

Future-proof your Hot Water Heating Solutions with CO₂ Heat Pumps





Future-proof your hot water heating solutions with CO₂ Heat Pumps

With renewable energy technology developing at an exponential rate, electricity is fast becoming the preferred heating energy source for smart buildings and smart property owners.

Solar power systems are already able to deliver huge savings for commercial power users, and with battery storage technology now the focus of intensive research globally, this key component in the renewable energy consumption cycle may soon make on-site storage of the power you need, an affordable reality.

Many who rely on fossil fuels for heating are finding their profits eroded as gas prices continue to rise, and combustion efficiencies maintain their status quo.

How to heat, the smarter way

You can save more on your energy bills—and contribute to a cleaner, greener and more sustainable future—with Automatic Heating Global's CO₂ Heat Pumps.

Boasting an efficiency around four times that of conventional electric water heating technology, Eco-Cute CO₂ Heat Pumps use minimal power and clever technology to heat your water to 90°C by extracting heat from the ambient air. Better yet, this process does not contribute to global warming, or run any of the risks associated with traditional combustion.



Why source your heat pump solution through Automatic Heating Global?

Not all heat pump solutions are created equal, that's why it's wise to work with the experts.

When you source your heat pump solution through Automatic Heating Global, you receive access to both project management services and engineering expertise. We invest time and attention in every project to ensure that only the best customised heat pump, or hybrid package, is designed to meet the unique demands of your individual project.

Our engineers provide one-on-one consulting sessions with you and your team, with no cost and zero obligation. Our project proposals and quotations are also provided free of charge.

A professional consultation with our technical advisers includes:

- An assessment of your current equipment and energy usage.
- A discussion on the best solution for you, to ensure the future-proofing of your hot water production, and to deliver you savings for years to come.
- A complimentary project proposal and quote.

What are you waiting for?

Call us now to arrange a free consultation on

1800 337 959

Why consider an Air-Sourced Hot Water Heat Pump System?

If you want to heat your water in the greenest, cleanest, and most sustainable way possible, an Air-Sourced Hot Water Heat Pump System is a great choice. Why? Because air-sourced heat pumps absorb heat from the air before transferring it to your water. They also run on electricity, as opposed to oil or gas, and are nearly four times more efficient than standard electric water heaters.

Not only do air-sourced heat pumps greatly reduce greenhouse gas emissions, they also save energy, which in turn saves you money.

The use of Air-sourced Hot Water Heat Pumps is on the rise

Consumers worldwide are increasingly seeking sustainable, cost effective alternatives to traditional fossil fuelled equipment. Using natural CO₂ as the refrigerant, and achieving a high coefficient of performance (COP), CO₂ heat pumps offer both ecological and financial benefits.

How do Air-sourced Hot Water Heat Pumps compare to conventional systems?

When it comes to energy output, the way an air-sourced heat pump works is different to the way conventional systems operate.

With conventional systems—e.g. electric, gas, or oil—1kW input of energy provides less than 1 kW of output energy or heat. Conversely, with a CO₂ heat pump system, every 1kW of input energy consumed produces an average of 3.9 x the input as output energy or heat, by first extracting heat from the outside air.

What is it about Air-sourced Hot Water Heat Pumps that makes them so efficient?

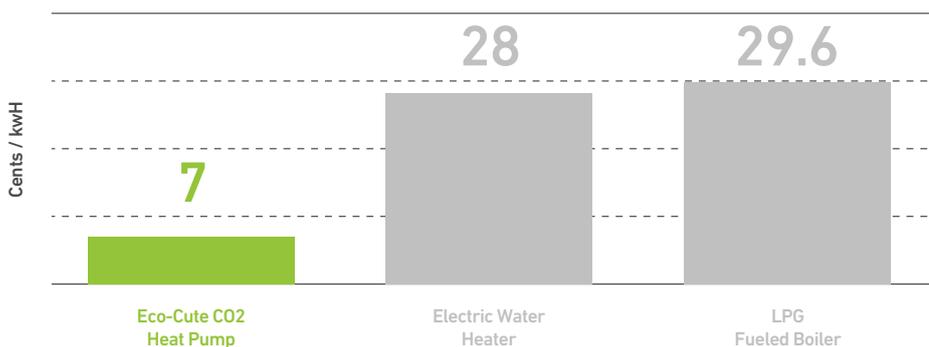
With no combustion, no flue gases, and no acidic condensate to dispose of, electric air-source hot water heat pumps offer a quick, clean and highly efficient way of providing domestic hot water.

The technology, developed many years ago, has been continually improved, and now provides significant opportunities for energy savings and sustainable heating where CO₂ is used as the refrigerant gas.

Summary of Air-sourced Hot Water Heat Pumps benefits:

- No combustion, flue gases or condensate
- Fossil fuel free
- Can operate on off peak tariffs
- Save energy and money
- Uses heat from solar energy in the air

Running Cost Comparison



APPROX
1/4
RUNNING COST

Eco-Cute offers Significantly lower running costs & CO₂ emissions

Why choose Eco-Cute CO₂ Heat Pumps for your project?

Eco-Cute CO₂ Heat Pumps boast many features and benefits, providing your project with a number of environmental and economic advantages.

The unique capacity of the Eco-Cute CO₂ Heat Pump to produce 90°C hot water makes it suitable for use in a wide range of industrial, commercial and residential environments, including but not limited to:

- food processing plants
- dairies
- shopping centres
- residential developments
- hotels
- restaurants
- hospitals
- aged care facilities, and
- recreational and educational facilities.

Eco-cute can also ensure a high level of safety, as the absence of combustion reduces the risk of fire.

Instead of the more conventional ammonia or haloalkane (R134A) refrigerant gases used in other systems, Eco-Cute CO₂ Heat Pumps use supercritical carbon dioxide (R744) as the refrigerant. CO₂, being a natural part of the air around us, can be safely returned to the atmosphere without any risk to humans or animals and with no detrimental impact on the environment or climate.

Eco-Cute CO₂ Heat Pumps:

- Produce 90°C hot water with an average COP of up to 4.2.
- Convert 1kW of input energy into 3.9kW of output energy.
- Provide energy efficient DHW and space heating solutions for industrial, commercial and residential applications.
- Utilise natural, eco-friendly refrigerant gas R744 (CO₂)
- Produce hot water up to 90°C, even within ambient temperatures that drop to as low as -25°C.



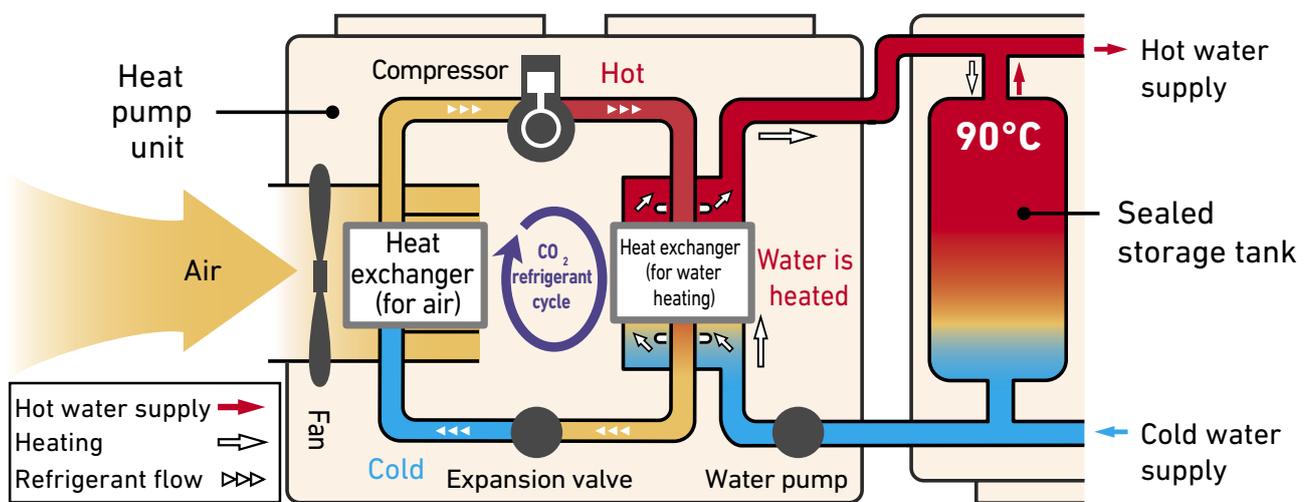
About the manufacturer



Itomic Nihon has been a leading manufacturer of hot water heaters in Japan since 1948. With over 2500 Itomic Eco-Cute CO₂ Heat Pumps installed globally, this product continues to demonstrate its worth as a proven and reliable non-fossil fuel water heating system.

How does an Eco-Cute CO₂ Heat Pump System Work?

Economic and environmentally-friendly, the Eco-Cute CO₂ High Temperature Hot Water Heat Pump System moves heat from one location to another, using a very minimal amount of energy.



First, heat is absorbed from a low temperature source (ambient air) by ozone-friendly R744 (CO₂), a natural refrigerant that does not harm the environment.

The hot refrigerant then passes through a heat exchanger, which in turn heats the water. The refrigerant is then cycled back into the system, and hot water is pumped to the storage tank.

As the warm gaseous refrigerant circulates through the system it passes through the compressor, and its pressure and temperature rises.

Advantages of using CO₂ as a refrigerant

As CO₂ is a natural, non-HFC refrigerant, it boasts an ozone depletion potential (ODP) of zero, and a global warming potential (GWP) of 1.

Conversely, traditional HFC refrigeration systems adversely impact climate change in two distinct ways: direct and indirect contribution. Direct contribution results from the release of refrigerants into the atmosphere.

Indirect contribution refers to the energy used to operate traditional refrigeration equipment. Essentially, the less energy required to operate the equipment, the lower the impact on the environment.

Refrigerant Characteristics

Refrigerant	HFC		Natural Refrigerant
	R410A	R407C	R744(CO ₂)
Ozone depletion potential	0	0	0
Global warming potential	1975	1653	1
Combustible	No	No	No
Toxicity	Low	Low	Low

Superior Features and Benefits

Heats up to 90°C - Due to its innovative design, the Eco-Cute CO₂ Heat Pump can produce hot water up to 90°C at low and high ambient temperatures (-20°C to 43°C)

Flexible - The same system can be simultaneously used for Space Heating & Domestic Hot Water

Ultra quiet operation – 60dB(A)

No combustion - reduces fire risk

Suitable for up to 60°C ΔT (flow 90°C, return 30°C)

Ambient operating temperatures from -5°C to 43°C (Special unit available for -15°C or -20°C)

Safe - Non-flammable CO₂ refrigerant

30% Space Saving due to Y Frame design (CHP-80)

Versatile - Suitable for a wide range of purposes, from small facilities to large buildings where hot water or heating is required.

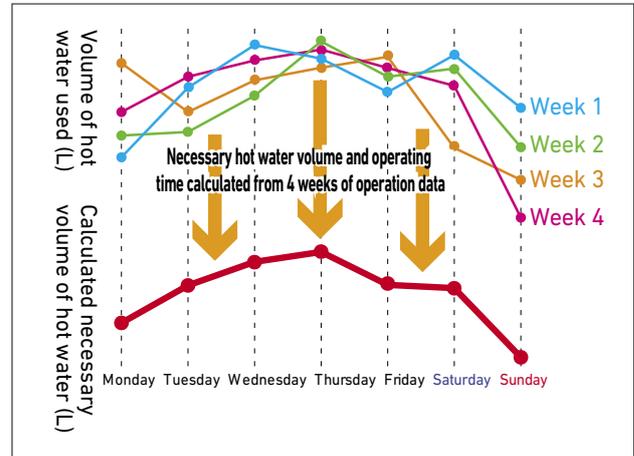
Eco friendly - The Eco-Cute CO₂ Heat Pump uses natural CO₂ refrigerant. This refrigerant has a global warming potential (GWP) of about 1/1700 that of R410 and zero ozone-depleting potential (ODP).

Energy efficient - Under optimal conditions, Eco-Cute CO₂ Heat Pumps achieve an exceptional coefficient of performance (up to 4.2) which equates to higher energy efficiency. Compared to the traditional electric hot water heater, the CO₂ hot water heat pump can save up to 75% heating energy. Further energy cost savings can be achieved through operation during off-peak times when a lower tariff is available.

Anti-freeze/Cold Area Units - the heat pump is fitted with a defrost solenoid valve which will open when the evaporator ices up. The hot gas will then flow through the evaporator and melts the ice.

One pass heating - It is suitable for heating water from low to high temperatures (large temperature difference) in one pass.

Reduces storage requirements - Since this hot water heat pump can heat water up to 90°C, the size of the storage tank can be reduced.



Energy Saving Function - This function is an energy-saving function that learns operation patterns from the four previous weeks to prevent unnecessary heating and temperature decreases in stored water through natural heat loss. The use of this function based on operation data stops the unit from boiling water unnecessarily.

Now you can hear yourself think!

There's a lot to think about when it comes to investing in a hot water heat pump system for your project, and noise levels are one of the important considerations.

At Automatic Heating Global, we appreciate the value of quality systems that operate with minimal distraction. That's why we've made sure that Eco-Cute CO₂ Heat Pumps deliver a comfortable operating noise level, so those working nearby can remain undisturbed by its smooth operation.

dB	Example
0	Healthy Hearing Threshold
10	A Pin Dropping
20	Rustling Leaves
50	Light Traffic
52	15kW Eco-Cute CO ₂ Heat Pump
54	26kW Eco-Cute CO ₂ Heat Pump
60	80kW Eco-Cute CO ₂ Heat Pump
60	Conversational Speech
70	Shower
80	Alarm Clock
100	Motorcycle (Riding)
120	Thunderclap
150	Fighter Jet Launch
180	Rocket Launch

Heat Pump Packages

	Package 1	Package 2	Package 3	Package 4	Package 5	Package 6
Capacity	 10x 2BR apartment	 16x 2BR apartment	 19x 2BR apartment	 28x 2BR apartment	 29x 2BR apartment	 32x 2BR apartment
DHW Solution	 15kW + 500L	 15kW + 1000L	 30kW + 1000L	 80kW + 1000L	 15kW + 2000L	 30kW + 2000L
Heat Pumps	1 x 15kW	1 x 15kW	2 x 15kW	1 x 80kW	1 x 15kW	2 x 15kW
Heating Output	15kW	15kW	30kW	70.1kW	15kW	30kW
Power Input	4.68kW	4.68kW	2 x 4.68kW	19.5kW	4.68kW	2 x 4.68kW
Electrical Supply	415/50/3Ph	415/50/3Ph	415/50/3Ph	415/50/3Ph	415/50/3Ph	415/50/3Ph
Circuit	10Amps/phase	10Amps/phase	20Amps/phase	51Amps/phase max	10Amps/phase	20Amps/phase
COP of Heating*	3.2	3.2	3.2	3.59	3.2	3.2
Ambient Operating Temp.	-25/43°C	-25/43°C	-25/43°C	-20/43°C	-25/43°C	-25/43°C
Water Temp. Setting	65°C (90°C max.)	65°C (90°C max.)	65°C (90°C max.)	65°C (90°C max.)	65°C (90°C max.)	65°C (90°C max.)
Refrigerant	R744 (CO2)	R744 (CO2)	R744 (CO2)	R744 (CO2)	R744 (CO2)	R744 (CO2)
Water Connections	25mm	25mm	25mm	25mm	25mm	25mm
PTR Valve Setting	700kPa	700kPa	700kPa	700kPa	700kPa	700kPa
ECV Setting	500kPa	500kPa	500kPa	500kPa	500kPa	500kPa
Operating Sound Level**	49dBA	49dBA	49dBA	60dBA	49dBA	52dBA
Storage	1 x 500L	2 x 500L	2 x 500L	2 x 500L	4 x 500L	4 x 500L
Rated Delivery	450L	900L	900L	900L	1800L	1800L
Hot Water Production Rate*	230L/hr	230L/hr	460L/hr	1076L/hr	230L/hr	460L/hr
First Hour Delivery	680L	1130L	1360L	1976L	2030L	2260L

* At an ambient temperature of 7°C ** At a height of 1.5M above ground level



Package 2 example with optional skid frame and ancillary products

	Package 7	Package 8	Package 9	Package 10	Package 11
Capacity	 41x 2BR apartment	 56x 2BR apartment	 67x 2BR apartment	 108x 2BR apartment	 150x 2BR apartment
DHW Solution	 80kW + 2000L	 160kW + 2000L	 80kW + 4000L	 160kW + 6000L	 160kW + 8000L
Heat Pumps	1 x 80kW	2 x 80kW	1 x 80kW	2 x 80kW	2 x 80kW
Heating Output	70.1kW	140.2kW	70.1kW	140.2kW	140.2kW
Power Input	19.5kW	39kW	19.5kW	39kW	39kW
Electrical Supply	415/50/3Ph	415/50/3Ph	415/50/3Ph	415/50/3Ph	415/50/3Ph
Circuit	51Amps/phase max	102Amps/phase max.	51Amps/phase max	102Amps/phase max.	102Amps/phase max.
COP of Heating*	3.59	3.59	3.59	3.59	3.59
Ambient Operating Temp.	-20/43°C	-20/43°C	-20/43°C	-20/43°C	-20/43°C
Water Temp. Setting	65°C (90°C max.)	65°C (90°C max.)	65°C (90°C max.)	65°C (90°C max.)	65°C (90°C max.)
Refrigerant	R744 (CO2)	R744 (CO2)	R744 (CO2)	R744 (CO2)	R744 (CO2)
Water Connections	25mm	25mm	25mm	25mm	25mm
PTR Valve Setting	700kPa	700kPa	700kPa	700kPa	700kPa
ECV Setting	500kPa	500kPa	500kPa	500kPa	500kPa
Operating Sound Level**	60dBA	63dBA	60dBA	63dBA	63dBA
Storage	4 x 500L	4 x 500L	8 x 500L	12 x 500L	16 x 500L
Rated Delivery	1800L	1800L	3600L	5400L	7200L
Hot Water Production Rate*	1076L/hr	2152L/hr	1076L/hr	2152L/hr	2152L/hr
First Hour Delivery	2876L	3952L	4676L	7552L	9352L

* At an ambient temperature of 7°C ** At a height of 1.5M above ground level



Yarra's Edge Tower 1

Boasting an enviable position in one of Melbourne's finest waterside locations, the eye-catching Yarra's Edge Tower 1 was one of the first completed apartment towers to grace the south bank of the Docklands.

The project

Conveniently situated a stone's throw from Melbourne CBD, Yarra's Edge Tower 1 is the first of five Mirvac developed towers built specifically for the Docklands precinct.

Designed by HPA Architects, the building is known for its sleek, distinctive silhouette, characterised by its multidimensional aesthetic and a unique skewed gold glass box that rests atop the tower. Holding a strong presence within the Docklands landscape, the building features sweeping curves, one striking golden wall, and another with sharp and straight angles.

Youthful, playful, and elegant, Yarra's Edge is situated at 50 Lorimer Street, Docklands, offering 175 apartments throughout its 32 floors. Since its launch in 2002, it has gained a reputation as one of the city's most unique residential developments.





Despite rave reviews, Yarra's Edge Tower 1 needed to improve its energy efficiency and the reliability of its hot water heating system.

Since its completion in 2002 Yarra's Edge has received 5 star ratings, however, the building's internal systems were recently in need of an urgent upgrade. To help get the job done right, the building management team enlisted the expertise of Automatic Heating.

The problem was that the existing Raypak boilers at Yarra's Edge Tower 1, first installed at the time of build, were old and inefficient, causing a range of issues. The main concern was that the pilot lights on the boilers often failed, mostly due to windy weather conditions. This caused the need to add additional fencing to the area, and to hire someone to attend the site on a regular basis to reset the equipment, which was costly and inconvenient.

The original Raypak boilers also ran at only 70% efficiency, whereas the new alternatives provided by Automatic Heating run at 94% efficiency.



How did Automatic Heating help to improve the energy efficiency of Yarra's Edge Tower 1?

When the building management team at Yarra's Edge Tower 1 first approached Automatic Heating, they needed to replace the complex's hot water system, and were looking for opportunities to reduce their gas consumption, and increase the reliability and energy efficiency of their internal systems.

After assessing the issues that the team at Yarra's Edge were experiencing with their old equipment, Automatic Heating installed a new and improved hybrid system that features high efficiency condensing boilers, a high efficiency heat pump, and twin coil storage tanks.

The project involved the replacement of the boilers that were no longer in efficient working order. Automatic Heating replaced the two Raypak 500kW boilers used for domestic hot water with five Meridian 150kW condensing boilers, featuring Eco-Cute 15kW High Temperature CO2 Heat Pumps and Plate Heat Exchangers.

The two initial Raypak 500kW boilers used for heating hot water were also replaced with six Meridian 150kW condensing boilers, to ensure that the new system was running as efficiently, sustainably, and economically as possible.

What are the advantages of the Eco-Cute 15kW High Temperature CO2 Heat Pumps installed at Yarra's Edge Tower 1?

Eco-Cute 15kW High Temperature CO2 Heat Pumps take advantage of the off peak electricity tariff, which reduces the cost of producing DHW.

The new heat pumps provide hot water for morning use, one of Yarra Edge's peak load times, and the accompanying Meridian boilers recharge the tanks when needed during the day, ready for the evening, another peak load period.

Inbuilt timers also shut the Meridian domestic hot water off during the night, allowing for even greater economic and sustainable efficiency.

Garden Hotel



Project Overview

Type	Hotel
Application	DHW
Units	CO ₂ Heat Pump Water Heater
Model	CHP-3000U
Number	4 units

NEDO Japan, joint project with the Chinese government, installed Itomic CO₂ heat pumps in this prestigious hotel, in order to disseminate the advanced energy-saving technology as a pilot case.

Cost Savings



Luxury Villa



Project Overview

Type	Accommodation
Application	Heating
Units	CO ₂ Heat Pump Water Heater
Model	CHP-80Y2
Number	5 units

CO₂ Heat pumps were adopted in this vast 3,000m² accommodation and recreational facility as a floor heating solution. A stable heating even in the severely cold weather, together with a safe and clean operation due to non-combustion system of the product, was acclaimed highly by the owner.

Installation

Ambient temperature in a winter time is very low in the Liaoning Province, so a chlorofluorocarbon heat pump cannot meet the heating demand. Instead, Itomic CO₂ heat pumps were introduced and they are now operating well down to -20° ambient. With anti-freeze heaters built inside the units, operation is maintained even if an unexpectedly low temperature hits the region.

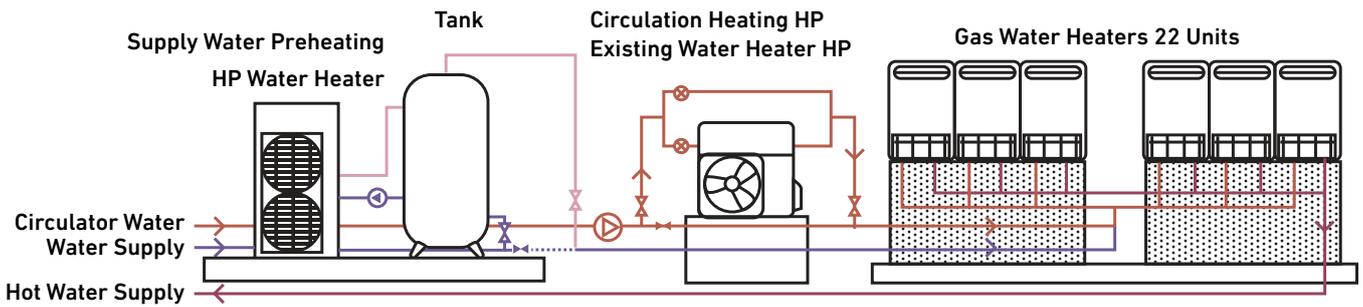
Comfort Hotel



Project Overview	
Type	Hotel
Application	Pre-heating
Units	CO ₂ Heat Pump Independent Unit
Model	CHP-12H, SPU-1
Number	1 unit / each

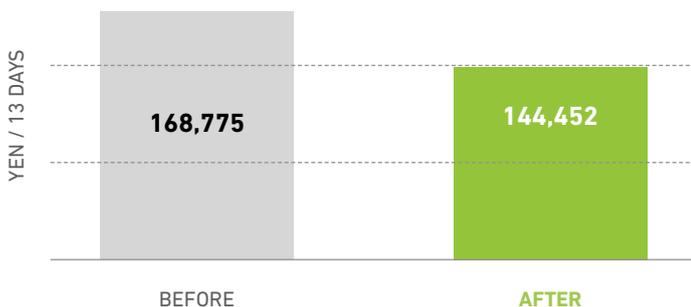
This hotel chain holds approx.170,000 rooms around the world and 51 hotels throughout Japan. They adopted Itoic CO₂ heat pump (12kW) as the guest room's hot water preheating, in order to cut the total energy cost. They have been successful in reducing the gas expenditure in the limited installation space. Their two other hotels also adopted our CO₂ heat pumps.

Installation Example



Cost Savings

Surveyed for 13 Days



Total initial cost
¥2,800,000
 Estimated Annual reduction
¥682,915
 Recoupment of investment
4.1 years

*24,323 Yen / 13days

Chicken Processing Factory



Project Overview

Type	Industrial
Application	Combination
Units	CO ₂ Heat Pump Water Heater
Model	CHP-80Y2
Number	1 unit

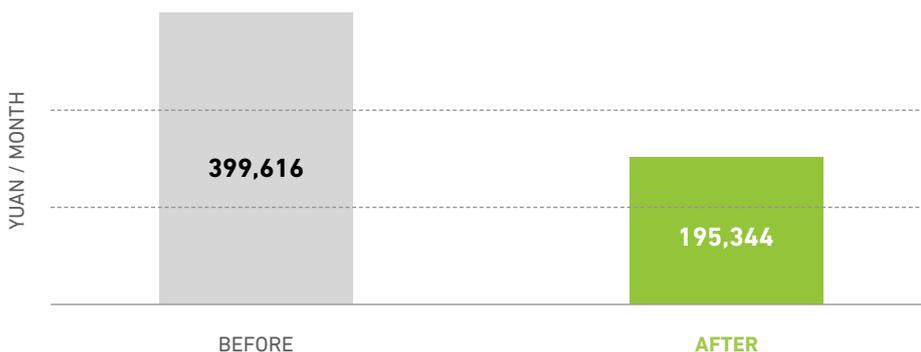
Under a famous frozen food brand, this company processes 7million chickens annually, and sells domestically and exports to the Southeast Asian countries. A large amount of hot water is consumed during the process, so our CO₂ heat pumps have been adopted for use in combination with the existing boiler in order to reduce the total energy cost.

Installation

Tons of hot water is consumed in this facility for cleaning, washing, and sterilizing purposes during the chicken processing. With the newly adopted hybrid system –an originally set heavy oil boiler is combined with a CO₂ heat pump. Hot water is supplied first by the CO₂ heat pump which has significantly reduced energy costs. The facility management is easier due to the non-combustion feature of the product.



Cost Savings



*2,405,138 Yuan / Year

Beer Factory



Project Overview

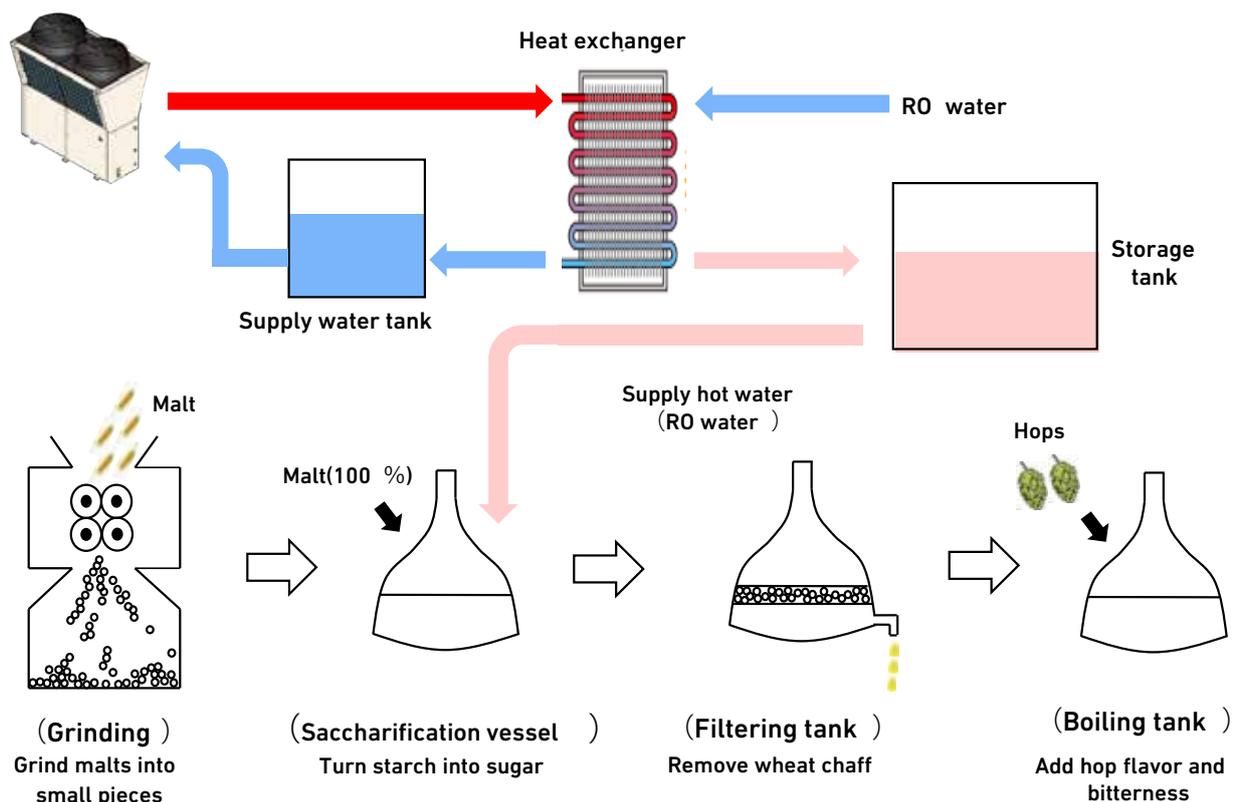
Type	Industrial
Application	Temperature Raising
Units	CO ₂ Heat Pump Water Heater
Model	CHP-80Y2
Number	1 unit

14 factories are located under this famous foreign beer brand.

Installation

A large amount of hot water is added to malts during the saccharification process (turning starch into sugar). The supply water temperature to the heat pump is strictly controlled at below 35°C so the stable efficiency is constantly maintained.

At the same time, the heat pump works well in reducing the summertime indoor temperature (sometimes as high as 40°C), as it discharges cool air during the operation.





AutomaticHeating
efficiency □ performance □ solutions

ABN 90 446 545 923

Tel: 1800 337 959 / Fax: +61 3 9310 5655
sales@automaticheating.com.au

P.O. Box 35, Epping VIC 3076, Australia

www.automaticheating.com.au