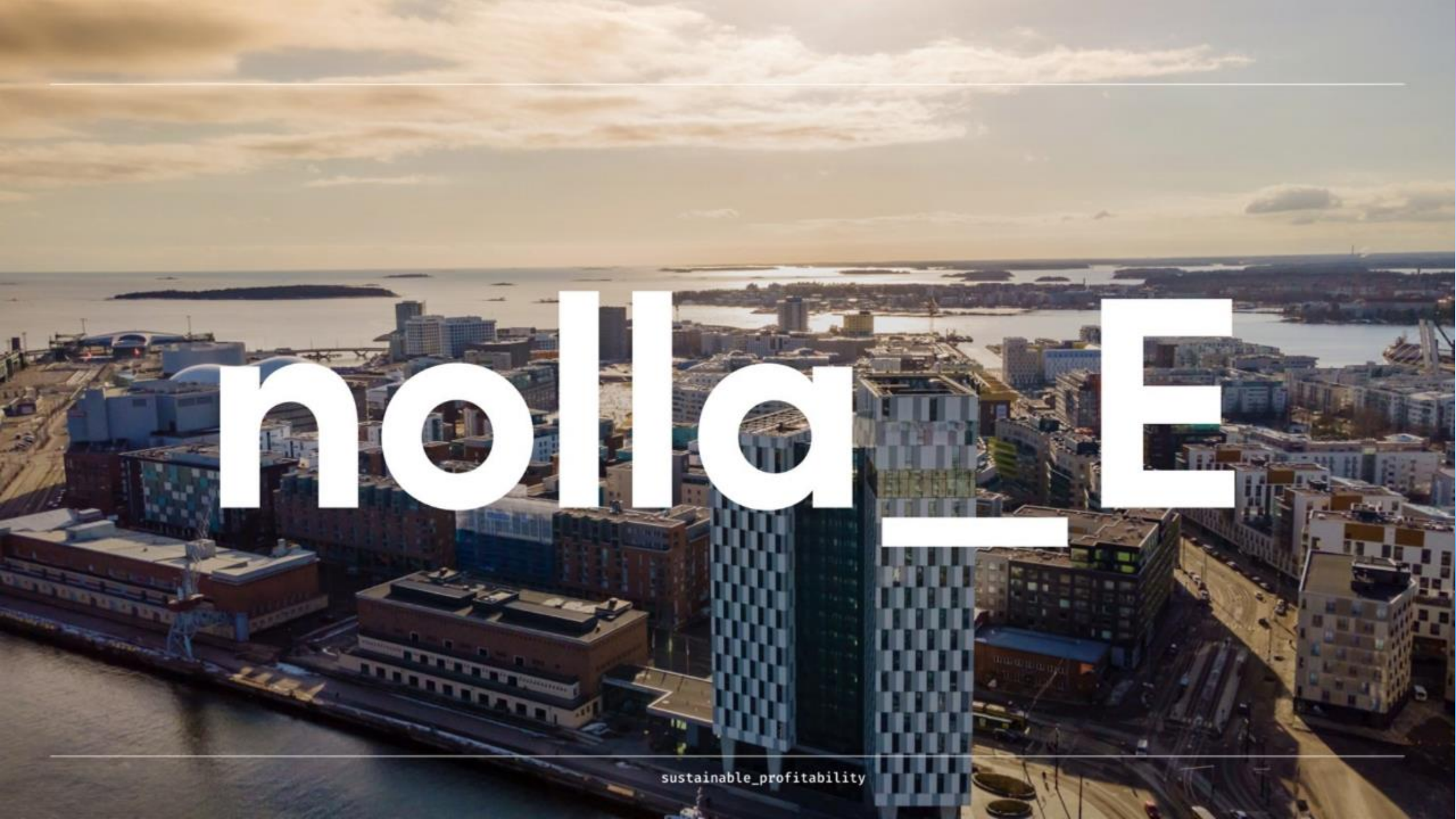

nolla_E
sustainable_profitability

The most profitable energy solution for your property

nolla_E is an energy efficiency software company that transforms buildings into carbon neutral so that it is economically sound.

We know that there is only one perfect combination of energy solutions for every single building.

We search, find, design and do the competitive tending for you.

Our service is a process

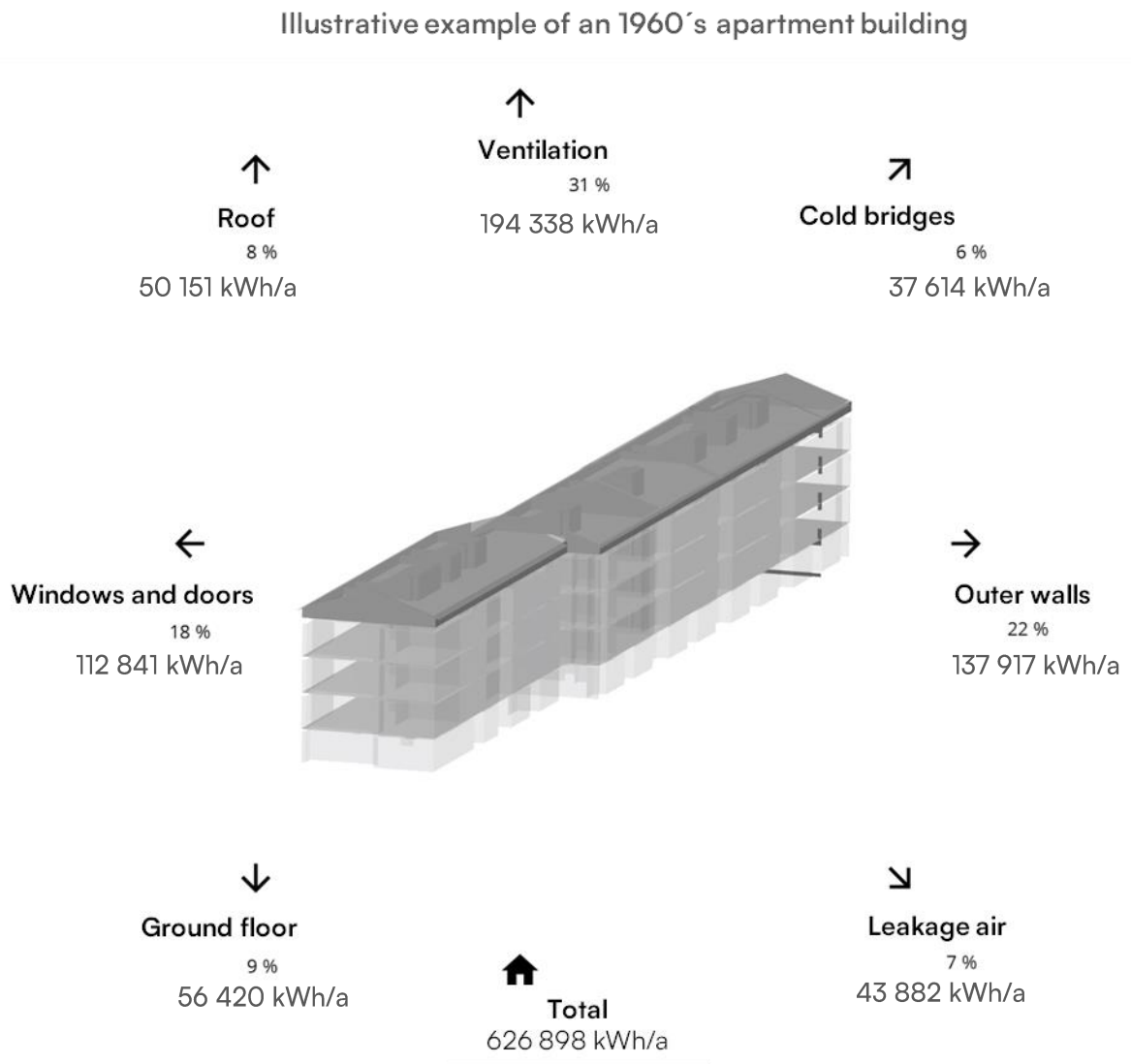
Simulation of the starting point  **Optimal re-engineering of energy flows**  **The most profitable combination of energy solutions as a frame for design**

Simulation

We simulate every kWh the building consumes per year, how much, where and when.

We create a digital twin of the energy use of the builiding and analyse the annual use hour by hour.

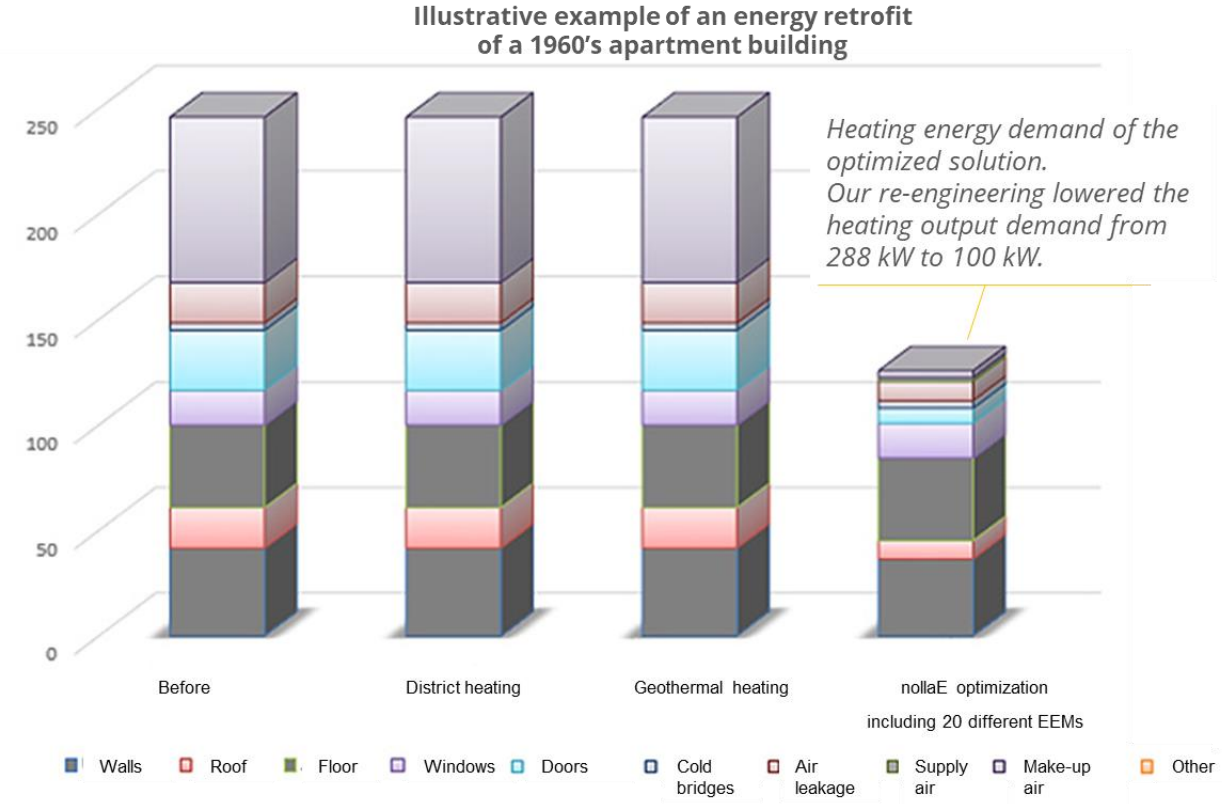
The simulation reveals the energy behaviour of the building and is an important stage before rearranging the energy flows.



Re-engineering of energy flows

As our software re-engineers the energy flows, it changes something in the building for thousands of times.

After calculating through around 30.000 alternative combination the software suggests the most energy-efficient and economically profitable of them.



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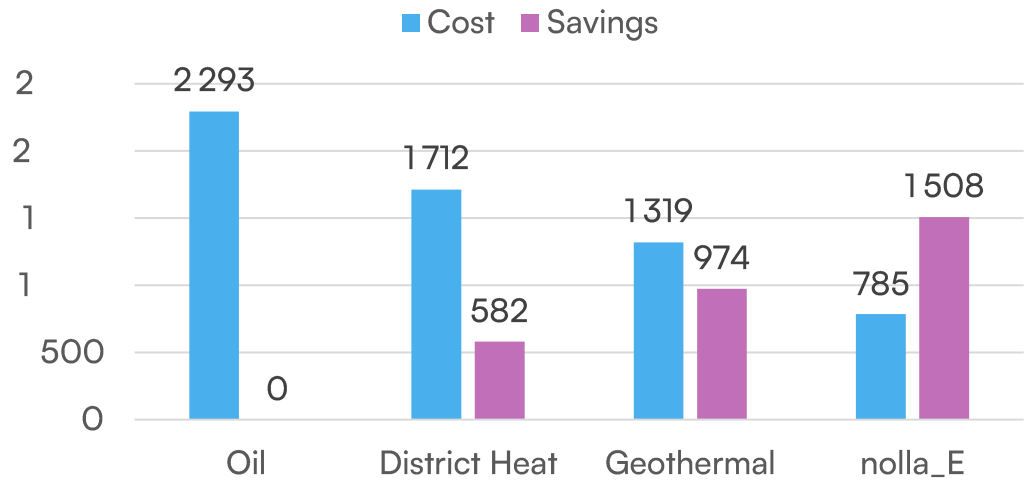
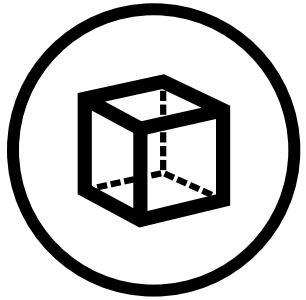


(Example 1960s apartment building.
Total costs over 20 years, €1,000)

Total costs over the next 20 years, including the investment, as well as operating costs and nolla_E's fee.

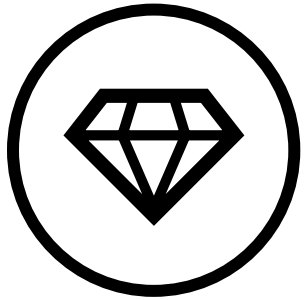
Since the size of the heating system was significantly smaller, the investment cost was correspondingly significantly lower.

Profitable alternatives for energy efficiency and carbon neutrality



We focus on each building individually and view energy efficiency holistically and not as just a heating system.

Re-engineering of energy flows works for both renovation and new construction projects.



We evaluate all possible alternatives and design solutions that others are not even looking for yet.

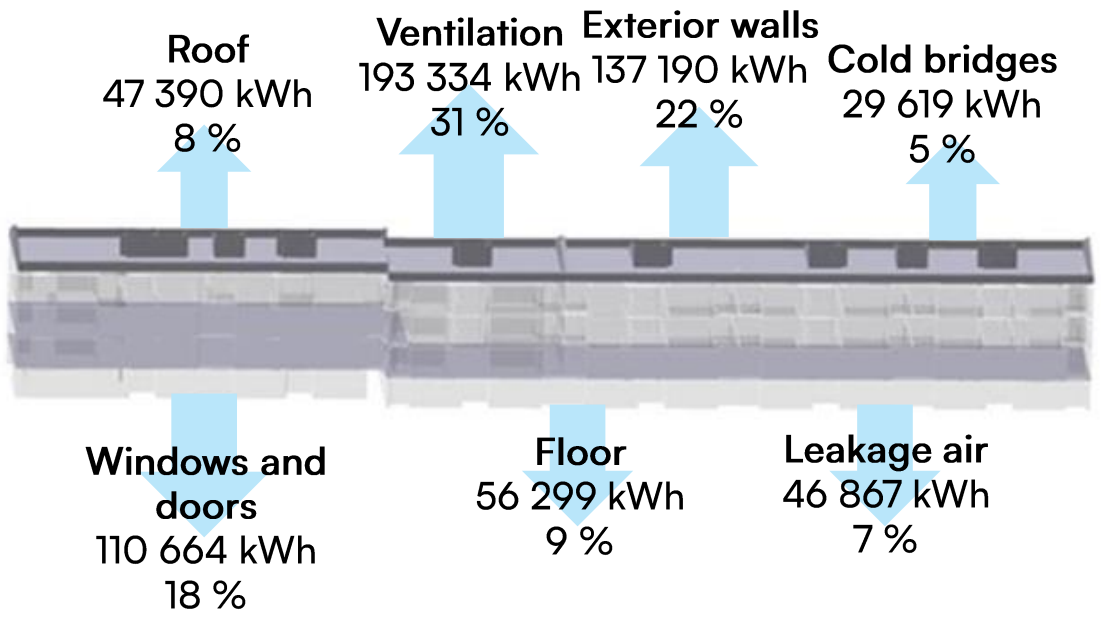
We always provide measurable added value to our clients — the best return, the shortest payback time, the smallest investment or carbon footprint.

Projects

Residential building, Raisio, Finland

Energy renovation designed by nolla_E for a residential building built in the 1960s

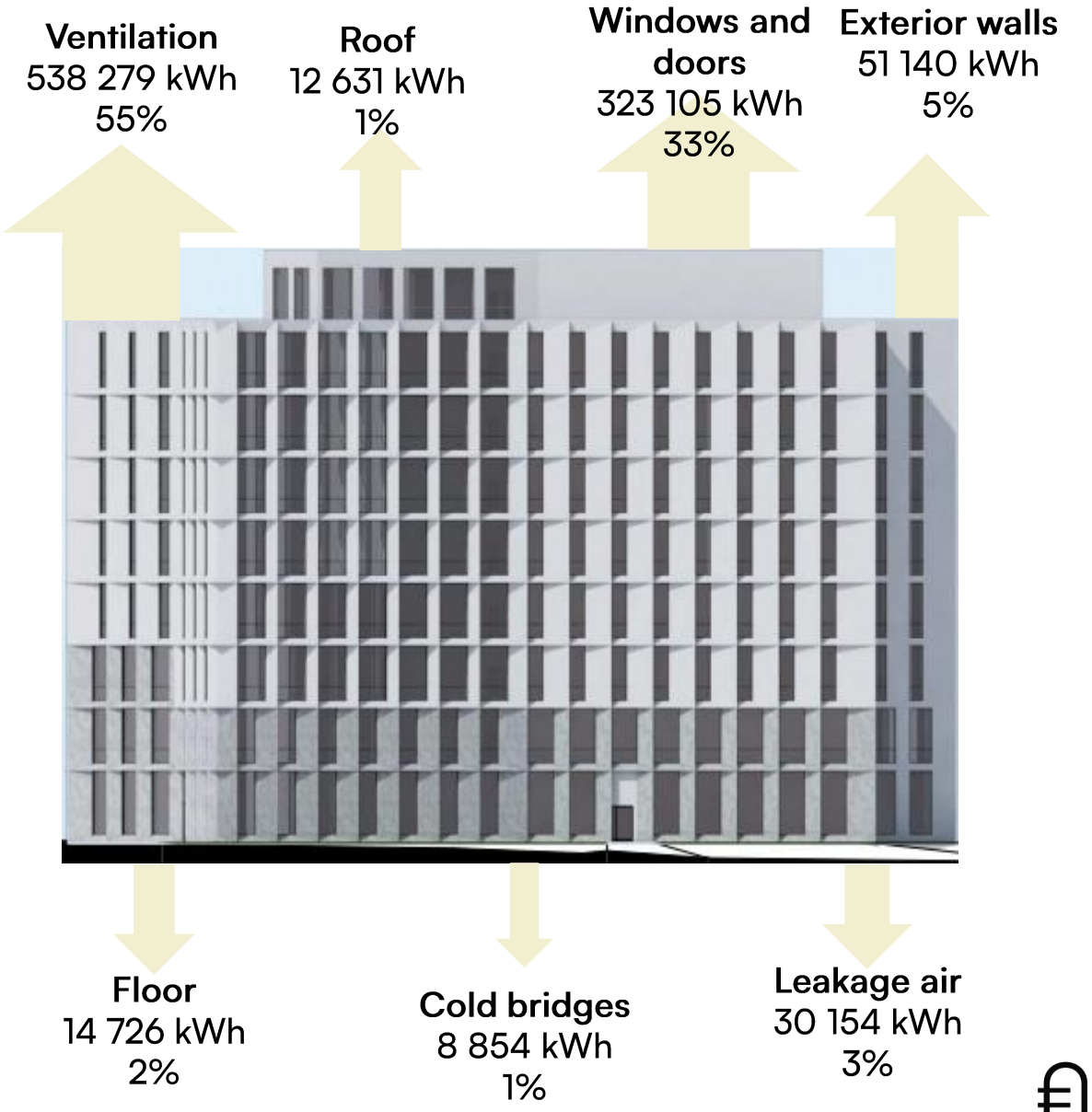
- Energy efficiency improvement of 65% and €16,000 savings in energy costs per year and €26,000 savings in initial investment
- A total of 20 measures, including the transition from oil heating to an optimized geothermal solution, more efficient ventilation and cost-effective additional insulation of the building



Total size 3.600m²	Planned solution	nolla_E-solution
Peak heating load	288 kW	100 kW
Annual energy demand	250.000 kWh	91.386 kWh
Energy demand/m²/a	69 kWh/m²	25kWh/m²
Annual energy cost a	25.000 €	9.138 €
Investment	493.000 €	467.000 €
Energy class	D	B

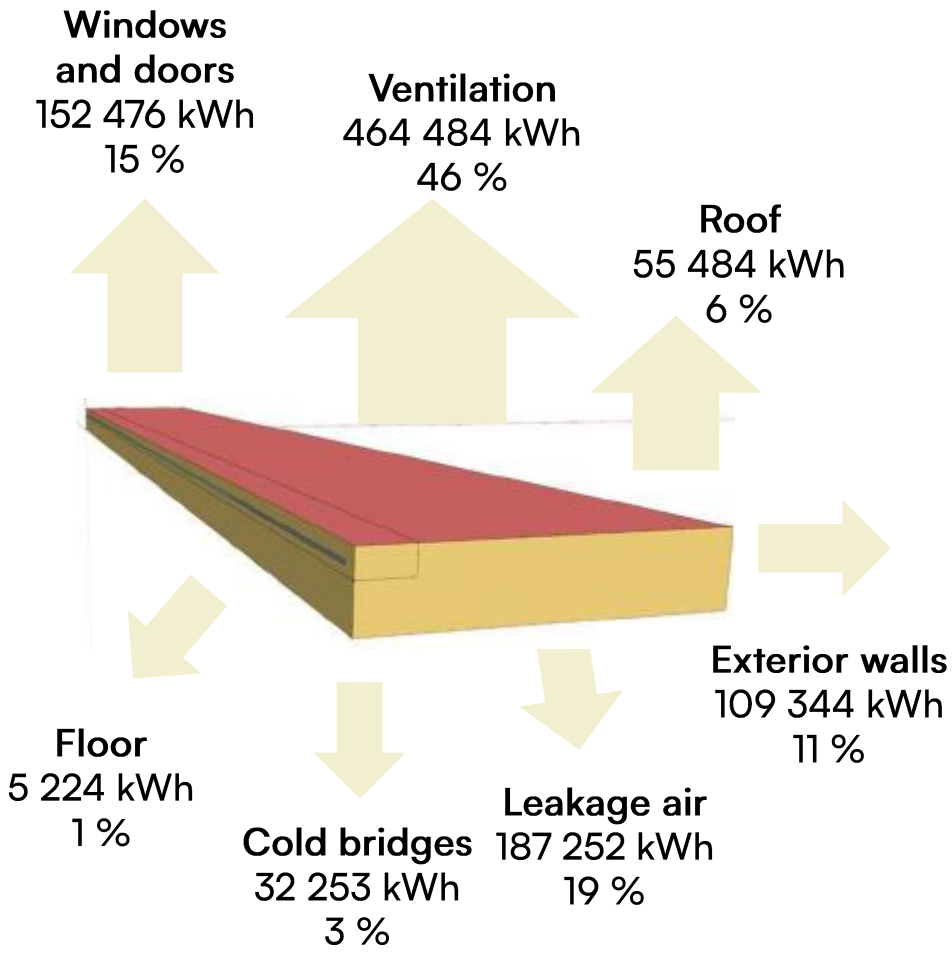
Office building, Turku. Finland

Total size 9.280 m²	Planned solution	nolla_E-solution
Peak heating load	333 kW	173 kW
Annual energy demand	741 MWh	476,5 MWh
Annual energy demand /m²/a	79,8 kWh/m²	51,3 kWh/m²
Annual energy cost	63.359 €	38.121 €
Investment	222.100 €	277.000 €
Payback time		2 years
ROI		46%
Energy class	B	A



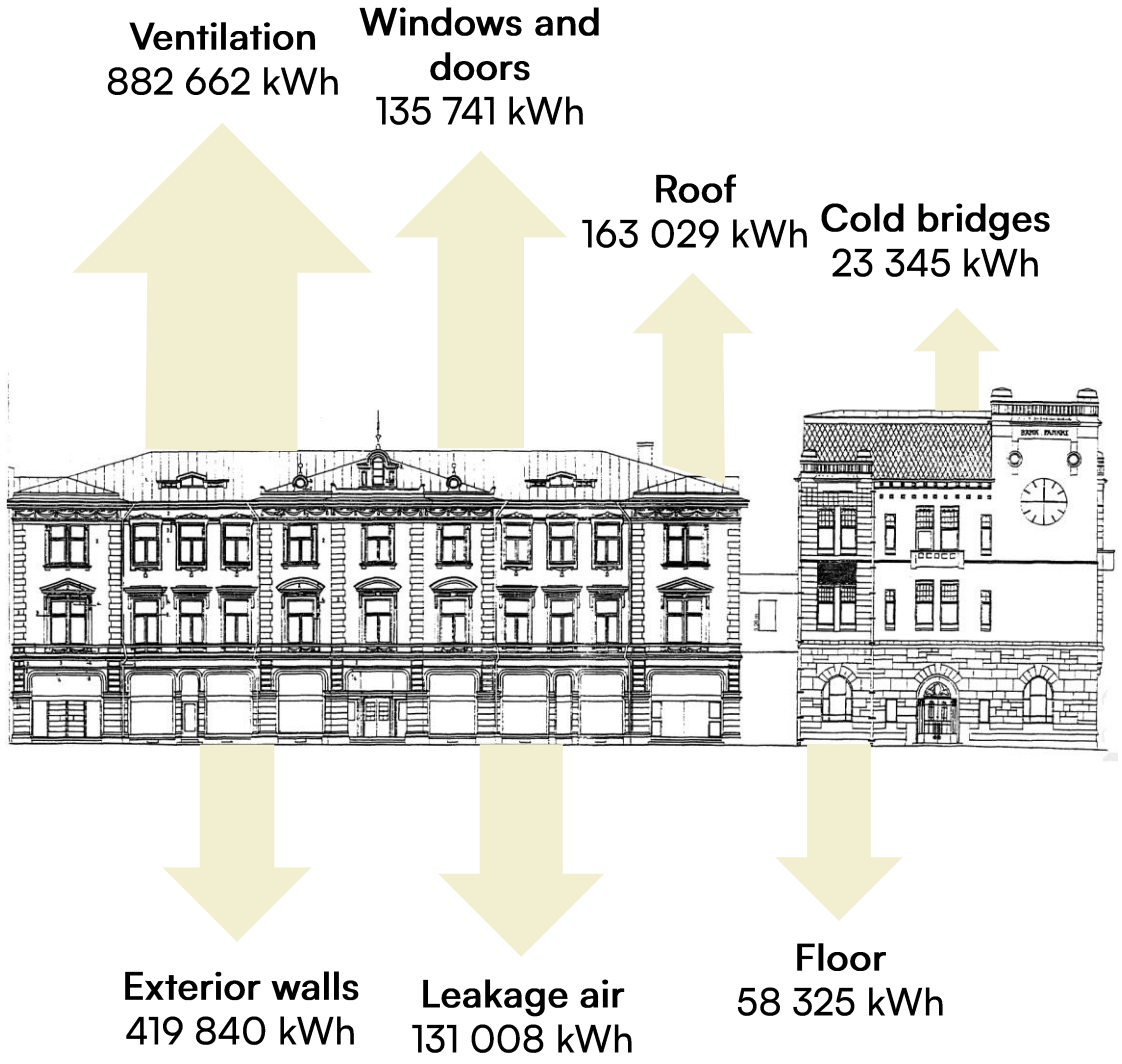
Industrial building, energy renovation Copenhagen, Denmark

Area 42.000m²	Starting point	nolla_E solution
Peak heating load	738 kW	450 kW
Annual energy demand	2 499 MWh	1 679 MWh
Annual energy demand /m²/a	60 kWh/m²	40 kWh/m²
Annual energy cost	3,8m DKK	2,7m DKK
Investment	0,5m DKK	4,8m DKK
Payback time		4 years
ROI		26 %



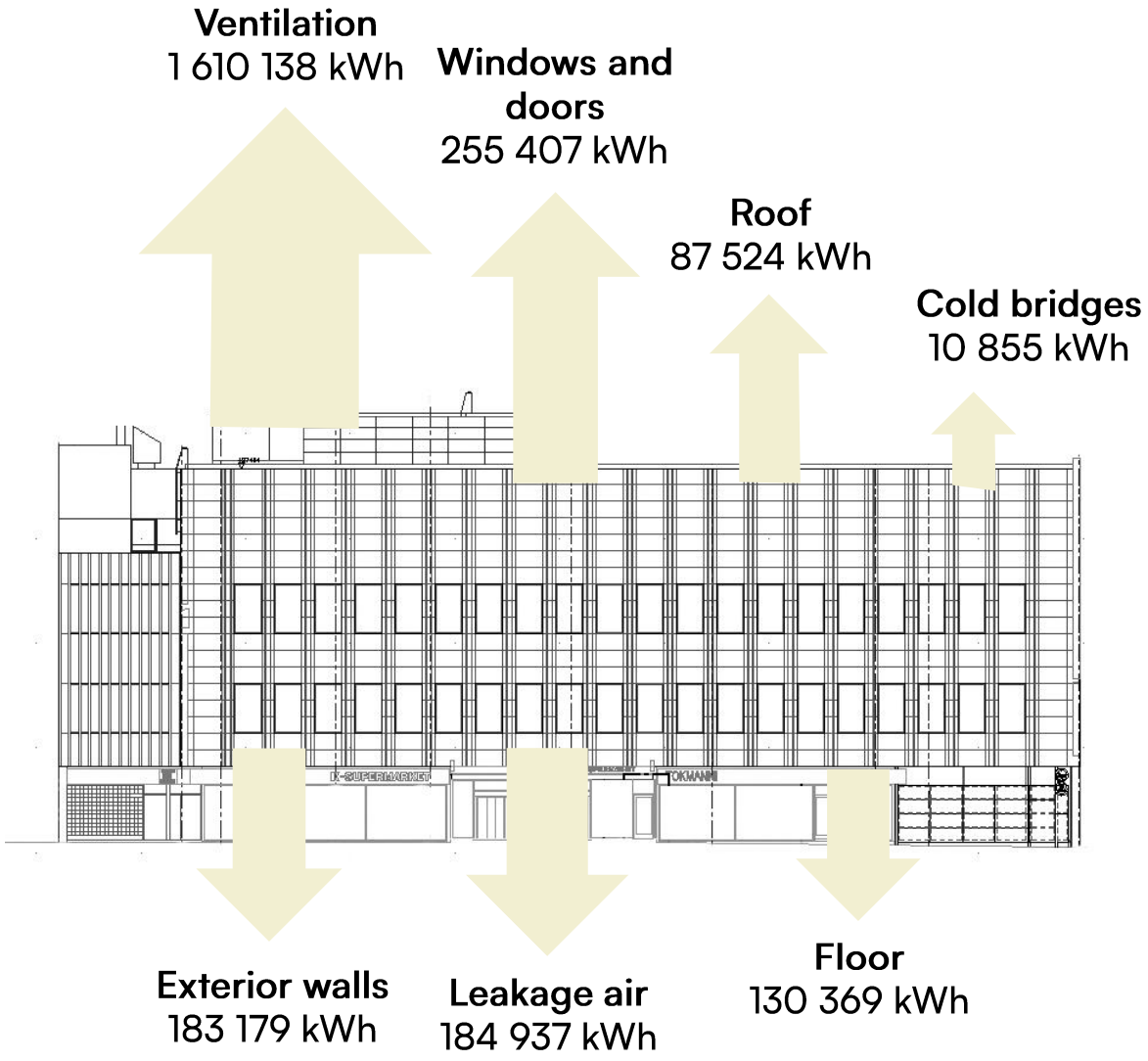
Office/Commercial Property, Turku

Size total 5.070m²	Planned solution	nolla_E-solution
Peak heating load	570 kW	408 kW
Annual energy demand	2.365.410 kWh	998.528 kWh
Annual energy cost	216.575 €	109.589 €
Investment	40.000 €	380.600 €
ROI		31%
Energy class	D	B



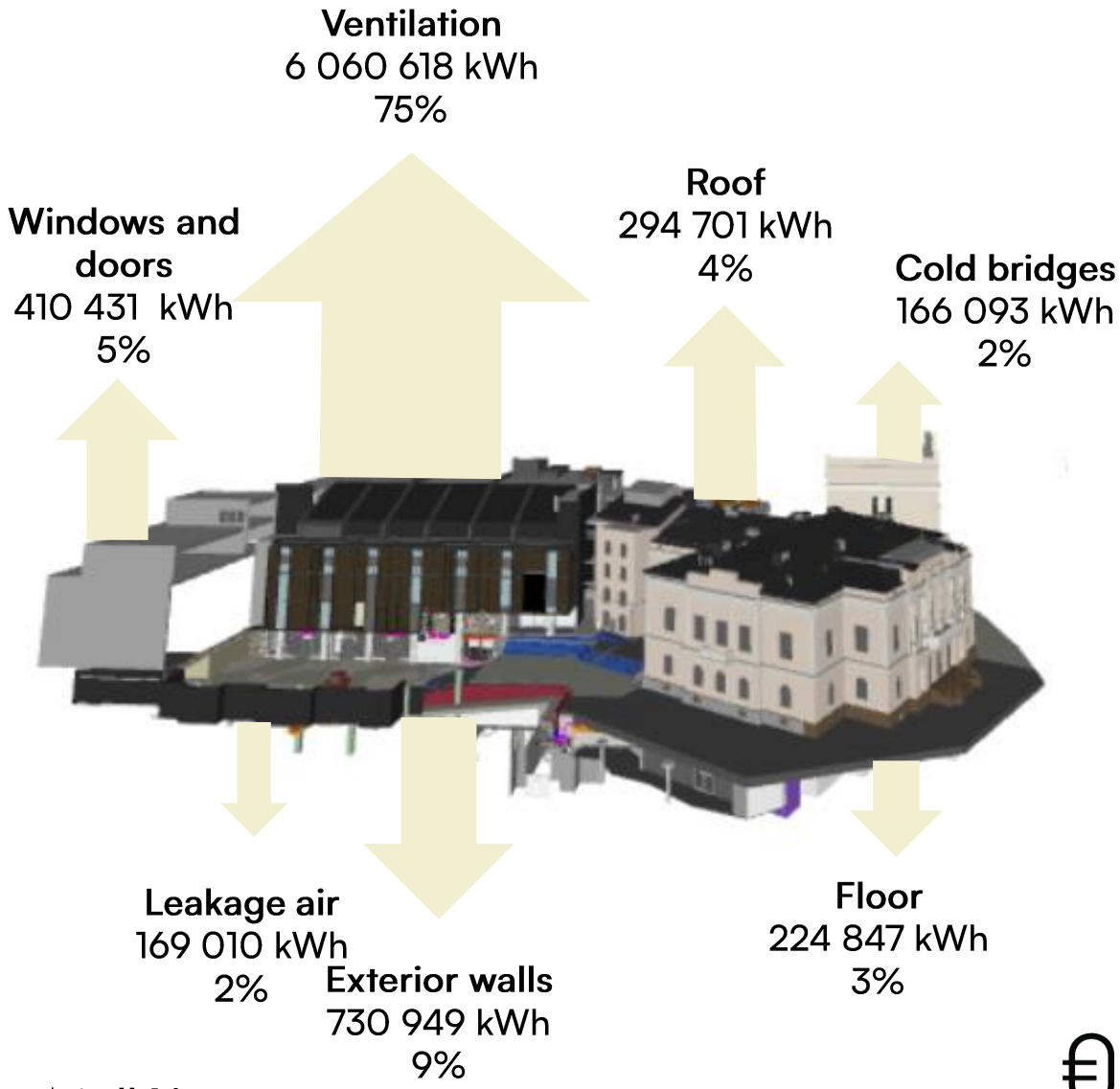
Office/Commercial Property and medical clinic, Turku, Finland

Size total 12.270m²	Planned solution	nolla_E-solution
Peak heating load	1.266 kW	411 kW
Annual energy demand	2.684.196 kWh	1.756.227 kWh
Annual energy demand /m²/a	219 kWh/m²	143 kWh/m²
Annual energy cost	200.757 €	135.829 €
Investment	0 €	157.200 €
ROI		41%
Energy class	C	B



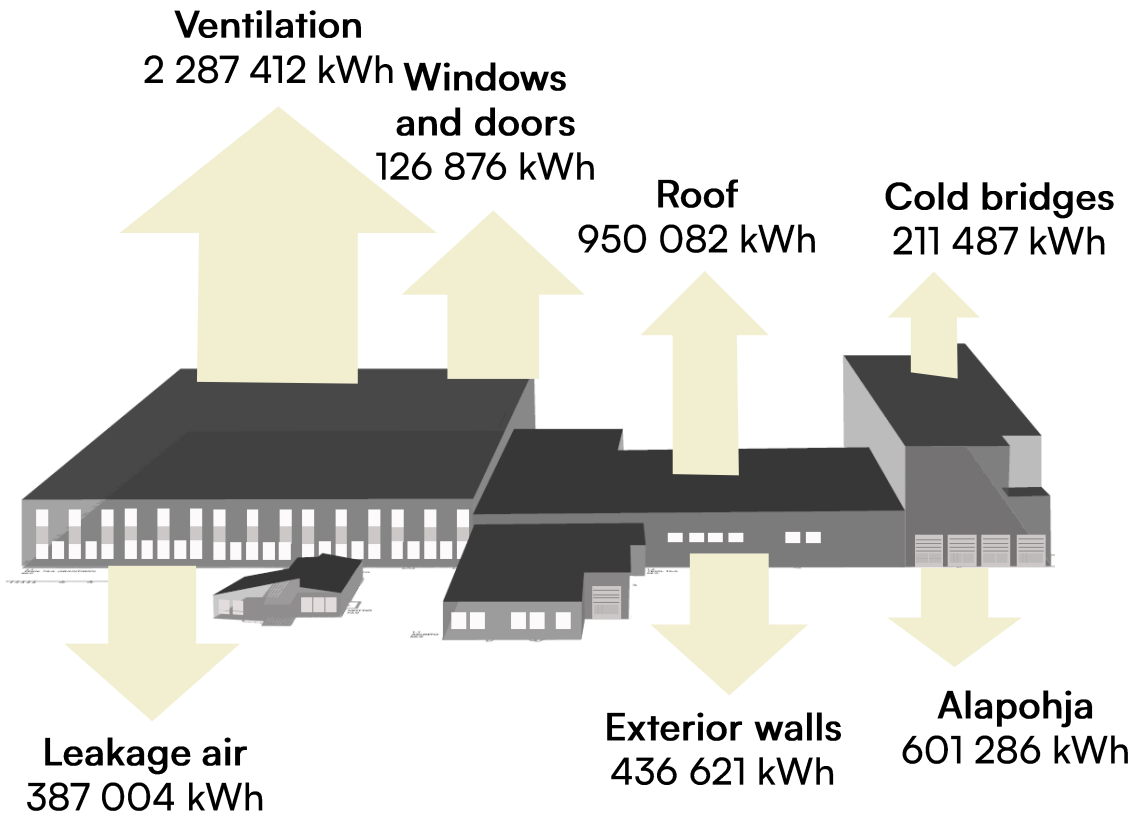
Office/Commercial property, Helsinki, Finland

Total size 19.465 m²	Planned solution	nolla_E-solution
Peak heating load	5.308 kW	2.500 kW
Annual energy demand	11.417 MWh	7.545 MWh
Annual energy demand /m²/a	586 kWh/m²	387 kWh/m²
Annual energy cost	1.133.300 €	877.803 €
Investment	165.000 €	1.341.800 €
Payback time		4,6 years
ROI		22%
Energy class	D	A



Office/ Warehouse property Porvoo, Finland

Area 24.262 m²	Starting point	nolla_E solution
Peak heating load	2787 kW	1758 kW
Annual energy consumption	6.527.272 kWh	4.340.008 kWh
Annual energy consumption m²	269 kWh/m²	178,9 kWh/m²
Cost of annual energy	461.161 €	327.666 €
Investment	0 €	234.050 €
ROI		57%

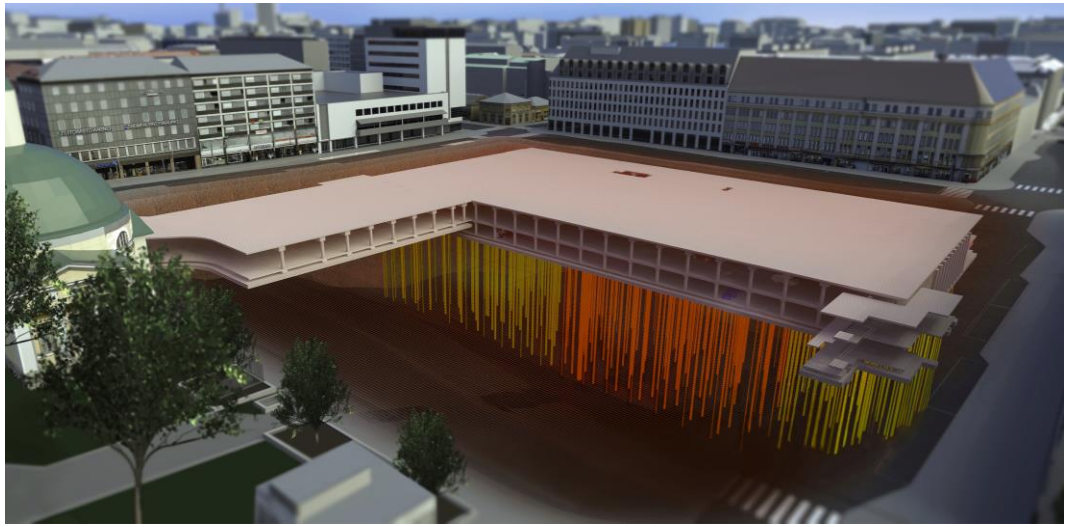


Toriparkki Turku, Finland

Upon completion, *Toriparkki* was the first zero-energy parking facility in Europe. The energy system designed by nollaE reduces annual carbon emissions by 950 tonnes compared to a conventional solution using heat pumps.

The innovative design combines solar and geothermal energy with an undergound heat storage.

- Parking facility, Yliopistonkatu, Turku
- Year of construction: 2020
- Size: 30.322 m2
- Owner: T-Park Oy

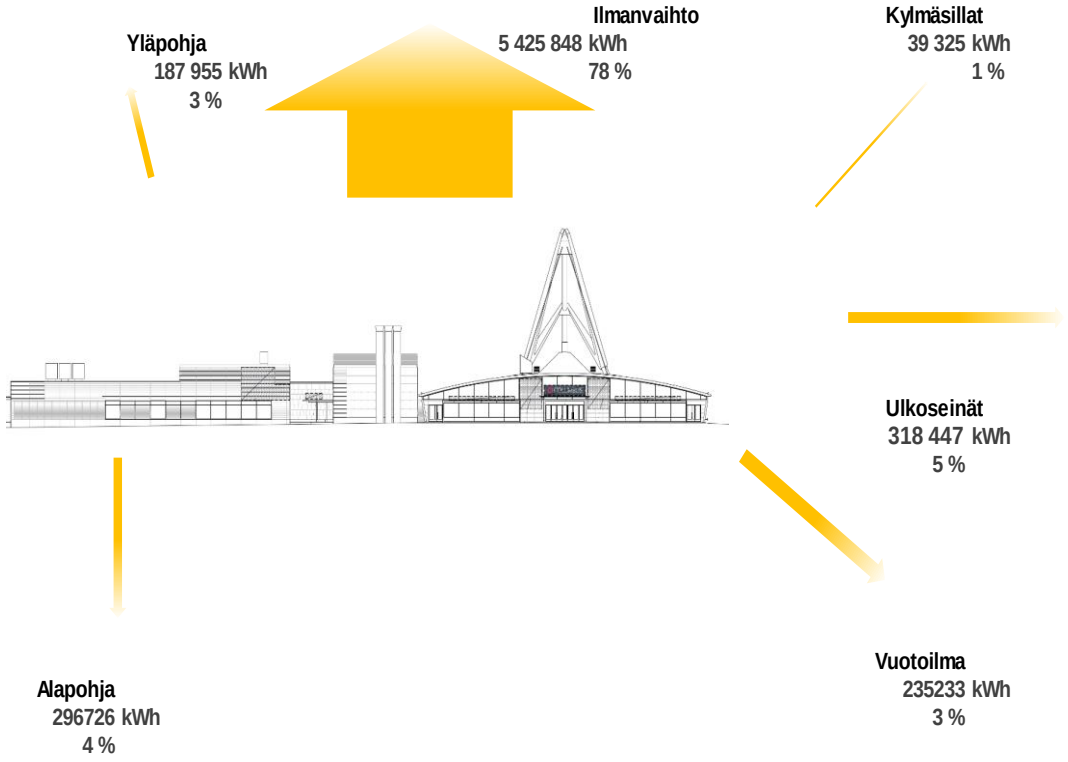


	Planned solution	nollaE-ratkaisu
Peak heating load	10.000 kW	6.600 kW
Annual energy consumption	10.600 MWh	106 MWh
Annual energy consumption m^2	349,6 kWh/m^2	3,5 kWh/m^2
Cost of annual energy	848.000 €	10.600 €
Construction costs	300.000 €	5.970.000 €

A video showing the Toriparkki energysystem is available in the adress:

https://www.youtube.com/watch?v=iCY-jwKefXo

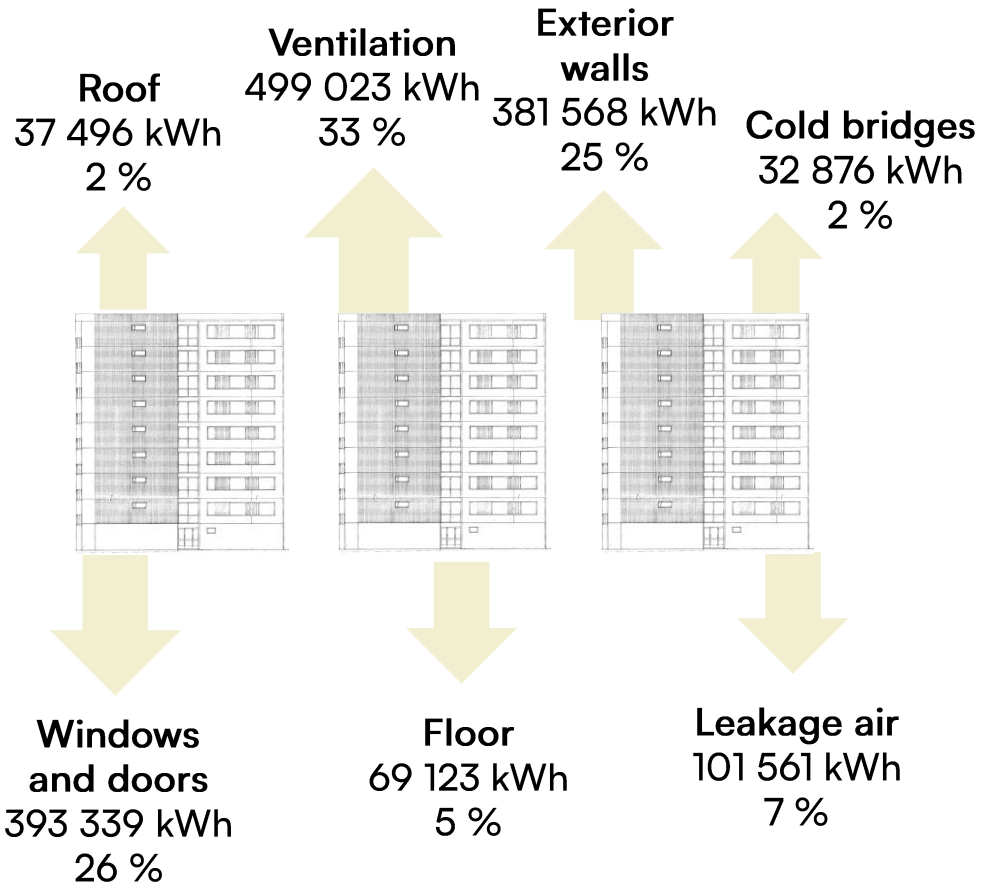
Shopping center, retrofit, Helsinki



Area 21 100 m²	Starting point	nolla_E re-engineered
Peak heating load	5015 kW	3051 kW
Annual energy demand	7 529 989 kWh	2 465 587 kWh
Annual energy demand /m²/a	356,9 kWh/m²	116,9 kWh/m²
Annual energy cost	771 927 €	397 947 €
Investment	500 000 €	1 789 886 €
Payback time		3,4 years
ROI		29 %
CO2-emissions		977 t
Energy class	D	A

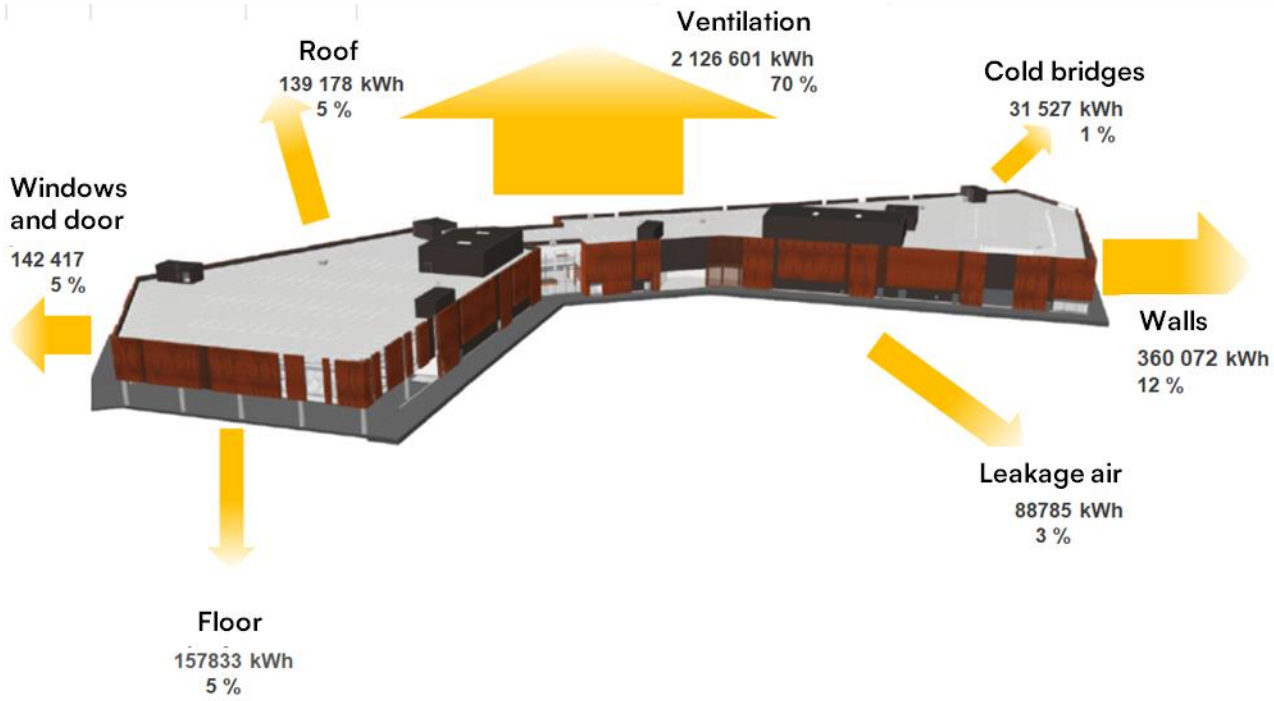
1970s Residential buildings x3, Turku, Finland

Area 8.794m²	Starting point	nolla_E solution
Peak heating load	503 kW	211 kW
Annual energy demand	759.389 kWh	495.809 kWh
Annual energy demand /m²/a	86 kWh	56 kWh
Annual energy cost	94.428 €	54.754 €
Investment	2.507.014 €	2.336.679 €
Energy class	B	A



Finland's first operationally carbon neutral shopping centre, Rauma

Size total 23.000m²	Planned solution	nolla_E-solution
Peak heating load	1442 kW	978 kW
Annual energy demand	4.845.521 kWh	1.632.103 kWh *
Annual energy demand /m²/a	210,7 kWh/m²	71 kWh/m²
Annual energy cost	421.042 €	171.371 €
Investment	382.000 €	965.764 €
Energy class	B	A

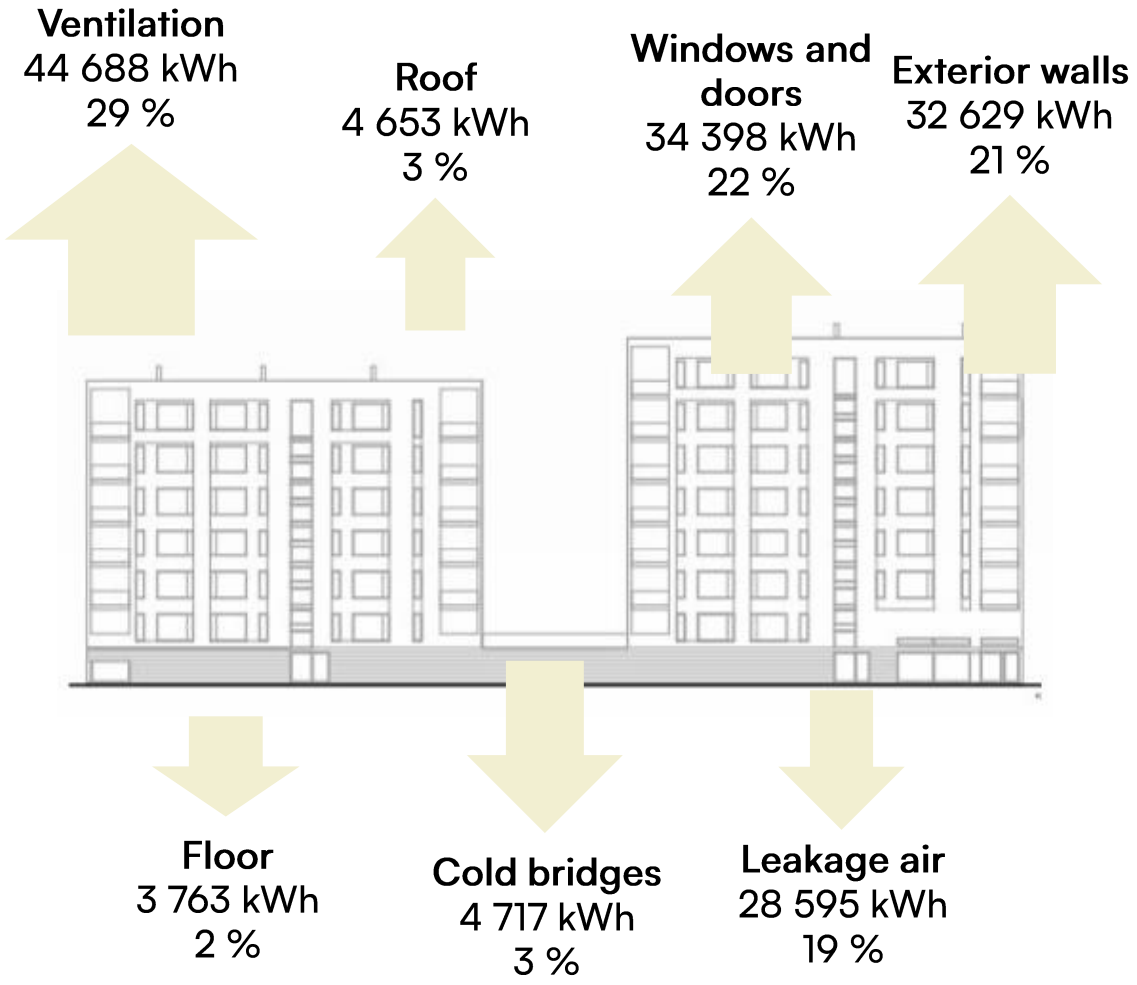


* Waste heat from the shopping centre used for heating neighbouring residential buildings being built.

Residential buildings x5 Rauma, Finland

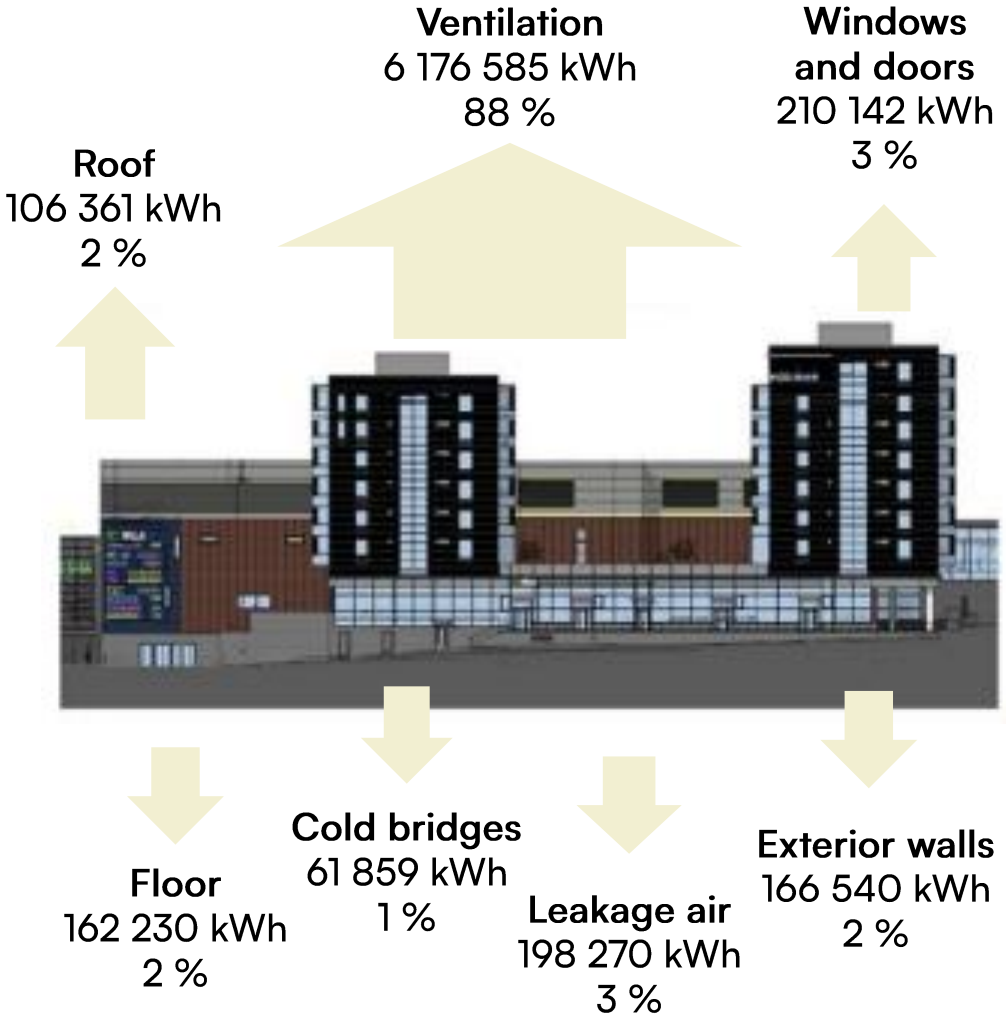
Total size 2.500m² x 5	Starting point	nolla_E solution
Peak heating load	450 kW	295 kW
Annual energy demand	1.600 MWh	1.320 MWh
Energy demand /m²/a	128 kWh/m²	65 kWh/m²
Annual energy cost	24.444 €	21.999 €
Investment		25.200 €

Note: Energy costs in the nolla_E-solution are income for the shopping centre



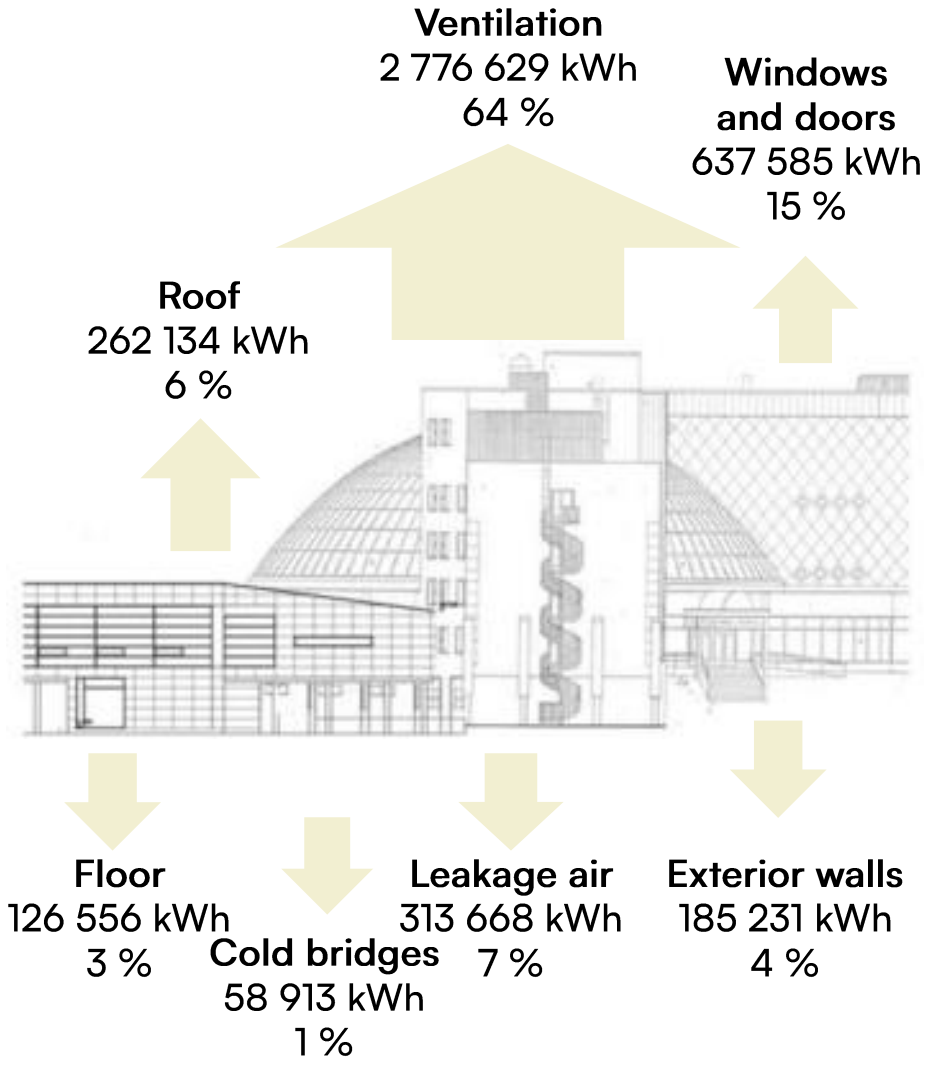
Shopping centre, energy renovation Hyvinkää, Finland

Pinta-ala 26.750m²	Lähtötilanne	nolla_E ratkaisu
Peak heating load	4 197 kW	2 624 kW
Annual energy demand	6 505 246 kWh	3 074 240 kWh
Annual energy demand /m²/a	243 kWh/m²	115 kWh/m²
Annual energy cost	456 416 €	283 417 €
Investment	25 000 €	521 000 €
Payback time		3 vuotta
ROI		35 %



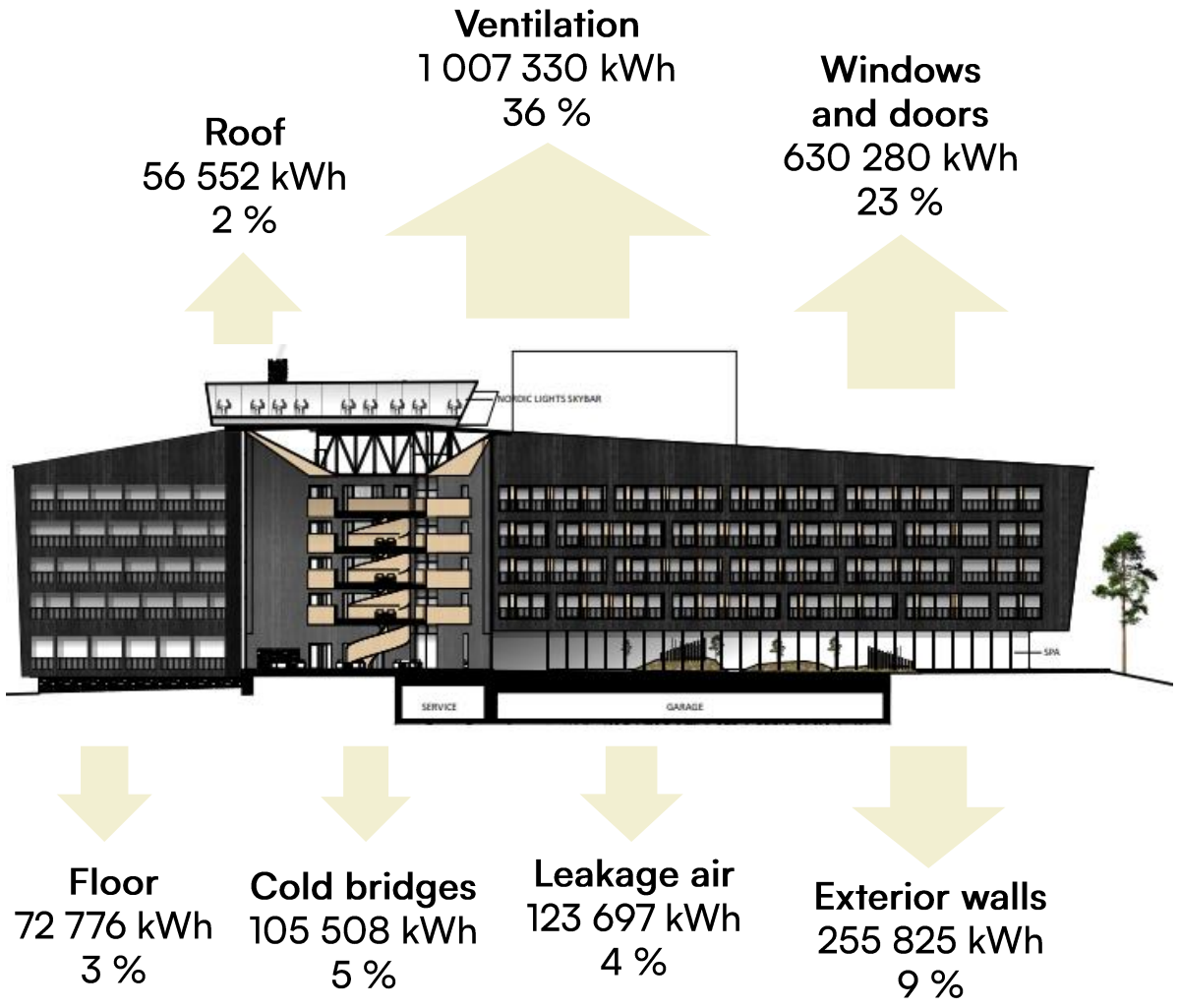
Spa Hotel, Renovation, Oulu, Finland

Area 15.757m²	Starting point	nolla_E solution
Peak heating load	1 961 kW	1 491 kW
Annual energy demand	6 792 MWh	4 371 MWh
Annual energy demand /m²/a	431 kWh/m²	277 kWh/m²
Annual energy cost	388 693 €	274 136 €
Investment	196 736 €	554 459 €
Payback time		3 years
ROI		34 %



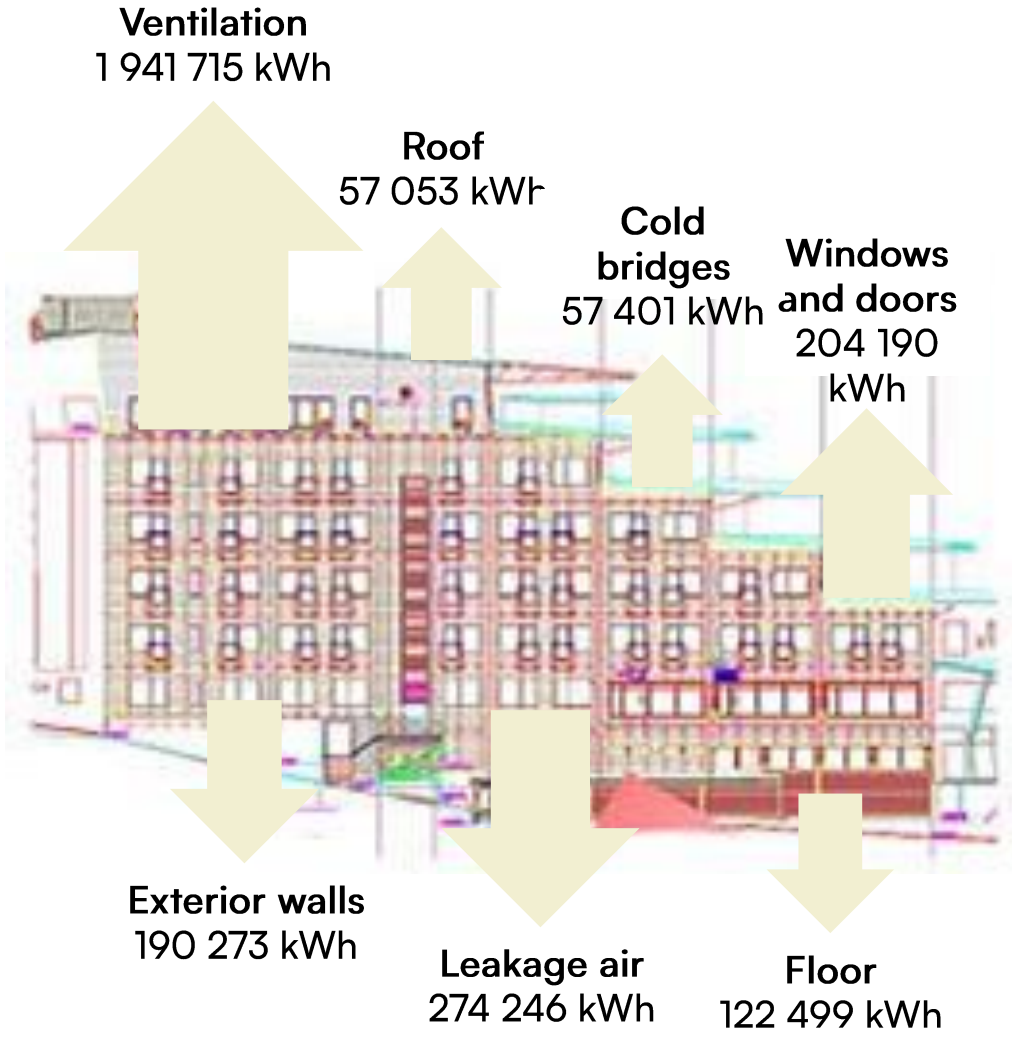
Hotel, new construction, Finnish Lapland

Area 19.600m²	Lähtötilanne	nolla_E ratkaisu
Peak heating load	1 297 kW	1 297 kW
Annual energy demand	6 792 MWh	6 006 MWh
Annual energy demand /m²/a	145	118
Annual energy cost	595 756 €	524 924 €
Investment	217 537 €	430 344 €
Payback time		3 years
ROI		33 %



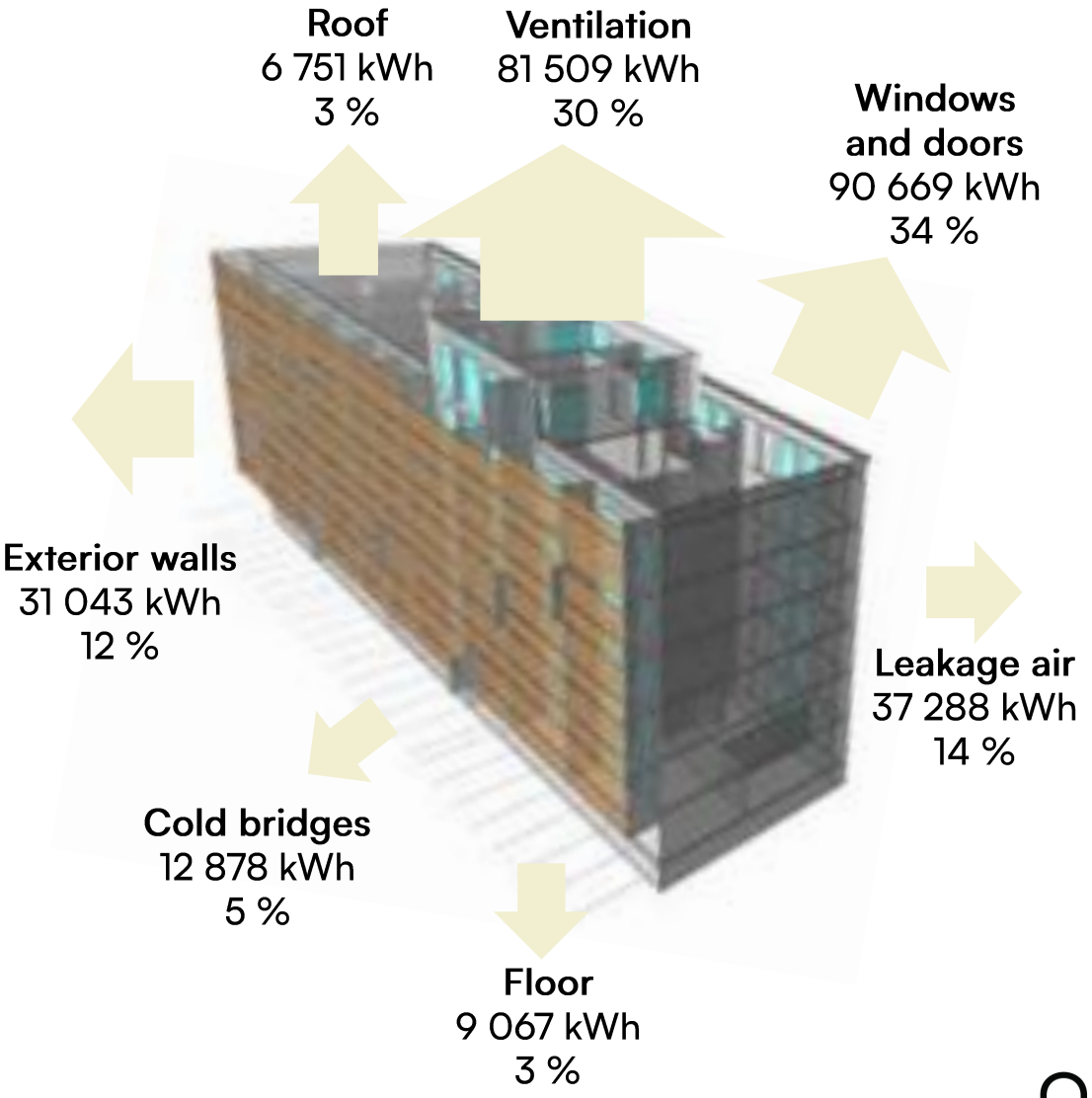
Hotel
Levi, Finnish Lapland

Area 15.000m²	Starting point	nolla_E solution
Peak heating load	653 kW	342 kW
Annual energy demand	2.198.310 kWh	402.740 kWh
Annual energy cost	173.676 €	34.232 €
Investment		538.000 €



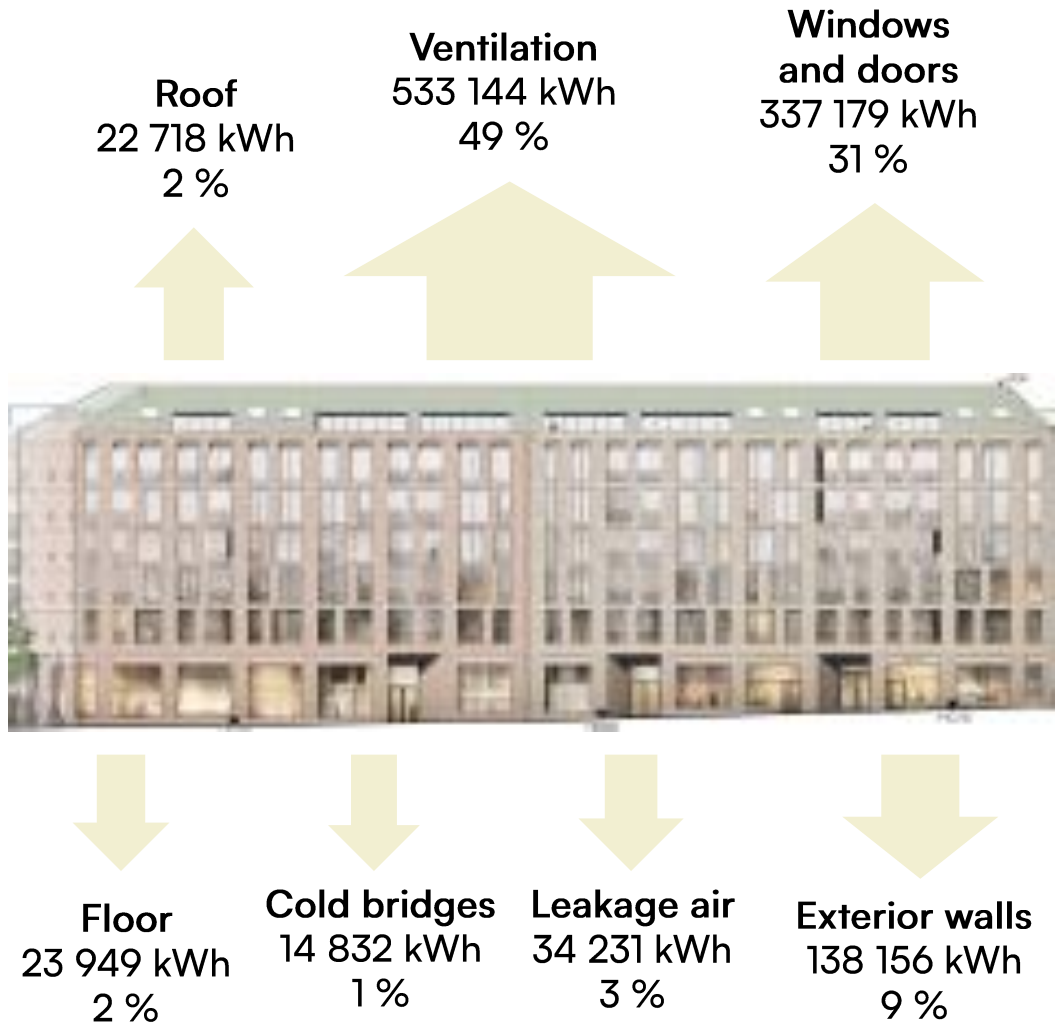
Residential building, new construction, Turku, Finland

Area 7.200m²	Planned solution	nolla_E solution
Peak heating load	140 kW	60 kW
Annual energy demand	476 198 kWh	176 006 kWh
Annual energy demand /m²/a	66 kWh/m²	24 kWh/m²
Annual energy cost	50 574 €	18 481 €
Investment	76 500 €	141 800 €
Payback time		3 years
ROI		38 %



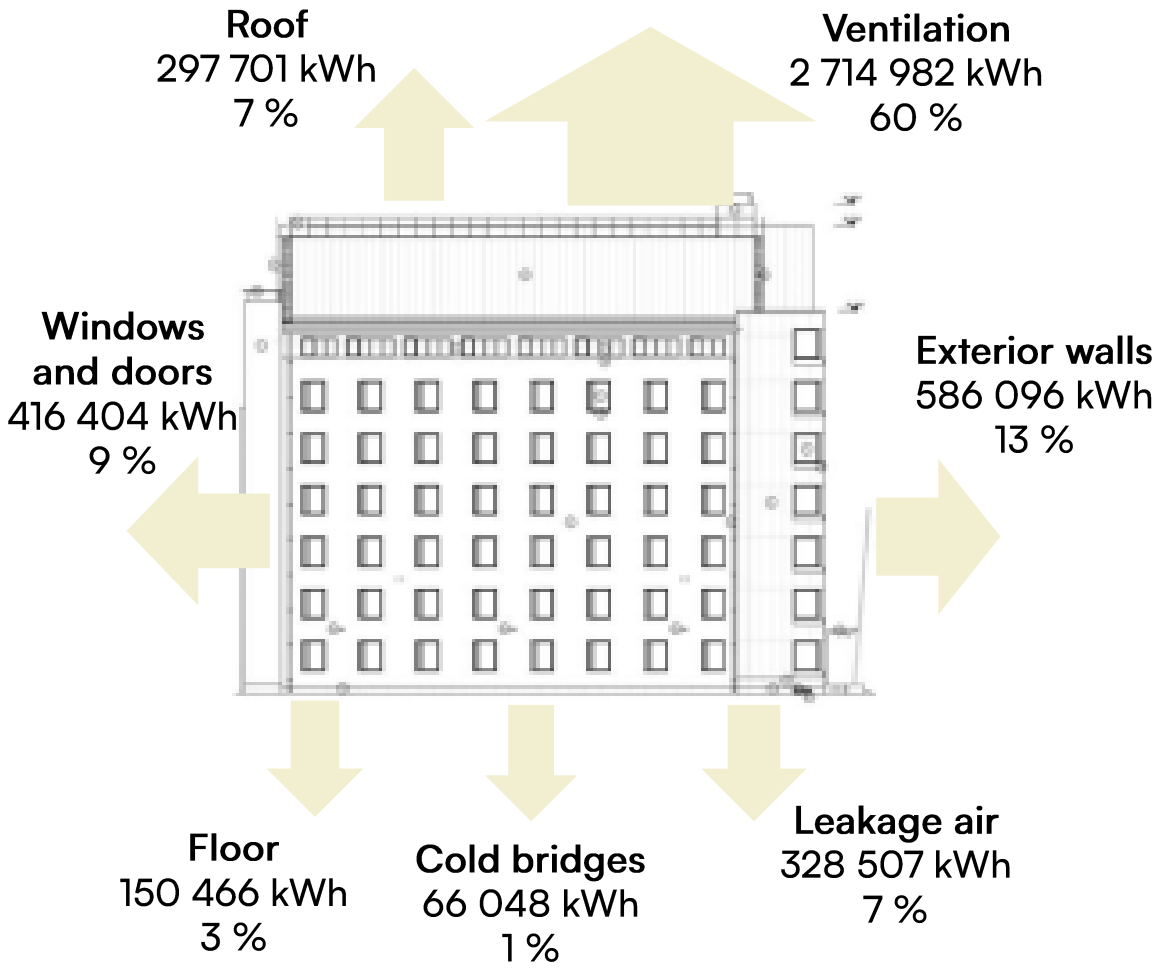
Residential building, new construction, Helsinki, Finland

Area 12.500m²	Starting point	nolla_E solution
Peak heating load	531 kW	271 kW
Annual energy demand	1 478 MWh	475 MWh
E-rating	81	60
Annual energy cost	171 209 €	59 661 €
Investment	324 861 €	463 294 €
Payback time		1 year
ROI		77 %



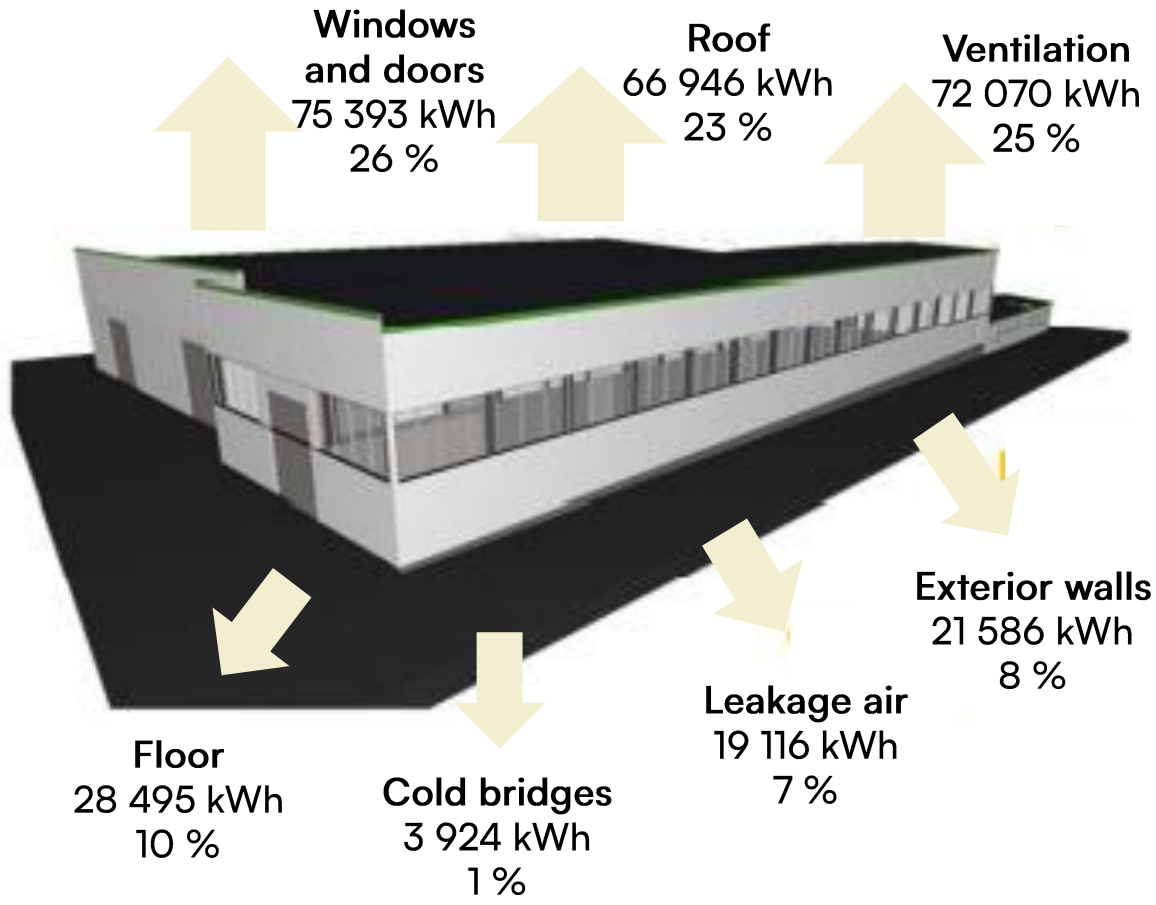
Residential buildings x3, energy renovation, Helsinki, Finland

Area 22.900m²	Starting point	nolla_E solution
Peak heating load	3 083 kW	1 500 kW
Annual energy demand	4 991 MWh	3 295 MWh
CO_2 emissions	3 714 t	1 106 t
Annual energy cost	440 793 €	324 503 €
Investment	80 000 €	592 669 €
Payback time		4 years
ROI		22 %



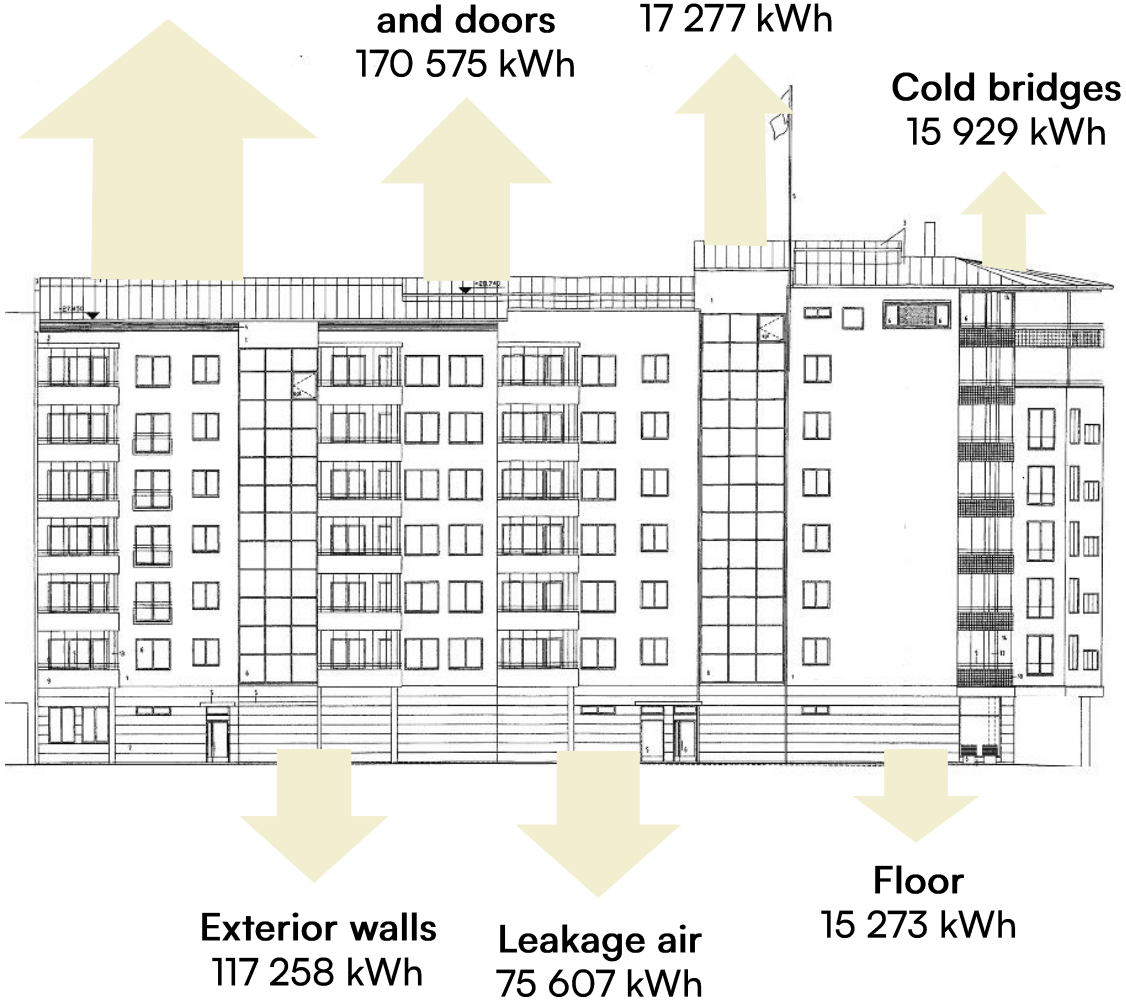
Industrial building, energy renovation Tampere, Finland

Area 2.175m²	Starting point	nolla_E solution
Peak heating load	423 kW	300 kW
Annual energy demand	714 MWh	388 MWh
CO2-emissions	3 714 t	1 106 t
Annual energy costs	39 906 €	22 564 €
Investment	37 051 €	107 571 €
Pay-back time		4 years
Return on Investment		25 %



Residential building with commercial space, Turku, Finland

Area 6.270m²	Lähtötilanne	nolla_E ratkaisu
Peak heating load	401 kW	230 kW
Annual energy demand	825.891 kWh	619.418 kWh
Annual energy costs /m²/a	131,7 kWh/m²	98,8 kWh/m²
Annual energy costs	81.590 €	63.629 €
Investment	0 €	54.840 €



1960s Residential building, energy renovation, Turku, Finland

Previous energy renovations at Domus Aboensis did not deliver expected savings and results. nollaE designed a solution that combined several energy saving measures, including using energy zones, heat recovery from the ventilation and seasonal underground heat storage.

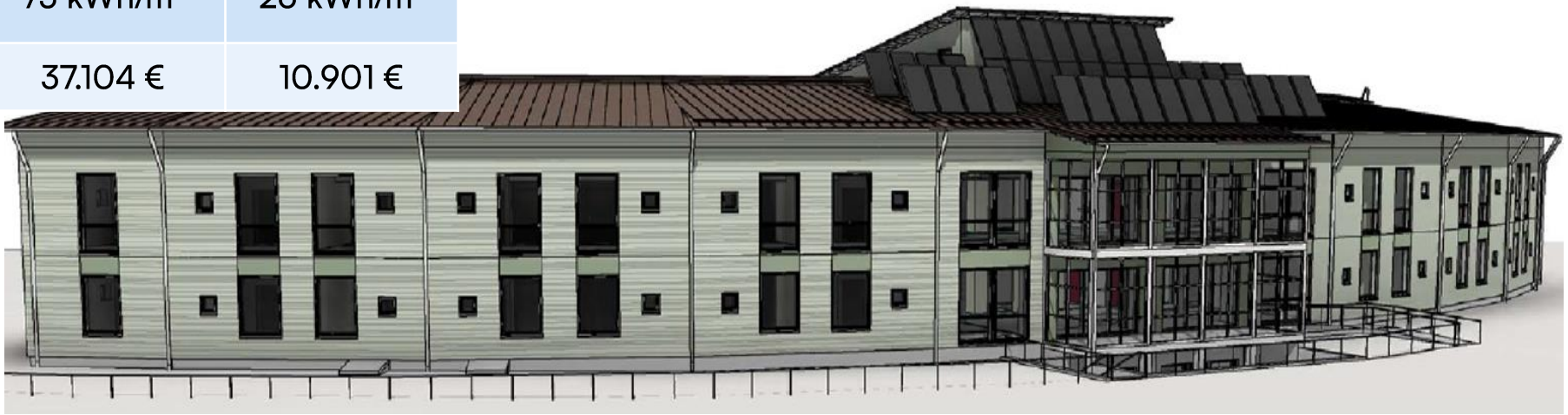
As a result, total annual energy consumption fell by 77% and carbon emissions by 58 tonnes compared to earlier.

- Two residential buildings, Piispankatu 10, Turku
- Year of construction: 1965
- Area: 3.320 m2
- Owner: Åbo Akademi University Foundation

Area 3.320m^2	Starting point	nolla_E solution
Peak heating load	243 kW	108 kW
Annual energy consumption	484.014 kWh	110.386 kWh
Annual energy consumption m^2	145,8 kWh/m^2	33,2 kWh/m^2
Cost of annual energy	37.753 €	8.823 €
Investment		218.000 €

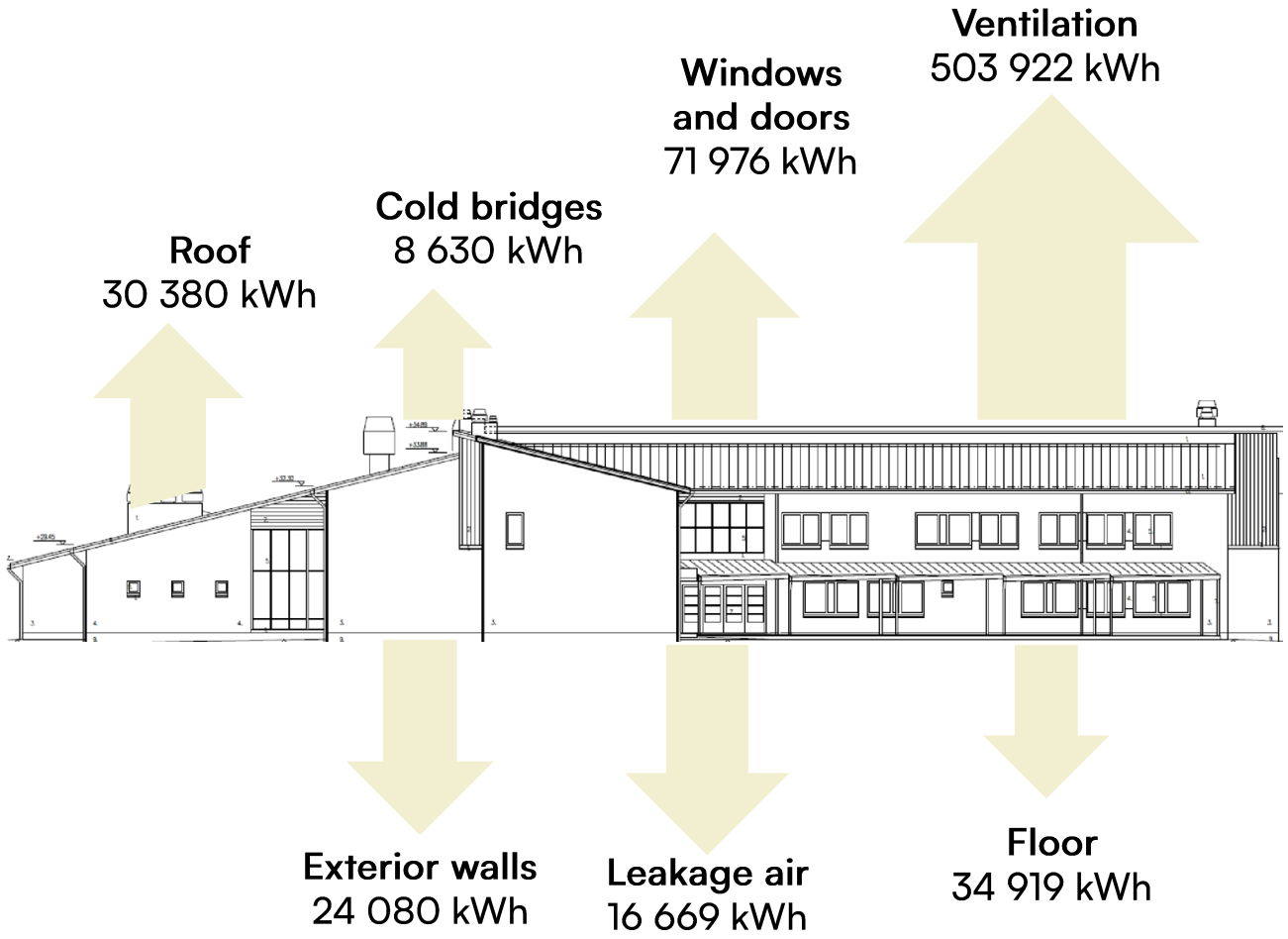
Residential and serviced living building, Espoo, Finland

Area 4.907m²	Starting point	nolla_E solution
Peak heating load	288 kW	125 kW
Annual energy consumption	371.040 kWh	109.010 kWh
Annual energy consumption/m²/a	75 kWh/m²	26 kWh/m²
Annual energy cost	37.104 €	10.901 €



Maunu School Rusko, Finland

Area 3.130m²	Starting point	nolla_E solution
Peak heating load	443 kW	340 kW
Annual energy consumption	944.017 kWh	605.433 kWh
Annual energy consumption m²	302 kWh/m²	193 kWh/m²
Cost of annual energy	42.480 €	27.244 €
Investment	50.000 €	43.534 €



Thank you!

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