
MAPPING OF THE SWEDISH ENERGY & ENVIRONMENTAL TECHNOLOGY COMPANIES ESTABLISHED IN GREATER CHINA

For The International Environmental Technology
Cooperation, The Swedish Government Offices of
Sweden, May 2014

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Summary

There is no doubt that the Chinese market is important to Swedish Clean-Tech companies and that they see a great future potential in China. However, even though the companies in general are very optimistic they also say that it is a tough market. Moreover, while a majority of the companies interviewed have a bright outlook regarding China, only half of the companies state that they are doing well or very well on the Chinese market. One possible explanation to this gap could be that the companies not yet have reached their ideal business in China and are present in China as a result of a long-term market commitment and strategy.

The findings of this report can be summarized as follows:

- There is a wide spread in which industry segments Swedish Clean-Tech companies can offer their expertise in. But the two largest segments are Air Pollution Control and Water Treatment.
- The business focus of most companies is serving the market with products and services. A few companies have production in China.
- Most companies are established in the greater Shanghai and Beijing area.
- Private companies are the largest customer group.
- The local government is an important player regardless of who your end-customer is. The government can shape an entire industry by setting industry standards and controlling land prices.
- Swedish Clean-Tech companies' competitors are mainly other foreign players. Local players typically compete with lower price and have better Governmental relations. A high proportion of companies claim to have equal, or partly equal, access to market as local players
- It is hard for the Swedish Clean-Tech companies to track or see any real world projects derived from the Chinese Government's spending, incentives, and new policies. According to the companies, this is the result of a lack of transparency, industry standards and well-developed regulations.

List of acronyms and definitions

- IMT: The International Environmental Technology Cooperation, The Swedish Government Offices of Sweden
- CENTEC: Centre for Environment Technology in Embassy of Sweden
- Greater China: refers to Mainland China (PRC), Hong Kong and Taiwan (ROC) together
- China: refers to Mainland China (PRC)
- Company: refers to all entities within a company-group in one market (China, Hong Kong and Taiwan are treated as three separate markets in this report). I.e. a "one-company-one-market" approach is used. Some companies have more than one entity in a market; these entities are treated as one company.
- E&ET companies: Energy and Environmental Technology companies
- HVAC: Heating, Ventilation and Air-conditioning

Introduction and overview

China has achieved an astonishing transformation over the past three decades. The country has become an industrial powerhouse, lifted hundreds of millions of citizens out of poverty, and created a growing middle class with rising levels of prosperity. But progress has come at a high environmental cost: air quality in hundreds of cities is worsening and water resources across the country are deteriorating. These and other environmental issues are addressed at a high level, and the awareness among the public is causing concerns. Governmental spending and incentives are substantial, as well as the need for foreign technology. The question posed then is: How can Sweden, as a forerunner within the Energy & Environmental Technology field, tap in to this opportunity? Which Swedish Energy and Environmental Technology companies are already present in China and how do they perceive the market?¹

Team Sweden – official Sweden’s joint actions in China

In order to support Swedish Clean-Tech companies in China the Swedish Embassy in Beijing, Centec, The Consulate Generals in Shanghai and Hong Kong, Growth Analysis, IMT and Business Sweden – The Swedish Trade and Invest Council work together and co-ordinate their actions and promotion activities. One objective of Team Sweden is to act as a door-opener for Swedish companies doing business in China.

Many Swedish Energy & Environmental Technology-companies have established themselves in China

The industry segments that Swedish companies are present in are widely spread-out. Air Pollution Control, Water Treatment, District Heating & Cooling, Energy Efficient Buildings and Sustainable Transport are company-number-wise the largest segments. The distribution of the 48 identified companies in different sectors is:

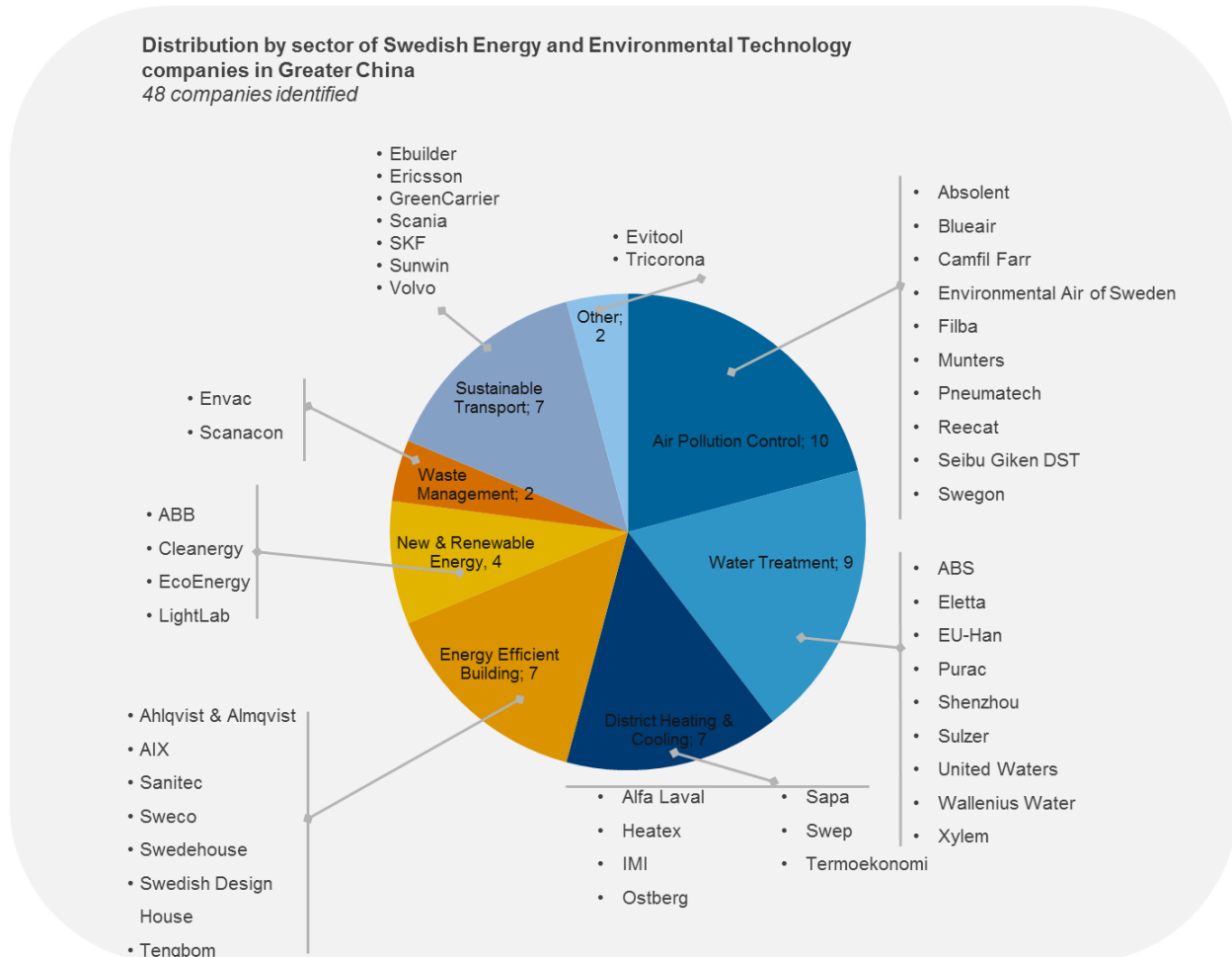
- Air Pollution Control: 10 companies
- Water Treatment: 9 companies
- District Heating & Cooling: 7 companies
- Energy Efficient Buildings²: 7 companies
- Sustainable Transport: 7 companies
- New & Renewable Energy: 4 companies
- Waste Management: 2 companies
- Other: 2 companies

¹ Read more about the project background and focus in appendix 1

² This group includes architect firms and technology consultants



Graph 1: Air Pollution Control and Water Treatment are the dominant segments in China



Business focus

The business focus of most companies is on serving the market with its products and services; i.e. sales. A few have both sales and production functions in China. Only two companies have local R&D as well. The business focus is also reflected in the size of the companies' China operations, which in general are small, with less than 50 employees³, implying that to only conduct sales requires fewer personnel than production and R&D.

Financial data is difficult to obtain in China and needs to be derived directly from the companies. However, 19 of the 38 interviewed entities were willing to disclose their turnover:

- **More than 100 MSEK:** 7 companies
- **Between 10-100 MSEK:** 5 companies
- **Less than 10 MSEK:** 3 companies
- **Pre-Turnover phase:** 4 companies

³ More than 75% of the companies have less than 50 employees



The geographical spread of the entities is mostly narrowed down to “Greater Shanghai” (40%) and “Greater Beijing” (29%). This also goes in line with the most common business focus, i.e. sales-related activities towards larger Chinese and foreign companies, that mostly are conducted in Greater Shanghai and Beijing. Some companies are established in, colloquially referred to as “Western China”, i.e. mid-west China. Western China is what to be considered as an up-and-coming area, with significant investments from both the Chinese Government and foreign players. From a Swedish perspective, Western China is commonly known for the set-up of Volvo Cars’ production plant in Chengdu.

Graph 2: Most entities are established in Greater Shanghai and Greater Beijing

Geographical spread of Swedish Energy and Environmental Technology companies in China
Percent of total per region

Shanghai

The business center of China. The city holds the largest part of foreign companies established in China. In business the term “Greater Shanghai” is commonly used; referring to Shanghai and surrounding cities such as Nanjing, Wuxi, and Suzhou.

Beijing

The capital of China. The term “Greater Beijing” is not commonly used, in this report it refers to Beijing and surroundings as well as Tianjin



China is an important market

The importance of the Chinese market is confirmed by most of the interviewed entities. 22 entities out of 27 that answered this question answered that the Chinese market is “important” or “very important” to them, while only two answered “not important.” This was no surprise, as this study only contains entities that already are established in China. What is more interesting is to take a qualitative approach and evaluate the individual comments. Many stress the importance of China in a global context, for example: “*The sales in China accounted for over 50% of our business*” and “*China is a very important market. To keep up global growth we need to grow in the Chinese market. In the past years the largest investments have been done in China*” and “*China has become a second home market in all business areas after our Headquarters in Sweden.*”

Analysis of the companies' situation in China

The Chinese market appears to be attractive for Swedish Energy & Environmental Technology-companies; with a very promising potential. However, the reality for the companies on-site is far from easy. This section presents conclusions regarding the market conditions for Swedish companies. The conclusions are derived from our interviews. We want to stress that these are general conclusions and that strong individual differences do occur.

Strong belief in the market

Swedish Energy & Environmental Technology-companies established in China are optimistic about the market-outlook. 29 out of the 31 entities answering the related questions claim that they see a possibility for growing demand of their products, where increased environmental awareness among the public and within the Government is an important driving force behind this. These and other market drivers pinpointed by the companies, along with more general comments, are shown in the below section:

Air Pollution Control

- The segment is growing, especially in 1st tier cities⁵, where residents pay more and more attention to the air quality.
- Recently air pollution issues have been brought to light through measurement of pollution levels from the Government and foreign Embassies and Consulates. The data has been made available to the public via e.g. smart phone applications.

Water Management

- Shortage of water makes re-use of water more important.
- Continuous (although slower) construction of residential and industrial buildings, in combination with stricter environmental protection requirements, drive the need for better technology.
- Local Government pays more attention to sub-urban and rural areas where infrastructure still is under-developed; this has a geographically expanding effect on the market.

District Heating & Cooling and Energy Efficient Buildings

- Goals and points-of-direction within in the 12th 5-year-plan set the general agenda for increased energy efficient thinking and behaviour. Some companies have noted a change in mind-set among provincial leaders; from short-sighted to more long-term thinking.
- HVAC-systems are in many cases outdated and major consumers of power. The Government has established financial incentives for property owners to upgrade HVAC-systems. This increases demand for new technologies.
- Despite the downturn of the real estate market in China, sustainable urban development is still growing.
- Many 2nd and 3rd tier cities start to introduce "eco city" projects that drive the "eager" to learn from Western experiences. Examples are Wuxi, Wuhan etc.

Waste Management

- Waste Management is considered a Government provided service; hence, the local Government has incentives to draw attention to new concepts, technologies, and products.
- A general trend is to increase recycling; both of Municipal Solid Waste and Industrial Waste. The trend is to increase "re-use", but also Waste-to-Energy.
- Niche areas such as treatment of food waste from restaurants, e.g. waste-oil-handling bring interesting opportunities

Sustainable Transportation

- The sector is growing steadily, following the direction of the overall economic performance.
- Huge investments in transportation infrastructure is one of the main contributors to this strong growth.
- The "green logistics" concept is growing. The logistics industry is very polluting due to the high consumption of diesel, road dust etc.
- Most interviewees in this sector hold a quite optimistic perspective towards further growth of their business in China.
- The growing concern over environmental issues also contributes to the growth in this sector, since the end customer is changing their focus to higher quality and environmentally friendly products.
- Some companies in this sector do not directly sell environmental technologies. Instead, by increasing fuel efficiency, using renewable energy and increasing transport efficiency, these companies can also contribute greatly to the environment.

5 1st tier cities: Beijing, Shanghai, Guangzhou, and Shenzhen

All five companies interviewed in this sector answered that they would stress environmental factors when they sell their products and services to the Chinese customers, even though the share of environmental technology, within their total sales or product portfolio, is not very high yet on an average level

These companies' focus is on helping their customers to reach operational efficiency or energy efficiency in the value chain to increase the customer's environmental performance. This focus actually brings new business opportunities back to them.

It's an important, but tough market

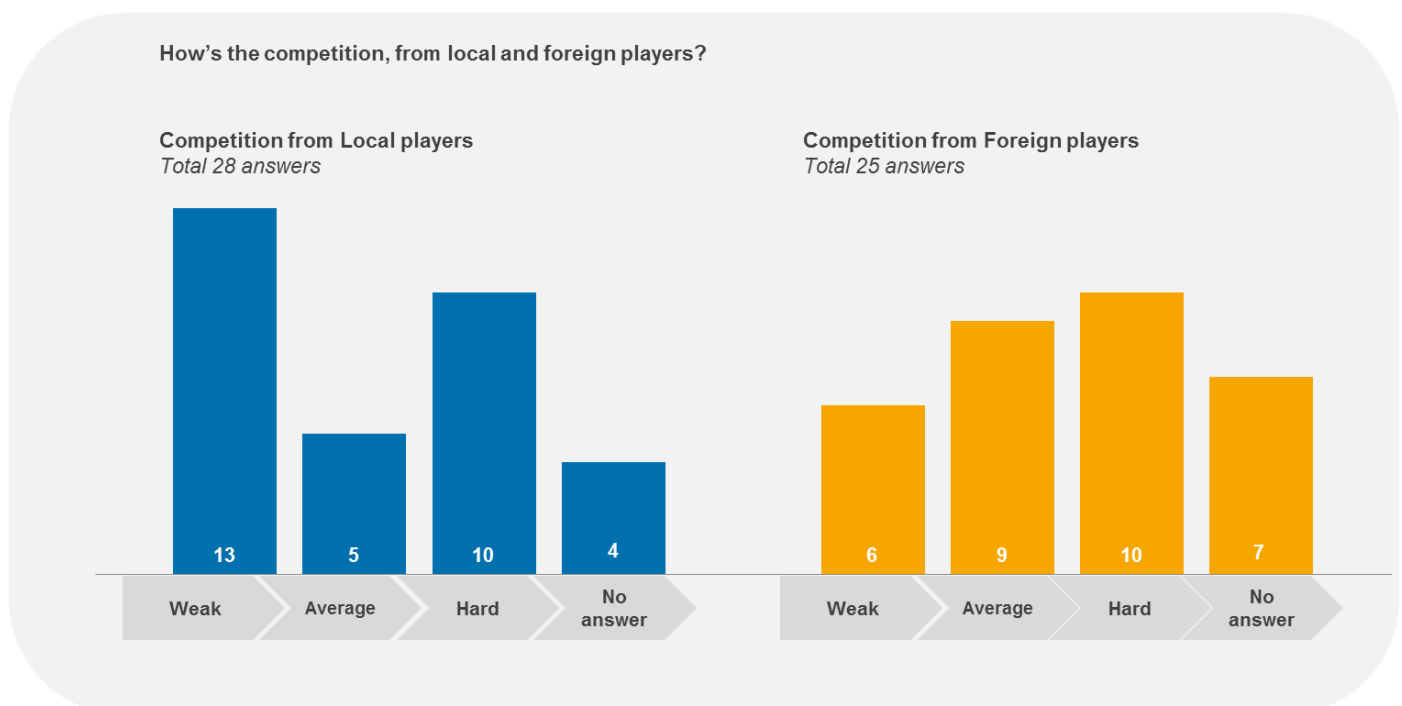
Despite the fact that the companies in general have an optimistic view of the market and a majority of the companies interviewed say that China is an important market, reality doesn't appear to match-up. Only 50% of the entities answered "good" or "very well" to the question of "How are you doing in China?" and around 20% of them answered "poor". Thus, one interpretation could be that many entities perceive that they yet have to reach their full business potential in China.

What are the challenges? If we start to look at competition, it foremost comes from other foreign players. As Swedish companies mostly are positioned in the high-end/high-tech market sphere, only a few local companies are able to compete. However, important to say is that local competitors gradually are catching-up in terms of product quality and technical knowledge. Still, local players typically compete with low price and better Governmental relationships. Worth to highlighting is that the more price-sensitive the buyers are the stronger advantage the local competitor will have. Two comments given by interviewees are good examples:

"The competition is quite strong and comes primarily from Danish and German players. In the past the competition from local players has not been strong, but they are catching-up gradually."

"To us, fierce competition comes from global players and the competition from local players is almost zero, since we're offering a different value to the market."

Graph 4: Competition mainly comes from foreign players



Overall, Swedish companies feel they are given equal market accesses in this market

Surprisingly, a high proportion of companies claim to have equal, or partly equal, access to market as local players. The “partly” mostly reflects the fact that local players, in many cases, have better networks. Companies that have Governmental players as their key customers, in general experience larger problems with “un-equality”. It is hard to determine if it is a question of corruption or pure business related preferences. For an example, one entity interviewed claimed that *“When it comes to issues such as pricing, down payment and relations with local government, our company is treated differently than our local competitors.”*

Lack of understanding appears to bring critical challenges

We have identified two barriers that the companies experience as most critical for growing at a preferred pace in China. The first relates to the understanding, from the companies’ perspective, of “where the business is and how to get it?” The second relates to the lack of understanding and the trust of products from potential buyers.

Barrier 1: where to find the real business?

Companies claim that, even if they hear a lot about Chinese Governmental spending, incentives, and new policies – it is very hard to track or see any “real world” projects. According to the companies, this is derived from a lack of transparency, lack of industry standards, and lack of well-developed regulations. These problems have various implications such as difficulties in pin-pointing and getting access to the decision makers. What also adds-up is difficulties with generally long processing times for e.g. purchasing decisions. These challenges are influence-wise relatively far away from both the companies and the Swedish Government; which makes it difficult to tackle them. For an example, one entity claimed that *“It is time consuming and difficult to find out the real agenda of the local government. Local government sometimes only consults foreign companies for initial concept but is not willing to pay for the services. We are not so interested in government’s open bidding projects because usually local companies have more advantage in winning the bidding”*.

Barrier 2: how to demonstrate Swedish quality to the potential buyers?

According to the companies, the origin of the products is very important, as it is seen as a general “quality stamp” on the products. One interviewee commented that *“The competition against the global competitors is very tough. It is very challenging to generalize, but the Germans purchase from German companies and the Americans purchase from American companies and so on.”*

This leads to an increased importance of show- and reference cases of Swedish products in China. Currently many companies lack a showcase, which creates a catch-22 situation; i.e. *“we need to have a showcase in order to sell our products, but in order to have a show-case we need to sell our products”*.

Conclusions

China is an important market to Swedish Clean-Tech companies and even though the market is tough most companies see a bright future in China. The increasing environmental awareness among Chinese people in general and Chinese leaders in particular, is one important driving force in order to create a demand for Swedish high-end environmental solutions.

The recent focus and development on emission standards and industry sector standards in China will most probably further raise awareness about the need for environmental protection and long term solutions and strengthen the importance of the Chinese market for Swedish Clean-Tech companies even more.

Both today and in the future Governmental relations on both local and central level play, and will continue to play, an important role in order to match China's need for Clean-Tech with what Sweden can offer in terms of solutions.

For companies within the Water Treatment, Energy Efficient Buildings and Waste Management segments, local municipalities and Government departments are in many cases direct customers. For the companies who mainly focus on private customers, the Chinese Government still plays an important role in the sense of shaping the entire industry. Examples of "shaping" are setting industry standards and controlling land prices. Therefore joint efforts to increase general awareness of the Sweden brand will continue to be an important task for Team Sweden.

Hong Kong and Taiwan as strategic markets

Summary of the conclusion derived from the research findings related to Hong Kong and Taiwan.

Hong Kong is known for being the regional financial and logistical hub

Swedish companies chose Hong Kong as its regional hub for South Asia; providing financial, logistical and technical support to the surrounding markets. Besides functioning as a regional hub, Hong Kong can also be a niche market for sales.

Swedish Energy & Environmental Technology-companies in Hong Kong are present in the Marine, Power, Water Treatment, and Waste Treatment segments. The three respondents to our interview in Hong Kong commented that the obstacles for growth include difficulties to change Governmental and public mind-sets (with regards to environmental issues) and shortage of technically skilled human resources. For example, one of the interviewees commented that *"In Hong Kong, the industries have shrunk which is a problem for suppliers of industrial equipment like us. Our strategy is to explore wider and deeper and develop more products and adapt to the needs for the local market"*.

Taiwan can be used as a test-market

As for Hong Kong, the regulatory and business environment in Taiwan is relatively mature compared to China. As the market is more developed, e.g. with strict environmental regulations already in place, new investments are getting fewer. This results in a slower market growth.

Although the market is not of significant size, companies regard it as a test-market for China and other parts of Asia.

Besides acting as a test-market, opportunities for sales also exist within certain niche segments. Two opportunities driven by recent developments are:

- Increase of electricity prices drives the demand for energy saving-technology and products suited for the processing industry, such as petrochemicals and steel.
- Pass of "Indoor Air Quality Management Act" drives the need for air quality control equipment suited for commercial buildings.

Appendix 1

Project Background and Focus

In March 2013, Business Sweden was assigned by The International Environmental Technology Cooperation, The Swedish Government Offices of Sweden (IMT) to conduct an overview report of Swedish Energy & Environmental Technology companies established in Greater China. IMT wanted to get a better picture of the companies present in China, what challenges they face and opportunities they see. With this scope in mind the company representatives were interviewed, and findings analysed. In February 2014, it was decided by IMT that a handful of Swedish companies working in the Sustainable Transport sector also should be included as potential interviewees in this mapping project. This was based on IMT's belief that the sustainable transport sector is very important, from an environment point of view, where Sweden has some important players active in China. A new round of interviews was then conducted and findings were analysed.

This report is the result of these two rounds of interviews and analysis efforts. The report was submitted to IMT in May 2014.

38 entities were interviewed

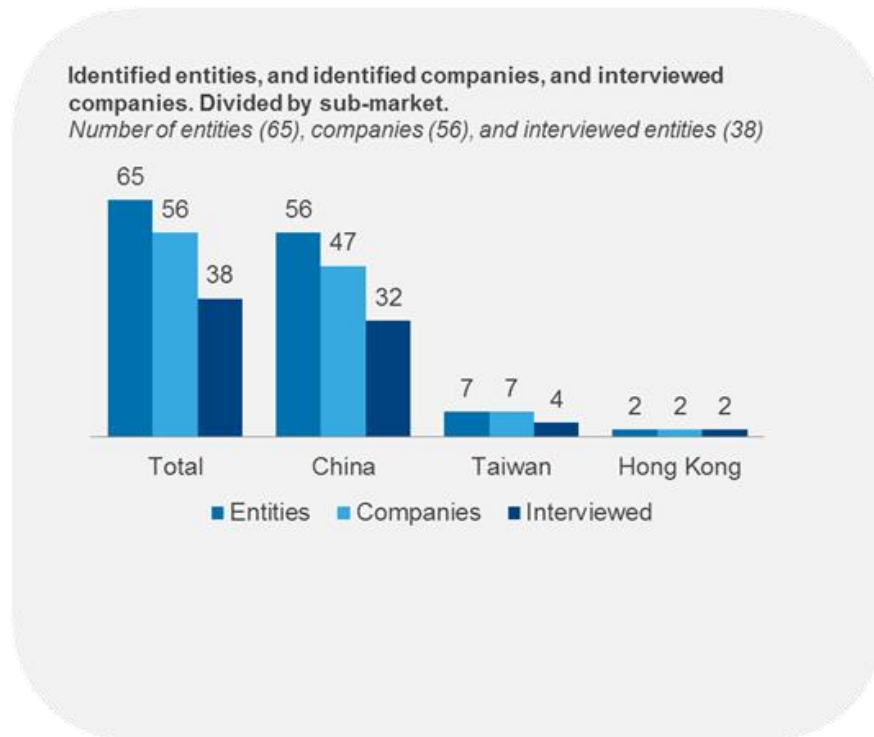
Some of the companies have several entities in Greater China. In order not to double-count similar answers from the "same" company we distinguish between "entities" and "companies". I.e. if a company has several entities on one sub-market; it is counted as one company. With sub-markets we mean China, Taiwan, and Hong Kong. Intuitively, if a company only has one entity on one sub-market; it's counted as one company.

Business Sweden used its existing list of Swedish subsidiaries in Greater China as the interviewee base of this project. The list is being updated regularly by different Business Sweden offices in Greater China. The list categorizes companies in different business areas, including Energy & Environmental Technology.

It is important to stress that the list should not be seen as complete. Business Sweden tracks Swedish companies' establishments in Greater China on a regular basis, but the companies are not obliged to report their presence to Business Sweden. This is especially true within in the Energy & Environmental Technology area, where most companies are small or medium sized, and it is difficult for Business Sweden to keep a record of each one.

65 entities were identified as potential interviewees in Greater China, including 7 in Taiwan, 2 in Hong Kong and 56 in China. 38 of these entities were interviewed. These entities could be boiled down to 48 companies.

Graph 5: Over 50% of the entities identified accepted interview



Example reasons why entities were not interviewed:

- Could not be reached at all
- No suitable interviewee could be identified by the company
- Rejected interview; claims such as “not relevant” or “no time” were common

Each interview comprised a list of questions. The questions were grouped into four key topic areas⁶:

- Basic Business Information
- Market Specific Business Information
- Obstacles and Competitive Environment
- Future Development and Support Needed

The interviews were conducted as discussions rather than as abstract, statistical exercises. From these discussions we derived quantitative results.

Interviews were conducted by six Business Sweden offices in Greater China

With offices in Beijing, Shanghai, Guangzhou, Chengdu, Hong Kong and Taipei – Business Sweden has extensive coverage in the region. This report was conducted by the Energy Environmental Technology Business Unit team, consisting of consultants from all six offices.

Appendix 2

INTERVIEW QUESTIONS

The questions asked in the interviews were slightly modified to suit the specific company and situation. Below follows the general questions:

Basic Business Information:

- What is your Turnover globally?
- What is your Turnover in Gr China?
- What is main business in Gr China?
- How long have you been established in Gr China?
- How many employees in Gr China?
- What's the main function of the Chinese subsidiary?
- Describe of your relationship with Business Sweden, CENTEC or IMT?

Market Specific Business Information:

- What sub-sector do you conduct business in Gr China?
- How do you describe the trend of this sub-sector in Gr China? Why?
- Do you see the possibility of growing demand for your products in Gr China?
- How would you describe the importance of the Chinese market for your company?
- How are you doing in the Gr China market?
- Who are your main customers in Gr China?

***The following 4 questions are asked only to Sustainable transport companies:*

- What kind of sustainable solutions (product and/or services) do you offer to Greater China? Is it a certain group of client? Whom are you major clients?
- How do you contribute to a greener environment?
- Do you stress on environmental factors when you sell your products/services?
- Could you estimate the share of environmental technology within your total sales/product portfolio?

Obstacles and Competitive Environment:

- What do you need/lack in Gr China?
- What are your main obstacles for growing in Gr China?
- Do you have equal access to the market compared to local companies?
- How do you describe global competition?
- How do you describe the local competition?

Future Development and support needed:

- What opportunities do you see in Gr China market that could increase your business?
- Would you be interested in joining more activities under the Team Sweden umbrella?
- What support you would like to get from Swedish Government?
- What support you would like to get from Business Sweden?

Appendix 3

List of the 48 Swedish Energy & Environmental Technology companies established in Greater China identified as potential interviewees

Company name	Business Focus	Location	Company website
ABB	New & Renewable Energy	China	www.abb.com.cn
ABB	New & Renewable Energy	Taiwan	
ABS	Water Treatment	China	www.sulzer.com
Absolent	Air Pollution Control	China	www.absolent.com
Ahlqvist & Almquist	Energy Efficient Building	China	www.ahlqvist-almqvist.se
AIX	Energy Efficient Building	China	www.aix.se
Alfa Laval (2)	District Heating & Cooling	China	www.alfalaval.com
Alfa Laval	District Heating & Cooling	Hong Kong	
Alfa Laval	District Heating & Cooling	Taiwan	
Blueair (2)	Air Pollution Control	China	www.blueair.cn
Camfil Farr	Air Pollution Control	China	www.camfil.cn
Camfil Farr	Air Pollution Control	Taiwan	
Cleanergy	New & Renewable Energy	China	www.cleanergy.com
ebuilder	Sustainable Transport	China	www.ebuilder.com
EcoEnergy	New & Renewable Energy	China	www.ecoenergy.se
Eletta	Water Treatment	China	www.eletta.cn/
Envac (3)	Waste Management	China	www.envac.com.cn
Envac	Waste Management	Taiwan	
Envac	Waste Management	Hong Kong	
Environmental Air of Sweden	Air Pollution Control	China	www.easab.com
Envitool	Other - Environmental consulting	China	www.envitool.cn

Company name	Business Focus	Location	Company website
Ericsson	Sustainable Transport	China	www.ericsson.com/cn
EU-Han	Water Treatment	China	
Filba	Air Pollution Control	China	www.filba.org
GreenCarrier	Sustainable Transport	China	www.greencarrier.com
Heatex	District Heating & Cooling	China	www.heatex.com
IMI (2)	District Heating & Cooling	China	www.tahydrionics.com
LightLab	New & Renewable Energy	Taiwan	www.lightlab.com
Munters (3)	Air Pollution Control	China	www.munters.com.cn
Munters	Air Pollution Control	Taiwan	
Ostberg	District Heating & Cooling	China	www.enventus.com
Pneumatech	Air Pollution Control	China	www.pneumatech.com.cn
Purac	Water Treatment	China	www.purac.com.cn
Reecat	Air Pollution Control	China	www.guilininvest.cn
Sanitec	Energy Efficient Building	China	www.sanitec.com
Sapa	District Heating & Cooling	China	www.sapagroup.com
Scanacon	Waste Management	China	www.scanacon.com
Scania	Sustainable Transport	China	www.scania.com.cn
Seibu Giken DST	Air Pollution Control	China	www.dst.cn
Shenzhou	Water Treatment	China	www.shenzhouen.com
SKF	Sustainable Transport	China	www.skf.com
Sulzer	Water treatment	China	www.sulzer.com/zh
Sunwin (Volvo joint venture)	Sustainable Transport	China	www.sunwinbus.com
Sweco	Energy Efficient Building	China	www.swecogroup.com

Company name	Business Focus	Location	Company website
Swedehouse	Energy Efficient Building	China	www.swedehouseinternational.com
Swedish Design House	Energy Efficient Building	China	
Swegon	Air Pollution Control	China	www.swegon.com
Swep (2)	District Heating & Cooling	China	www.swep.net
Tengbom	Energy Efficient Building	China	www.tengbom.se
Termoekonomi	District Heating & Cooling	China	www.termoekonomi.se
Tricorona	Other - Environmental consulting	China	www.tricorona.com
United Waters	Water Treatment	China	www.uwiag.com
Volvo	Sustainable Transport	China	www.volvo.com
Volvo	Sustainable Transport	Taiwan	
Wallenius	Water Treatment	China	www.walleniuswater.com
Xylem	Water Treatment	China	www.xyleminc.com