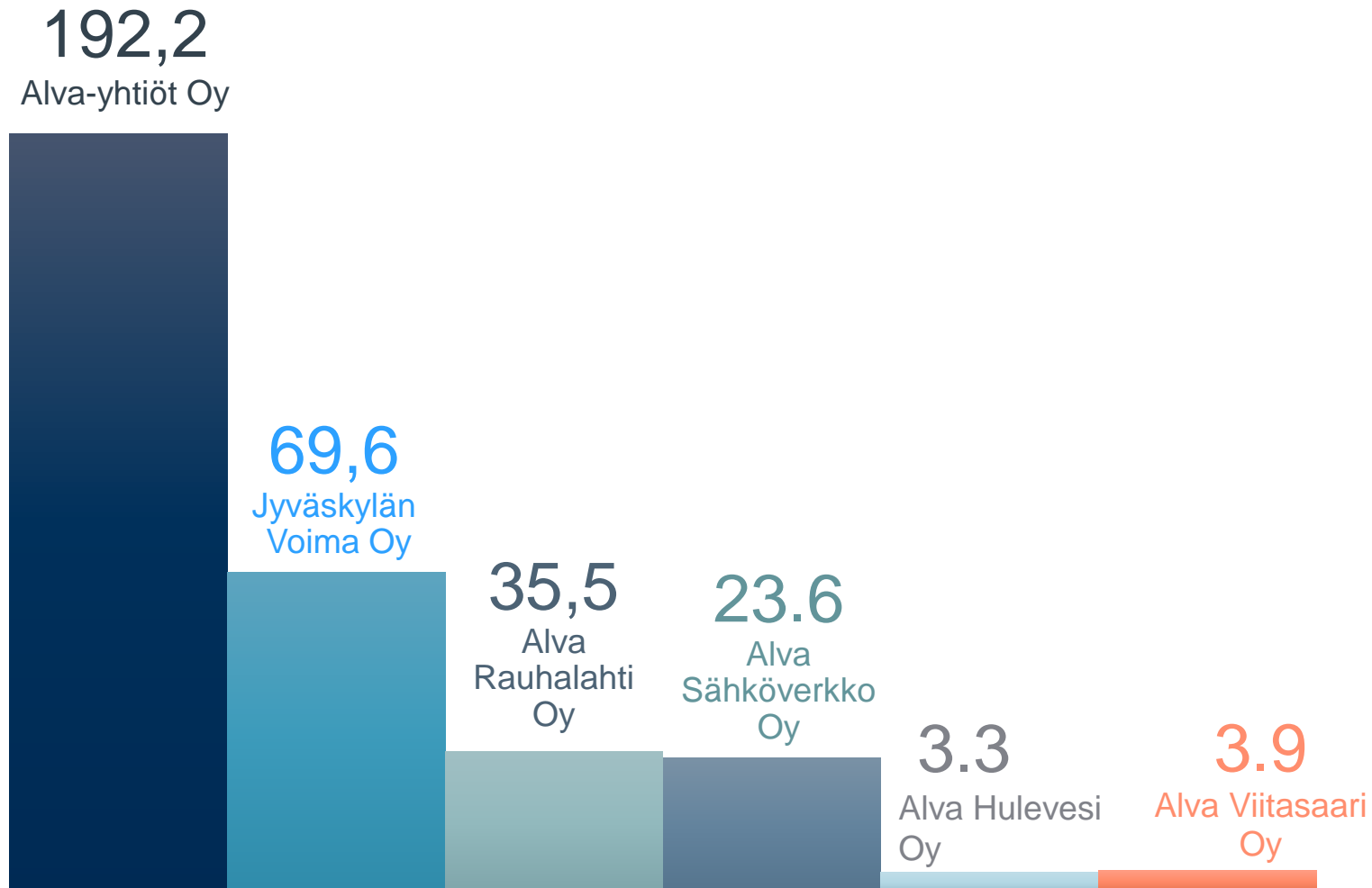
Change in the number of employees



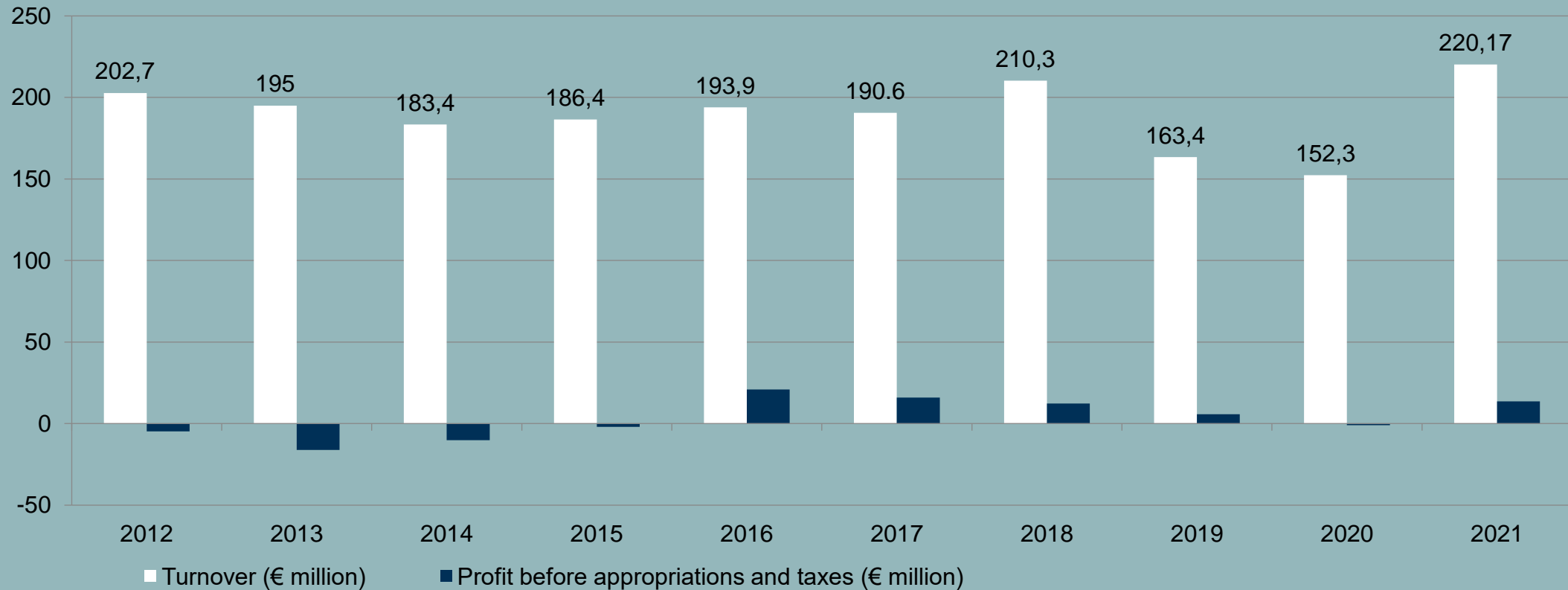
- All JE-Urakointi (JEU) employees transferred to JyNet Urakointi Oy in an acquisition on 1 March 2012.
- At the beginning of 2015, operating employees of JVO and JYT transferred to Jyväskylän Energia.
- Eight employees from Wiitaseudun Energia transferred to Jyväskylän Energia Group on 1 December 2018.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

FINANCES

Turnover of group companies in 2021 (€ million)



Group's turnover and result in 2010–2021



NETWORKS

Electricity, heat, water

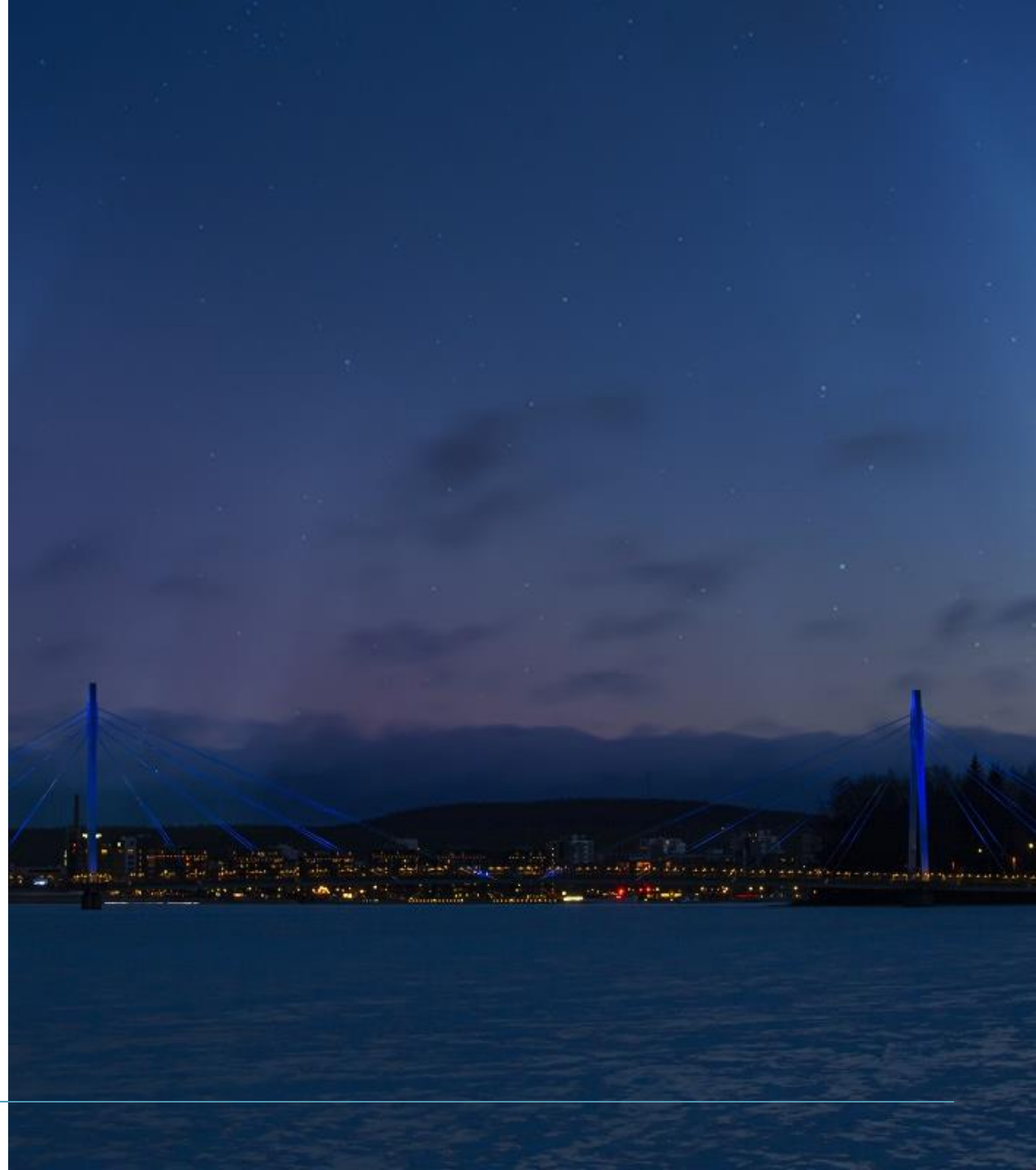
Electricity network

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 1,389 kilometres in total. In 2021, some 677 GWh of electricity was transmitted to more than 10,300 connections.

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

More information: alva.fi/sahkoverkko



NETWORKS

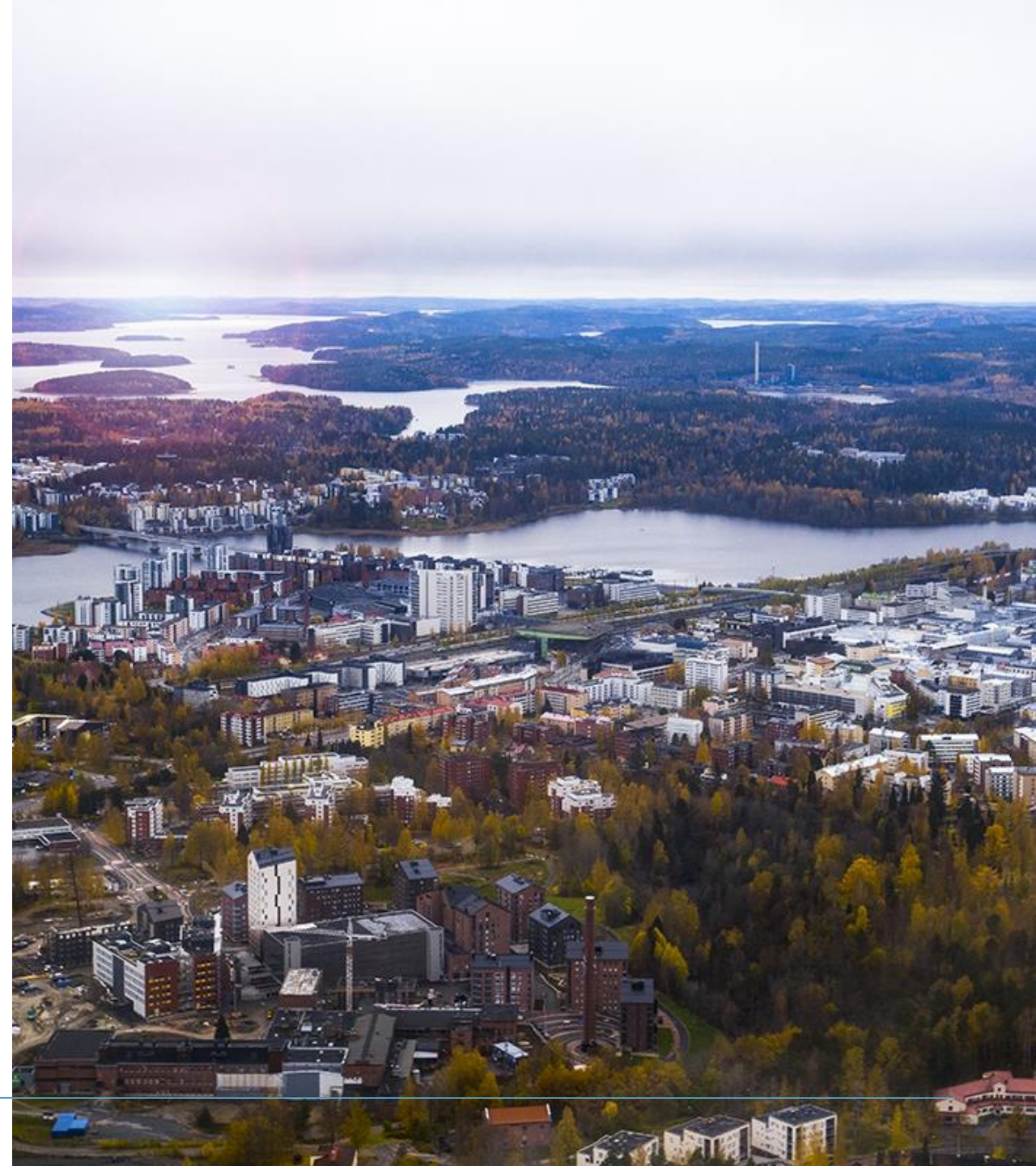
Heat network

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. Prices have not increased between 2015 and 2021.

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 489 kilometres in the Jyväskylä region and 39 kilometres in Viitasaari.



NETWORKS

Water supply networks

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

A total of €11.4 million was invested in the water networks and water production during the accounting period, of which €1.7 million was allocated to storm water networks.

The most significant investments were a repair investment in the Naulatehdas wastewater pumping station in Vaajakoski, the renovation of a water supply system in Puutarhakatu and the renovation of a critical water supply connection between Keljo and the centre of Jyväskylä along Pengertie.

We maintain 881 kilometres of water supply networks and 11 elevated water reservoirs in the Jyväskylä region. In Viitasaari, we have 101 kilometres of water supply networks and two elevated reservoirs. There are 48 booster pump stations in the Jyväskylä region.

The wastewater network in the Jyväskylä region is 907 kilometres in length, and there are 246 waste water pumping stations. Viitasaari has a wastewater network of 77 km with 56 pumping stations.



PRODUCTION

Our annual production (2021)

1.3

TWh of heat

0.7

Twh of electricity

9.0

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.
 - We also produce heat and power from biogas at our micro-CHP plant.
 - 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: see 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 Inspecta Sertifiointi Oy.
 - 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: peat and wood
- 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
- Year of commissioning: 1986



ENERGY PRODUCTION (VIITASAARI)

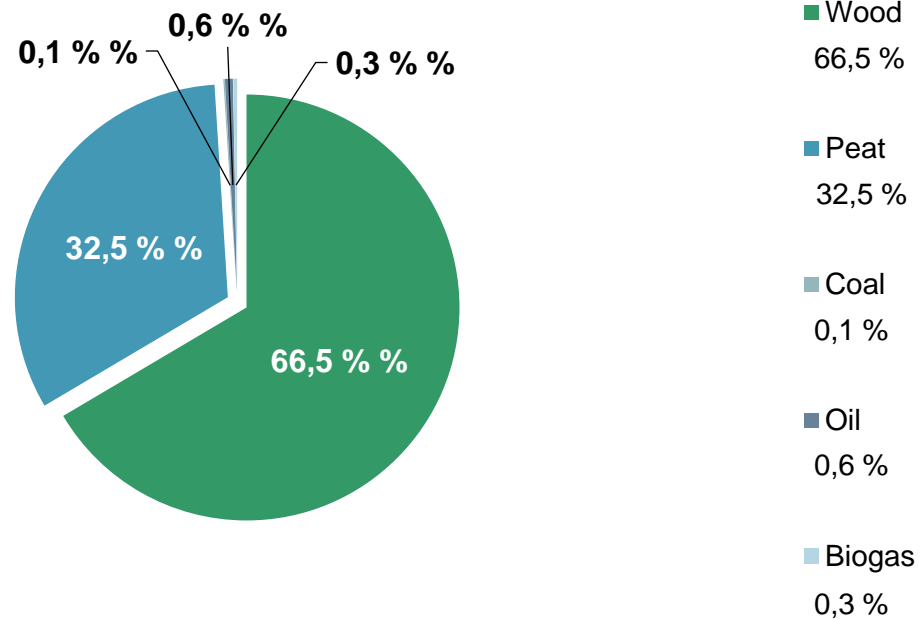
Kokkila heat plant

- 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 2021

In 2021 the share of biofuels was 66,8 % 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 quality control carried out in our laboratory, the health authority monitors the quality of water regularly.

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

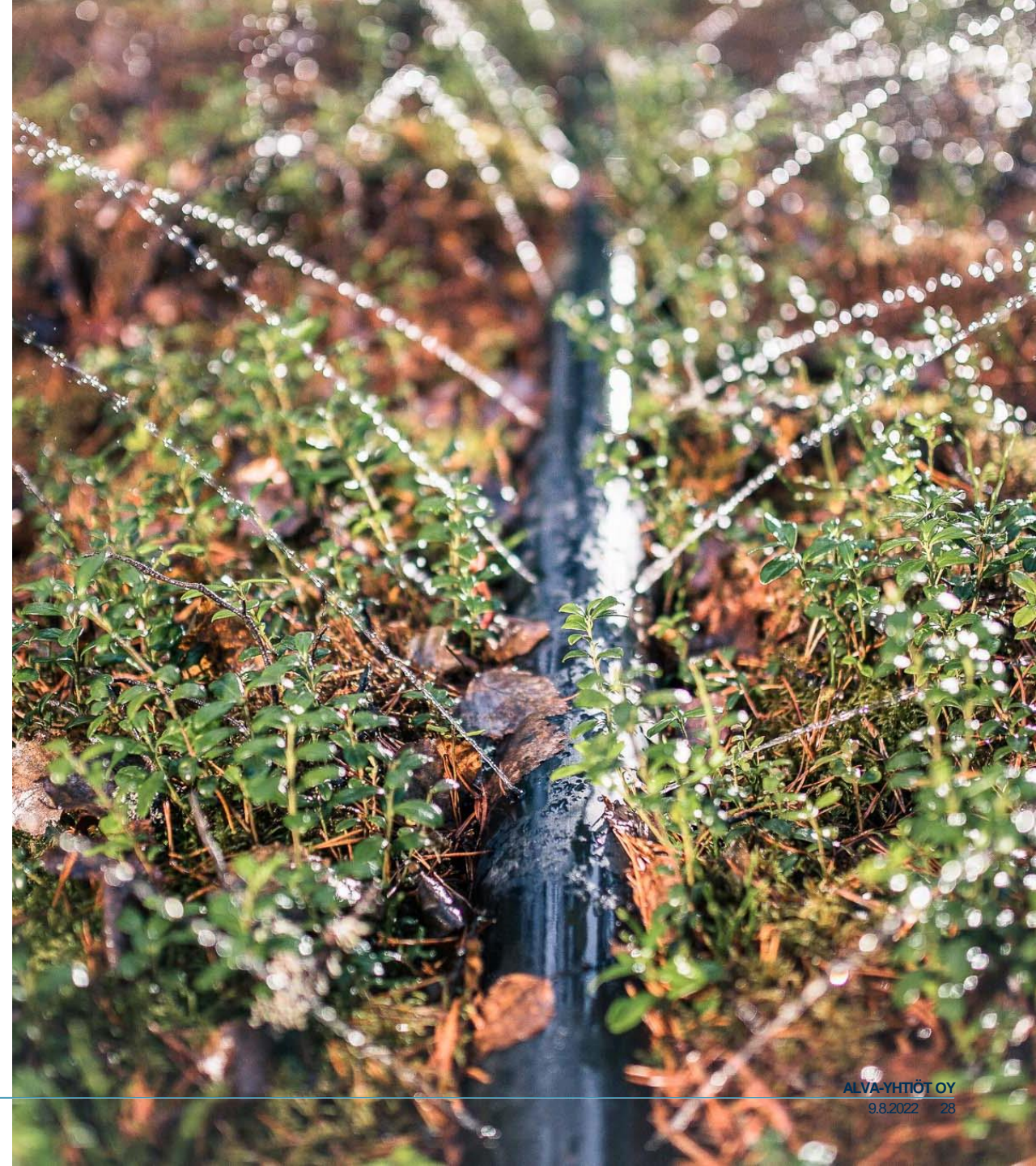


Tap water produced at several plants

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.

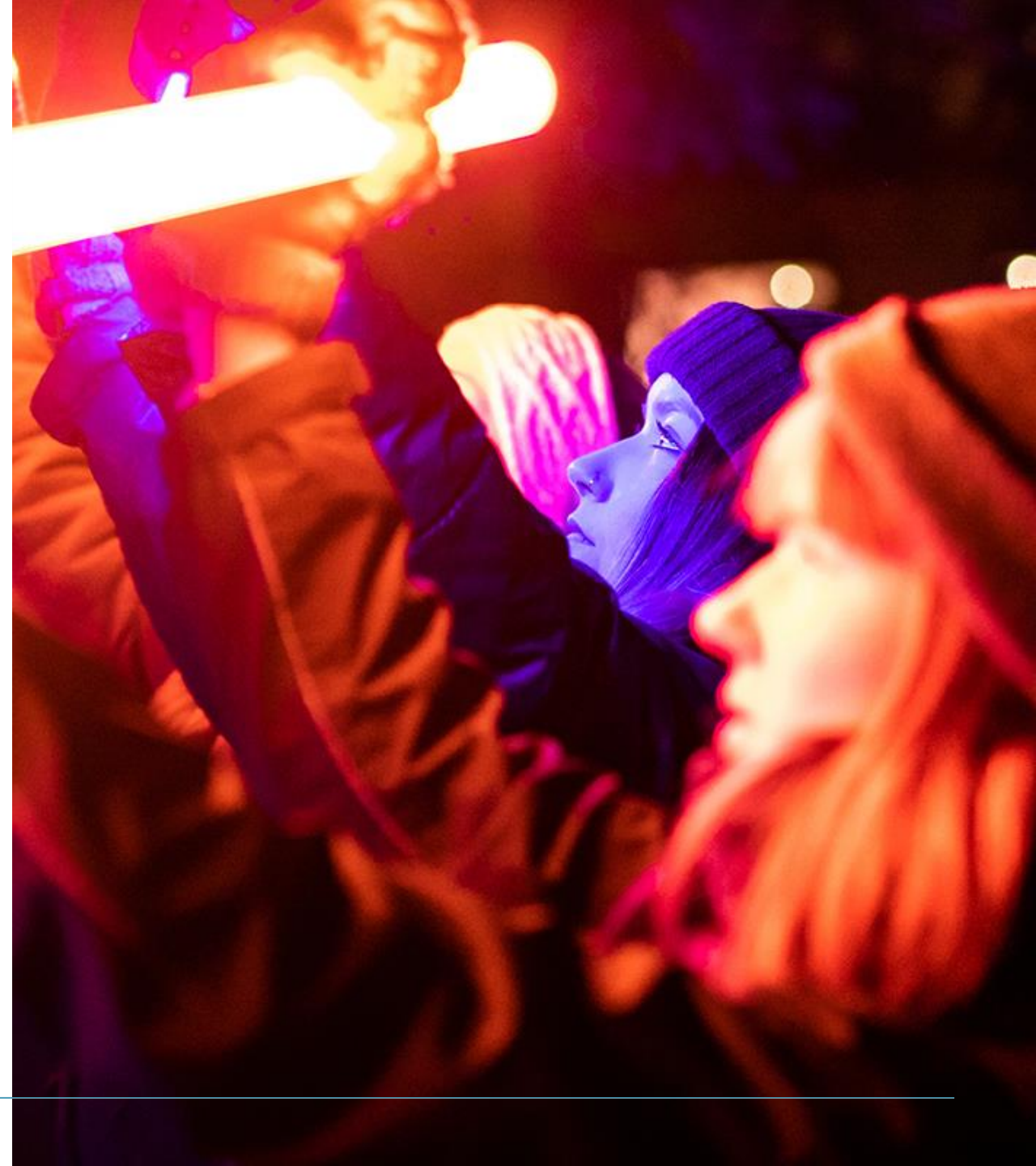
ECOLOGICAL RESPONSIBILITY

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](#)



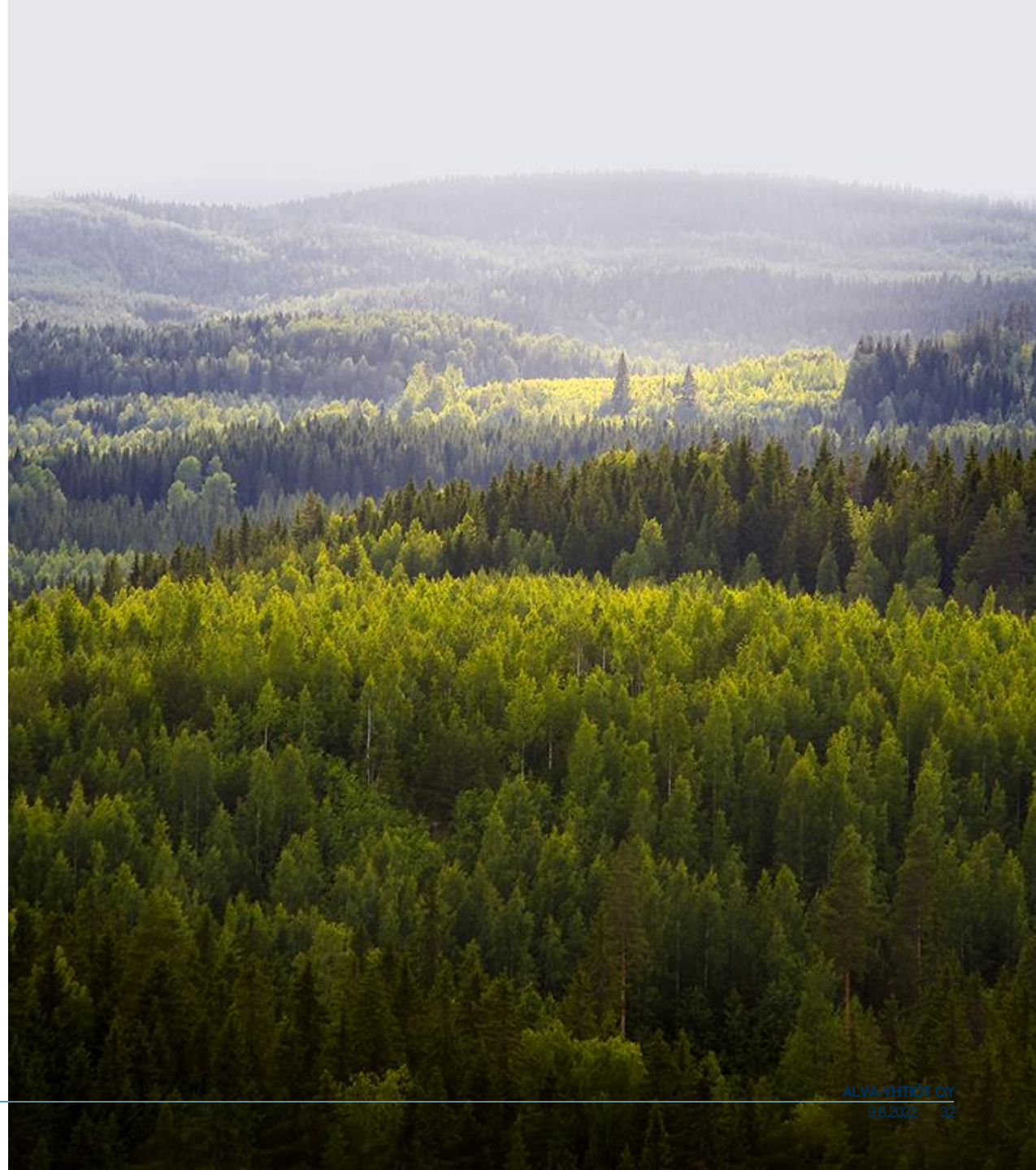
Carbon footprint calculation

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

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.

We will provide more information about our carbon footprinting as it progresses. You can also read a blog post by Sallamari Piispanen, our environmental expert who participated in the development of the calculation method:

[Hiilijalanjäljen pienentäminen on kaikkien asia \("Everybody is responsible for the reduction of our carbon footprint"\)](#)



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.



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.

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.

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 2021

113

CO₂ g / produced district heating energy kWh

Our specific emissions have decreased
as much as 36 % from 2019.

Our specific emissions are declining, and our carbon neutrality target will reduce them even further in the years to come. The benefit-sharing method* has been used in the calculation of the specific emission factor.

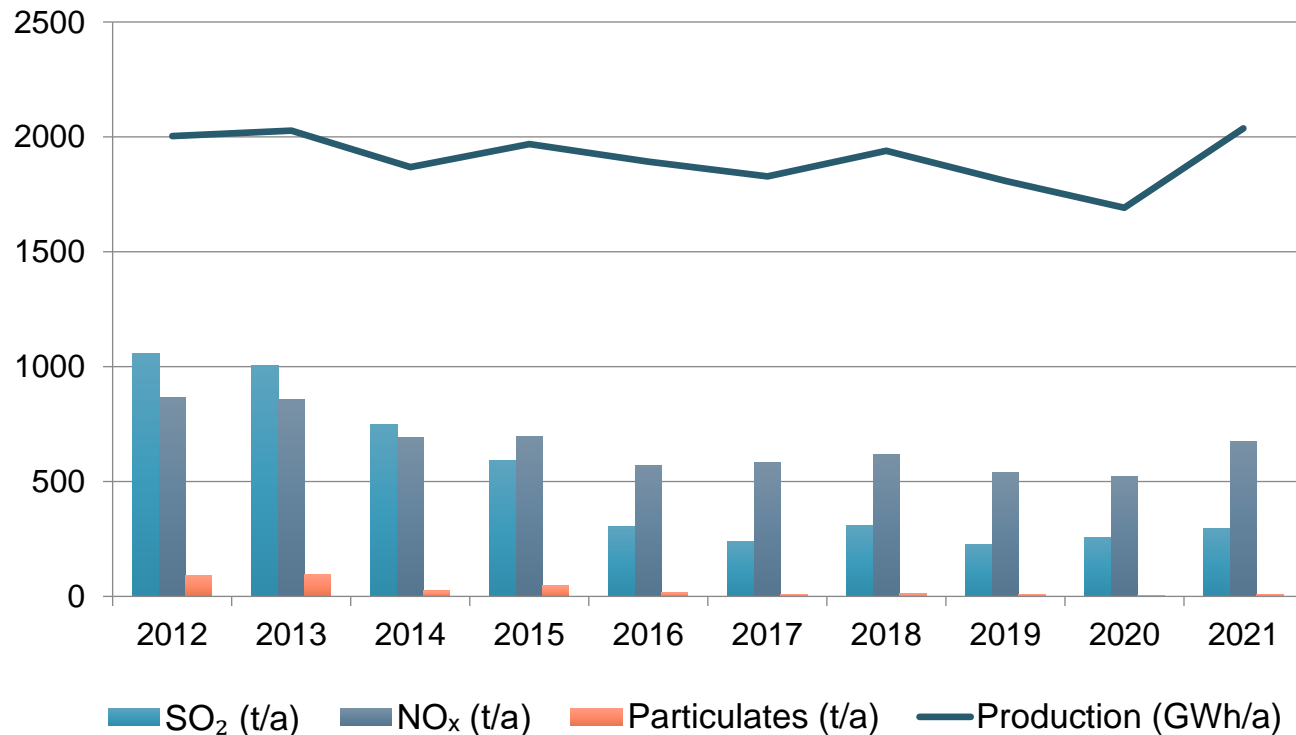
*The benefit sharing method refers to the sharing of the fuels of and emissions from combined electricity and heat production in proportion to the fuel consumption of alternative production methods. As alternatives, condensing power production is used for electricity and boiler heat for heat. When the 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

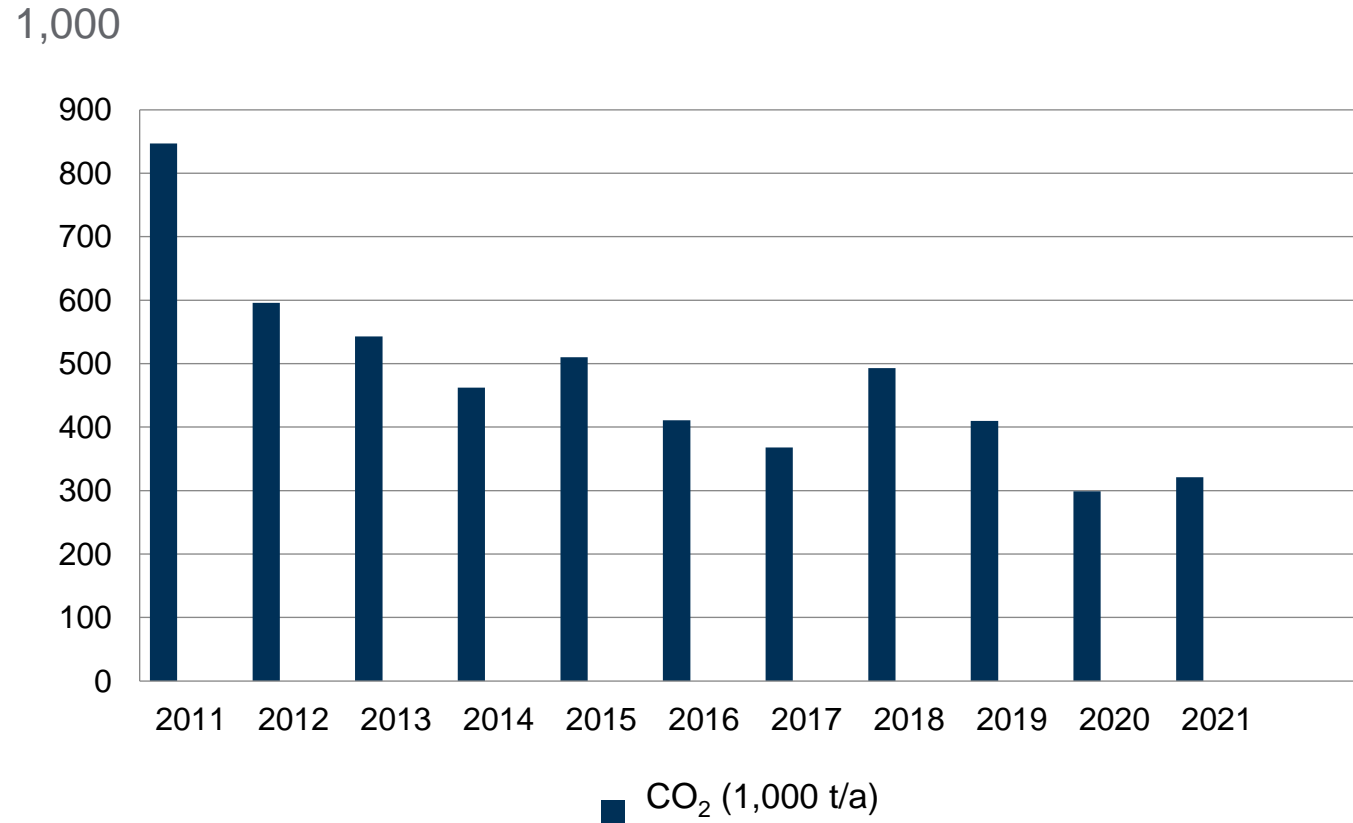
SO₂ = Sulphur dioxide

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

	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Share of green heat from electricity sold (%)	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	4,5
Network losses, electricity (%)	2,09	2,18	2,28	2,15	2,08	2,2	2,4	2,5	2,7	2,7
Network losses, district heating (%)	8,8	8,9	6,5	8,0	8,4	8,3	7,9	8,6	7,1	8,4
Make-up water in district heating (m ³)	15 700	19 422	10 500	9 990	9 292	11 110	6 690	9 960	3 673	10 311
Consumption of pumping electricity, district heating (MWh)	7 715	9 067	9 608	7 946	7 442	7 378	7 221	8 531	8 395	9 057
Waste water leaks to waterways/soil (m ³)	219	171	390	280	657	1 442	543	248	874	2 995
Water water leaks to waterways/soil (percentage of wastewater)	0,002%	0,001%	0,003%	0,002 %	0,005%	0,011 %	0,004 %	0,002 %	0,006%	0,023%
Repaired leaks in water mains (quantity)	31	23	27	31	37	29	25	31	42	26
Share of biofuels from all fuels (%)	66,8	58,9	47,8	49,3	53,8	51,9	51,7	50,9	44,8	40,5

* 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.
- We are Great Place to Work –certified company



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. We have supported, for example, the following through different projects and parties:

- low-income families
- the elderly, children and young people
- nature conservation projects
- sports clubs and teams
- culture



Social responsibility: key figures

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

* Occupational accidents that have caused at least one day of incapacity to the group's own employees

** The number of occupational accidents per million hours worked

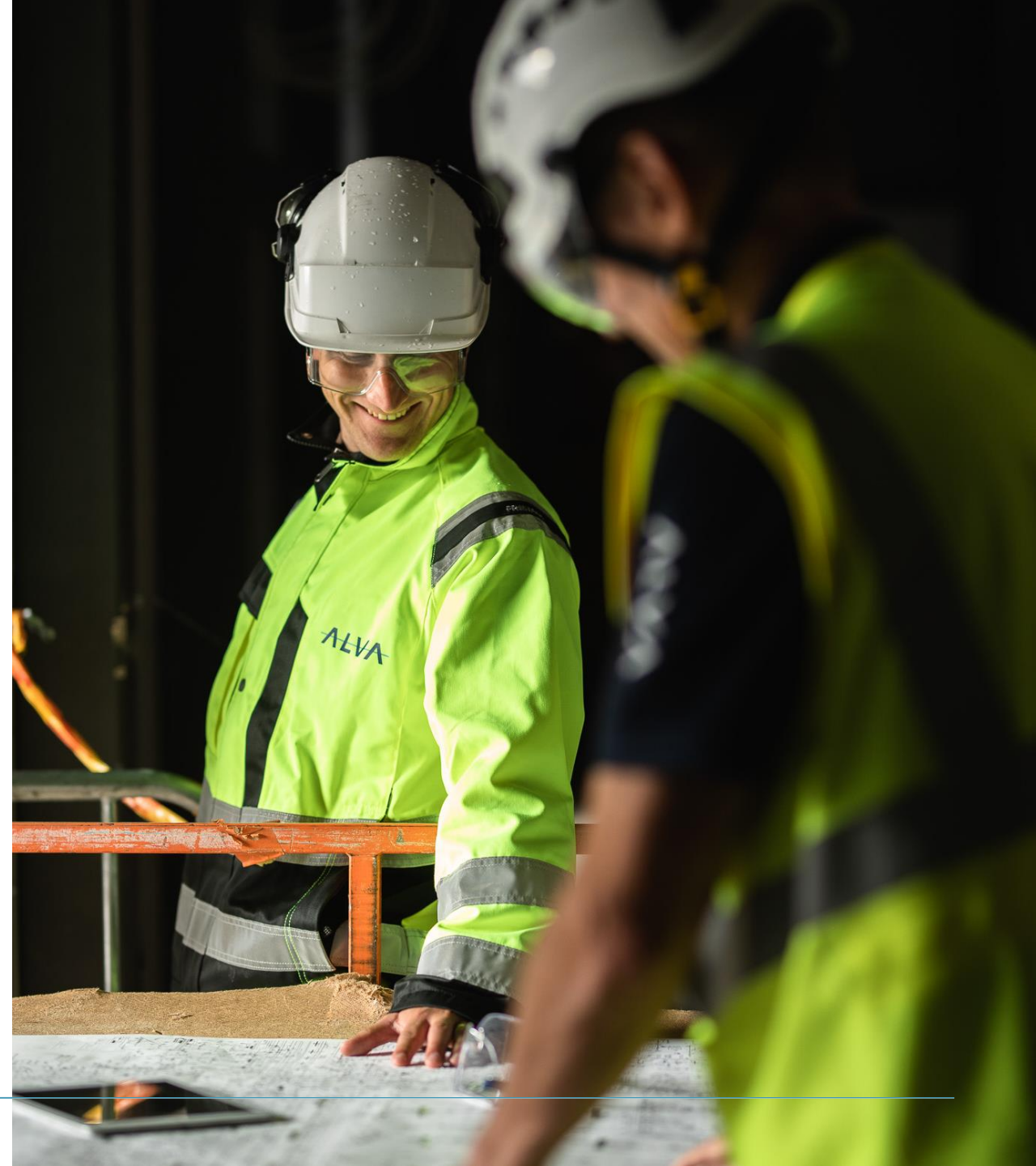
¹⁾ SAIDI = total average interruption duration, h/customer

²⁾ SAIFI = average number of interruptions per customer

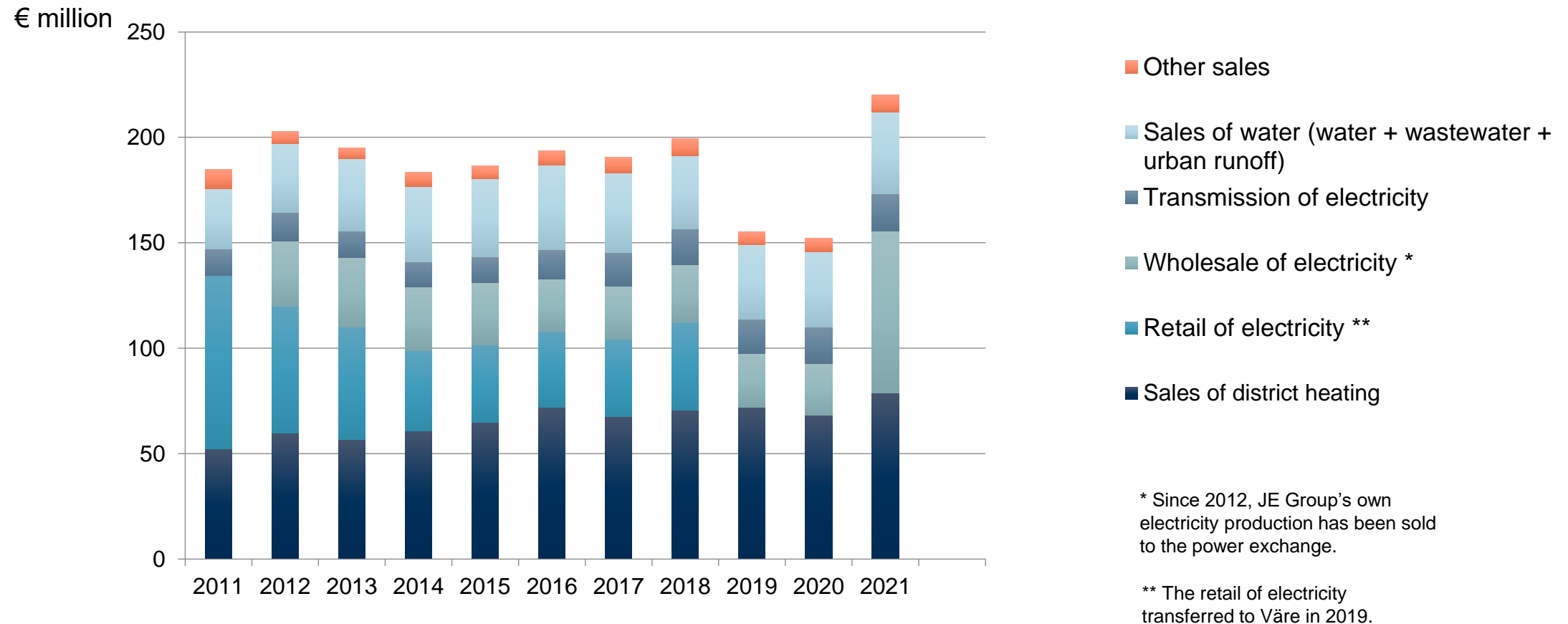
FINANCIAL RESPONSIBILITY

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

	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Turnover (€ million)	220,2	152,3	163,4	210,3	190,6	193,9	186,4	183,4	195	202,7
Operating profit (€ million)	26,2	12,8	20,2	26,8	31,8	36,4	17,7	8,7	6,2	16,3
Income tax (€ million)	3,88	0	1,26	0,74	2,11	3,19	0	1,03	0	0,07
Dividends (€ million)	4	4,0	4,0	4,0	4,0	1,6	0	0	0	0
The owner's interest expenses (€ million)	6,1	8,9	8,9	8,9	8,9	9,1	12,9	13,1	16,5	16,5
Investments (€ million)	113,7	23,4	28,2	32,2	27,6	26,1	28,2	29,9	37,9	32,6
Return on equity (%)	7,5	-1,4	3,3	7,7	10,3	15,3	neg	neg	neg	neg
Equity ratio (%)	18,6	21,7	22,7	22,4	22,1	20,0	17,0	6,5	8,4	1,1
Wages and salaries ¹⁾ (€ million)	15,38	13,9	14,1	13,9	14,1	13,8	13,7	13,3	13,1	12,7
Purchases from suppliers (€ million)	156,9	97,8	101	136	107	105	119	138	139	140

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

2021

Positive and negative aspects

Alva Group's pros in 2021

- Financial performance was excellent. After years of negative performance, the strong increase in the market price of electricity significantly boosted the Group's result.
 - The effects of the COVID-19 pandemic were not reflected in the products and services we delivered to our customers.
 - The development of asset management through networks continued, with the goal of achieving ISO 55001 asset management certification for water supply (*which was achieved in early 2022 as the first water utility in Finland*).
 - Great Place to Work: The results of a personnel survey carried out in November and December resulted in the Group being able to use the Great Place to Work-Certified™ label in its communications.
 - Alva's electricity transmission customer prices remain among the lowest in Finland. In district heat, Alva was the second most affordable provider in a comparison of large Finnish cities by Finnish Energy.
- Alva is a shareholder in Väre Oy, which sells electricity and energy services to consumers. The unprecedented turbulence in the wholesale electricity market at the end of 2021 led to huge losses for electricity retailers. Väre's result was also negative but clearly among the best in the industry, which can be considered a success in terms of risk management and a "defensive victory" in a very difficult market situation.
 - In energy production, measures related to the accelerated phase-out of peat could be started in 2021.
 - During the accounting period, Alva introduced a carbon footprint calculation model for its own operations, and the performance report was verified by an external consultant using the data for 2019.
 - Alva wishes to help its customers in the optimal use of water and energy. The demand for energy data and its exploitation has increased, in particular, and the number of co-development projects has already reached double digits.
 - The quality of the domestic water supplied by Alva to its customers was excellent.

Alva Group's cons in 2021

- The commercialisation of digital remote metering services was slowed down by the global shortage of components.
 - Prices of emissions allowances and fuels continued to increase, resulting in significant additional costs for the Group.
 - The Group's equity ratio deteriorated further as the amount of debt increased following the redemption of a previous significant machine leasing contract to the Group's own balance sheet.
 - Legal disputes with certain minority shareholders of Jyväskylän Voima Oy continued.
- There was an oil spill at the Rauhalahti power plant, resulting in an estimated 40 cubic metres of oil ending up in the soil at an oil pumping station. However, leaking of the oil into Lake Jyväsjärvi was successfully prevented by immediate first response measures.
 - The condition of a generator at the Keljonlahti power plant was deemed to have deteriorated to such an extent that a rewinding of the stator would be necessary in 2022.
 - The heat transfer capacity of the Keljonlahti power plant's boiler feedwater bypass economizer was found to have deteriorated to such an extent that it would have to be repaired in 2022.

Research and development activities in 2021

- The SER ProCom project on the recovery of waste electronic and electrical equipment progressed according to plan in cooperation with Tapojärvi Oy and Elker Oy.
 - Other circular economy business opportunities were explored by investigating markets and technologies for the recycling of plastics and the recovery of critical raw materials from sewage sludge.
 - As part of a consortium, Alva participated in the following projects:
 - * The Hiilimetsätalous (“Carbon Forestry”) project launched by VTT Technical Research Centre of Finland, the key goals of which are to identify the impact of carbon forestry on forestry operators and determine the impact on the timber market using calculations and analyses.
 - * The Tietoa tuottamaan (“Producing Data”) project of JAMK University of Applied Sciences, which aims to develop the digital capabilities and understanding of the participating companies by developing computing platforms, solutions and operating models, and testing them with concrete pilot cases.
 - Alva’s internal ash project continued to investigate the potential for the recovery of ash fractions from the power plants and barriers to the recovery.
- During the accounting period, an analysis of existing data from the water, electricity and heat networks to meet the requirements of existing customers was started. The resulting dataset was used to develop an energy reporting service requested by the customers, the first steps of which were taken in May 2021.
 - Alva and 14 other energy companies launched a joint research project to explore the potential of geothermal energy and develop drilling technology through a pilot drilling project in the Tarastenjärvi area of Tampere.
 - Alva has developed an energy optimisation product that will allow for postponement of periods of peak power demand in the heating of properties to times when Alva’s overall power demand is lower.
 - The development of the Smart Water Cycle IoT concept with international market potential in collaboration with Uros Oy in Alva’s development environment continued, and customer pilot projects were realised in Kazakhstan and Brazil. Alva was responsible for customer support and the project management of the pilot projects in collaboration with local partners. The project developed an operating model to support internationalisation.

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