

# 恒有源科技发展有限公司

## 北京城区住宅供暖以“中央液态冷热源系统” 替代燃煤锅炉工程

HYY Co., Ltd.

the Replacement of Coal Boiler with the Renewable Energy Sourced Cooling and Heating Energy Environment System for Heating Supply in Beijing

## “中央液态冷热源系统”的环境效果

- 中央液态冷热源系统使用了地（水）源热泵的原理。
- 系统的运行费用比一般空调系统节约能源25-50%。每冷吨负荷可减少用电量大约一千瓦。

### Environment of Renewable Energy Sourced Cooling and Heating Energy Environment System

- Environment of Renewable Energy Sourced Cooling and Heating Energy Environment System uses the theory of Soil (Water) Sourced Heating Pump.
- Operating cost of this system lower than the cost which is adopt air conditioning system for 25-50%, and reducing consumption of electricity for 1kw per tone.

## 在北京推广中央液态冷热源系统 减少的二氧化碳气体排放量

- 目前北京住宅取暖以燃煤锅炉为主
- 平均每一取暖季所需要的燃煤为每平方米30公斤
- 使用中央液态冷热源系统由于利用了地下的浅层低能，在同样的建筑物中，只需要16公斤煤所发的电力。每平方米减少燃煤14公斤。

The Emission Quantity of CO<sub>2</sub> will be decreased if the Renewable Energy Sourced Cooling and Heating Energy Environment system applied.

- Residences in Beijing keep warm regard the coal boiler as principle currently
- The quantity for burning coal average is 30kgs per m<sup>2</sup> in winter.
- Renewable Energy Sourced Cooling and Heating Energy Environment System collect heat energy gathered from the shallow ground, in the same construction, it just needs the electric power that equal to burning coal for 16kgs, 14kgs of coal was decreased.

## 热量公式的计算

### The Formula for Calculate Quantity of Heat

- 燃煤锅炉的热量：  
 $30 \times 70\% \times 5000 = 105000$
- 30公斤煤，每公斤5000大卡的热量，以70%的锅炉效率供热得到105000大卡的热量。
- 中央液态冷热源的热量：  
 $860 \times 4 \times 30.5 = 105000$
- 以30.5kwh电力可以得到105000大卡的热量
- 2004年，华北电网发电每kwh用煤为0.533公斤。
- 两者差为30-16.25 = 13.74 约合9.8公斤标煤
- Quantity of heat (an inflaming boiler with coal):  $30 \times 70\% \times 5000 = 105000$
- 30 - quantity of coal; 5000kcal - quantity of heat; 70% -- efficiency of boiler;
- Quantity of heat (Renewable Energy Sourced Cooling and Heating Environment System):  $860 \times 4 \times 30.5 = 105000$
- 30.5Kwh electric power can obtain 105000kcal of quantity of heat.
- In 2004, 0.533kgs coal can get 1kwh electric power in North China.
- The difference is 13.74 (30-16.25), it is equal to 9.8kgs of coal.

## 使用数据的几点说明

- 燃煤锅炉使用了效率较高的大型锅炉的数字
- 发电使用的燃煤量为2002年数字，2005年这一数字减少了4%，今后还将持续降低。
- 运输煤炭和输送电力的因素均未计算，由于北京距离煤炭产地较远，运煤及煤灰的能耗远远高于输送电力的消耗。

### Explanations

- The inflaming boiler with coal used a numeral which is a higher efficiency boiler.
- The number was used from 2002, this numeral reduced 4% in 2005 and will also keep depress.
- The factor that transports coal and electric power are not computed, because Beijing is far from the producing area of coal, consumption of transport coal and ash great higher than transport the electric power.

## 其它替代的计算

- 北京市在“十五”时期曾计划在北京市区推广2000万平方米电采暖。
- 电采暖的方式有电锅炉、电热膜、热电缆等。
- 电采暖的最高效率为100%。

### Substitution

- During the period of Beijing the 11th 5 years plan, the electric heating method was popularize for 20,000,000 square meter
- The electric heating method includes electric boiler, electric heating film, electric cable etc.
- The top efficiency of electric heating is 100%.

## 项目替代直接电采暖 1000万平方米的效益预计

- 年节电96.85kwh/m<sup>2</sup>×1000万=968500万kwh
- 减少二氧化碳气体排放98万吨
- 减少二氧化硫排放8000吨
- 节约标准煤38.73万吨

### The performance that adopts the electricity directly to heating 10,000,000 square meters.

- 9685000 kwh of electricity will be economized.
- 980000 tones of CO2 will be decreased.
- 8000 tones of emission of CO2 will be decreased.
- 38730 tones of standard coal will be economized.

## 中央液态冷热源的其它环境效益

- 在目前的技术条件下，发电锅炉的烟尘量、二氧化硫含量的排放量都远远小于供暖的燃煤锅炉，实施这一工程有利于减少颗粒物、SO<sub>2</sub>、NO<sub>x</sub>等污染物的排放，有利于减少酸雨等对环境的危害。从而有利于改善空气质量。
- 各国经验证明，使用浅层地能采暖是目前效率最高，环境最友好的方式。

### Condition Benefit

- Under the current technique condition, the amount of smoke and dust, the emission of CO2 produced by electric boiler, it is smaller than boiler with burning coal. If the system applied that solving the problems such as reducing granule, SO2, NOX etc pollutant; reducing acid rain to harm environment, then improving air quality.
- The experiences prove that using shallow ground geothermal is an efficiency and friendly way to environment currently.

## 对未来变动因素的考虑

- 由于使用“中央液态冷热源系统”供暖可以减少矿物能源的30~50%，即使使用的全部电力来自于燃煤，也能减少30%以上的温室气体排放，由于北京未来的电力将增加来自风力、水力、核能等比例，这一项目未来减少二氧化碳气体排放的效果会更为明显。

### The consideration of the factor to the future

Using Renewable Energy Sourced Cooling and Heating Environment System to heating can decrease the mineral energy for 30-50%. even though using all of electric power that produced by boiler with burning coal, can also decrease 3% of air emission from warm house. In Beijing area, the electricity energy will be increase, such as produced by wind power, water power and nuclear power etc., the result that reduce the emission of CO2 will be more obvious in the future.

## 对北京新建项目取暖的说明1

- 北京市的“十一五”规划草案已经明确，亦庄、通州、顺义三个新城五年内新增建筑面积约4000万平方米。
- 北京市“十一五”规划中已明确在北京大力发展利用浅层地能取暖。
- 2005年，恒有源公司在北京浅层地能取暖的工程比例中约占50%
- 计划在三个新城的比例占到30%左右。

### Illumination 1

- The plan of Beijing 11th 5 years already explains that Beijing will increase construction area in five years about 40,000,000 square meters in three new towns; they are Yizhuang, Tongzhou and Shunyi.
- The plan of Beijing 11th 5 years already explains that Beijing will develop the heating method of shallow ground geothermal energy.
- In 2005, HYY CO., Ltd. has heating project in shallow ground geothermal energy about 50% in Beijing.
- HYY makes a Plan that in three new towns has 30%.

## 对北京新建项目取暖的说明2

- 北京市领导多次到恒有源公司考查，肯定了这一技术，要求在北京推广。
- 北京市发改委、建委、环保局等部门推荐使用这一技术。
- 恒有源公司已在新城中设立了分公司，已有样板工程。

### Illumination 2

- The leaders of Beijing government came to HYY CO., Ltd. many times; they confirmed this technique and requested to extend it in Beijing area.
- The Development and Innovation Committee of Beijing, the Construction Committee of Beijing and the Environment Committee of Beijing were recommended that to using this technique.
- HYY CO., Ltd. was already established a branch in new town and have had the sample project.

## 推广中央液态冷热源系统的障碍

- 对新能源缺乏认识。浅层地能的开发在北京只有不到6年的历史，人们对它的认识不够，需要加大宣传力度。
- 由于产品使用时间短，规模小，目前在价格上高于传统取暖的燃煤锅炉。
- 在北京虽然有大量的示范工程，但缺乏大面积使用的范例。

### Obstacles to extend Renewable Energy Sourced Cooling and Heating Environment System

- Lack understanding to the new energy. The exploitation of shallow ground geothermal energy was just having 6 years in Beijing; people's understanding is not enough.
- The price of this system higher than traditional way due to product's usage time is not enough and the scope is small.
- Although there have a great deal of sample project in Beijing, lack the great usage.

## 对该工程的认识

- 浅层地能取暖取代燃煤锅炉已经进入商业化的初级阶段。
- 取得外部的支持，列入CDM项目，可以加快项目的进程，以规模效益促进产业的成熟。
- 新建筑的取暖设备寿命超过10年，安装后将持续使用，故在建设大发展的时期，安装利用可再生能源的设备有重大意义。

### To Understanding the Project

- The shallow ground geothermal energy will replace the traditional heating and cooling techniques, this innovation have already came into the first step of commerce.
- Obtain support of the exterior, be included in the CDM item, they will speed this progress and promote the industry to maturate with great scope.
- Heating equipments of lately construction have usage life more than 10 years; it will keep on use after installation. Therefore, it have great significance that install the equipments with renewable energy

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