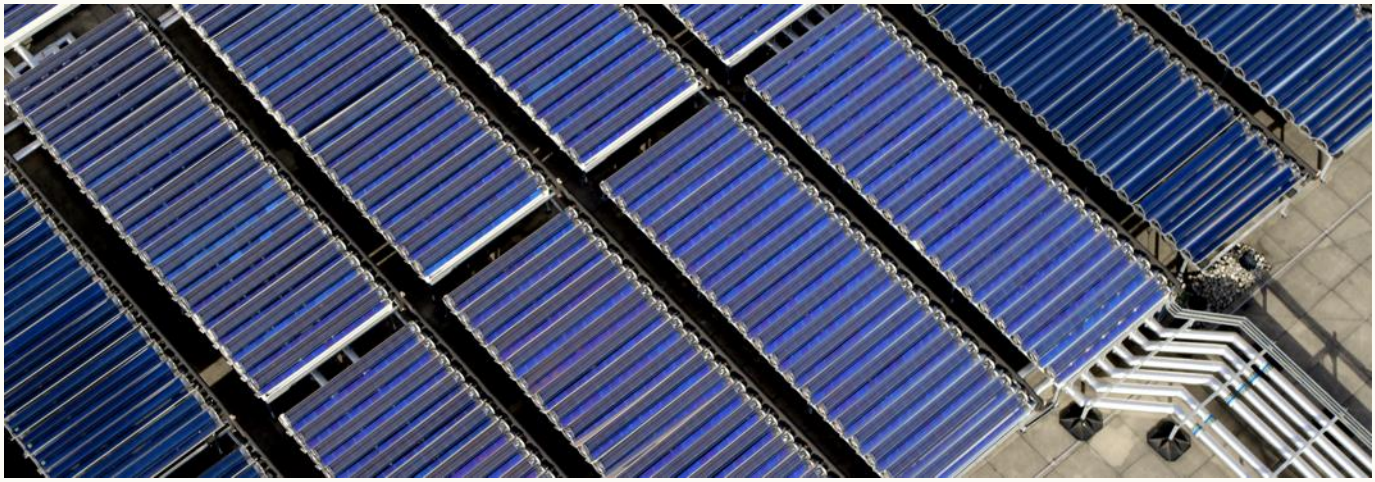
virtu by Naked Energy.

Solar Redefined

Winner Supplier Innovation Awards 2023

virtu by Naked Energy.

Solar Redefined



Naked Energy is a pioneering renewable technology design and engineering business headquartered in the UK.

The business tackles the largest roadblock to net zero, the decarbonisation of heat. Heat makes up 51% of all global energy demand, significantly larger than transport and electricity.

Naked Energy aims to tackle this issue by removing fossil fuels from the global commercial and industrial space through the deployment of Virtu, its high impact, cost effective and versatile solar heat and power technologies.

The Virtu product range is TUV Rhineland certified, ensuring compliance with international performance and durability standards.

The Virtu product range represents a new and revolutionary category of solar technology, delivering:

✓ More energy in less space
✓ up to 4 times the carbon savings (when compared with PV)
✓ up to 50% greater returns
✓ A versatile and beautiful solution to delivering on your ESG targets

Virtu is suitable for end-consumers with a constant heat demand, i.e. hospitals, multi-dwelling residential developments, hospitality, leisure centres as well as different forms of manufacturing, incl. food & beverage.

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2024: Virtu in numbers

100+
projects

9,846 m²
collector area

11
countries

3.62 GWh
heat per year

25.4 MWh
electricity per year

1500 t
carbon saved

Selected projects

Site
British Library

Location
London, UK

Technology
Virtu^{HOT} & Virtu^{PVT}

Application
DHW, dehumidification of rare books section

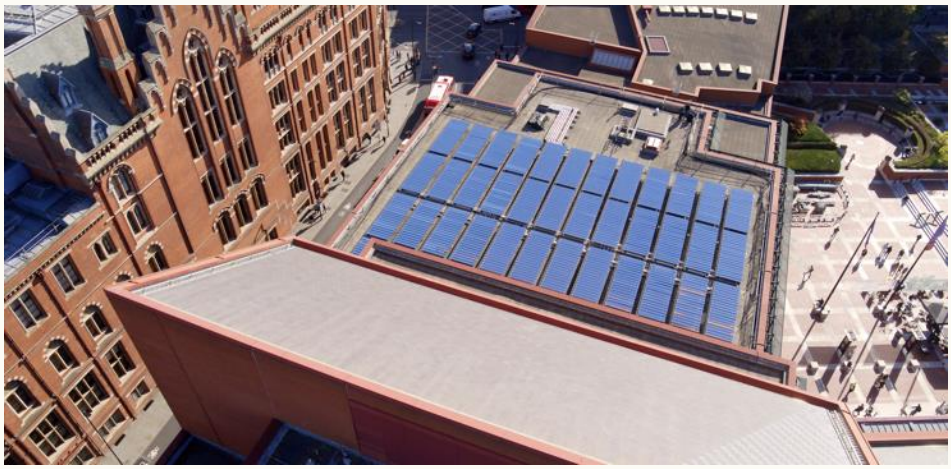
Array size
950 collectors | 617 m^2 gross area

Capacity
366 kWp thermal and 17 kWp electrical

Annual thermal output
212,380 kWh

Annual electrical output
13,440 kWh

Carbon savings
46.5 tonnes per year



The Virtu installation at the British Library is the largest solar thermal installation in the UK to date. The British Library is a grade I listed historic building and Virtu was selected for its performance as well as its low profile and overall aesthetic. The engineering integration and controls strategy was complex, as the hot water and electricity generated by Virtu had to be used in several different ways, including the dehumidification of the rare books section. This project was installed by our partner Convert Energy.

Site
Delémont Apartments

Location
Delémont, CH

Technology
Virtu^{HOT}

Application
DHW pre-heat to displace natural gas

Array size
1590 collectors | 1034 m^2 gross area

Capacity
636 kWp thermal

Annual thermal output
193,800 kWh

Carbon savings
41 tonnes per year

These modern, new-build apartment buildings follow the Switzerland net-zero carbon standards for new developments. The VirtuHOT installation is part of a comprehensive renewable energy system, including PV and ground source heat pumps. Hot water generated by Virtu is used with inter-seasonal storage, providing most of the thermal demand at zero operation cost to the building asset manager.

➢ Click here to read the full case study.

Selected projects

Site
Westgate Leisure Centre

Location
Chichester, UK

Technology
Virtu^{HOT}

Application
Pool heating

Array size
420 collectors | 315 m^2 gross area

Capacity
168 kWp thermal

Annual thermal output
111,720 kWh

Carbon savings
23.5 tonnes per year

This municipal swimming pool and leisure centre benefits from VirtuHOT to providing over over 40% of its annual thermal load. This project benefitted from Salix funding through the Public Sector Decarbonisation Fund (PSDS) and was installed by our partner Solar UK.

➢ Click here to read the full case study.

Site
Creighton University

Location
Nebraska, USA

Technology
Virtu$^{HOT\ HD}$

Application
Domestic Hot Water

Array size
220 collectors | 139 m^2 gross area

Capacity
69 kWp thermal

Annual thermal output
81,360 kWh

Carbon savings
17 tonnes per year

Graves Hall at Creighton University is the first application of Virtu in the United States. The installation is part of Graves Hall, a new-build student dormitory, housing to 400 first year students on the Omaha campus. VirtuHOT HD will significantly save on water heating costs and assist the university in achieving its sustainability goals. This project was delivered by our partner ELM Solar.

➢ Click here to read the full case study.

Selected projects

Site
Ealing/Hounslow Schools

Location
London, UK

Technology
Virtu^{HOT}

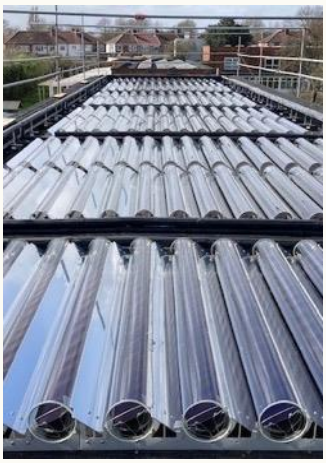
Application
Domestic Hot Water

Array size
980 collectors | 735 m^2 gross area

Capacity
392 kWp thermal

Annual thermal output
287,280 kWh

Carbon savings
60 tonnes per year



A total of 18 primary schools in the West London boroughs of Ealing and Hounslow received around 50-60 Virtu^{HOT} tubes each. The installations reduce the operational overheads and provide carbon savings for these local authority-run schools. These projects were funded through the Public Sector Decarbonisation Scheme (PSDS). All installations were carried out by our partners Stonegrove and Megan Renewable.

Site
Neils Rodin

Location
Borex, CH

Technology
Virtu$^{HOT\ HD}$

Application
Space heating

Array size
125 collectors | 94 m^2 gross area

Capacity
50 kWp thermal

Annual thermal output
38,760 kWh

Carbon savings
8 tonnes per year

Located in the Swiss Alps, this bespoke application of Virtu$^{HOT\ HD}$ is installed on a mounting frame with a 70° angle providing heat to greenhouses growing speciality citrus fruit. The near vertical configuration provides an even energy output throughout the spring, summer and autumn months. This project was delivered by our Swiss partner, Ponzio Group.

Selected projects

Site
University of Westminster

Location
London, UK

Technology
Virtu^{HOT} & Virtu^{PVT}

Application
Domestic Hot Water

Array size
195 collectors | 146 m2 gross area

Capacity
70.9 kWp thermal & 4.4 kWp electrical

Annual thermal output
24,990 kWh

Annual electrical output
3,640 kWh

Carbon savings
6 tonnes per year

One of Naked Energy's first commercial installations: Virtu^{HOT} and Virtu^{PVT} provide hot water and electricity to the University of Westminster's student dormitory living quarters. This installation has been operational since 2021 and continues to provide zero carbon heat at zero running costs to the customer.

➢ Click here to read the full case study.

Site
Active Office

Location
Swansea, UK

Technology
Virtu^{PVT}

Application
Domestic Hot Water & power

Array size
40 collectors | 30 m^2 gross area

Capacity
16 kWp thermal & 2.9 kWp electrical

Annual thermal output
3,920 kWh

Annual electrical output
2,240

Carbon savings
1 tonnes per year

The Active Office is the United Kingdom's first energy positive office building and was Naked Energy's very first commercial project. A total of 40 Virtu^{PVT} tubes were installed and have been in operation since 2018. Thanks to the SPECIFIC team at Swansea University, the overall system includes a 2500 L thermal store and a 2 stage Hitachi heat pump to provide space heating and hot water. Tours to this site are available on request.

➢ Click here to read the full case study.

Selected projects

Site
CEPAC Rotherham

Location
Rotherham, UK

Technology
Virtu^{HOT}

Application
Domestic Hot Water

Array size
100 collectors | 70 m^2 gross area

Capacity
40 kWp thermal

Annual thermal output
26,600 kWh

Carbon savings
5.5 tonnes per year

CEPAC is a manufacturer of paper and packaging products. The Virtu^{HOT} installation on the facility in Rotherham, England, provides domestic hot water to decarbonize staff offices.

Site
Weno Pluimvee

Location
Barneveld, The Netherlands

Technology
Virtu^{HOT}

Application
Space Heating

Array size
120 collectors | 90 m^2 gross area

Capacity
88 kWp thermal

Annual thermal output
32,824 kWh

Carbon savings
7 tonnes per year

The installation provides ambient heating for a Dutch industrial agricultural facility, a chicken broiler. Virtu^{HOT} is used in combination with a heat pump to provide underfloor heating and ventilated hot air to maintain the desired environmental conditions. This project was delivered by our regional partner, Venfeld.

Selected projects

Site
Nyma Makersplaats

Location
Nijmegen, The Netherlands

Technology
Virtu$^{HOT\ HD}$

Application
DHW & space heating

Array size
685 collectors | 513 m^2 gross area

Capacity
199 kWp thermal

Annual thermal output
166,595 kWh

Carbon savings
35 tonnes per year

Nyma Makersplaats is an impressive refurbishment of an old synthetic silk facility to become a "makers place" for a variety of artisanal craft businesses. Virtu^{HOT} is used with a heat pump to provide space heating and hot water. This project was delivered by our regional partner, Venfeld.

➢ Click here to read the full case study.

Site
Sportshall Drievliet

Location
Ridderkerk, The Netherlands

Technology
Virtu^{HOT}

Application
Space heating & cooling

Array size
350 collectors | 262 m^2 gross area

Capacity
140 kWp thermal

Annual thermal output
95,736 kWh

Carbon savings
20 tonnes per year

Sportshall Drievlet is a community facility in the heart of Ridderkerk, close to the city of Rotterdam. This sports hall complex benefits from Virtu^{HOT} providing space heating and cooling. The project was granted local subsidies to support vapour absorption cooling, demonstrating best-in-class engineering excellence. This project was delivered by our regional partner, Venfeld.

Selected projects

Site
Mandarin Oriental Hyde Park

Location
London, United Kingdom

Technology
Virtu^{HOT}

Application
DHW

Array size
120 collectors | 90 m^2 gross area

Capacity
48 kWp thermal

Annual thermal output
39.7 MWh

Carbon savings
7.3 tonnes per year

In the heart of Knightsbridge, Mandarin Oriental Hyde Park, London, stands as an icon of luxury hospitality, renowned for its impeccable service and timeless elegance. Driven by a commitment to sustainability it has ambitious 2030 goals set to reduce energy intensity by 30% and carbon intensity by 50%. This project was delivered by our Partner SHEco.

➢ Click here to read the full case study.

Site
AELTC, Wimbledon

Location
London, UK

Technology
Virtu^{HOT}

Application
DHW

Array size
130 collectors | 97.5 m^2 gross area

Capacity
52 kWp thermal

Annual thermal output
36.5 MWh

Carbon savings
6.23 tonnes per year

Having identified heating as a main issue, AELTC aimed to transition to a more sustainable heating solution, aligning with their ambitious environmental goals, while ensuring uninterrupted, efficient energy supply throughout the year. The installed VirtuHOT system delivers DHW for player showers, gym facilities and kitchens. This system was installed by our trusted partner VitoEnergy.

Selected projects

Site
WTC Den Haag

Location
Den Haag, Netherlands

Technology
Virtu$^{HOT\ HD}$

Application
DHW

Array size
155 collectors | 116.25 m^2 gross area

Capacity
43.4 kWp thermal

Annual thermal output
46.5 MWh

Carbon savings
8.4 tonnes per year

Located in the centre of Den Haag, the WTC is high-end hub for businesses and professionals to network. The Virtu$^{HOT\ HD}$ installation operates in synchrony with a water-to-water heat pump generating hot water for the kitchens of the WTC building. This project was delivered by our exclusive distribution partner for the Netherlands, Venfeld.

Active Office Deep Dive

The Active Office was Naked Energy's first commercial project with 40 VirtuPVT operating since 2018. Thanks to the SPECIFIC team at Swansea University, the overall system includes a 2500 L thermal store and a 2 stage Hitachi heat pump to provide space heating and hot water. Tours to this site are available on request.

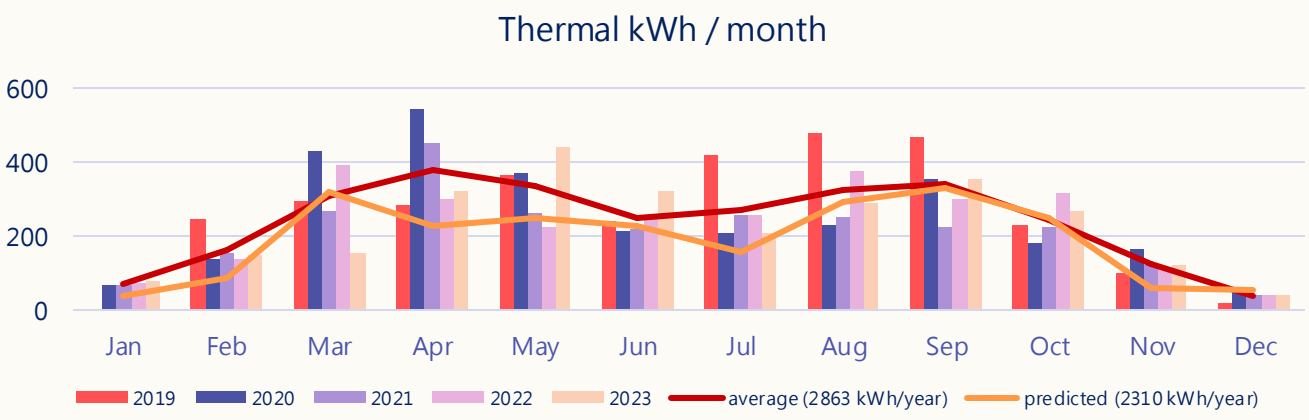
Array size
40 Virtu^{PVT} tubes

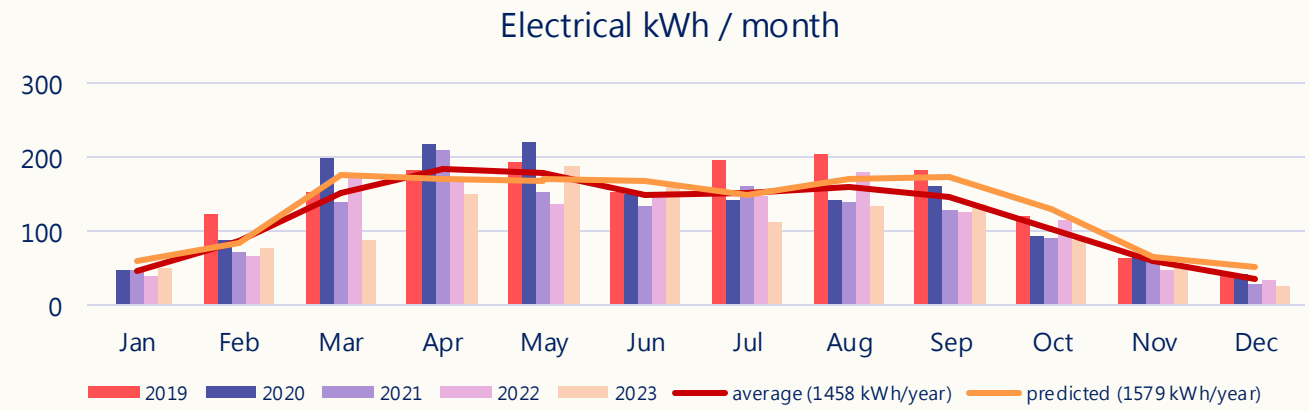
Application
Space heating and hot water (combi) for offices

Hydraulic setup
Virtu heats main thermal store in parallel with heat pump

Mean fluid temperature
50 °C

Orientation
Vertical facade





Predictions made using averaged weather data from 2006-2016.
Some discrepancy is expected between generation and prediction due to differences in irradiance each year.

University of Westminster Deep Dive

One of Naked Energy' s first commercial installations: Virtu^{HOT} and Virtu^{PVT} provide hot water and electricity to the University of Westminster' s student dormitory living quarters. This installation has been operational since 2021 and continues to provide zero carbon heat at zero running costs to the customer.

Array size
75 Virtu^{HOT} + 60 Virtu^{PVT} tubes

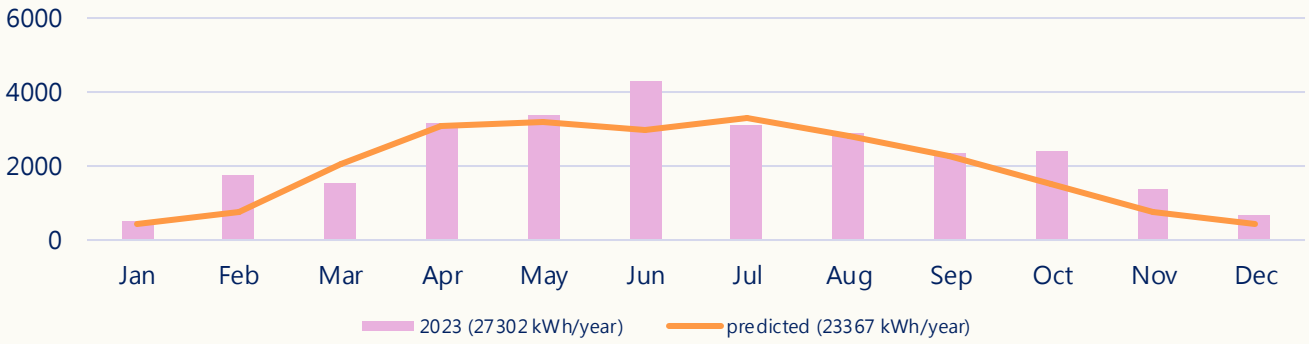
Application
Domestic Hot Water for student residences

Hydraulic setup
Hot water preheat

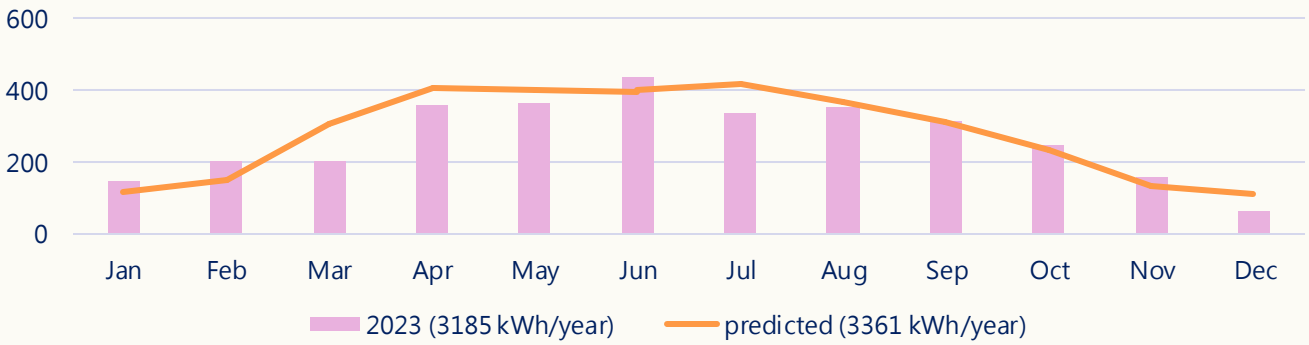
Mean fluid temperature
60 ºC

Orientation
Sloped roof

Thermal kWh / month



Electrical kWh / month



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Westgate Leisure Centre Deep Dive

This municipal swimming pool and leisure centre benefits from VirtuHOT to providing over over 40% of its annual thermal load. This project benefitted from Salix funding through the Public Sector Decarbonisation Fund (PSDS) and was installed by our partner Solar UK.

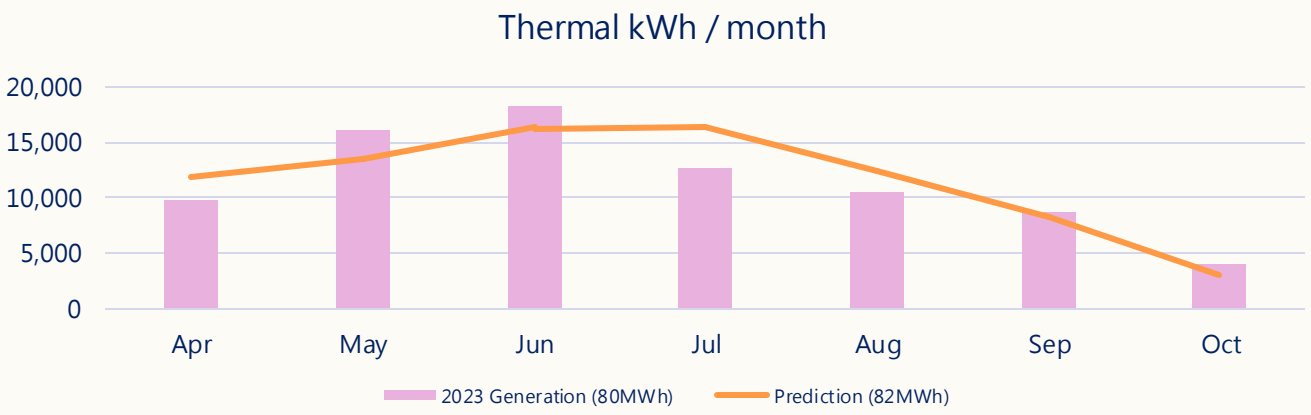
Array size
420 Virtu^{HOT} tubes

Application
Swimming pool heating

Hydraulic setup
Heat delivery via heat exchanger

Mean fluid temperature
45 ºC

Orientation
Flat roof, 45º southwest



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British Library Deep Dive

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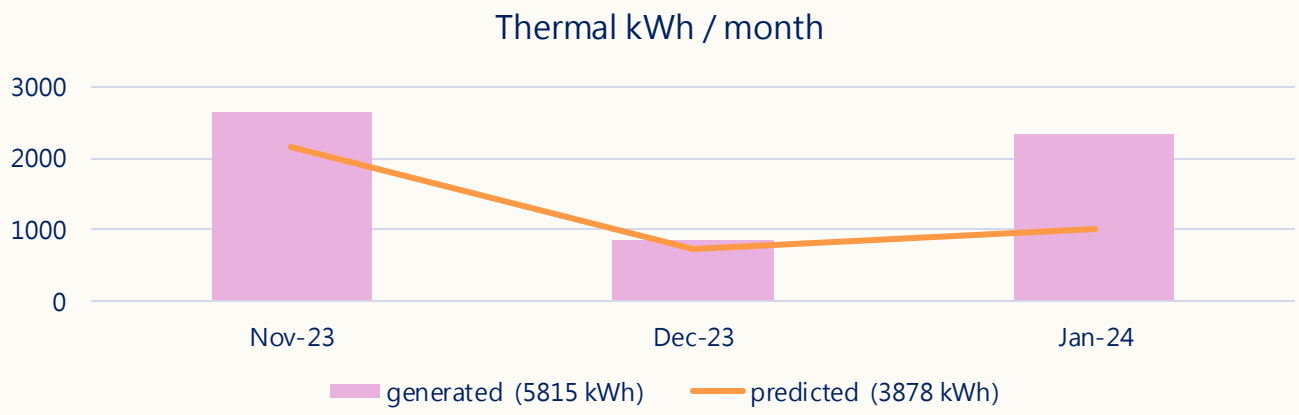
Array size
710 Virtu^{HOT} + 240 Virtu^{PVT} tubes

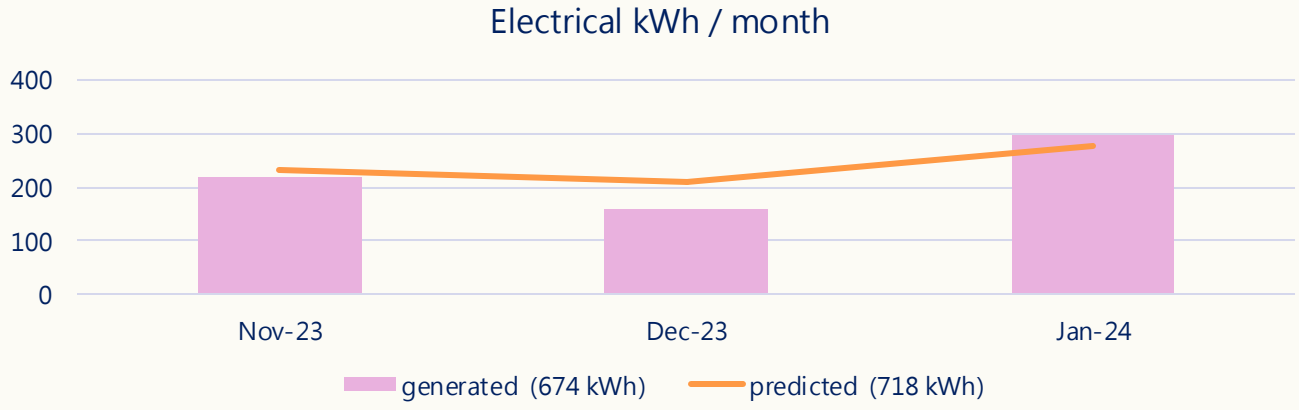
Application
DHW, dehumidification of rare books section

Hydraulic setup
Hot water preheat and direct to LTHW loop

Mean fluid temperature
60 ºC

Orientation
Flat roof



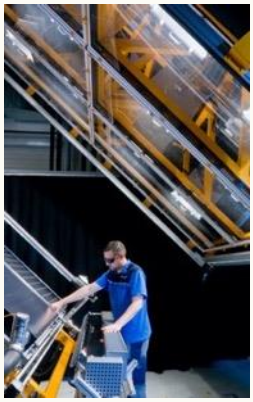
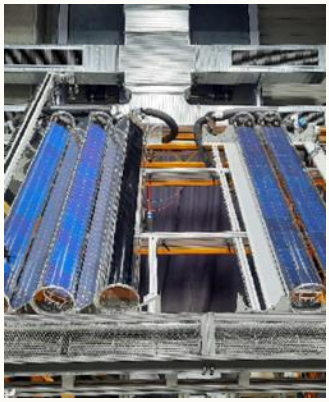


Predictions made using averaged weather data from 2006-2016.
Some discrepancy is expected between generation and prediction due to differences in irradiance each year.

Independently tested and certified by TÜV Rheinland

Naked Energy have undergone 3rd party testing and certification with various international certification bodies, including TÜV Rheinland. It is an independent inspection service that has been a global leader since its foundation 145 years ago.




A TÜV Rheinland certification is globally recognized and ensures the authenticity of a company's safety and performance claims in compliance to international standards.

Testing includes but is not limited to:

- Determination of performance data by means of a unique indoor solar simulator
- Sample picking and production site inspections
- Testing of cyclical mechanical stress
- Hail testing with ice balls of different hail classes
- Testing of ageing by means of climate chambers (humidity/frost, damp/heat, temperature cycles)
- Cyclical outdoor and indoor shock tests on collectors and absorbers
- Rain penetration and frost resistance tests
- Fire tests on collectors

Virtu certification document: http://www.solarkeymark.nl/DBF/PDF_Downloads/DS_3125.pdf

Assured performance

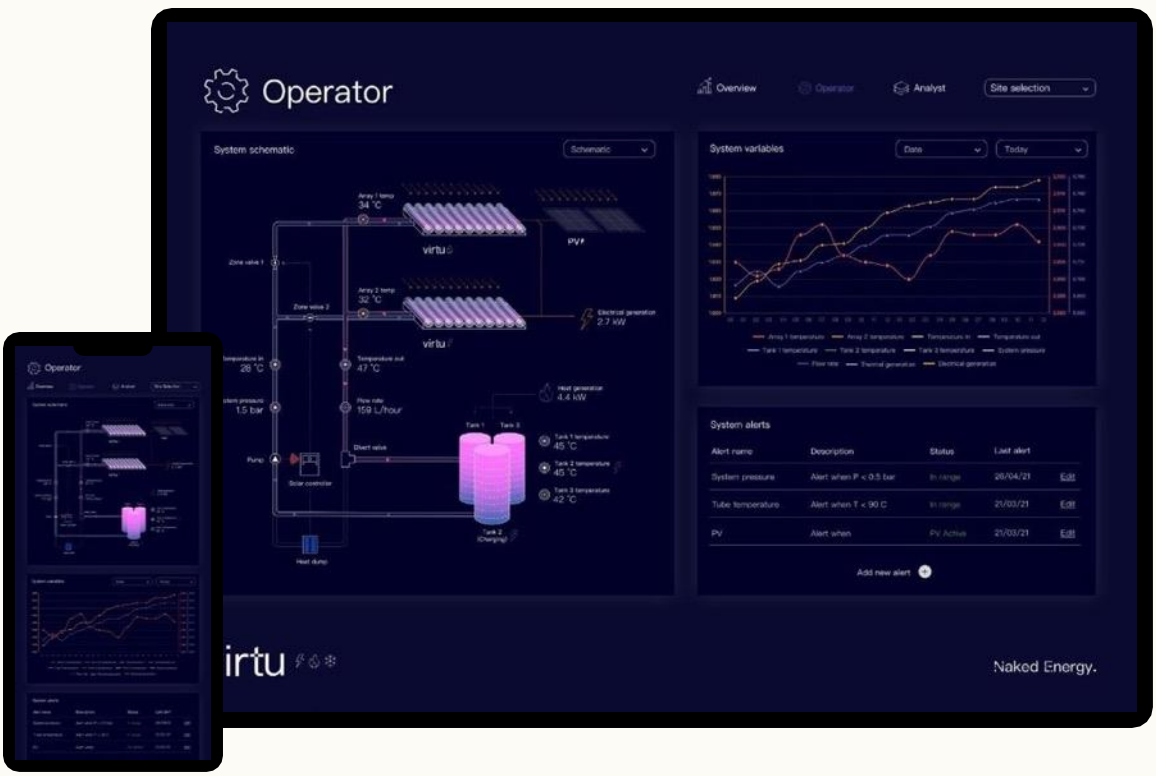
clarity 24–7

Clarity24-7 is Naked Energy proprietary cloud-based remote monitoring platform. It provides users with reliable real-tine data on performance and condition of renewable energy systems.

The remote monitoring platform enables accurate, ongoing measurement of array performance, providing customers with confidence in continued system functionality.

Features include:

- Thermal Output monitoring
- Electrical Output monitoring
- Financial and sustainability reporting
- Carbon reporting
- Automated fault detection
- Performance optimisation
- PV/renewables integration



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