



PROMOTING SWEDISH DISTRICT HEATING & COOLING TECHNOLOGY IN CHINA (2020)

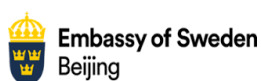
SUMMARY

Business Sweden, in close collaboration with Embassy of Sweden and SweHeat & Cooling, has been arranging 16 district heating/cooling roadshow conferences in China in 14 different cities since 2012.

In 2019 and 2020 Business Sweden is assigned by the Swedish Energy Agency to perform promotion activities in area of district energy in the Chinese market in close collaboration with Embassy of Sweden in Beijing and SweHeat & Cooling. Several activities promoting Swedish district energy solution has been performed in 2019, including roadshows to three cities.

A well-structured district heating and cooling promotion plan for year 2020 is required to coordinate the promotional activities. Since the outbreak of COVID-19 is affecting promotional events, an alternative plan – Plan B – moving promotional activities online is being evaluated and planned.

Swedish Energy Agency, Embassy of Sweden, Business Sweden and SweHeat & Cooling are working closely in performing a market evaluation and creating a district heating/cooling promotional plan for 2020 based on understanding of the Chinese market and Swedish offerings. The intent is to update this plan for 2020 onwards on a yearly basis.



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INTRODUCTION

Business Sweden, in close collaboration with Embassy of Sweden and SweHeat & Cooling, has been arranging 16 district heating/cooling roadshow conferences in China since 2012. The roadshow conferences have covered 14 cities in China. Among the roadshow conferences performed, majority of the conferences focus on district heating.

With support from the Swedish Energy Agency, a district heating and cooling promotion plan for year 2019 was developed to optimize the promotional activities. In 2019 several activities have been performed to promote Swedish district heating and cooling solution in the Chinese market:

- Sino-Swedish District Energy Conferences were performed in Yantai city, Shandong province and Beijing respectively in September 2019 with focus on district heating. The Swedish delegation was headed by Mr. Magnus Carnwall, Energy Counsellor, Embassy of Sweden. Participating companies were IVL, Alfa Laval, Elpanneteknik Sweden AB, Östberg, Vexve OY, Swep, Termoekonomi, Wideco, Zeta Boiler / Z&I and PG Monitoring;
- Wuhan– Sweden District Heating and Cooling Roundtable was conducted in Wuhan city, Hubei province in December 2019. Eight companies participated in the event (six Swedish companies and two other foreign companies complementing the Swedish solutions in district cooling). The participating companies are: Alfa Laval, Elpanneteknik Sweden AB, Östberg, PG Monitoring, Munters, Zeta Boiler/ Z&I, Evapco and Johnson Controls (York). The Swedish delegation was headed by Mr. Magnus Carnwall, Energy Counsellor, Embassy of Sweden;
- *“Promoting Swedish District Heating & Cooling Technology in China (2019)”* was completed at the beginning of June 2019 and distributed to the relevant Swedish companies. The free downloadable version of the report is available at <http://heatnetworks.se/international-promoting-swedish-district-heating-cooling-tech-in-china/>
- *“District Energy by Sweden – Best Practice Guide”* was compiled in English and Chinese to promote Swedish technology and solutions in area of district heating and cooling. English version of the Best Practice Guide is available at <http://heatnetworks.se/sweden-best-practice-guide/> for free downloading. Hardcopies of the Best Practice Guide are distributed to the relevant Chinese stakeholders at the district energy events organized by the Embassy of Sweden in Beijing, SweHeat & Cooling and Business Sweden;
- Participation in selected 3rd party events to promote Swedish district energy solutions
- Participation in high-level meetings between Sweden and China

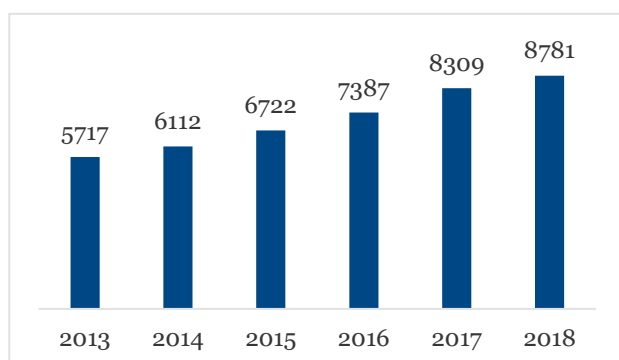
A well-structured district heating and cooling promotion plan for year 2020 is required to coordinate the promotional activities. The plan shall support a long-term ambition to promote Swedish district energy expertise in China, and the short-term promotion shall support the long-term vision.

DISTRICT HEATING AND COOLING IN CHINA

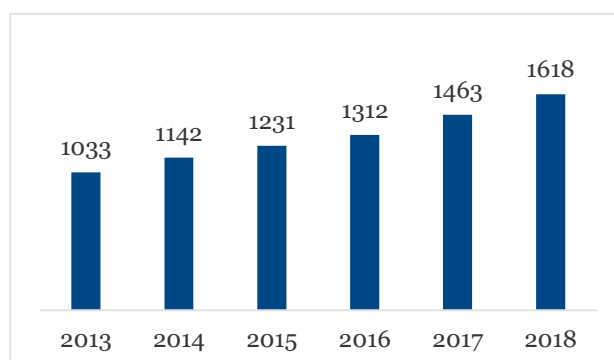
DISTRICT HEATING

By 2018, the central heating area of Chinese cities has reached 8,781 million square meters, and 1,618 million square meters in county towns.

*Chart 1: Area of district heating in cities
(unit: million square meters)*



*Chart 2: Area of district heating in county towns
(unit: million square meters)*



Latest news related to district heating

Energy Law soliciting opinions

On April 10th, 2020, the [National Energy Administration](#) issued the "Energy Law of the People's Republic of China (Consultation Draft)" and solicited opinions.

The Energy Law (Consultation Draft) intends to make renewable energy a priority area for energy development.

- Developing combined heat and power, and cogeneration of heat and power subject to local conditions;
- Optimizing the structure of natural gas utilization and increase the proportion of natural gas in primary energy consumption.

The state encourages urban and rural areas to develop and utilize renewable energy on the spot and build a multi-energy complementary distributed clean energy supply system. Support the development of rural energy resources, promote the use of renewable energy according to local conditions, improve the energy consumption conditions for farmers' cooking and heating, improve the efficiency of rural production and domestic energy consumption, and increase the proportion of clean energy in rural energy consumption.

National Development and Reform Commission publicly solicited opinions on several measures such as heating prices and charges

On April 10th, 2020, National Development and Reform Commission, together with other relevant department, has drafted "Opinions on Regulating the Charges of Urban Water Supply, Electricity, Gas, and Heating Industries to Further Improve Service Quality (Consultation Draft)" to solicit opinions from the public. For more info please kindly click [NDRC](#)

According to the document, by 2025 the charge for water supply, electricity, gas and heating shall be standardized and unreasonable charges shall be removed. A scientific, standardized and transparent pricing system shall be established. Government subsidy mechanisms is further improved, quality and efficiency of public utility products and service supply has been significantly improved.

National Energy Administration recognizes heating by biomass boiler

National Energy Agency, in late 2019, requested relevant local authorities to submit information related to heating by biomass boiler.

According to National Energy Agency, heating by biomass boiler is regarded as green, low-carbon, clean and renewable heating method. It is suitable for small and medium-sized industrial parks and urban heating.

Beijing promotes ground source heat pump

The Beijing Development and Reform Commission approved three ground source heat pump projects in 2019, located in Shijingshan, Haidian and Shunyi district respectively. The projects in Haidian district and Shijingshan district were completed by end of 2019. The project in Shunyi district plans to be completed by October 2020. After completion, the total heating area will reach 360,000 square meters, which can replace about 4,500 tons of coal, which is equivalent to reduction of carbon dioxide emissions by 11,300 tons and nitrogen oxide emissions by 6.66 tons.

In January this year, the Beijing Development and Reform Commission and eight other authorities jointly issued the “*Implementation Opinions on Further Accelerating the Application of Heat Pump Systems to Promote Clean Heating*”. This policy proposes that by 2022, the city will add a heating area of 20 million square meters with heat pump as heating source and by then the accumulated heating area by heat pump will reach 80 million square meters, accounting for 8% of the city's heat supply. After this goal is achieved, on average, the annual consumption of fossil energy such as coal and gas will be reduced by approximately 1 million tons equivalent to standard coal, and carbon dioxide emissions will be reduced by 2.4 million tons.

Key challenges for the district heating market in China

Interviews with Swedish companies active the district heating sectors indicates the following challenges in China's district heating market

- General lack of knowledge and capabilities on how to make the most of the available technologies, the design, construction and operation of the project using the technology is far from satisfactory
- Chinese heating supply companies are city-owned and it is highly related to the local government funding (subsidy). Most of the heating companies (except those in big cities like Beijing) lack enough financial support from the government so they have strong price pressure in the procurement process that leads to the reduction of technology level and work quality
- Local heat and business plans should be developed
 - This includes plans for merging DH companies, pooled operation, rehabilitation of outdated and low-efficient technology, and demand-driven supply
 - So far there is no initiative from the Central Government to implement a policy requiring Cities to develop good energy plans

Foreign companies in China has identified some barriers to work with Chinese heating companies:

- Since the heating companies are financed by the city or state-controlled companies, procurement of equipment must go through public tenders and very often the lowest price wins (most often resulting in low quality material being procured).
- District heating companies are operators. Heating fees collected from end users are not able to support their sustainable development, therefore the heating companies must request funds from the city for upgrading equipment etc. Some district heating companies are not able to afford advanced technology / equipment due to financial reasons.

DISTRICT COOLING

Market overview

The business climate for district cooling in the China is market driven, which is relatively like that in other countries. In the absence of regulations specific to district cooling, some building codes indirectly support the energy efficiency improvements espoused by district cooling.

Energy demand for space cooling in buildings in the People's Republic of China ("China") is rising rapidly, placing strains on the electricity system and contributing to local air pollution and carbon dioxide (CO₂) emissions. China saw the fastest growth worldwide in energy demand for space cooling in buildings over the last two decades, increasing at 13% per year since 2000 and reaching nearly 400 terawatt-hours (TWh) of electricity consumption in 2017. As a result, space cooling accounted for more than 10% of total electricity growth in China since 2010 and around 16% of peak electricity load in 2017. That share can reach as much as 50% of peak electricity demand on extremely hot days, as seen in recent summers. Cooling-related CO₂ emissions from electricity consumption consequently increased fivefold between 2000 and 2017, given the strong reliance on coal-fired power generation in China. (Source IEA report "The Future of Cooling in China" June 2019)

Although the demand for cooling is increasing there are only about 15-20 District Cooling projects in China, so the growth potential for District Cooling is very large.

Key challenges for the district cooling market in China

Key problem with district cooling is that projects are not economically sustainable because of the way Chinese Design Institutes design and implement the District Cooling systems, reason being that:

- Oversizing the capacity is typical in district cooling in China – more equipment and heat exchanger installed than necessary
- All investment is made at once (instead of step by step), without calculating how quick the buildings will be rent out
 - An example is that Guangzhou University built everything at the beginning and it took 10 years to reach a breakeven result
- Chinese design institutes are not experienced in district cooling and the expert committee has traditional thinking without international experiences.

Sweden enjoys a high reputation of district cooling in the Chinese market. Swedish experience and competence in district cooling is to be shared at cooling conferences.

SWEDISH COMPETENCE IN DISTRICT HEATING AND COOLING

The Swedish government has announced *Sustainable Heating and Cooling* to be a prioritized area for international collaboration in the coming years.

Sweden has 60 years of experience of installing & modernizing heat networks and District Heating worldwide.

- During the last 60 years Sweden has achieved a nationwide expansion of heat networks with a substantial reduction of CO₂-emissions
- Nearly all of the fuel is from renewable sources
- The Swedish Electrical Power market was deregulated 1996
- DH is competing with other heat sources and the heat networks have mixed ownership, municipalities, investors (large, small), coops (customer owned)

Example of competences in the Swedish offerings

<p>Products, components, management and engineering competences are highly developed in Sweden in all the areas.</p>	<p>Building and installation</p> <ul style="list-style-type: none"> • Automation • Radiators/under floor heating • Balancing valves • Pumps <p>Energy Transfer Stations (ETS)</p> <ul style="list-style-type: none"> • Heat exchanger • Automation & Control • Meters <p>Heat and cooling distribution</p> <ul style="list-style-type: none"> • Pumps • Leakage detection systems • Pre-insulated valves • Monitoring & Control <p>Energy supply</p> <ul style="list-style-type: none"> • Biomass hot water/ steam boilers • Large heat exchangers / brazed heat exchanger • Gas turbines & Gas engines • Combined Heat & Power • Large heat pump applications • Thermal energy storage tanks • Heat energy meters • Waste to energy <ul style="list-style-type: none"> ○ Waste handling, sorting etc. ○ Combustion process ○ Combined Heat & Power ○ Flue gas treatment ○ Flue gas condensing
<p>Services</p>	<p>Knowledge/ consultants</p> <ul style="list-style-type: none"> • Pre-feasibility/Feasibility • Peer-to-peer advice • System design • Project planning • Procurement • Installation & operations • Maintenance and administration <p>Energy Management</p> <ul style="list-style-type: none"> • Scada, controllers, optimisation • Communication • Decision support • Maintenance support • Operations services

OPPORTUNITIES FOR COLLABORATION AND TARGET STAKEHOLDERS

DISTRICT HEATING

Potential target market for Swedish companies includes:

Energy systems based on household waste



- Waste to Energy for production of electricity, District Heating & District Cooling
- Sorting of garbage will result in possibilities for bio-gas production that can be upgraded to transportation fuel
- Recycling of different materials
- Plasma gasification of hazardous waste

Upgrade of existing Power Plants to more flexible operation



- Modification of steam turbines and boilers combustion systems
- Addition of thermal energy storage
- Installation of electrical boilers for use of renewable electricity at night



Long Transmission lines for District Heating



Rehabilitation of existing District Heating systems



Biomass to energy

Key stakeholders for Swedish district heating conference:

Target participants from Chinese side are:

- Relevant government agencies
- Municipal government officials
- Development and Reform Commission of city level, preferably provincial level
- Municipal heating supply offices
- Local district heating companies
- City planners
- Local thermal groups, such as Beijing Thermal Group, Taiyuan Thermal Group, etc.
- Design institutes, such as North China Municipal Engineering Design & Research Institute Co., Ltd.

DISTRICT COOLING

Starting in Sweden in the early 1990's, District Cooling (DC) has had a rapid development. Today, District Cooling production in Sweden has grown to the same size as the production of the much older product wind power. But there is a very important difference: Unlike wind power, District Cooling has been successfully established without any subsidies! The cooling business in Stockholm is run by the energy corporation Fortum and alone accounts for about half of the national supply. 7 000 000 square meters of commercial area in the Swedish Capital are supplied with District Cooling via the cooling distribution network, that is currently 76 kilometers long.

Potential target market for Swedish companies includes:

- Energy Transfer stations with Heat Exchangers & Control Equipment
- Piping networks
- Production Plants with Thermal Energy Storage

Key stakeholders for Swedish district cooling conference:

Target participants from Chinese side are:

- Project owners, such as commercial building developers
- Municipal government officials
- Development and Reform Commission of local levels
- Design institutes, such as Guangdong South China Architectural Design & Research Institute and East China Architectural Design & Research Institute (ECADI)
- Engineering companies

ENGAGEMENT OPTIONS

Swedish actors have for a long time been working actively in the promotion of district heating and cooling. During the last couple of years, the government, embassies, Business Sweden and SweHeat & Cooling have conducted activities together with among others China. The goal has been to promote knowledge and understanding of Swedish expertise in district heating and cooling. The competition within the area is substantial from the Nordic region – Finland and Denmark – as well as from other countries – Germany, Italy, Korea and USA. Large global actors such as EDF, Engie, Suez, Veolia/Dalkia and more are also established on the market. Regarding suppliers of equipment there are also numerous Chinese companies that make up the competition.

Foreign companies seeking to expand in China have in the past met significant challenges. Hence, a Swedish initiative within district heating and cooling in China needs to be long term (minimum 5 years),

well established within a broad base of companies and organizations and defined by clear goals and aspirations.

In addition to conventional engagement options, moving promotional activities online has been evaluated due to outbreak of COVID-19.

CONVENTIONAL ENGAGEMENT OPTIONS

- Memorandum of Understanding (“MoU”) or similar:

The purpose of Memorandum of Understanding (“MOU”) is to formally create a mutually beneficial working relationship between the parties signed.

A Memorandum of Understanding on energy cooperation was signed between the Ministry of the Environment and Energy of Sweden and the National Energy Administration of China in March 2017. The objective of this Memorandum of Understanding is to establish a framework for cooperation in the field of energy between Sweden and China, enabling scientific and technology exchange, capacity building, exchange of experiences and exploring trade exchange opportunities in Sweden and China, with a special focus on sustainable energy development.

MoU can be signed between countries, cities, associations etc. Follow-up activities are crucial after MoU signed. In the field of district heating and cooling it can be further explored the need and possibilities of an agreement.

- Workshop / seminar / conference / roadshow in China

Tailored made program with local partners aiming to influence and engage with a targeted audience. Themes can be technical, commercial and/or policy focused. Audience can be potential customers, partners or influencers relevant for the Swedish companies.

High level participation from Embassy of Sweden helps to secure high level participation from the Chinese side. Participation from Swedish Energy Agency plays an important role. This is particularly important to the heating event as district heating is not a pure commercial business in China (semi-government business). Training targeting managers and engineers in China

Develop a new type of seminar that have parallel sessions and works more as a training course where the Swedish companies are more like instructors and thereby build relations with staff of the local companies. These seminars we could charge for as they will be more like training sessions. Suggestion is to charge 2500 RMB for the 2-day seminar.

The agenda for such a seminar could look as follows:

Introduction to the Workshop			
Business Management track	Combined Heat & Power, Heating Boiler Plants	Distribution Piping Networks	Substations & Building systems, Energy Savings
Business Planning, Public Private Partnerships, Financing, Cost Structure, Tariffs etc.	CHP & Boiler Plants burning different renewable fuels, Electrical boilers for heating and balancing of electrical system, Control, SCADA, Optimization of operation etc.	Prefabricated pipe systems, pipe-joints, pre-insulated valves, leak detection systems, data gathering from pipe networks etc.	Balancing of buildings heating systems, heat energy recovery, heat exchangers, prefabricated substations, controls for substations, data gathering and transfer of data etc.
Local Company Managers	Technical Staff, local company appoints 20-30 leading staff	Technical Staff, local company appoints 20-30 leading staff	Technical Staff, local company appoints 20-30 leading staff
2-3 Swedish professionals with experience from this type of work.	Mälarenergi Zeta Boilers, Valmet, ABB, Elpanneteknik, SaltX, Consultants	PG-monitoring, Mittel, Wideco, Vexve, Langfan Piping Consultants	Alfa Laval, SWEP, Östberg, Regin, Siemens,
Panel Discussion with Selected Swedish Companies			

- Study trips to Sweden

Political and top management-level visit to Swedish District Energy Utility Companies. Tailor-made program on experience sharing and site / company visits.

Study trip to Sweden preferably could be combined with major conference / fairs in Sweden or in other neighboring countries.

Suggest cooperating with China District Heating Association or other relevant organizations to recruit Chinese participants.

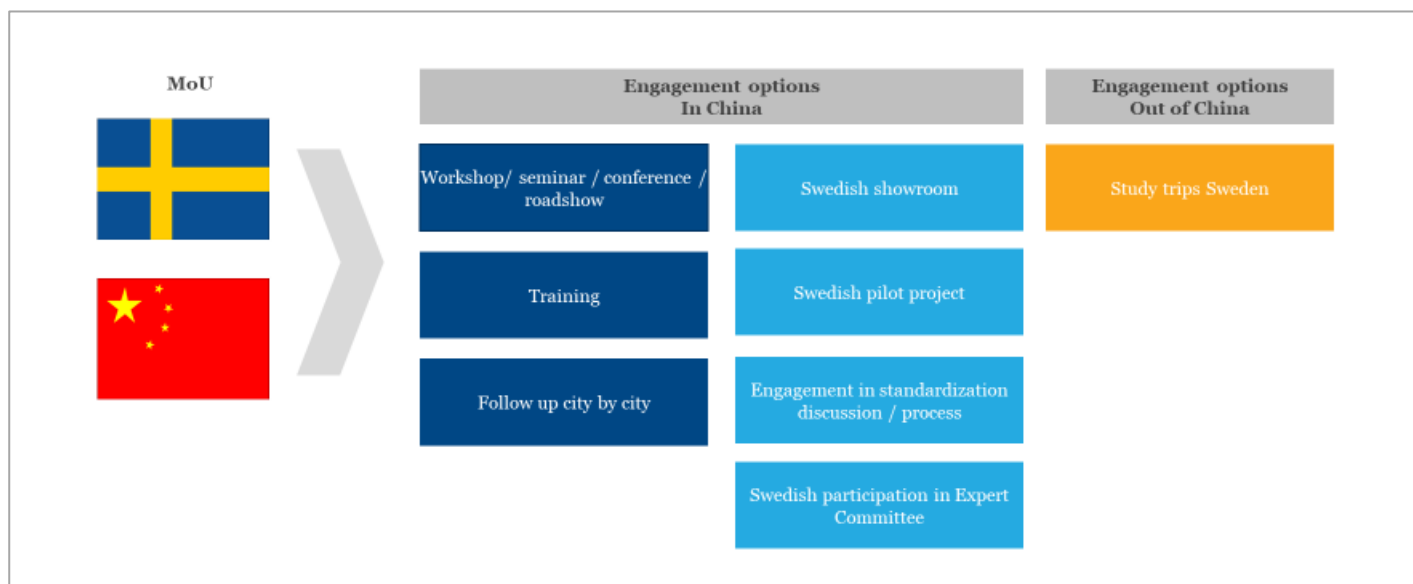
Suggest cooperating with Swedish solution providers in district heating / cooling, Smart City Sweden (a good showcase for smart & sustainable city solutions from Sweden) in order to secure a good program in Sweden.

- Follow up city by city

Based on the relations created through this process a “Swedish” team will visit each city and together with officials and professionals outline and structure a cooperation project where services and products from Swedish companies can be implemented.

- Other engagement options
 - Showroom showcasing Swedish solutions
 - Pilot project
 - Engagement in standardization discussion / process
 - Swedish participation in Expert Committee in China providing advice to project owner etc.

Illustration: Engagement options



MOVING PROMOTIONAL ACTIVITIES ONLINE

The outbreak of COVID-19 has created difficulties in travels or organizing conferences. How to conduct the promotional activities online has been evaluated.

Summary of the key findings is:

- Physical workshop outperforms online workshop for promotion activities;
- It is possible to move district heating/cooling promotion activities online, but it must meet certain criteria:

- Target audience of the DH /DC online workshop is expected to be stakeholders that have interest and motivation to join the workshop, e.g. district administration with DH / DC project in pipeline and keen on learning DH / DC solutions;
- Number of participants for an online workshop is suggested to be within 20;
- Short video outclasses company presentation in PowerPoint format for an online workshop;
- Length of an online workshop is suggested to be 1 hour or slightly more than 1 hour with interaction between Swedish companies and Chinese stakeholders;
- Zoom or WeChat Work are preferred digital tools.
- Suggest Swedish company prepare a company video to present company and products/ solution for online promotion activities

GEOGRAPHIES FOR SWEDISH COMPETENCE

China is launching a "New Infrastructure" campaign to offset the economic impact of the coronavirus pandemic and boost sustainable growth.

In a meeting held on Monday, April 20th, 2020 the NDRC (National Development and Reform Commission) provided a clear definition of the “new infrastructure” that will be included in these expanded investment plans for 2020.

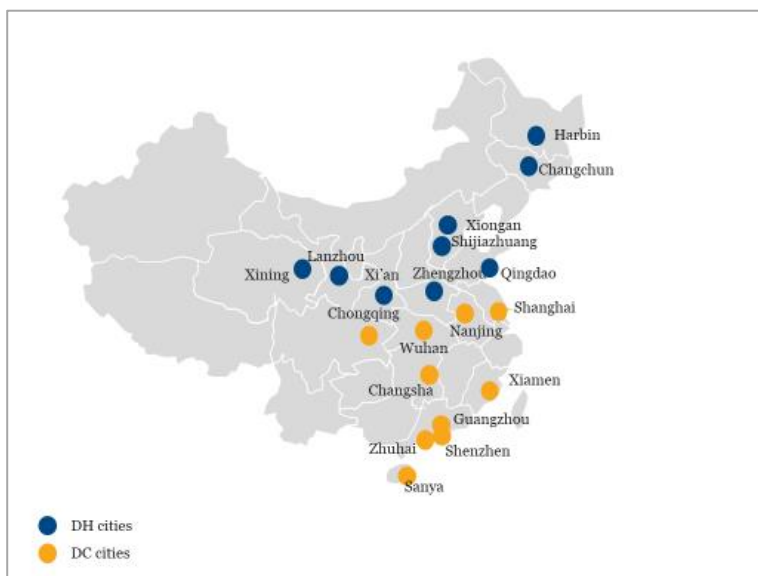
According to NDRC, China will invest in information, integration and innovation infrastructure projects and promote technologies related to 5G, Internet of Things, satellite internet, artificial intelligence, cloud computing, blockchain, data centers and smart computing centers. China will continue to support scientific research related to these technologies, which will be applied in the country’s energy, transport and industrial sectors.

Business Sweden and SweHeat & Cooling will monitor district energy projects driven by New Infrastructure. Cities with projects in pipeline will be prioritized for district heating / cooling roadshows.

District heating:

Several cities are selected as potential sites for district heating roadshows.

- Harbin, Heilongjiang province
- Changchun, Jilin province
- Shijiazhuang, Hebei province
- Xiong'an, Hebei province
- Lanzhou, Gansu province
- Xining, Qinghai province
- Xi'an, Shaanxi province
- Zhengzhou, Henan province
- Qingdao, Shandong province



City selection criteria for district heating include:

- Change of fuel type (changing from coal to oil/gas; using renewable energy, industrial waste energy etc. as heating source);
- City with projects in pipeline, e.g. new district heating / cooling project;
- No waste city pilot;
- City with waste to energy projects;
- “2+26” cities of air pollution transmission channel in Beijing-Tianjin-Hebei area;
- Recommendation from Swedish companies as well as Chinese relevant organizations;
- 2nd tier city in major province (e.g. 2 tier cities in Shandong province).

Name of city	Population	Project info/ heating plan	Remark
Harbin, Heilongjiang province	10,8 million (2018)	Clean Heating Plan 2019-2021 Objective: by 2021 the clean heating rate will reach 80%, 70% and 40% in urban areas, towns and rural areas respectively.	Harbin has close cooperation with Danish companies in district heating
Changchun, Jilin province	7,7 million (2018)	Jilin province, on April 3 rd , 2020, passed an investment plan on improving heating system. Total investment at RMB 22 billion incl. 7 billion budgeted for 2020. For more info please click here	On-line business meeting with Great Resources (a company in Changchun city of Jilin province focusing on biomass to energy) is planned in May 2020.
Shijiazhuang, Hebei province	11,0 million (2019)	Blue Sky Plan (2018-2020) By 2020, the total emissions of sulfur dioxide and nitrogen oxides in Shijiazhuang City will decrease by 40% compared with 2015; the average concentration of urban fine particles (PM2.5) will drop by more than 33% from 2015; the number of days with good air quality in cities will increase by 17% compared to 2015.	China-Finland Heating Technology Center is in the city
Xiong'an New Area, Hebei province	1 million (2017)	Clean heating system: build distributed heating systems that are supplemented by electricity, natural gas, geothermal, solar energy, air energy, urban waste heat, and bioenergy. By 2035, 35 main stations and 60 sub-stations will be built in the start-up area. Combined with the geothermal resources of the new area, a multi-energy complementary integrated heating system will be formed.	<ul style="list-style-type: none"> • New Area supported by Chinese central government • Swedish delegation visited Xiong'an Group in January 2020. District energy is one of the topics for discussion • Follow up activities in 2020 with the heating companies
Lanzhou, Gansu province	3,7 million (2018)	Clean Heating Plan (2018-2021) It is planned that by 2021 clean heating will account for 81,3% of the total heating area. An evaluation indicates that the proportion of clean heating in heating season from 2018-2019 was 81,8% in Lanzhou city, the goal of 81,3% by 2021 was completed ahead of schedule.	
Xi'ning, Qinghai province	2,4 million (2019)	National Development Reform Commission and Ministry of Housing and Urban-Rural Development has issued "Lanzhou-Xi'ning City Cluster Development Plan" in 2018. The plan is valid till 2035. Such cities as Lanzhou, Xi'ning, Baiyin, and Haidong shall carry out clean heating projects to improve air quality. Please click here for the plan.	

Xi'an, Shaanxi province	10,0 million (2018)	Clean heating rate reaches 100% by 2021. District heating with clean heating source is prioritized in urban areas. According to the city's renewable energy distribution conditions, promote the construction of ground source heat pumps, sewage source heat pumps, and mid-deep geothermal heating projects. For areas not covered by municipal central heating, geothermal energy heating, sewage source heating and other centralized heating methods are suggested.	Nordic Sustainable Cities promotion activities conducted in Xi'an in 2018 and 2019
Zhengzhou, Henan province	10,3 million (2019)	Clean Heating Plan 2017-2021 Using geothermal heat as a heat source to provide central heating for residents in areas not covered by the central heating pipe network in Zhengzhou city.	<ul style="list-style-type: none"> • Danish heating delegation visited the city in 2016 • Finnish delegation visited the city in 2018 focusing on clean heating
Qingdao, Shandong province	9,5 million (2019)	Two heat pump projects planned for 2020	

District cooling:

- Chongqing (planned for 2020 DC activities)
- Shanghai
- Nanjing, Jiangsu province
- Changsha, Hunan province
- Xiamen, Fujian province
- Wuhan, Hubei province (DH/DC workshop conducted in Dec 2019)
- Guangzhou, Shenzhen and Zhuhai, Guangdong province (DC workshop conducted in Zhuhai city, 2018)
- Sanya, Hainan province

City selection criteria for district cooling include:

- City with potential projects
- Recommendation from Swedish companies as well as Chinese relevant organizations

NECESSARY PARTNERSHIPS

Summary of necessary partners

China Renewable Energy Engineering Institute (CREEI)	Design institute	Potentially invited speaker for Swedish district heating/cooling roadshows
China District Heating Association (CDHA)	Association	Local partner for Swedish district heating conference
China Association of Building Energy Efficiency Clean Heating Industry Committee (CHIC)	Association	Established in 2018 Potential local partner for Swedish district heating conference
China Association of Building Energy Efficiency, District Energy Division	Association	Potential local partner for Swedish district cooling conference
Chinese Association of Refrigeration	Association	Potential local partner for Swedish district cooling conference

China Refrigeration and Air-conditioning Industry Association (CRAA)	Association	Potential partner for cooling conference, but the association requires endorsement from ministry in China for cooperation
Biomass Industry Branch of China Industrial Development Association	Association	Potential partner for Swedish district heating conference
Provincial / municipal heating office and relevant government officials	Governmental organization	Potential partner for district heating conference at local levels

Partners in China

China Renewable Energy Engineering Institute (CREEI, 水电水利规划设计总院)

<http://www.creei.cn/portal/index/welcome.html>

The Institute is currently under the management of China Power Construction. The institute manages hydropower, wind power, solar photovoltaic power generation from technical perspective; and it functions as an industrial policy research center for the development and construction of electric power, water conservancy and clean renewable energy.

Suggest involving the organization in the Swedish district heating/ cooling conference as guest speaker or co-organizer.

China District Heating Association (CDHA, 中国城镇供热协会)

<http://www.china-heating.org.cn/>

Contact: Ms. Niu Xiaohua, Deputy Secretary General, phone: 13910700293

Founded in 1987, China District Heating Association is a national, industry-based, non-profit social organization that is voluntarily formed by urban heating enterprises, institutions, and social organizations. The purpose of the association is to serve as a bridge between government departments and enterprises, provide services, reflect demands, regulate behaviors, develop self-discipline, safeguard the legitimate rights and interests of members, strengthen industry norms, and promote the sustainable development of urban heating in China.

The Association has more than 700 membership companies including heating suppliers, research institute and equipment suppliers.

CDHA has cooperation with Danish Board of District Heating (DBDH). Starting from 2013, there were four Sino-Denmark Green Heating Forum hosted jointly by DBDH and CDHA. The latest one, the 4th Sino-Denmark Green Heating Forum, was held in 2017 in Denmark.

CDHA was the local partner for the Sino-Swedish District Energy Conference held in Beijing in September 2019.

China Association of Building Energy Efficiency Clean Heating Industry Committee (CHIC) (清洁供热产业委员会)

<http://www.chic.org.cn/>

Established in 2018, China Clean Heating Industry Association (CHIC) is an organization composed of entities and individuals such as clean heating enterprises, product equipment manufacturers, energy conservation and environmental protection companies and financial investment institutions. It is a branch of China Association of Building Energy Efficiency.

Mission of CHIC is to publicize the policy of clean heating, guide the market for reasonable competition and promote the healthy and sustainable development of the industry.

Key tasks of CHIC include: Clean heating industry policy research; industry standard formulation; technology promotion; financing service; brand publicity; market expansion and international exchange.

China Association of Building Energy Efficiency, District Energy Division (中国建筑节能协会 区域能源专业委员会)

<http://www.cabee.org/>

Contact: Mr. Xu Wenfa, phone: 13910163921

Under the Ministry of Housing and Urban-Rural Development, the association is a nationwide, industry-based, non-profit organization organized by building energy conservation and green building related enterprises, social organizations and individuals. It is mainly engaged in community standards, certification marks, technology promotion in the field of building energy conservation and green building.

Chinese Association of Refrigeration (中国制冷学会)

<http://www.car.org.cn/>

Chinese Association of Refrigeration (CAR) was founded on April 25th, 1977. CAR is a national scientific organization in the field of refrigeration and air-conditioning. CAR is a member of the International Institute of Refrigeration (IIR, headquarter in Paris). Up to now, CAR has 620 company members, 101 fellow members, more than 1,000 senior members, more than 13,000 ordinary members and 10,000 student members. CAR has the most of the KOLs in China in the areas of refrigeration and cooling as their advisors, executes, or members.

CAR is committed to solidify and serve its members and the refrigeration workers. For the development of refrigeration science and technology, CAR has conducted a wide range of events and activities such as academic exchange both at home and abroad, publishing professional books, technological materials and science textbooks. CAR is responsible to formulating and revising standards of refrigeration technology and products, improving cold chain standardization system. CAR is co-organizer of China Refrigeration Expo.

China Refrigeration and Air-conditioning Industry Association (CRAA, 中国制冷空调工业协会)

<http://www.chinacraa.org/>

Contact: Wang Kaixiang, phone 136 0133 2064

China Refrigeration and Air-conditioning Industry Association is a national-level industrial organization mainly representing refrigeration and air-conditioning manufacturers, and research, design institutes. CRAA was established in 1989 and it currently has 20+ employees, all based in Beijing.

CRAA has been the co-organizer for China-Sweden District Heating and Cooling Workshop in 2017 and 2018. The workshop in 2017 was taking place in Shanghai and the Consulate General of Sweden in Shanghai has been involved. The 2018 workshop was taking place in Xi'an.

China-Sweden District Heating and Cooling workshop in 2017 and 2018 was initiated and supported by the Chinese Ministry of Ecology and Environment and Swedish Environmental Protection Agency, as they categorize the workshop under the program of "Montreal Protocol on Substances that Deplete the Ozone Layer".

CRAA could be a local partner for district cooling conference. However, CRAA wishes to have endorsement from Chinese Ministry of Ecology and Environment to be able to co-organize district cooling event.

Biomass Industry Branch of China Industrial Development Association (BEIPA, 中国产业发展促进会生物质能产业分会)

<http://www.cn-bea.com/index.html>

Contact: Mr. Zhang Dayong

Established in 2017. A key organization with focus on agriculture and forestry biomass power generation, biomass energy heating, biological natural gas (biogas), gasification, biomass liquid fuel and biomass fuel processing and production etc. Members of the association include organization in area of investment and construction, operation management, technology research and development, equipment

manufacturing, academic research, engineering construction, and consulting services in the biomass sector.

SYNERGIES/COLLABORATION OPPORTUNITIES WITH OTHER SWEDISH AND INTERNATIONAL INITIATIVES

- **Nordic Sustainable Cities 2020**

A program supported by Nordic Innovation with involvement of trade promotion organizations from all Nordic countries in China. Business Sweden is actively involved in the project.

Six cities in China has been selected to promote Nordic Sustainable Cities concept. The selected cities are Beijing winter Olympics / Zhangjiakou, Xi'an/ Xixian, Chengdu, Wuhan, Zhaoqing and Yixing.

Suggest actively involved in the relevant promotional activities in 2020.

- **Smart Cities**

<http://smartcitysweden.com/global-goals/>

Smart City Sweden has a showroom located in in Hammarby Sjöstad, Stockholm. In the showroom, visitor will be able to explore smart and sustainable city solutions from all over the country. Smart City Sweden showroom has received many visitors from China incl. city management, researchers, company representatives etc.

Smart City Sweden is managed by IVL Swedish Environmental Research Institute. IVL China organization has promoted the Smart City Sweden concept at many locations in China incl. Beijing, Qingdao, Harbin, Baotou (Inner Mongolia) and Sichuan etc. According to IVL, the Smart City Sweden concept is well received by relevant stakeholders in China.

IVL has been invited to participate in the district heating and cooling event.

- **Cleantech Hub**

<http://cleantechhubs.se/hub/shanghai/>

Given Sweden's long experience and strong expertise in cleantech, and more specifically in the field of innovation of renewable energy, sustainable technologies and green transport, the program was established to spread knowledge and innovations internationally.

The program, powered by Swedish Energy Agency, aims to support Swedish cleantech companies to grow internationally by the establishment of three cleantech hubs in San Francisco, London and Shanghai. These selected cities across different continents are all characterized by major economies, a high level of innovation and a thriving investment climate.

The project started from 2017 and purposes of the program are:

- Increase marketing and exposure of Swedish innovations through strategic promotion and advisory
- Prepare the selected cleantech companies for an international expansion
- Offer a fast track introduction to new markets, strategic partners and investors
- Provide local support and business development to maximize their international growth potential

Business Sweden in China is the operator for the Cleantech Hub program. Involve relevant Cleantech Hub companies in the district heating and cooling activities.

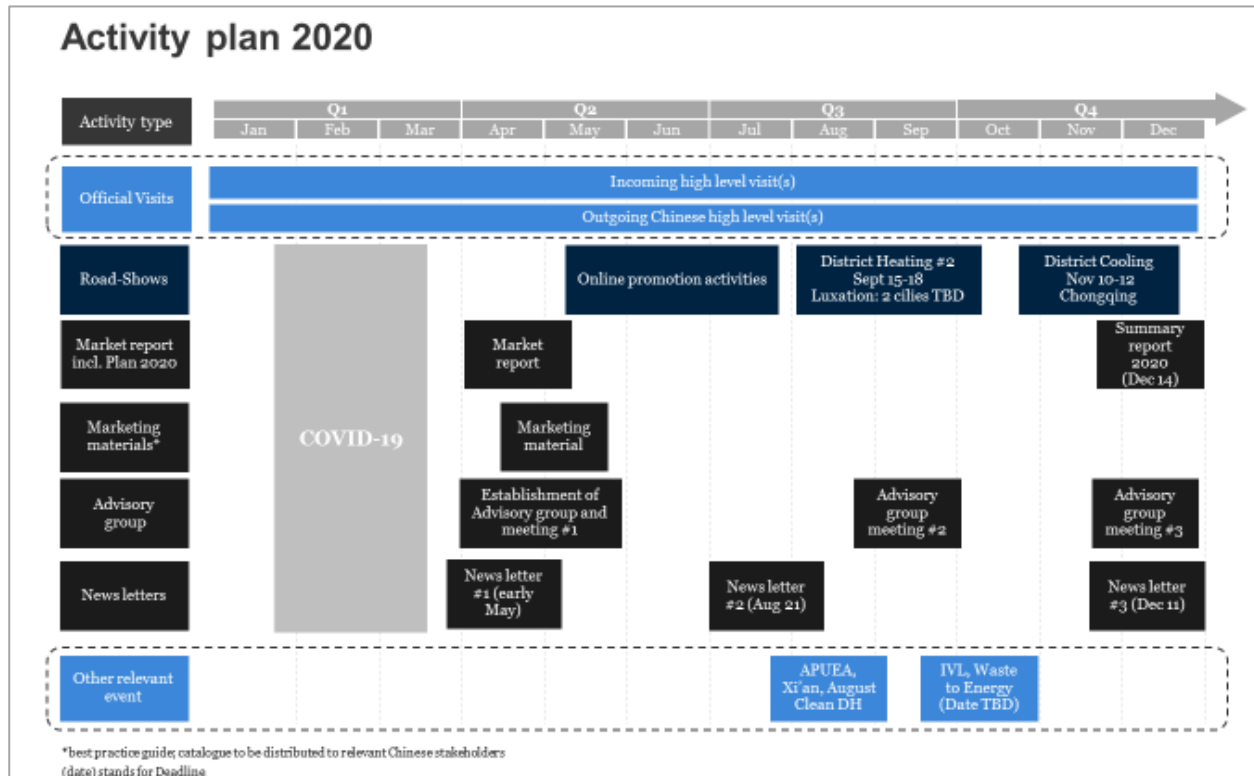
- **Business Finland**

Business Sweden will inform Business Finland on planned activities and invite them to have joint activities.

3RD PARTY EVENTS AND CONFERENCES

Due to outbreak of COVID-19, events / exhibitions of all types have been cancelled, postponed or moved to online only conference to mitigate the spread of coronavirus.

Business Sweden and SweHeat & Cooling continuously monitors the development.



ACTIVITY PLAN 2020

Q1, 2020	<ul style="list-style-type: none"> - A study on moving promotion activities online was conducted
Q2, 2020	<ul style="list-style-type: none"> - Market report & plan 2020 - Production of marketing materials - Forming the advisory group and performing the 1st meeting /Skype meeting - Newsletter #1 - Perform district heating/ cooling activities online before travel / gathering restriction is removed
Q3, 2020	<ul style="list-style-type: none"> - 2nd meeting/ Skype meeting of the advisory group - Newsletter #2 - Perform district heating/ cooling activities online before travel / gathering restriction is removed - District heating conference, subject to pandemic status - Participation to 3rd party events (if any)
Q4, 2020	<ul style="list-style-type: none"> - District cooling conference, subject to pandemic status - 3rd meeting/ Skype meeting of the advisory group - Newsletter #3 - Summary report of year 2020 - Assessment of the promotional activities in 2020 and plan for 2021

Other issues	<ul style="list-style-type: none"> - Suggest the concept of setting up a more platform-like creature to promote Swedish heating and cooling technologies, not relying on a substantial budget from a certain agency; - Participation to selected event(s) organized by 3rd parties such as: APUEA Xi'an event in August; Waste to Energy conference by IVL. - Consider leverage Heat Networks website to promote Swedish district heating and cooling technologies in China; - High level meeting(s).
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COMMUNICATION

Website and social media account are to be used to promote the relevant activities, particularly the district heating and cooling conference / roadshow.

Website and Social media accounts shall include but not limited to:



Website of Sustainable Heating & Cooling by Sweden



Website of SweHeat & Cooling



Business Sweden Asia-Pacific

Business Sweden Asia-Pacific at LinkedIn



Newsletter

KPI

Customer survey has been conducted after the conferences in 2019. Key feedbacks are:

- Swedish companies are in general satisfied with roadshow preparation and execution, and they are keen to know more of the Chinese participants prior to the event;
- The roadshow has led to potential leads for most of the Swedish companies;
- Effect of the conference would be better if the Chinese participants could attend the conference from beginning till the end (number of participants often reduced after lunch);
- One-to-one meeting is preferred by the Swedish companies in addition to company presentation to the audience;
- Swedish companies are interested in cities that have heating and cooling projects.