

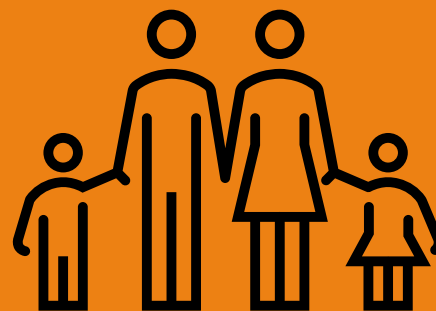
Electric Car Charging at home

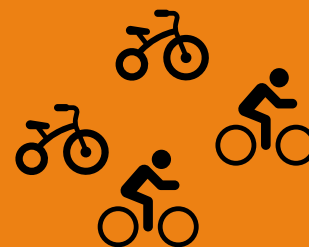
Single-family houses and apartment buildings in Kajaani

Ville Keränen



Granlund





Granlund



Granlund

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Electrical Engineer

Building Automation Specialist

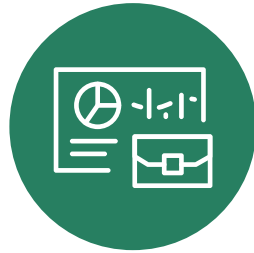
AI Developer

Our business areas



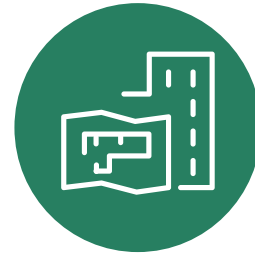
DESIGN

Extensive engineering expertise, MEP design market leader in Finland



SERVICES AND CONSULTANCY

Strong expertise in property, energy and environmental consulting



CONSTRUCTION MANAGEMENT AND SUPERVISION

Project management, cost control and monitoring



SOFTWARE

Granlund Manager brings property management to a new level



PROPERTY MANAGEMENT

Supporting housing companies in the Helsinki metropolitan area

Our strengths



ENERGY



SUSTAINABILITY



DATA AND DIGITALISATION



PRODUCTIVITY



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Type 2 Chargers sold in Finland

2021 20 700 kpl

2022 26 100 kpl

2023 22 800 kpl

Electric Cars in Finland

- **Average** 8,5 %
- Uusimaa 14,6 %
- Varsinais-Suomi 8,8 %
- Pirkanmaa 8,2 %
- -----
- Lappi 4,5 %
- Etelä-Pohjanmaa 4,4 %
- Pohjois-Karjala 4,3 %
- **Kainuu** 3,3 %

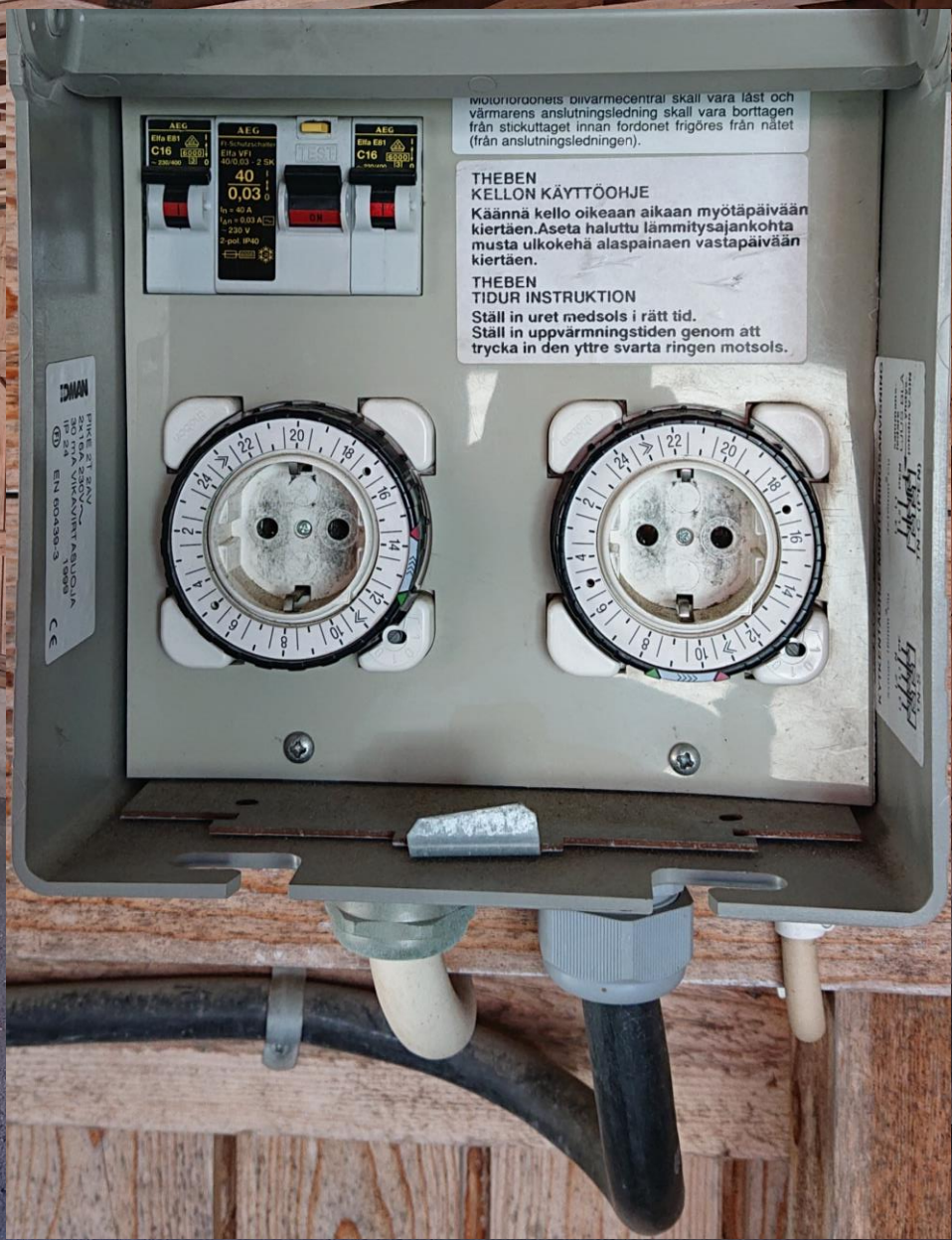


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Typical Scenarios in Apartment Buildings



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Typical Solutions in Apartment Buildings



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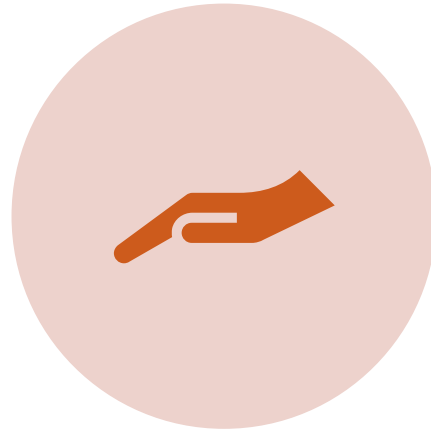
Power comparison

	1X8 A / 1,8 kW	3X8 A / 5,5 kW	3x16 A / 11 kW
50 km / day	6 h	2 h	1 h
100 km / day	12 h	4 h	2 h
Battery Heating -20 Celcius 0-5 kWh	0 - 3 h	0 - 1	0 - 0,5 h
Cabin Heating -20 Celsius 5-10 kWh	3 - 6 h	1 - 2 h	0,5 - 1 h

Public acceptance



MONEY



SAFETY



ATTITUDE

Fire Safety

- BEV burn less likely than traditional cars
- Reporting bias, 4 fires out of 5 has been reported in news paper
- At the Stavanger airport hundreds of cars were burn but no battery fires

Fire Safety

Rescue Departments

- [Fire Safety Guide](#)

Vesa Linja-aho

- [Perceived and Actual Fire Safety – Case of Hybrid and Electric Vehicle Fires in Finland 2015–2023](#)
- [Electric vehicle charging safety – The state of art, best practices and regulatory aspects](#)

- 2024 for cases where electric car involved
- <https://www.iltalehti.fi/kotimaa/a/a9fcab26-8efa-425b-b162-e2f331425287>
- <https://www.is.fi/kotimaa/art-2000010252344.html>
- <https://www.ksml.fi/paikalliset/6664364>
- <https://yle.fi/a/74-20086292>
- None of them seems as battery fire

Key Points for Success

- Enough knowledge
- Tailored solution
- Fair cost sharing



FRANKENSTEIN'S NEW ELECTRIC CAR

IT'S A VOLTSWAGON!



WILHELM

5/2022

www.theshelteredlife.com

Thank you!

Ville Keränen

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Vehicle Comparisons

Vehicle Type	Internal Combustion Engine		Electric Vehicle		Net Savings with an EV
	Vehicle (Upfront Price)	7-Year TCO	Vehicle (Upfront Price)	7-Year TCO	
Compact Sedan	Toyota Corolla LE (\$22,050)	\$42,348	Chevrolet Bolt EUV* (\$22,550)	\$31,768	\$10,581
Sedan	Toyota Camry SE Nightshade (\$28,960)	\$44,307	Tesla Model 3 (\$38,990)	\$44,180	\$127
Compact SUV	Nissan Rogue SV (\$29,700)	\$44,209	Volkswagen ID.4 (\$31,495)	\$37,110	\$7,099
Full Size SUV	Toyota Highlander L (\$39,270)	\$48,286	Tesla Model Y (\$42,490)	\$43,925	\$4,361
Pickup Truck	Ford F-150 XL Supercrew (\$43,515)	\$50,622	Ford F-150 Lightning* (\$42,495)	\$47,797	\$2,825

Vehicles are model year 2024, except those with an asterisk (*), which are model year 2023.

<https://www.nrdc.org/bio/isabella-sullivan/cheaper-and-cleaner-electric-vehicle-owners-save-thousands>