DAIKIN

Daikin, your partner to boost your LEED® project

Team up with us to achieve your LEED® objectives, while staying within budget

Creating a sustainable future together

Air is something that surrounds us 24 hours a day. At Daikin, the future of the world's air is our greatest concern. We use our expertise about air, our feeling for innovation and our mastery of technology to improve the air we breathe. Aiming for sustainable growth, and a sustainable society through technological strength and outstanding human resources, guided by the United Nations Sustainable Development Goals (SDGs).

The Sustainable Development Goals, defined in 2015, are a set of 17 global development goals that aim to contribute to global sustainable development and to tackle broad topics such as poverty, health, education, energy, global warming and gender equality.

The target date set for the SDGs to be achieved is 2030. For more information on the Sustainable Development Goals, please visit: sdgs.un.org/goals

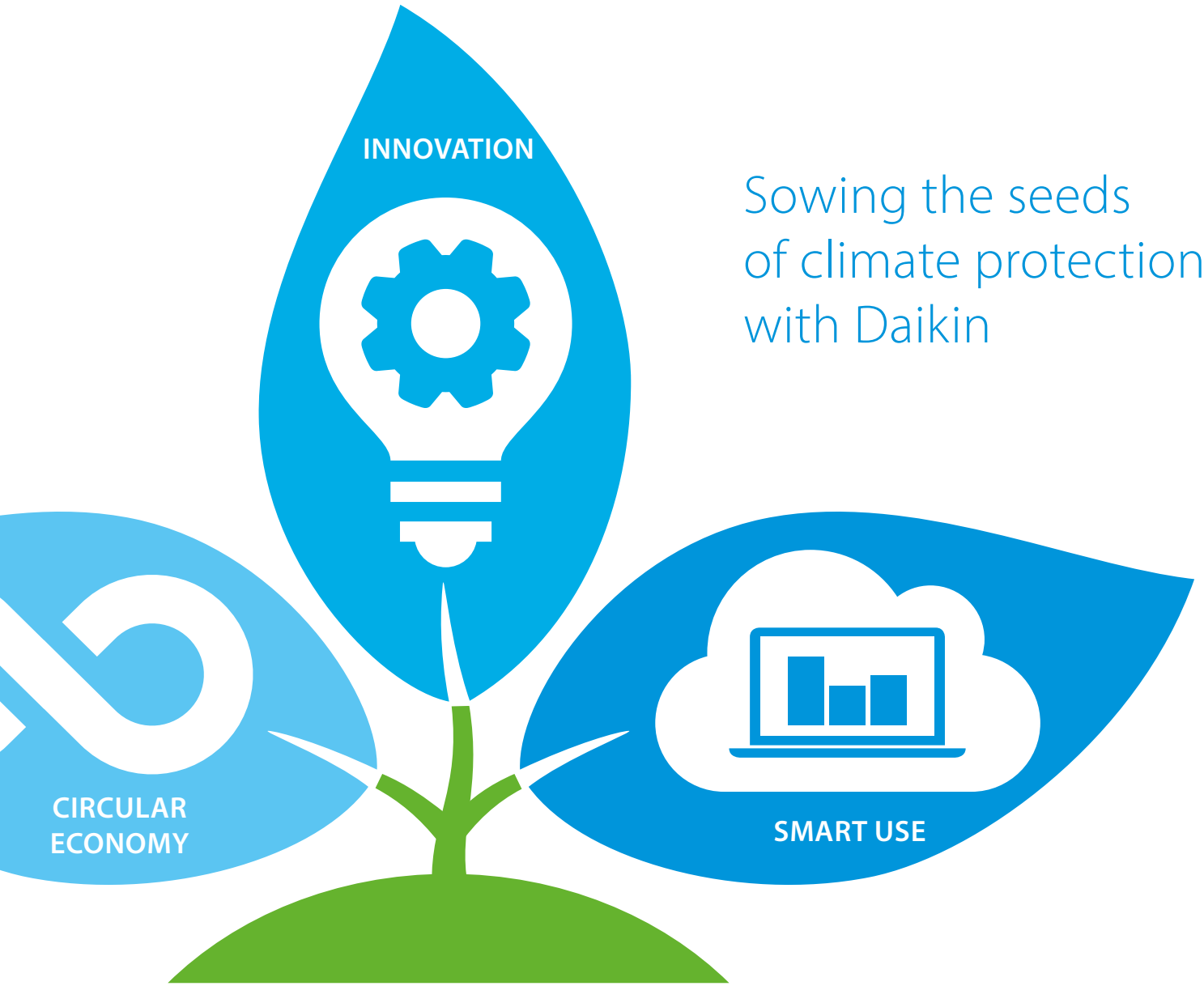
LEED
LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

If you're also commited to explore sustainable solutions that allow you to increase the market value and decrease the running costs of your building, LEED and this brochure is your ideal guidance. As a **LEED expert**, Daikin offers **advice** and the **solutions** to reach the **sustainable performance of your building** you want within the budget you foresee.

LEED® is the preeminent program for the design, construction, maintenance and operations of high-performance green buildings.
LEED® and its related logo, is a trademark owned by the U.S. Green Building Council® and is used with permission.

Determined to reduce our environmental footprint and the one of our customers, we aim to be CO_2-neutral by 2050. A circular economy, innovation and smart use – these are the stepping stones on our path.

For more information visit: daikin.eu/building-a-circular-economy



Sowing the seeds of climate protection with Daikin

Through a circular economy

- Re-use refrigerants through L∞P by Daikin
- Enable customers to create their own circular economy of refrigerants through the recover-reclaim-reuse program

Through innovation

- Introducing the lower GWP refrigerant R-32 and R-1234ze
- Offer high seasonal efficiencies
- Maximise efficiency 24/7 by deploying unique auto cleaning filters
- Adapted systems for well insulated or passive buildings

Through smart use

- Rigorously follow up on energy consumption via the Daikin Cloud Service
- Factor in expert advice to continuously optimise system efficiency
- Enable predictive maintenance to ensure optimum operation and uptime
- Prevent energy waste with smart key cards and sensors

What is LEED?

The **LEED** (Leadership in Energy and Environmental Design) Green Building Rating System is a **voluntary, evolving, consensus-based international standard for developing high-performance, sustainable buildings**, using a comprehensive, point-based system. The LEED certification programme is initiated by USGBC (US Green Building Council) and is internationally recognized. The certification confirms that a building is designed and built to achieve a performance that surpasses national standards for energy savings, water efficiency, CO_2 emissions reduction, indoor environmental quality, stewardship of resources and environmental impacts.

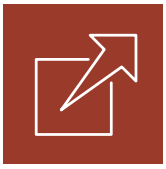
These topics are specified in **9 categories**, on which the building is evaluated. **LEED points are awarded per credit on a 110-point scale, resulting in four levels of performance**: Certified, Silver, Gold and Platinum. The final LEED building performance recognises the effort the investor or building owner have done and results in increased property, leasing or renting value.

Daikin contributes in 4 LEED categories:

Energy & Atmosphere

Indoor Environmental Quality

Materials & Resources



Innovation & Regional Priority

Sustainable Cities

Location & Transportation

Water Efficiency

Integrative Process

Why LEED?

LEED offers many advantages for project developers, building tenants and building owners:

Highly improved quality of life for the building user

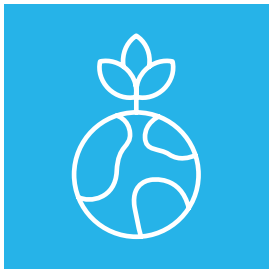
- Improved comfort
- Easier to attract talent
- Higher work efficiency
- Lower sick rates

High building value for the developer and owner

- Higher selling and rental prices (up to 20%!)
- Fast sale or rent out
- Higher project ROI

Lower operational, maintenance and refurbishment costs

- Lower running costs thanks to highly efficient building technologies
- Lower renovation costs thanks to building flexibility and longer compliancy with legislation



Lower environmental impact of the building

- Lower CO2 footprint of the building
- Cleaner technologies for better health and pollution reduction
- Better waste management
- Efficient use of land and resources

Daikin, your partner for your green project

Choosing the sustainable path is no longer a matter of choice, it's an obligation. As every building is unique, it requires a different solution to match its unique properties. It is essential to have an **HVAC-R partner** like Daikin, with knowledge and portfolio **to achieve your LEED objectives while staying within budget**.

Our HVAC-R total solutions increase the environmental value of buildings and enhance the working environment of tenants. Integration of Daikin technologies will therefore contribute to the overall sustainability level of the building and enable you to **to reach a LEED Gold or Platinum score**.

Daikin heat pumps can contribute in

4 out of 8 LEED categories

and can help achieve

18~35 LEED points*

* Feasibility analysis done by Daikin

Scan the code to download

Save time by using our in-depth LEED assessment sheet, created by our team of experts, as base of evidence towards assessors when applying for a LEED certification.

Why Daikin?

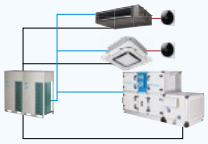
to maximize your LEED rating

1. A global leader with local manufacturing service infrastructure and resources to provide **oustanding aftercare support**, advanced commissioning and hand-over.
2. Daikin remote monitoring services ensure a **pro-active aftercare,** by detecting excessive energy use or potential issues before they occur to maximise system lifetime and minimize operational costs.
3. **First class Indoor Air Quality** thanks to low VOC emission, optimal thermal zoning fresh air supply, monitoring and a low acoustic performance.
4. **Responsible sourcing and waste reduction**: BES6001 and ISO14001 certification delivers extra credits for the project.
5. Low carbon heating, cooling, ventilation and refrigeration thanks to **market-leading seasonal efficiency**.
6. Reduced environmental impact thanks to **refrigerant leak detection** systems and reuse of existing refrigerant through the **L∞P by Daikin** program.
7. High quality and performant products result in a **positive life cycle analysis**.
8. Our system are designed to be **easily adaptable** and upgradable to meet future building demands

Find out in which categories Daikin gains points in the LEED v4.1/v4.0 for New Construction and Major Renovations on the next pages.

VRV

Credits related to
VRV solutions

Category	Page	Section	Objective	Maximum points that can be obtained	
				VRV	
Energy & Atmosphere (EA)	page 10	EA Prerequisite: Fundamental commissioning and verification	To support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.	✓	
		EA Credit: Enhanced commisioning	To further support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.	4	
		EA Prerequisite: Minimum energy performance	To reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.	✓	
		EA Credit: Optimize energy performance	To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use.	1 up to 18	
		EA Prerequisite: Building-level energy metering	To support energy management and identify opportunities for additional energy savings by tracking building-level energy use.	✓	
		EA Credit: Advanced energy metering	To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.	1	
		EA Prerequisite: Fundamental refrigerant management	To reduce stratospheric ozone depletion.	✓	
		EA Credit: Enhanced refrigerant management	To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.	1	
Indoor Environmental Quality (EQ)	page 16	EQ Prerequisite: Minimum indoor air quality performance	To contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ).	✓	
		EQ Credit: Enhanced indoor air quality strategies	To promote occupants' comfort, well-being, and productivity by improving indoor air quality.	2	
		EQ Credit: Construction indoor air quality management plan	To promote the well-being of construction workers and building occupants by minimizing indoor air quality problems associated with construction and renovation.	1	
		EQ Credit: Indoor air quality assessment	To establish better quality indoor air in the building after construction and during occupancy.	1	
		EQ Credit: Thermal comfort	To promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.	1	
		EQ Credit: Acoustic performance	To provide workspaces and classrooms that promote occupants' well-being, productivity, and communications through effective acoustic design.	1	
Materials & Resources	page 20	MR Credit: Environmental Product Declarations	To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.	1	
Innovation & Regional Priority (RP)	page 21	RP Credit: Regional Priority	To provide an incentive for the achievement of credits that address geographically specific environmental, social equity, and public health priorities.	1 up to 4	
				Up to 35 points	

Credits related to: Applied systems
(Chillers, Air handling units, Fan coil units) ..... page 26

Detailed points information

Energy & Atmosphere (EA)

EA Prerequisite: Fundamental Commissioning and Verification

AIM

Provide specific information for achieving the Owner's Project Requirements (OPR) related to heating, air conditioning, ventilation and refrigerating systems in buildings, in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1–2007 for HVAC&R Systems.

For HVAC-R systems the emphasis is on:

› HVAC-R systems to fully support The Commissioning Process activities of Guideline 0-2005
› Verification during each phase of The Commissioning Process
› Acceptance during each phase
› Documentation during each phase
› Systems Manual specific requirements
› Training for operations and maintenance personnel and occupants

PREREQUISITE

We comply to this request by providing installation manuals and a schedule of commissioning for the HVAC-R work, including an overview for commissioning and recommissioning.

EA Credit: Enhanced Commissioning

6 points can be scored

AIM

To further support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.

1 Option 1: Enhanced systems commissioning (4 points)

Path 1 (3 points): Complete the enhanced commissioning process according to ASHRAE Guideline 0–2005 and ASHRAE Guideline 1.1–2007

Path 2 (1 point): Develop monitoring-based procedures and identify points to be measured and evaluated to assess performance of energy-consuming systems

2 Option 2: Envelope commissioning (2 points)

VRV IV / VRV 5 heat pumps:

+4 POINTS

We comply with Path 1 & 2 via our local service support teams that can assist in advanced commissioning and hand-over and who can provide an extensive set of documentation to make a user guide and training schedule for HVAC-R.

We provide seasonal testing of the building by testing the system in full load conditions (heating in mid-winter or cooling in summer and part-load conditions (spring and autumn).

We facilitate the building operations review, by continuous monitoring of the system and providing automatic evaluation of the energy use via our intelligent Touch Manager or VRV Cloud Service.

EA Prerequisite Minimum Energy Performance

AIM

To establish the minimum level of energy efficiency for the proposed building and systems (5% > baseline) and to reduce environmental & economic impacts associated with excessive energy use.

PREREQUISITE

We comply by offering data to perform Dynamic Simulation Modelling to define the energy performance of our systems. At least 5% of improved energy possible with heat pump systems.

EA Credit Optimize Energy Performance

18 points can be scored

AIM

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

1 **Option 1: Energy Performance Compliance (1-18 points)**
Follow the ASHRAE Standard 90.1-2016 to estimate energy performance and share of renewables.

VRV IV / VRV 5 heat pumps:
+1~18
POINTS

Daikin VRV heat pumps highly contribute to gain up to 18 points for this credit.
Using our heat pumps in combination with other energy performant building materials they enable you to reach a LEED Gold or Platinum score.
Daikin products are eligible for simulation with European efficiencies.

Smart use reduces energy consumption

Continuous optimisation of system efficiency through our cloud solutions ensures our systems run at best efficiency.

Integration of presence sensors and window or key card contacts ensure the system only operates when needed, preventing energy waste while keeping maximum comfort.

EA Prerequisite Building-Level Energy Metering

AIM

To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.

PREREQUISITE

Via our intelligent Touch Manager or VRV Cloud Service we comply by offering the possibility for detailed energy follow-up on system and building level.

EA Credit: Advanced Energy Metering

1 point can be scored

AIM

To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.

1 **By installing advanced energy metering for (1 point):**

- All whole-building energy sources used by the building
- Any individual energy end uses that represent 10% or more of the total annual consumption of the building

VRV IV / VRV 5 heat pumps:

+1 POINT

Through our optional intelligent Touch Manager or Daikin Cloud Service advanced energy metering is possible.

The iTM coordinates easily with other Building Management Systems implemented on site or can be implemented as a BMS on it's own. This thanks to the permanent data collection and measurements of the energy usage of all energy consumers in the building. Additionally submetering is possible per floor through our PPD function.

EA Prerequisite: Fundamental Refrigerant Management

AIM

To reduce stratospheric ozone depletion.

PREREQUISITE

All Daikin HVAC-R systems use refrigerants with an ODP of 0.

In case of existing systems with CFC's Daikin has developed a range of VRV systems that can easily replace VRF systems with CFC's (R-22), keeping the refrigerant piping.

Scan this code for more info

EA Credit: Enhanced Refrigerant Management

2 points can be scored

AIM

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimising direct contributions to climate change.

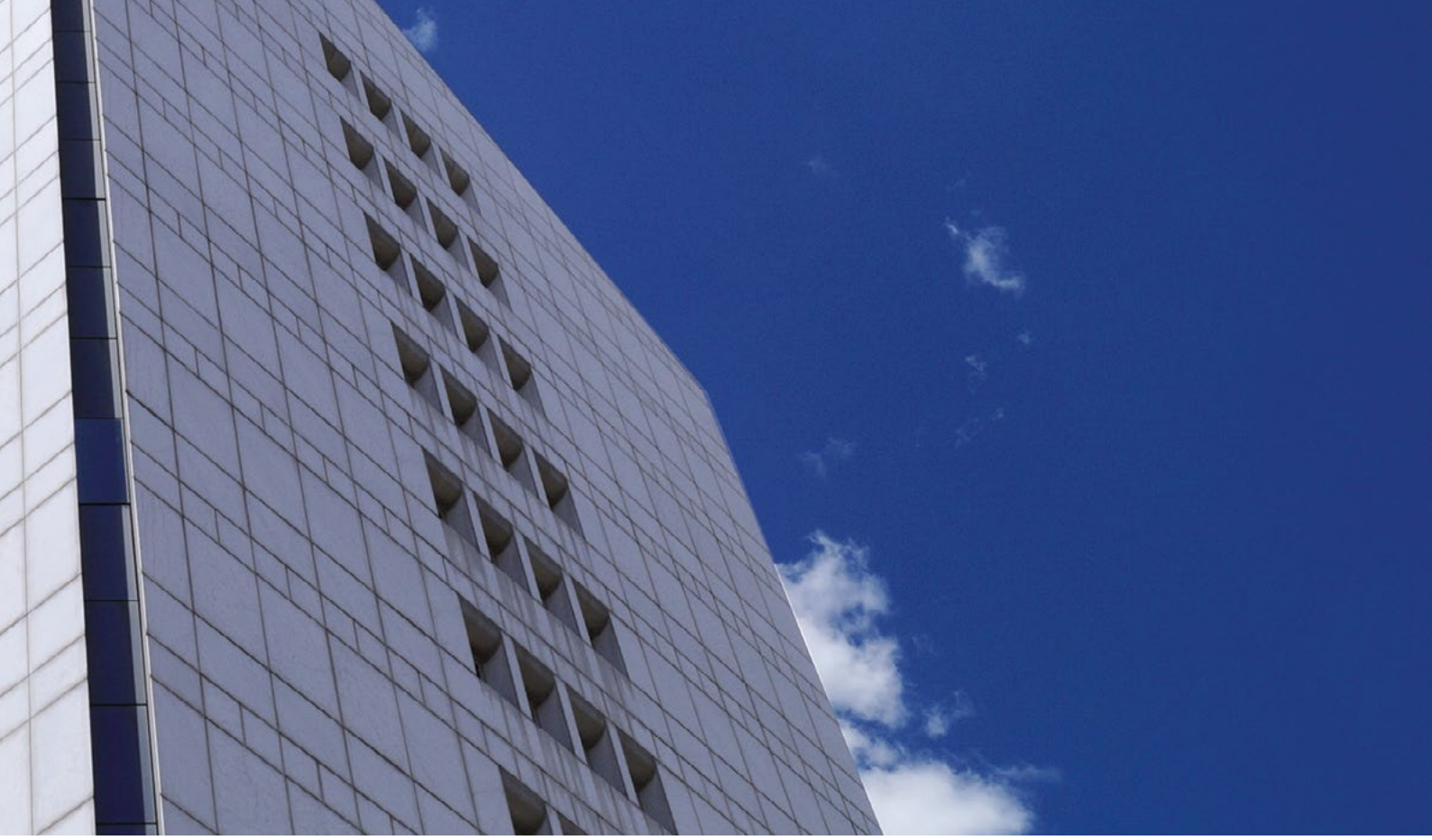
1. Option 1: No Refrigerants or low impact (1 point)

2. **Option 2: Calculation of refrigerants (1 point)**

VRV 5 heat pumps: +1 POINT

We can provide all the needed information to calculate the impact of the refrigerant.

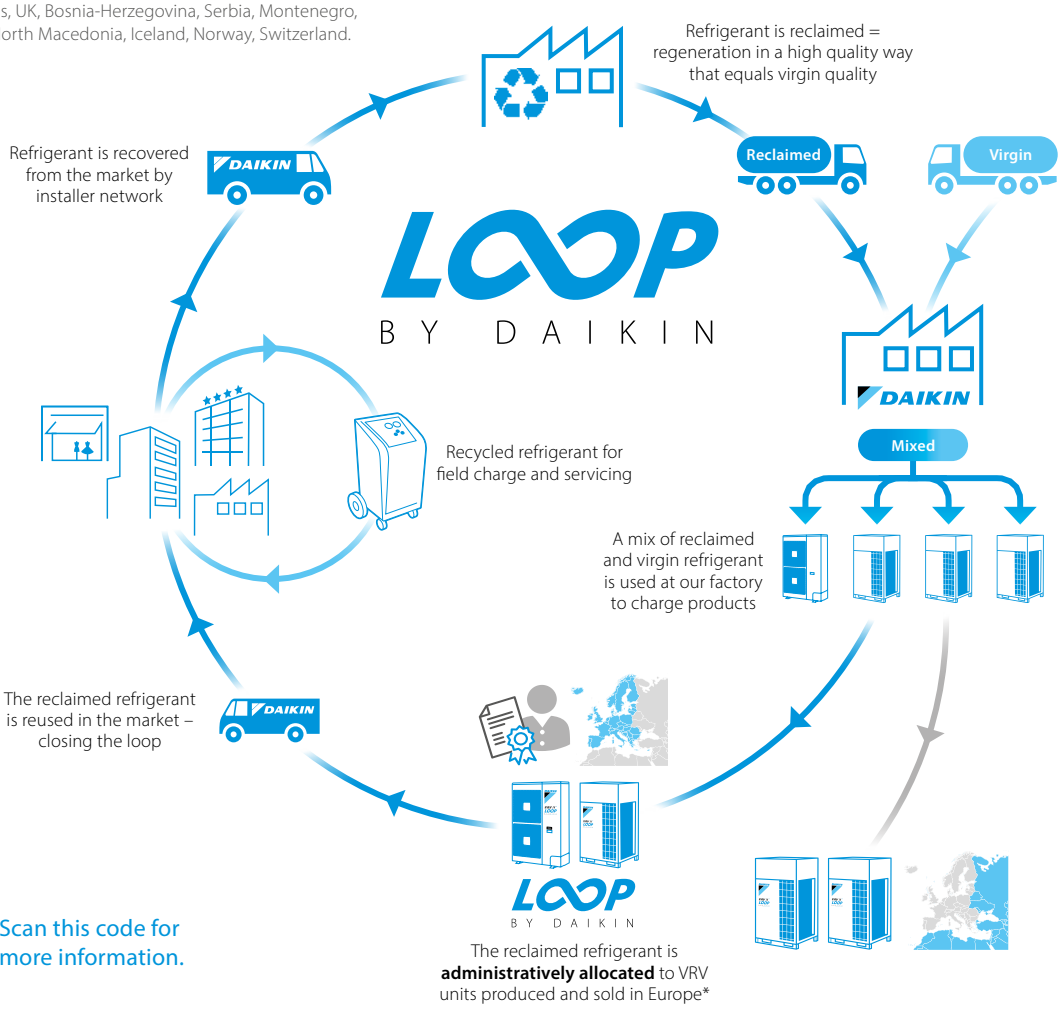
Our VRV 5 heat pumps on R-32 refrigerant have a standard leak detection system integrated and meet the refrigerant atmospheric impact <= 13.



Beyond certification – the circular economy of refrigerants

Daikin goes beyond the current LEED assessement, offering all of it's VRV heat pumps produced and sold in Europe* with reclaimed refrigerant. This means that new VRV systems reuse refrigerant and avoid more than 250,000 kg of virgin gas being produced each year.

*EU member states, UK, Bosnia-Herzegovina, Serbia, Montenegro, Kosovo, Albania, North Macedonia, Iceland, Norway, Switzerland.



Scan this code for more information.

Detailed points information

Indoor Environmental Quality (EQ)

EQ Prerequisite: Minimum Indoor Air Quality Performance

AIM

To contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ).

For ventilation (Mechanically Ventilated Spaces) must be compliant with either:
› Option 1: ASHRAE Standard 62.1-2010 or a local equivalent
› Option 2: CEN Standards EN 15251-2007 and EN 13779-2007 (for projects outside the U.S.)

PREREQUISITE

Daikin ventilation equipment (Modular L, VAM and VKM) are compliant with the local legislation in matter of ventilation comfort in buildings.

EQ Credit: Enhanced Indoor Air Quality Strategies

2 points can be scored

AIM

To promote occupants' comfort, well-being, and productivity by improving indoor air quality.

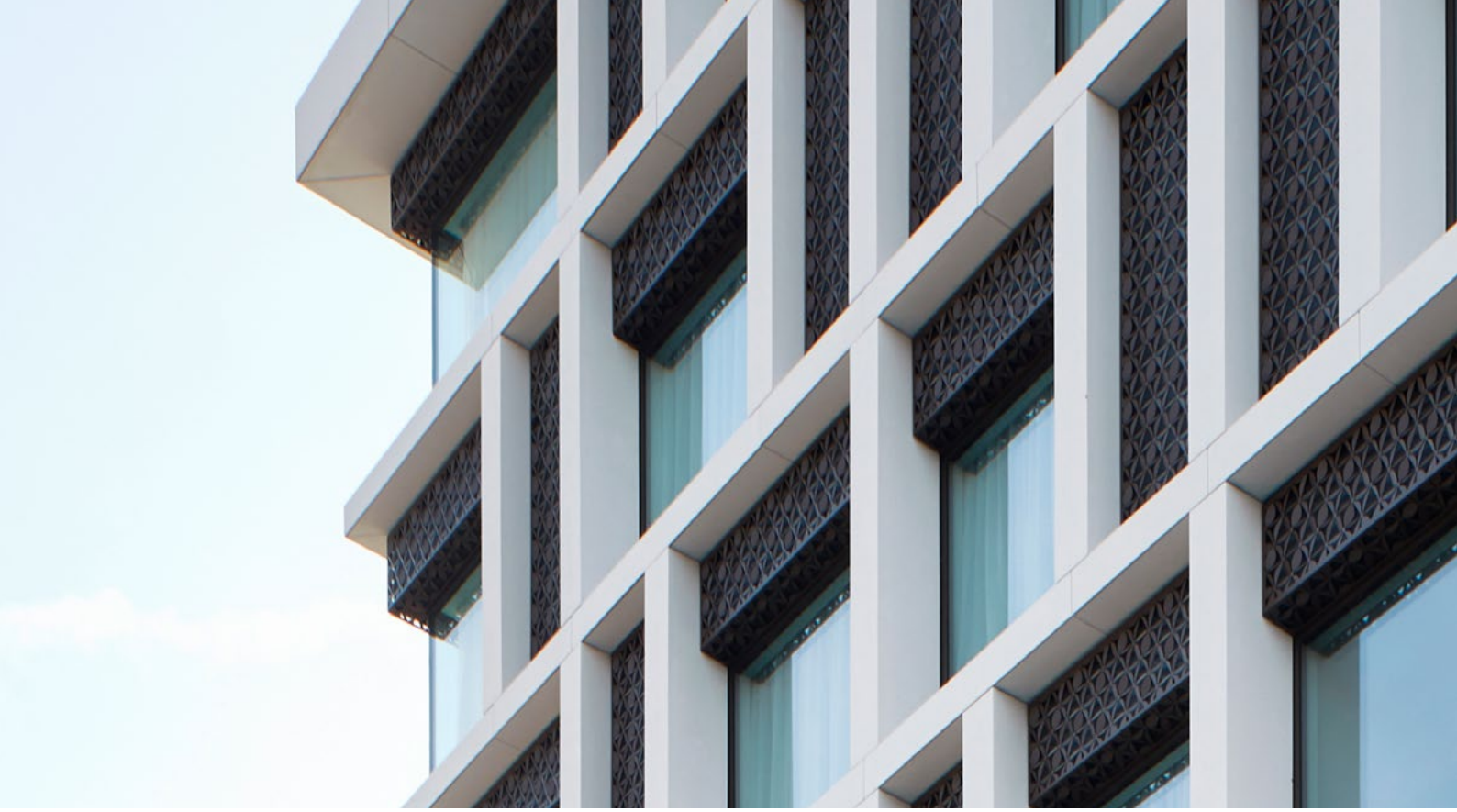
Comply with 3 strategies for 1 point or 6 strategies for 2 points:

- Filtration of Outdoor Air
- Filtration of Recirculated Air
- Increased Ventilation 15%
- Increased Ventilation 30%
- Carbon Dioxide Monitoring
- Additional Source Control and Monitoring

VRV IV / VRV 5 heat pumps:

+2 POINTS

Heat pump systems are fully compatible with Daikin Ventilation, and have no interference with strategy of providing fresh air. The fresh Air supply can be provided via Daikin Ventilation units with full carbon dioxide sensors and modular ventilation strategy complying with minimum of MERV 13 (ePM1 50%) filtration class.



EQ Credit: Construction Indoor Air Quality Management Plan

1 point can be scored

AIM

To promote the well-being of construction workers and building occupants by minimising indoor air quality problems associated with construction and renovation.

1 By developing and implementing an IAQ management plan (1 point)

VRV IV / VRV 5 heat pumps:

+1 POINT

The system is part of the indoor air quality plan (description of the systems in the building + which influence they have on the indoor air quality).
There is no issue in establishing the equipment to work according to LEED demands under this section.

EQ Credit: Indoor Air Quality Assessment

2 points can be scored

AIM

To establish better quality indoor air in the building after construction and during occupancy.

1. Option 1: Flush-out (1 point)
   - › Path 1: Before Occupancy
   - › Path 2: During Occupancy

2 Option 2: Air testing - VOC (1 point)

VRV IV / VRV 5 heat pumps:

+1 POINT

Daikin VRV systems have no negative reaction on the VOC and formaldehyde emission on the building. Our FQS team can support in Air testing.

Advantages of direct expansion

VRV systems

The use of refrigerant as heat transfer medium makes our VRV systems highly efficient and allows very precise zone and climate control with a fast response to changing temperatures.

EQ Credit: Thermal Comfort

1 point can be scored

AIM

To promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.

1 Thermal comfort design and thermal comfort control (1 point)

VRV IV / VRV 5 heat pumps:

+1 POINT

The set-point of our equipment during winter and summer corresponds to thermal comfort standards set forward in ASHRAE, ISO and CEN regulation. Our units can operate between 21~32°C DB (14~25°C WB) for summer and 15~27°C DB for winter.

Apart from Madoka controller, the DAIKIN IAQ sensor can be installed on site to further monitor thermal comfort in terms of humidity and air speed.

EQ Credit: Acoustic Performance

1 point can be scored

AIM

To provide (work)spaces that promote occupants wellbeing, productivity, and communications through effective acoustic design.

1 Maximum background levels from HVAC systems (1 point)

VRV IV / VRV 5 heat pumps:

+1 POINT

We publish all relevant noise performance of our systems in line with EU regulations. Both our indoor and outdoor units have a good acoustic performance and have a wide range of solutions for acoustic attenuation in case of tight noise regulations.

Detailed points information

Materials & Resources

MR Credit: Environmental Product Declarations

2 points can be scored

AIM

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts.

1. **Option 1: Environmental Product Declaration (EPD) (1 point)**
2. Option 2: Embodied Carbon/LCA Optimization (1 point)

VRV IV / VRV 5 heat pumps:

+1 POINT

Daikin can contribute to gain 1 point (Option 1) providing Environmental Product Declaration (EPD) of its products

Detailed points information

Innovation & Regional Priority

RP Credit: Regional Priority

4 points can be scored

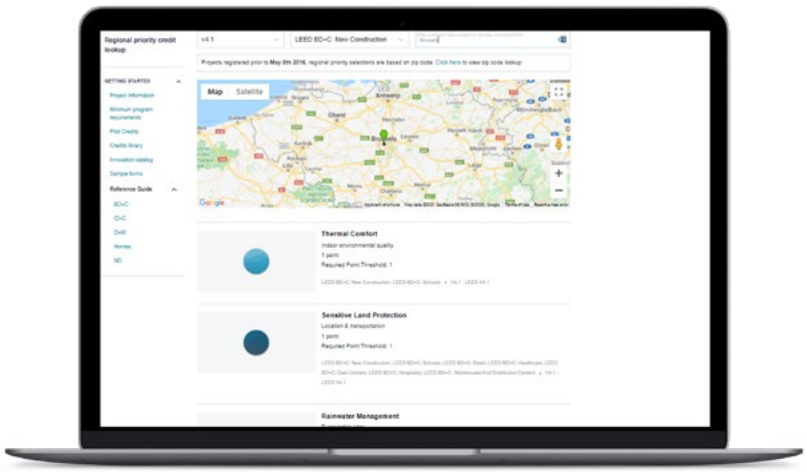
AIM

To provide an incentive for the achievement of credits that address geographically specific environmental, social equity, and public health priorities.

1 **Depeding on the region where the building is constructed the eligible credits might differ. At www.usgbc.org/regional-priority-credits you can find the list with applicable credits for which additional points can be scored.**

VRV IV / VRV 5 heat pumps:
+1~4
POINTS

For the Brussels area there are 6 credits eligible of which 2 are directly linked to our systems: Thermal comfort and Optimize energy performance



VRV total solution at a glance

Typically, many buildings today rely on several separate systems for heating, cooling, air curtain heating and hot water. As a result energy is wasted. To provide a much more efficient alternative, VRV technology has been developed into ...

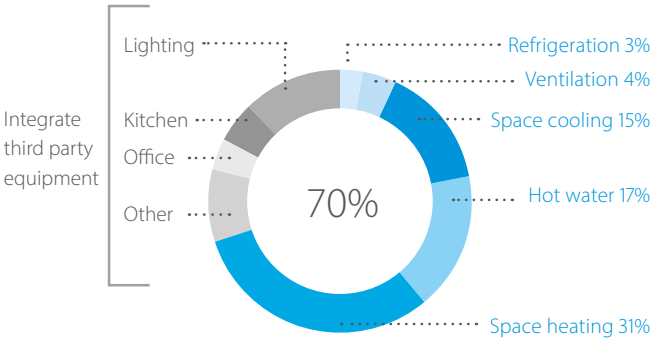
a total solution managing up to

70%

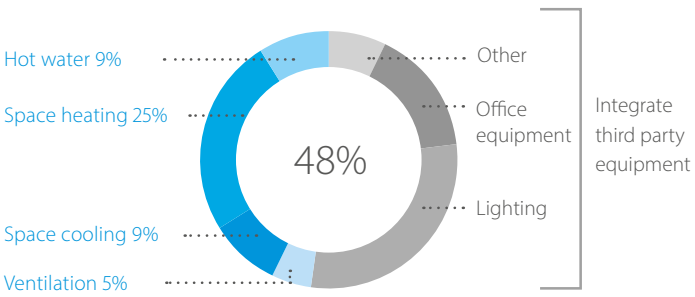
of a buildings energy consumption giving large potential to cost saving

- **Heating and cooling** for year round comfort
- **Hot water** for efficient production of hot water
- **Underfloor heating /cooling** for efficient space heating/cooling
- **Fresh air ventilation** for high quality environments
- **Air curtains** for optimum air separation
- **Controls** for maximum operating efficiency

Average hotel energy consumption



Average office energy consumption



Office total solution application

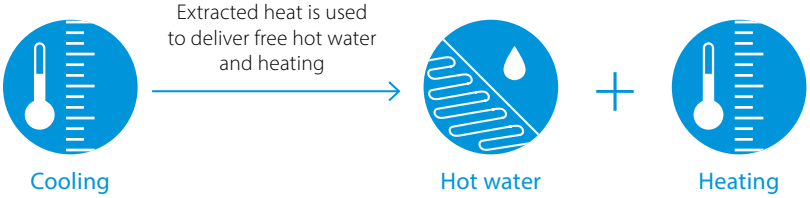
FRESH AIR VENTILATION
› Minimising energy waste by recovering exhaust heat
› Centralised control with the cooling & heating system
› A range of air filtration filters ensures supply of clear air

HEATING AND COOLING
› Wide range of indoor units models to suit the application
› With optional presence sensors
› Individually controlled per zone

CENTRALISED CONTROL
› Complete Daikin Building Management System
› Plug & play connectable
› Smart energy management
› Predictive maintenance

HOT WATER
› Cutting the cost of hot water by use of heat pump technology
› 'Free' hot water production by transferring heat from areas requiring cooling
› Possibility to connect solar panels

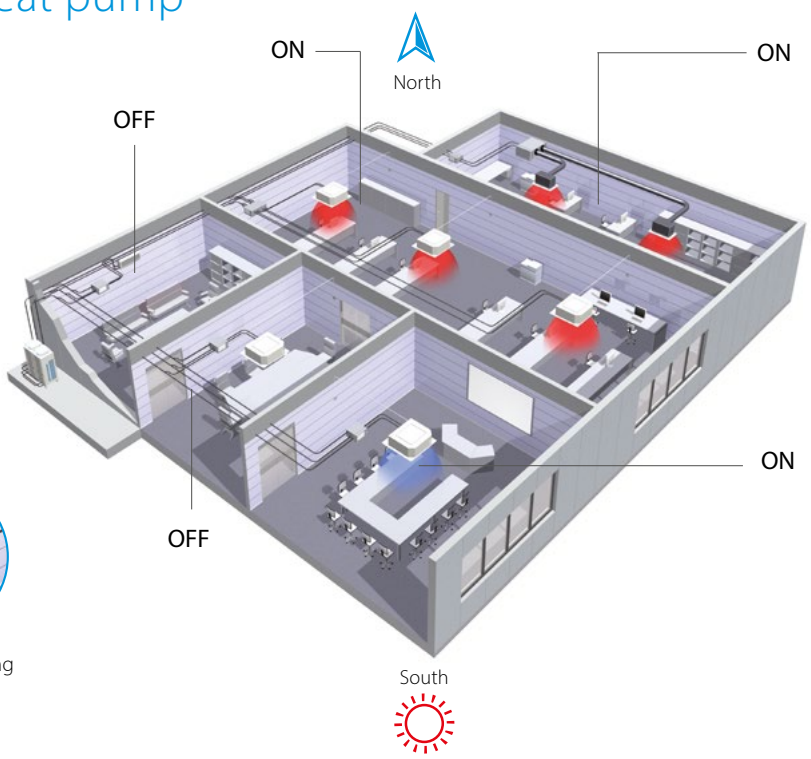
"Free" heat and hot water production
A VRV total solution heat recovery system reuses heat, from for example offices and server rooms, to warm other areas or produce hot water.



VRV system advantages

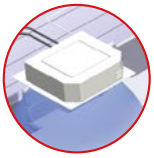
Air cooled (heat recovery) heat pump

- Fast and easy to install: no need for additional components
- Simultaneous heating AND cooling with individual temperature control*
- "Free" heating and hot water production by transferring heat from areas requiring cooling*
- In rooms where there is no occupation the system can be switched off
- Running costs can be 30 to 40% lower when compared to water fan coil systems
- Operation range from - 25°C ~ 52°C

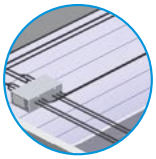


Components:

Outdoor unit



Indoor unit



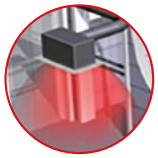
Refrigerant piping (and BS box*)

Water cooled (heat recovery) heat pump

- Suitable for high rise and large buildings because of the nearly unlimited possibilities of water piping
- Not affected by outdoor temperature/climate conditions
- Reduce CO_2 emmisions thanks to the use of geothermal energy as a renewable energy source
- Allows heat recovery in the entire building thanks to the storage of energy in the water circuit
- Lower refrigerant levels thanks to the limited distance between outdoor and indoor units
- Very compact & stackable units reduce plant room space

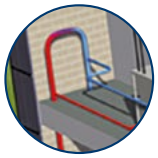
Components:

Outdoor unit

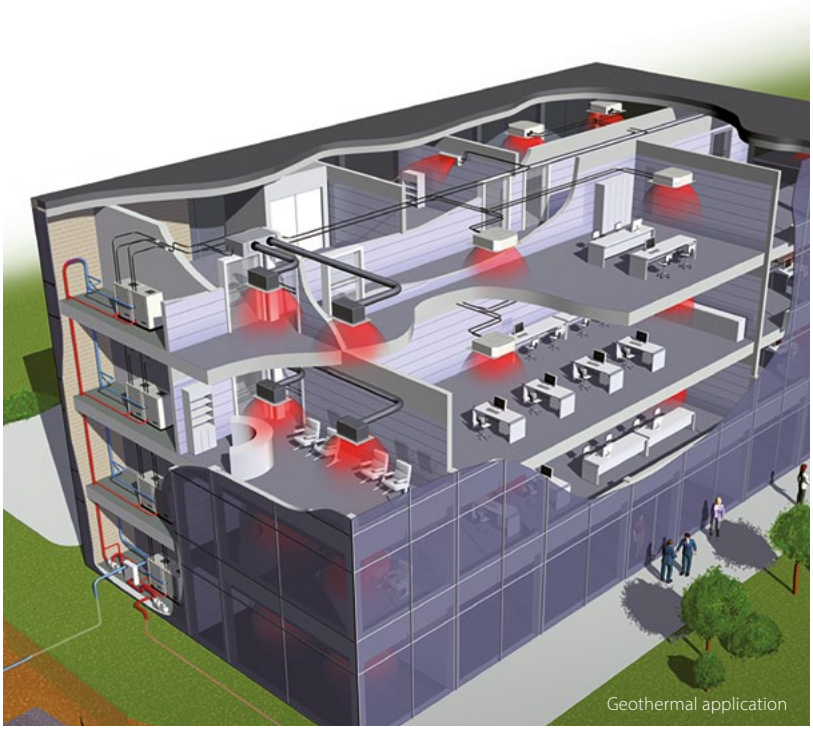


Indoor unit

Refrigerant piping (and BS box*)



(Geothermal) water loop



Geothermal application

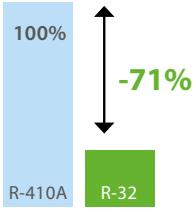
* VRV heat recovery only

Designed for the future

Definitely the best air cooled heat pump we ever made!

VRV 5 S-series

R-32 BLUEVOLUTION



Lower CO_2 equivalents thanks to R-32 refrigerant

› R-32 Global Warming Potential (GWP) is 68% lower than R-410A
› 15% less refrigerant charge
› Leading to a **GWP reduction of 71%** on system level!

-71%
potential global warming impact

ErP 2021 COMPLIANT

Industry-leading real life efficiencies

› Exceeding the ErP 2021 ecodesign legislation
› Tested with our most sold indoor units

Unique Variable Refrigerant Temperature

Variable Refrigerant Temperature

› The biggest leap in efficiency since the inverter compressor
› Continuous adjustment of both the inverter compressor speed and the refrigerant temperature, ensuring the necessary capacity to meet the building load with the highest efficiency at all times!

Applied Systems

Credits related to Chillers, Air Handling Units and Fan Coil Units

Category	Page	Section	Objective	Chillers and heat pumps	Air Handling Unit	Fan Coil Units	Maximum points that can be obtained	
Energy & Atmosphere (EA)	page 28	EA Prerequisite: Fundamental commissioning and verification	To support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.	✓	✓	✓	N/A	
		EA Credit: Enhanced commisioning	To further support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.	✓	✓	✓	4	
		EA Prerequisite: Minimum energy performance	To reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.	✓	✓		N/A	
		EA Credit: Optimize energy performance	To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic harms associated with excessive energy use.	✓	✓		1 up to 18	
		EA Prerequisite: Building-level energy metering	To support energy management and identify opportunities for additional energy savings by tracking building-level energy use.	✓	✓	✓	N/A	
		EA Credit: Advanced energy metering	To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.	✓	✓	✓	1	
		EA Prerequisite: Fundamental refrigerant management	To reduce stratospheric ozone depletion.	✓			N/A	
		EA Credit: Enhanced refrigerant management	To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.	✓			1	
Indoor Environmental Quality (EQ)	page 34	EQ Prerequisite: Minimum indoor air quality performance	To contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ).		✓	✓	N/A	
		EQ Credit: Enhanced indoor air quality strategies	To promote occupants' comfort, well-being, and productivity by improving indoor air quality.		✓	✓	2	
		EQ Credit: Construction indoor air quality management plan	To promote the well-being of construction workers and building occupants by minimizing indoor air quality problems associated with construction and renovation.		✓	✓	1	
		EQ Credit: Indoor air quality assessment	To establish better quality indoor air in the building after construction and during occupancy.		✓	✓	1	
		EQ Credit: Thermal comfort	To promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.		✓	✓	1	
		EQ Credit: Acoustic performance	To provide workspaces and classrooms that promote occupants' well-being, productivity, and communications through effective acoustic design.	✓	✓	✓	1	
Materials & Resources	page 38	MR Credit: Environmental Product Declarations	To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.	✓	✓		1	
Innovation & Regional Priority (RP)	page 39	RP Credit: Regional Priority	To provide an incentive for the achievement of credits that address geographically specific environmental, social equity, and public health priorities.	✓	✓	✓	1 up to 4	
							Up to 35 points	

Credits related to:
VRV ..... page 9

Detailed points information

Energy & Atmosphere (EA)

EA Prerequisite: Fundamental Commissioning and Verification

AIM

Provide specific information for achieving the Owner's Project Requirements (OPR) related to heating, air conditioning, ventilation and refrigerating systems in buildings, in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1–2007 for HVAC&R Systems.

For HVAC-R systems the emphasis is on:

› HVAC-R systems to fully support The Commissioning Process activities of Guideline 0-2005
› Verification during each phase of The Commissioning Process
› Acceptance during each phase
› Documentation during each phase
› Systems Manual specific requirements
› Training for operations and maintenance personnel and occupants

PREREQUISITE

Daikin complies to this request by providing IOM (Installation, Operation and Maintenance) manuals, as well as documentation for commissioning process.

EA Credit: Enhanced Commissioning

6 points can be scored

AIM

To further support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.

1 Option 1: Enhanced systems commissioning (4 points)

Path 1 (3 points): Complete the enhanced commissioning process according to ASHRAE Guideline 0–2005 and ASHRAE Guideline 1.1–2007

Path 2 (1 point): Develop monitoring-based procedures and identify points to be measured and evaluated to assess performance of energy-consuming systems

2 Option 2: Envelope commissioning (2 points)

+4 POINTS

Daikin easily complies with Option 1 having a wide-spread technical assistance network that can support during each phase of commissioning process, providing detailed documentation and user guide including the procedures and measurement points to assess performance of energy-consuming systems as well as instructions for maintenance and repairs. Moreover, Daikin can provide training schedule for HVAC-R systems to prevent errors and maintain performance.

EA Prerequisite Minimum Energy Performance

AIM

To establish the minimum level of energy efficiency for the proposed building and systems (5% > baseline) and to reduce environmental & economic impacts associated with excessive energy use.

PREREQUISITE

Daikin complies by proving all technical data needed to perform whole building energy simulations as well as BIM files that can be easily implemented in the global system simulation model.

EA Credit Optimize Energy Performance

18 points can be scored

AIM

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

1 Option 1: Energy Performance Compliance (1-18 points)

Follow the ASHRAE Standard 90.1-2016 to estimate energy performance and share of renewables.

+1~18
POINTS

Daikin chillers and heat pumps highly contribute to gain up to 18 points for this credit. Using our units in combination with other energy performant building materials they enable you to reach a LEED Gold or Platinum score. Daikin products are eligible for simulation with European and American efficiencies.
Daikin can provide cutting edge technologies in terms of energy efficiency, as inverter driven compressors and free cooling.
Daikin FCUs, with their high efficient components (such as BLDC fan-motor) and advanced control strategies, highly contribute to gain up to 18 points reducing energy consumption while keeping the Owner's Project Requirements (OPR) for indoor environmental quality.
Daikin AHUs, with their high efficient components and advanced control strategies, highly contribute to gain up to 18 points reducing energy consumption while keeping the Owner's Project Requirements (OPR) for indoor environmental quality.

EA Prerequisite Building-Level Energy Metering

AIM

To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.

PREREQUISITE

Daikin complies to this requirement by providing detailed energy consumption through the connection of a third party energy meter sensor to Daikin iTM (intelligent Touch Manager) and DoS (Daikin on Site).

EA Credit: Advanced Energy Metering

1 point can be scored

AIM

To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.

1 **By installing advanced energy metering for (1 point):**

- All whole-building energy sources used by the building
- Any individual energy end uses that represent 10% or more of the total annual consumption of the building

+1 POINT

Through the Daikin iTM (intelligent Touch Manager) and DoS (Daikin on Site) platform, advanced energy metering is possible.
The iTM can act as a mini BMS directly or can be integrated to another BMS available on site.
Moreover, Daikin AHUs can be equipped with Modbus and/or Bacnet communication modules for the integration to third party BMS.

EA Prerequisite: Fundamental Refrigerant Management

AIM

To reduce stratospheric ozone depletion.

PREREQUISITE

All Daikin HVAC-R systems easily fulfill this prerequisite using refrigerants with an ODP of 0.

EA Credit: Enhanced Refrigerant Management

2 points can be scored

AIM

To reduce ozone depletion and support early compliance with the Montreal Protocol while minimising direct contributions to climate change.

1. **Option 1: No Refrigerants or low impact (1 point)**
2. **Option 2: Calculation of refrigerants (1 point)**

+1 POINT

Depending on what chiller or heat pump is selected, Daikin can contribute via option 1 (Low impact refrigerants) thanks to an extensive product range with R-1234ze refrigerant, or via option 2 after calculation of refrigerant impact in case other solutions are preferred (R-134a, R-32, R-513A)
Daikin AHUs are compliant with Option 1 in case no Direct Expansion coil is present.
Otherwise they are compliant with Option 2 and Daikin provides all needed information about the refrigerant used in the Direct Expansion coils in order to evaluate the whole HVAC-R system refrigerant impact.

Detailed points information

Indoor Environmental Quality (EQ)

EQ Prerequisite: Minimum Indoor Air Quality Performance

AIM

To contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ).

For ventilation (Mechanically Ventilated Spaces) must be compliant with either:
› Option 1: ASHRAE Standard 62.1-2010 or a local equivalent
› Option 2: CEN Standards EN 15251-2007 and EN 13779-2007 (for projects outside the U.S.)

PREREQUISITE

Daikin AHUs are compliant with the local legislation in matter of ventilation comfort in buildings and can guarantee the minimum, or even higher, outdoor air intake flow to cope with the legislation and the Owner's Project Requirements.
Moreover, Daikin focuses the attention on the quality of construction and material used in the AHUs, to make the units easily cleanable and choosing materials that avoid the growth of mold and other harmful microorganism.
Even precise pressure sensors are used to determine the airflow and be sure the desired and needed air is supplied in the occupied spaces.

EQ Credit: Enhanced Indoor Air Quality Strategies

2 points can be scored

AIM

To promote occupants' comfort, well-being, and productivity by improving indoor air quality.

Comply with 3 strategies for 1 point or 6 strategies for 2 points:

- Filtration of Outdoor Air
- Filtration of Recirculated Air
- Increased Ventilation 15%
- Increased Ventilation 30%
- Carbon Dioxide Monitoring
- Additional Source Control and Monitoring

+2 POINTS

Daikin AHUs can easily contribute to gain 2 points enhancing even more the IAQ compared to the minimum requirements described in the EQ Minimum indoor air quality performance. Indeed Daikin AHUs can be equipped with filtration systems up to HEPA 14 and can increase the outdoor airflow of more than 30% if fans have been properly chosen.
Moreover Daikin IEQ (Indoor Environmental Quality) Sensor can monitor the concentration of many parameters and pollutants, including Carbon Dioxide, and alert the AHU and, on turn, the building automation system.

EQ Credit: Construction Indoor Air Quality Management Plan

1 point can be scored

AIM

To promote the well-being of construction workers and building occupants by minimising indoor air quality problems associated with construction and renovation.

1 By developing and implementing an IAQ management plan (1 point)

+1 POINT

Daikin can easily contribute to gain 1 point by providing additional filters with efficiency ISO Coarse 90%, or even higher, to be temporarely used during construction and pre occupancy phases, in such a way that, just before occupancy filters can be replaced with clean ones and with the design filtration efficiency.

EQ Credit: Indoor Air Quality Assessment

2 points can be scored

AIM

To establish better quality indoor air in the building after construction and during occupancy.

1. Option 1: Flush-out (1 point)
   - › Path 1: Before Occupancy
   - › Path 2: During Occupancy

2 Option 2: Air testing - VOC (1 point)

+1 POINT

Daikin AHUs can satisfy Option 1 Path 1 or Path 2 delivering the correct amount of outdoor air to perform the building flush-out always keeping an internal temperature between 15°C and 27°C with a relative humidity no higher than 60%. Moreover, with the time scheduler of the Daikin Controller, unit can automatically switch on and switch off accordingly to occupancy.

EQ Credit: Thermal Comfort

1 point can be scored

AIM

To promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.

1 Thermal comfort design and thermal comfort control (1 point)

+1 POINT

Daikin AHUs can be designed to guarantee thermal comfort conditions in accordance with ASHRAE Standard 55–2017.

Moreover, for an optimised thermal comfort control, Daikin IEQ Sensors can be installed on site to further monitor many environmental parameters and eventually adjust the air temperature and/or air speed.

EQ Credit: Acoustic Performance

1 point can be scored

AIM

To provide (work)spaces that promote occupants wellbeing, productivity, and communications through effective acoustic design.

1 Maximum background levels from HVAC systems (1 point)

+1 POINT

AHUs can be designed to reduce as much as possible the sound noise, by acting on the panels insulation material and/or taking advange to silencers modules mounted, wherever needed, in the AHU.
Among the complete AHU documentation, a sound level report is provided.
We publish all relevant noise performance of our systems in line with EU regulations.
Chillers, heat pumps, fan coil units have a good acoustic performance as well and have a wide range of solutions for acoustic attenuation in case of tight noise regulations.

Detailed points information

Materials & Resources

MR Credit: Environmental Product Declarations

2 points can be scored

AIM

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts.

1. **Option 1: Environmental Product Declarations (EPD) (1 point)**
2. Option 2: Embodied Carbon/LCA Optimization (1 point)

+1 POINT

Daikin can contribute to gain 1 point (Option 1) providing Environmental Product Declaration (EPD) of its products

Detailed points information

Innovation & Regional Priority

RP Credit: Regional Priority

4 points can be scored

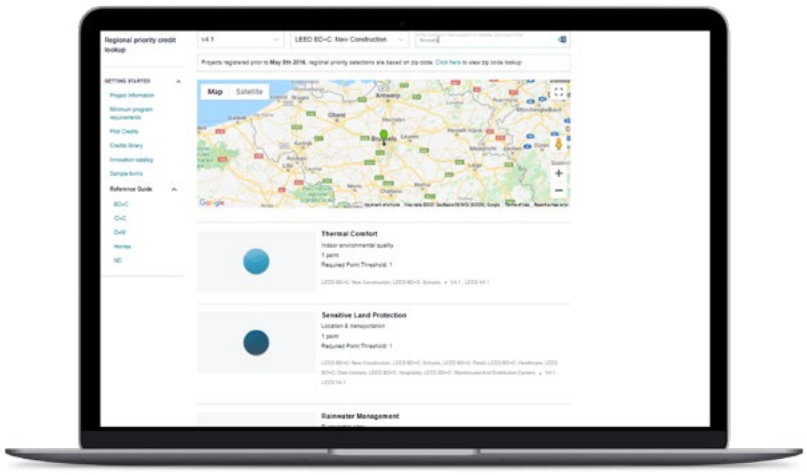
AIM

To provide an incentive for the achievement of credits that address geographically specific environmental, social equity, and public health priorities.

1 **Depeding on the region where the building is constructed the eligible credits might differ. At www.usgbc.org/regional-priority-credits you can find the list with applicable credits for which additional points can be scored.**

+1~4
POINTS

For the Brussels area there are 6 credits eligible of which 2 are directly linked to our systems: Thermal comfort and Optimize energy performance



Case studies

Daikin has successfully participated in many green and sustainable projects. Helping builders achieve BREEAM Excellent, LEED Gold, WELL and similar certificates has become one of our specialities – and our case studies prove it!

El Dorado Business Tower

LEED Platinum

VRV advantages in Large-Scale Buildings

- Energy savings: Over 45% more efficient than chillers
- Space savings: Around 1,500 m^2 more useable space
- Installation period: Far shorter than chillers

The Eldorado Business Tower is an office building which also includes boutiques, restaurants and a fitness gym on its lower floors. The structure's green credentials were firmly established when it became South America's first recipient of LEED Platinum certification.

Big energy savings thanks to VRV

Eldorado tower was carefully designed to achieve high environmental performance. Due to its size, Gafisa, one of Brazil's leading construction companies, had originally intended to install a chiller air conditioning system.

However, it reconsidered this approach after reviewing electricity costs as well as maintenance and technical requirements. **VRV provided many advantages** amongst enormous energy savings of more than 45% compared to chiller systems, major space savings, faster installation and expert after-sales service.

Efficient Partial Load Operation

The system's high efficiency, particularly during partial load operation, has helped to dramatically reduce the electricity used by air conditioners. Three years after installation, Gafisa calculated power consumption was actually more than 30% below that contracted for LEED certification.

Location

Sao Paulo

Building details

Number of floors: 32
Total floor space: 67,650 m^2
Application: Offices and shops

Daikin systems installed

- 196 VRV heat pump outdoor units (3,516 HP)
- 968 VRV indoor units (Concealed ceiling and cassette type)
- Intelligent manager control system

Sevilla Tower

LEED Gold

The Sevilla Tower was an exceptional challenge from many points of view. Maximum flexibility and adaptability towards future use, high energy efficiency, optimum maintenance and management costs and high levels indoor air quality. This landmark with leisure facilities, offices and hotel is a true benchmark with LEED Gold certification

Highly efficient heat recovery

To meet the high target for energy efficieny, water-cooled VRV heat pumps were used. They can independantly heat and cool to meet the different demands of each area or tenant and allow heat recovery. A water loop acts as a source or heat sink for the Daikin VRV units, allowing further heat recovery throughout the entire building. When the loop cannot compensate, cooling towers and boilers provide the differential to maintain the temperature of the water loop.

The energy recovery mode is so efficient that, during certain times of the year, all the heat required by certain areas of the building is provided by the heat extracted from other areas, **achieving a zero balance of energy** to be transferred to or from the outside , with the consequent energy savings.

Maximum flexibility to cater future needs

Another important aspect was that the HVAC installation needed to provide the flexibility and adaptability for future repurposing of the building. **Already 2 years after the finalization of the project, office floors were transformed into hotel rooms to meet the growing demand**. The individual control of every individual indoor unit made this transformation easy, ensuring maximum comfort also for the future hotel guests.

Individual control for each tenant

Each tenant or user has absolute control of the air comfort of their premises or room. They can adjust cooling, heating or fresh air according to their own needs, maintaining a high level of indoor air quality.

The Daikin mini BMS system reports on the energy consumption attributable to each indoor unit, which allows each tenant to be assigned the corresponding consumption.
The entire HVAC system is plug and play connectable highly reducing installation costs of the control solution.

Location

Sevilla, Andalucia, Spain

Building details

Useable floor space: 68,000 m^2
Height: 180.5 m
Floors: 3 basements, 40 floors

Daikin systems installed

- 108 VRV water-cooled units
- 120 Branch Selector (BS) boxes allowing heat recovery
- 522 VRV indoor units (slim concealed ceiling)
- 6 Hydroboxes and hot water tanks to produce and store hot water
- 6 Expansion valve kits connecting AHU's to the refrigerant circuit

For more in-depth information you can download our assessment sheet, created by our team of experts, to help you increase your building's rating.

You also save time using this sheet as base of evidence towards assessors when applying for LEED certification.

Scan this code to download the sheet.

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