THE CASE FOR SWEDISH GREENTECH IN PAKISTAN

Opportunities for deploying Swedish Greentech and renewable energy technologies in an energy-hungry market faced with massive shortages of power and natural gas.

WHY PAKISTAN?

The Stockholm-based investment fund Tundra Fonder, which is investing in leading blue chip companies in Pakistan, especially in the energy and food-processing sectors states that Pakistan is an exciting and lucrative market over the medium-to-long term. The fund says:

"*Behind the international media image of Pakistan as a hotbed of terrorism and international threat, we have found something completely different. A young, fast-growing population, skilled executives and some of the most exciting and cheap companies we have ever encountered during our years in emerging markets. The Pakistan fund will likely be one of the world's riskiest equity funds for the foreseeable future. In our view, investors should have an investment horizon of at least 10 years. But rarely have we seen a market with such long-term potential that is valued so low."* http://www.tundrafonder.se/en/pakistan/,

Pakistan's stock market was the fifth most profitable bourse in Asia in 2012. It realised returns of 49 per cent in Pakistani rupee terms and 22 per cent in US dollar terms, and it is continuing to perform well in 2013 with the market index at Karachi Stock Exchange (KSE) breaking all previous records to cross 18,000 points in late February. The growth at KSE index is backed by a strong performance by leading industries in Pakistan, despite a lingering energy crisis that is hindering overall economic growth and productivity in the country.

There is an opportunity in the energy crisis in Pakistan for providers of energy solutions. Pakistan's expanding energy market is already being pursued by several other countries including Germany, South Korea, Turkey and China. Corporate and public awareness about green technology in Pakistan is on the rise, the country has abundant indigenous resources and raw materials to produce clean energy. This presents a major opportunity to many Swedish green technology companies, who are the forefront of global innovation and expertise in a wide range of green sectors.

CTS MARKET TEST

To test the Pakistani energy market's appetite and willingness to use Swedish green technologies, Chamber Trade Sweden (CTS) and the Swedish Embassy in Pakistan organised a series of seminars in Pakistan from 25-28 February to promote Swedish green technologies, products and expertise. The seminars, supported by the Swedish Foreign Ministry, were held in three major industrial centres – Lahore, Sialkot and Karachi – and attracted a large number of public and private sector organisations and businessmen.

An information questionnaire distributed among participants in these three industrial centres identified 10 priority areas. The annual turnover of a large number of companies that answered the questionnaire ranges between $5 million - $1 billion. These companies are interested in buying products, technology and services of Swedish greentech companies, becoming resellers, partners in local joint ventures, setting up or investing in greentech manufacturing facilities in partnership with Swedish greentech companies.

Priority Greentech Sectors In Pakistan:

- Waste Management
- Waste-To-Energy
- Combined Heat & Power Plants (CHPs)
- Water Purification
- Sewage Management & Treatment
- Solar Power
- Small-Scale Wind Energy
- Hybrid (solar-wind) Captive Power Solutions
- Biogas Production And Distribution
- Energy Efficiency & Clean Industrial Production

WHERE ARE THE GAPS?

Public Sector

The public sector dominates the decision-making and licencing processes for all major projects in Pakistan, and is often slow to promulgate policy and project implementation frameworks and guidelines. Nevertheless, there are now several efficient public entities working on trade development encouraging and promoting Public-Private Partnerships (PPPs) and joint ventures with international companies.

Several industrial estates and free economic zones set up by the government are seeking to set up captive power stations of up to 50MW and more. Some are eager to develop a cluster of power plants with capacities ranging between 1-5MW and 10-20 MW, based on renewable technologies such as waste-to-energy, solar power, biogas, and plants that could run on multiple fuels to ensure sustainable power supplies.

Water purification, waste management, sewage management and treatment, biogas production and distribution projects of various sizes are also a dire need of the public sector, which is struggling to build civic infrastructure to keep pace with the expansion of population in the urban and rural areas of Pakistan.

Private Sector

The private sector in Pakistan is responsible for a majority of the revenue making export industries such as textiles and garments, leather products and sports goods. It also dominates an expanding local market of fast moving consumer goods (FMCG), milk and food processing and packaging, mineral water and beverages.

Over the last five years, many private sector businesses have had to cut down their operations or totally shut them down due to power shortages. But there are many who can afford to run their own gas, gasoline, diesel and fuel-oil power generators and thus are benefitting from the country's expanding consumer market, dominated by a young population with more than 50pc of the country's total population of 180 million below the age of 25.

Private sector companies exporting their products are suffering the most. They struggle to meet their orders on time and are desperate to find sustainable energy solutions in the absence of limited power supplies from Pakistan's national grid. During the three seminars in Pakistan, many private sector companies showed interest and willingness to acquire Swedish greentech solutions to meet their energy needs.

Many companies are looking for solutions for water purification, treatment of wastewater, sewerage, and clean industrial production.

WHAT ARE THE CHALLENGES?

High startup costs, financing

Like anywhere in the world, the implementation of greentech projects is being held back by the high initial setup costs and the absence of project financing instruments and payback guarantees to lending agencies and banks. But despite these challenges, several private sector businesses are now pursuing greentech projects, after realising their long-term environmental, financial and sustainability benefits.

Project finance companies and banks are willing to invest in and provide commercial loans for sustainable greentech projects, especially in the energy sector. The project finance market for greentech projects is almost non-existent in Pakistan at present, but this presents a good opportunity for Swedish institutions willing to export their knowledge and expertise to create further opportunities for the export of Swedish greentech products and services to Pakistan.

The implementation of a few successful pilot projects could jumpstart the development of greentech ventures in Pakistan, and Swedish companies have the experience and expertise to make this happen and gain sustainable long-term benefits by taking the lead in a energy-hungry and expanding market.

WHERE ARE THE OPPORTUNITIES

The opportunities lie in the gaps. Pakistan could have increased the exports manifold if the industries would have had sustainable energy and power supplies. The back-breaking energy crisis being faced by Pakistan is also bringing a painful but positive change in the level of awareness and necessity for action among the public and the private sector to overcome the rising energy deficit.

Power Shortages
Pakistan is facing acute power shortages, which are affecting productivity and are crippling the country's economy. Power shortages are holding back Pakistan from realising its real potential for enhancing exports of a wide range of goods and services, as well as commodities. Power shortages range between 3,000MW - 4,000MW in the winter and 5,000MW-7,000MW in the summer.
Pakistan's total installed power generation capacity stands at more than 23,000MW but only 14,000MW is in operation. The peak summer demand of more than 18,500MW. At present, more than 35 per cent of Pakistan's population is not connected to the national power grid and relies on kerosene, wood and cow dung for cooking, heating, and other basic energy needs.

Limited Hydropower Development
Pakistan has the potential to produce 50,000MW – 100,000MW of hydropower by setting up large-scale and a cluster of small dams and power generation projects. Pakistan's current installed hydropower capacity stands at 6,400MW and production hovers around 6,000MW in the summer and falls down to as low as 1,000MW-1,500MW during the cold winter months due to lack of water in the water reservoirs.
Sweden has a rich experience and reliable technologies that could be used to build small hydropower projects in Pakistan.

Natural Gas Shortages
Pakistan's natural gas shortages now stand at 1.5 billion cubic feet a day (bcf/d) to 2bcf/d. The two state-owned gas utilities – Sui Southern Gas Company (SSGC) and Sui Northern Gas Pipelines (SNGP) – have provided gas connections for more than 6.8 bcf/d but total gas supplies are 4.2 bcf/d, of which 10-13 per cent is lost to theft and leakages in the gas transmission and distribution system. The share of natural gas in Pakistan's energy mix now stands at around 50 per cent and is one of the highest in the world. It increased significantly after the government introduced CNG in 1998, which became the preferred fuel for the auto sector by the end of 2005 because it was cheaper than gasoline, diesel and Liquefied Petroleum Gas (LPG).

Gas import plans
At present, Pakistan does not import any natural gas and only imports small quantities of Liquified Petroleum Gas (LPG). Pakistan plans to import natural gas via a cross-country pipeline from Iran and has signed agreements for supplies of 750 million cubic feet a day (mcf/d) to start in late 2014 or early 2015. Iran has completed its part of the pipeline to the Pakistani border, but construction work on the Pakistani part of the pipeline has not started yet.
Pakistan also plans to import natural gas through the Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline project, which envisages the supply of natural gas from Turkmenistan through Afghanistan and then further on to India. The project calls for Turkmen gas to start flowing into Pakistan in 2017. The TAPI project is in the early stages of planning and has not moved beyond a gas sales and purchase agreement.

Gas Price Issues
The average price of natural gas in Pakistan is $4-4.5mn Btu. The imported natural gas and LNG will cost between $11-$18mn Btu and will be used only for power generation and will be extremely costly and uneconomical for consumption in the domestic sector.

Rising Reliance on imported oil and furnace oil
Rising power and natural gas shortages are forcing Pakistan's power generation plants to rely more on imports of expensive and environmentally unfriendly furnace oil from the Mideast Gulf, and the rising oil import bill exceeded $14 billion in 2012 and is having a negative impact on the economy. Pakistan's crude oil imports are set to surge in 2013 after a 1.5pc decline in 2012, compared with 2011, to 6.53mn t (130,687 b/d). Pakistan's gasoline imports increased by 33 per cent to 37,983 b/d in 2012 and reliance on imported crude oil is likely to continue rising for many years to come if there are further delays in adapting alternate energy as an integral part of the country's energy mix.

Looking for LNG
Pakistan has been planning to import Liquified Natural Gas (LNG) since 2005. The latest plans call for the import of LNG equivalent to 800 mcf/d of natural gas, which will be around 7mn t/yr. Pakistan's plans to set up two floating LNG terminals and regasification facilities and a smaller LNG receiving facility. However, progress has been slow and natural gas shortages are continuing to rise.

Big difference between price of local gas and imported LNG
Pakistan's current average power generation costs are around 9-11 US cents kWh. Power generated from natural gas costs around 4.5 US cents and from furnace oil between 15-20US cents kWh. According to Pakistan's Oil & Gas Regulatory Authority (Ogra), imported LNG will cost around $18-18.5mn Btu and will be four times as expensive compared to the average local gas prices of $4.5mn Btu. Cost of power generated from imported LNG will be around Rs20.49kWh ($0.2277).

Liquified Petroleum Gas (LPG)
Pakistani gas utilities Sui Southern Gas Company (SSGC) and Sui Northern Gas Pipelines (SNGP) plan to inject 150-200mf/d of LPG-based synthetic natural gas (SNG) into their networks over the next 18-36 months. This could create demand for 1.46mn t/yr of imported LPG that will be used for producing synthetic natural gas. SSGC and SNGP have set up LPG subsidiaries to develop the entire LPG supply chain business including the import, storage, bottling and extraction of LPG.

LPG Autogas
In the next three to four years, the government is expected to phase out Compressed Natural Gas (CNG) vehicles and restrict their use to public transport. LPG bottling and distribution will expand in the coming years. LPG storage capacity increased by more than 11pc in 2011 to 30,000 tonnes. Pakistan currently has about 10 LPG autogas stations and about 50 more are in different stages of construction.

Potential For Waste Management & Waste-to-Energy
At present, more than 50,000 tonnes a day (t/d) of waste is being generated in Pakistan, of which 14,000 t/d is in generated in Karachi, 6,000 t/d in Lahore, and the rest in other cities which produce an average of 100-200 t/d. Only 1,000 t/d is being managed, and 90 per cent of it is municipal waste some of which is being burnt by industries facing gas, power and furnace oil shortages.
A number of opportunities have been identified during course of research in Pakistan in the following waste management and waste-to-energy segments:

- Energy From Crop & Agriculture Waste
- Energy From Municipal Waste
- Recycling Industrial Waste
- Recycling Electronic Waste
- Recycling & Safely Disposing Pharmaceutical Waste
- Energy From Textile waste
- Energy From Cotton & Yarn Waste
- Energy From Rice husk

- **Small-scale wind energy**
  Pakistan currently has only two 50MW wind energy projects under construction at Jhimpir in the Sindh province. Several studies have identified a potential of 50,000MW - 100,000MW of wind energy. Small-scale wind energy expertise from Sweden could create joint ventures that could produce equipment, as well as transfer technology and skills to Pakistan for developing economical wind energy solutions in the coming years. The government has to date approved wind power projects of more than 1,500MW.

- **Solar Energy**
  Swedish Solar energy technologies for power generation, cooling and heating could see the implementation of joint ventures and partnerships with private sector companies in Pakistan. Working in partnership with reliable local partners to bring down the cost of projects, Swedish companies could create many new opportunities for equipment manufacturing and installation operations.

- **Water Purification**
  Availability of potable water is a major challenge, especially in the rural and remote areas of Pakistan. Several international donor and development agencies and NGOs are working on providing clean drinking water but the demand and need far exceeds what is currently being done. Multinational and large-scale national companies are also seeking solutions and to set up water purification projects through their CSR programmes.
  Pakistani companies could benefit immensely from acquiring technologies, expertise and training from Swedish companies who could also use the CSR PAKISTAN platform to develop and implement a wide range of water purification projects in partnership with Pakistani companies and local/municipal governments, as well as NGOs and international donor and development agencies.

- **Water Recycling**
  Swedish water recycling technologies could play an instrumental role in ensuring the availability of water in areas that are not connected to the municipal sewerage networks. Remote rural areas and small villages in the mountainous regions could particularly benefit from Swedish water recycling technologies and expertise. A number of large-scale NGOs and companies are keen on implementing water recycling projects. Swedish companies could design, develop and implement a wide range of water recycling projects based on innovative technologies.

- **Energy-efficient, sustainable building solutions**
  Sweden has developed innovative emissions-free housing and building solutions that could be used for wide range of applications in Pakistan. From construction of low cost housing to schools, libraries, clinics and small hospitals in rural areas to storage facilities and small factories, there could be a number of opportunities that could be realised in partnership with Pakistan, regional and international NGOs working in Pakistan, as well as the CSR programmes of the corporate sector.

To ensure sustainable energy supplies to its growing population and an economy with immense potential for growth, Pakistan has to develop a multi-fuel system, which will include green and alternate energy, imported LNG and LPG, natural and biogas.

Swedish Greentech Representative Office In Pakistan
Setting up a representative office of Swedish Greentech and sustainable development companies in Pakistan could generate exports to Pakistan by creating awareness and proactively marketing Swedish green technologies, as well as play the role of a conduit to realise technology transfer, partnership and joint venture opportunities.

Swedish Greentech networks, investment companies, angel investors and companies with a long-term vision and commitment to the development of green energy, and increasing exports of Swedish green technologies are encouraged to contact us for further details.

This case on Swedish Greentech business opportunities has been prepared by Capital Business Sweden for Chamber Trade Sweden.
http://www.chambertradesweden.se

For project opportunities, please contact:
Charlotte Kalin, CEO Chamber Trade Sweden charlotte.kalin@chambertrade.se
Yawar Mian, Chamber Trade Sweden yawar.mian@chambertrade.se