

Beijing HuaYuan TaiMeng Energy-saving Equipment Co., Ltd was set up in the year of 2011 and it's one of the subsidiary company under Moon Group. It's China National High-tech enterprise and an industry-university-research base of Tsinghua University for waste heat utilization. The factory in Baoding is 66,000 m².

The company is supported by the scientific research strength of Tsinghua University, and focus in industrial waste heat utilization(cooling or heating), comfortable air conditioning & central heating.



- 66,000 m² factory
- 5200 m² chiller performance testing lab.
(China national lab standard)
- yearly production capacity of more than 2,000 units.

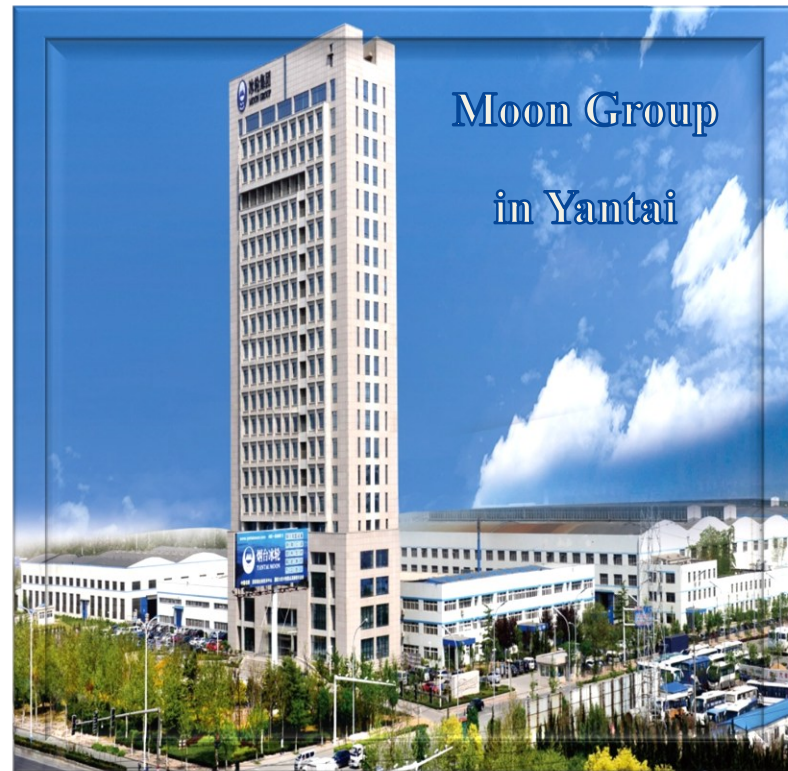
- Natural gas chiller
- Hot water chiller
- Steam chiller
- Exhaust + hot water chiller.
- Absorption heat pump (7 different types)
- Direct contact heat exchanger
- Gas fired smokeless boiler

Moon Group was started in 1956, it's one of the leading company in China cooling industry. It's the top 100 mechanical company in China.

After more than 60 years development, Moon group is consist of 6 main business. Low temp. frozen, central A/C, environment protecting heating, energy chemical device, sealing technology, precision casting.

Moon Group have factories in China, UK, Malaysia, South Africa, Vietnam. Etc., and 21 offices world wide, the products were sold to more than 100 countries.

- The moon group own 5 China National Science and Technology Innovation Platforms.
- More than 140 patents.
- Employee of more than 5,000.
- Moon Group is the owner of HYTM and Dunham-Bush





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Company Introduction



Tsinghua University architecture energy saving
research center



HYTM cooperation with
universities

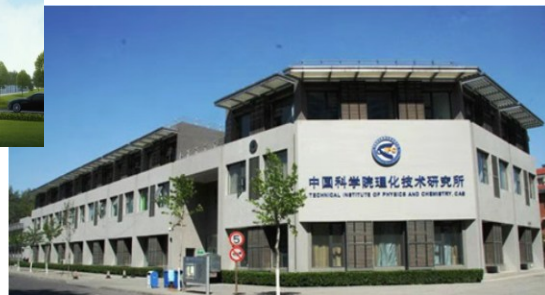


北京清华同衡规划设计研究院
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Beijing Tsinghua Tongheng Urban Planning
& Design Institute



Hebei Tsinghua development
research institute



Institute of Physical and Chemical
Technology, Chinese Academy of
Sciences



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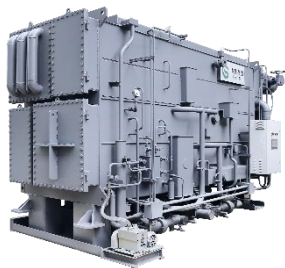
Company Introduction



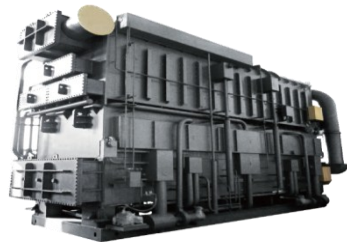
- CE Certification (PED, EMC & MD)
- ASME
- UL
- ISO9001 Quality Management Certification
- ISO14001 Environment Management Certification
- ISO18001 Occupational health and safety management system certification
- CRAA Certification
- Energy Saving Product Certification

Or customer local certifications

Heat Pump



Big delta-T Heat pump



Waste heat recycle heat pump



Exhaust deep recycling heat pump



Direct fired heat pump



Heating network enlarge heat pump



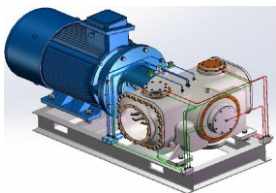
Exhaust driven heat pump



Catagory II heat pump



Direct contact heat exchanger



compressor



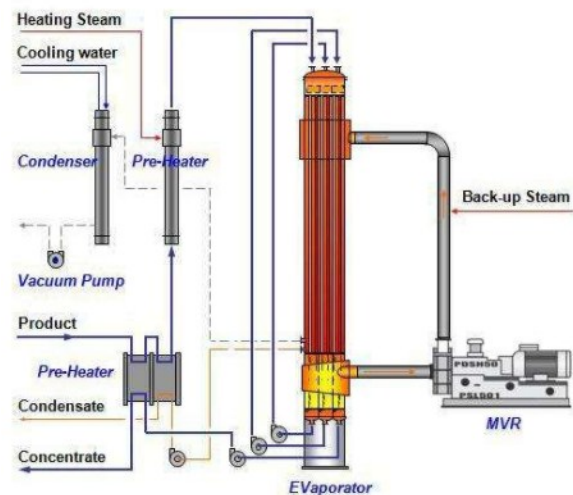
heater



System integration installation



Separators/Evaporative Crystallizers



MVR(Mechanical Vapor Re-compression) is an advanced evaporation technology in domestic and foreign evaporation field. This technology compresses the secondary steam generated in the evaporation process by a steam compressor, increases the pressure and temperature of the secondary steam, and returns it to the evaporator as a heat source to heat the original solution. This process makes full use of the latent heat of the secondary steam to achieve cyclic heating. The purpose of replacing fresh steam, saving a lot of energy, greatly reducing operating costs, and truly achieving the triple effect of energy saving, emission reduction and water saving.

MVR technology is widely used in the treatment of high-salt waste water and industrial production.

Comparison of energy consumption between multi effect evaporation and MVR evaporation

10t/h- Na_2SO_4 Comparison of Energy Consumption and Cost of Evaporative Crystallization System					
		MVR		3 stage evaporation	
		Data	Cost USD	Data	Cost USD
Electricity consumption	Compressor (KW)	300	30	0	0
	others (KW)	130	13	130	13
Steam (t/h)		0.1	3.1	4	124
Cost per hour USD			46.1		137
Yearly Operation cost USD		8000 hours	0.37M		1.1M
Note: electricity-0.1USD/KW.H. Steam -31USD/t;					

Advantages of MVR evaporator:

1. Low energy consumption, low operating costs, environmental protection, and pollution-free. The evaporation process only consumes electricity, with electricity consumption as low as 25 kWh per ton of water evaporated.
2. It covers a small area and has few supporting facilities for public utilities, with almost no need for steam and circulating cooling water.
3. Small temperature difference evaporation, mild product evaporation
4. It can evaporate at low temperatures, especially suitable for heat sensitive materials



Absorption chiller

➤ Natural gas chiller

- Energy source:
Natural gas, city gas,
LPG, Diesel, etc.

➤ Function: Cooling &
Heating

➤ Cooling Capacity:
140—10550KW

➤ Heating Capacity:
112—8440KW

Steam chiller

- Energy source:
0.01—0.3MPa steam
single stage
0.04—0.8MPa steam
two stage

➤ Function: Cooling

➤ Cooling Capacity:
140—10550KW

Hot Water Chiller

- Energy source:
hot water above
70°C

➤ Function: cooling

➤ Cooling capacity:
140—10550KW

Exhaust Chiller/ exhaust + hot water chiller

- Energy source:
250°C +

➤ Function: cooling
& heating

➤ Cooling capacity:
140—10550KW

Factory in Baoding, total area is 66,000 m², yearly production capacity is 2,000 units





Specially designed degreasing tank

- Degreasing of steel plate and steel pipe raw materials
- Semi-finished parts degreasing
- Three treatment processes
- Completely remove impurities, oil stains, etc. on the surface of the parts



Huge Sandblasting Room

- Surface precision sandblasting
- Eliminate the stress caused by welding
- Ensure the quality of the painting



Digital Machining Center

- Drill intelligently with high precision
- Ensure the air tightness of the tube expending



High Precision Helium spectrometer

- Japan original
- Precision as high as 10^{-12} Pa.m³/Sec, the highest precision in the absorption field.



Plasma cutting machine



Hydraulic Press machine



Bent machine



Band sawing machine



Five axis welding robot



Welding sports car



Pipe automatic welding



Imported tools

Multifunctional comprehensive laboratory



- Built in China national standard. The highest and model testing platform in this field
- Tsinghua university unique HVAC test base

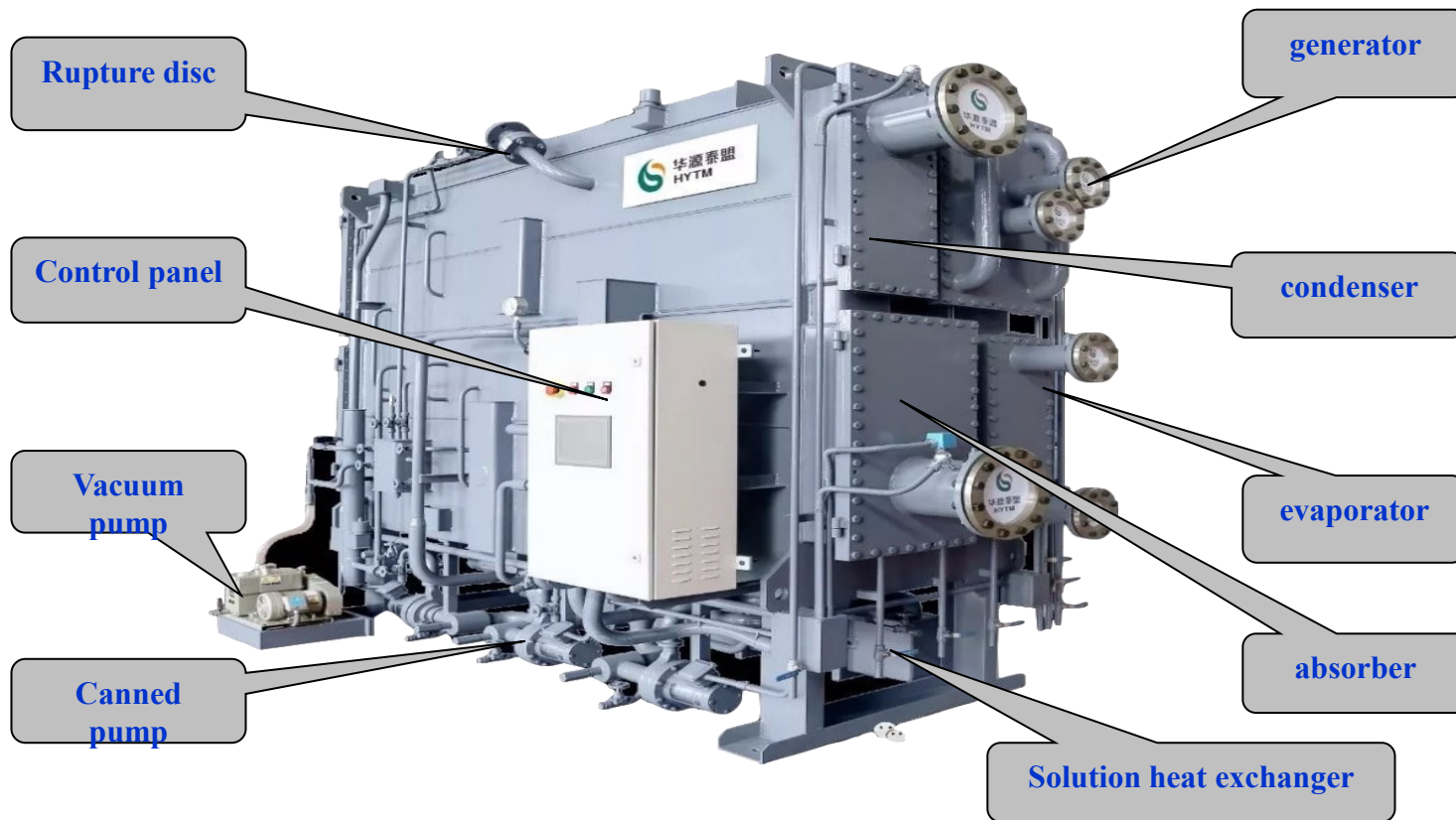


- Whole unit performance testing.
- Exhaust condensate heat exchange platform
- Heat transfer testing platform
- Comprehensive laboratories such as working fluid physical properties laboratory, electronic control laboratory, physical and chemical laboratory



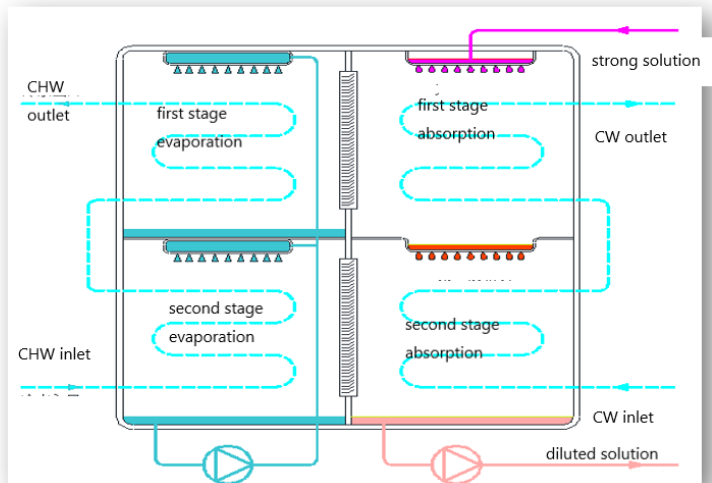
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Features



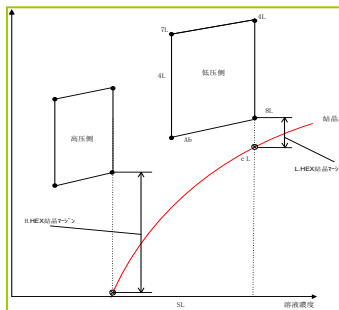
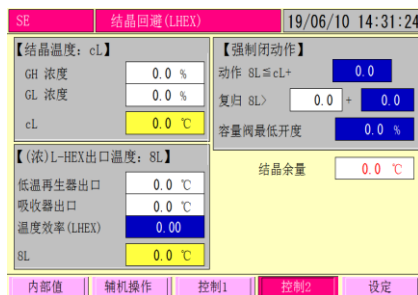


High Efficient Two stage evaporation/absorption



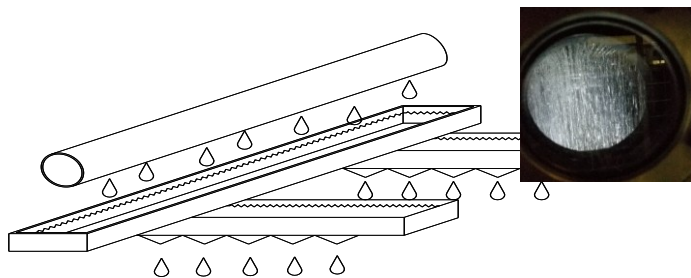
- Evaporator and absorber is consist of two stage, the high side and low side. Efficiency is higher.
- Chiller size is smaller and less space taking.
- Decrease the LiBr solution inside the chiller and low risk of crystallization. More safety to the chiller.
- Reach lower chilled water outlet temp.

Multi-stage anti-crystallization design



- LiBr solution concentration real-time display in the chiller touch screen, if any possibility of crystallization, then the chiller will automatically open the dilution valve.
- Chiller auto dilution during power off period. Zero possibility of crystallization.
- Auto de-crystallization system.

Unique liquid layout design



- different liquid layout design in different part of the chiller.
- Evaporator is designed with spray nozzle.
absorber is 4 stage gravity drop spray system
- The unique spray system increased the chiller efficiency.

Strict Vacuum Control

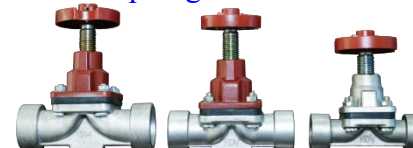
Vacuum is the life of the absorption chiller

High quality tubes	445J2 tubes is better in quality. Low impurity content, high temperature resistance, corrosion resistance, slow corrosion
Diaphragm valve	Zero leakage
Use Li2M0O4 inhibitor	No toxic.
New technology in expending connection	Two sealing groove expansion joints are adopted between the heat exchange and the tube sheet to reduce the possibility of leakage
High-precision large-scale helium mass spectrometer leak detector	Precision as high as 10^{-12} Pa m ³ /s, higher than others
Auto purge sytem	Inject system + vacuum pump.



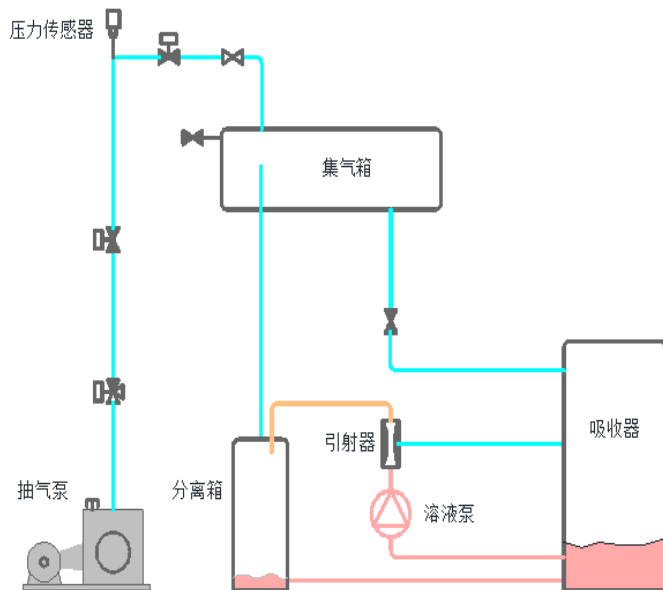
helium mass spectrometer

Diaphragm valve



Two sealing groove

Auto purge system



- Chiller is designed with auto purge system, and inject, collect, gas/liquid separate, pressure detect, 3 set of electromagnetic control logic. High safety and precision.
- During the chiller operation, the chiller will automatically gather the non-condensable gas into the gas tank and if the pressure higher than the set value, then the chiller will start the vacuum pump automatically and purge the air out. No need manual operation

Intelligent control system



- **12 inch colorful touch screen**
- **PLC control**
- **display the chiller status dynamically**
- **Alarm function**
- **Fault memory function**
- **Fault avoid design**
- **Chiller interlock design**
- **Self protection design**
- **Full dilution control circle**
- **Standard RS485 interface**

Inner Mongolia Star Chemistry Four Effect Evaporative Crystallization System

Industry:

Organic silicon production industry Production wastewater

Features: High organic, difficult to degrade, high toxicity, high salt content, and high water content

This project: 40m³/h; 4.5% sodium chloride salt content;

Pretreatment removes most organic matter and scaling ions;

There is still a risk of scaling;

The park has stable and low-cost steam supply;

Own 7t/h of waste steam available;

Process selection: Four effect evaporation crystallization process

Effectiveness: 40m³/h. 4.5% saline wastewater desalination for supplementing circulating water

Production: 1.8t/h sodium chloride salt for digestion in the park



Big Delta-T Heat pump in Taiyuan



Hundreds of similar projects in
Yantai, Jinan, Changchun,
Zhengzhou

Totally renovated heating stations: 1200 Total increased heating area: 52 million m² Coal saving : 1.05million tons

Exhaust dust emission cutting: 0.71 million tons. CO₂ emission cutting: 2.60 million tons.

SO₂ emission cutting: 79,000 tons. NOx emission cutting : 79,000 tons equal tree planting: 79,000 tons

Total heating pipe lines more than 37.8 km, height difference 180m, 6 times cross the river, 8 times cross bridge, 1 time cross the high speed road, opened 3 mountain tunnels of 15.7 km.

Jinan Coal Plant Exhaust recycling project-world's first coal exhaust recycling project



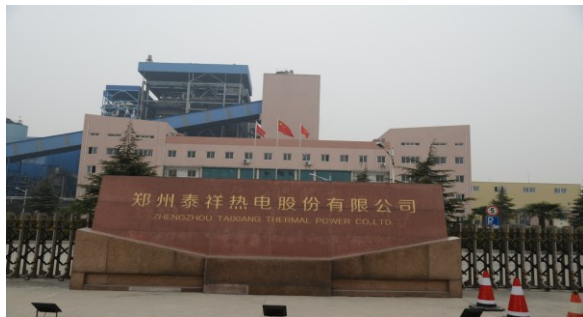
Exhaust recycled: 16MW Heating area increased: 0.37 million m²
Condensate W. recycled: 37,000 tons/year Coal saving 8500 tons/year
CO₂ emission cutting: 22,000 tons /year SO₂ emission cutting: : 638 tons
/year Nox emission cutting : 318 tons/year

Tianjin Tianbao Project-first whole year running exhaust recycling project



Exhaust recycled: 8.1MW Steam saving: 49,000 tons/ year.
Condensate W. recycled: 56,000 tons/year Coal saving 4300 tons/year
CO₂ emission cutting: 12,000 tons /year SO₂ emission cutting: : 352 tons
/year Nox emission cutting : 176 tons/year

Zhengzhou Taixiang Thermal Power Co.,LTD. -world's first super low steam driven



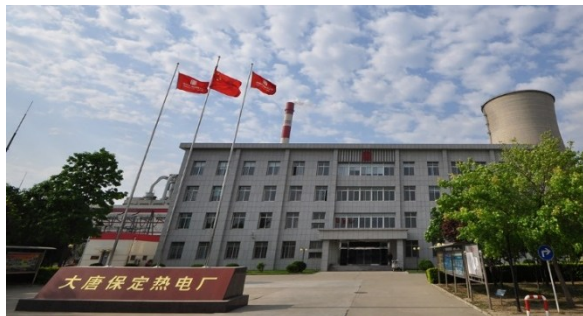
Driven steam pressure: 0.07MPaG

Heat recycled: 89MW Total heating Cap.: 216MW

Payback period: 3.3 years.

HYTM
International
leader

Datang Baoding Thermal Plant- Beijing City Energy Saving show case



Driven steam pressure: 0.08MPaG

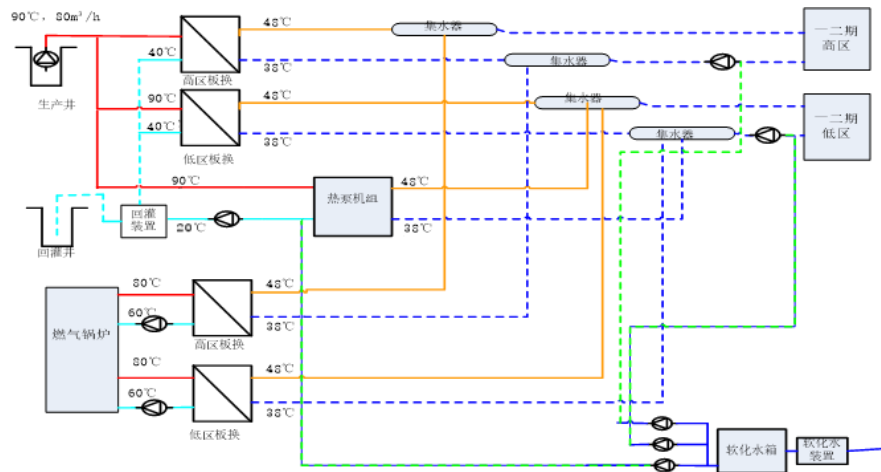
Exhaust recycled: 58MW Total heat recycled: 218MW

Payback period: 3.1 years.

China energy saving prize



Shanxi Geothermal Heating Project-Big Delta-T Design



Total heating area: **240,000m²**

Heating Cap.: **10,065kW**

Secondary supply W. temp.: **48 °C~38 °C**

Traditional plant heat exchanger parameter: Geothermal wall outlet temp.: **90°C**

Return W.: **40°C**

HYTM heat pump parameter: Geothermal wall outlet temp.: **90°C**

Return W.: **20°C**

Total heating area increased: **40%**

Payback period: **1** heating season



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