



# THE ENERGY SECTOR IN BANGLADESH

A short presentation on market potentials  
for Danish technology providers and investors



## SUMMARY: SIGNIFICANT ENERGY INVESTMENT OPPORTUNITIES COMING UP IN BANGLADESH



Bangladesh has seen annual growth rates of around 6% for the last decade

The recent international downturn has not had significant negative effects. On the contrary, an increased focus on Bangladesh as the most cost efficient production hub in Asia has been seen. Further economic growth is, however, seriously threatened by unfulfilled and growing energy needs

~4,000 MW of electricity is produced. Demand is estimated at ~6,000 MW and growing at ~500 MW a year

1,800 MMCFD of gas is produced. Demand is 2,300 MMCFD

Government is set to undertake emergency plans to add more generation capacity each year until 2014

Focus will be on setting up new power plants, promote sustainable energy activities and increase energy efficiency

A large number of tenders will be floated in the coming months leaving ample business opportunities for Danish investors and technology providers within the energy sector



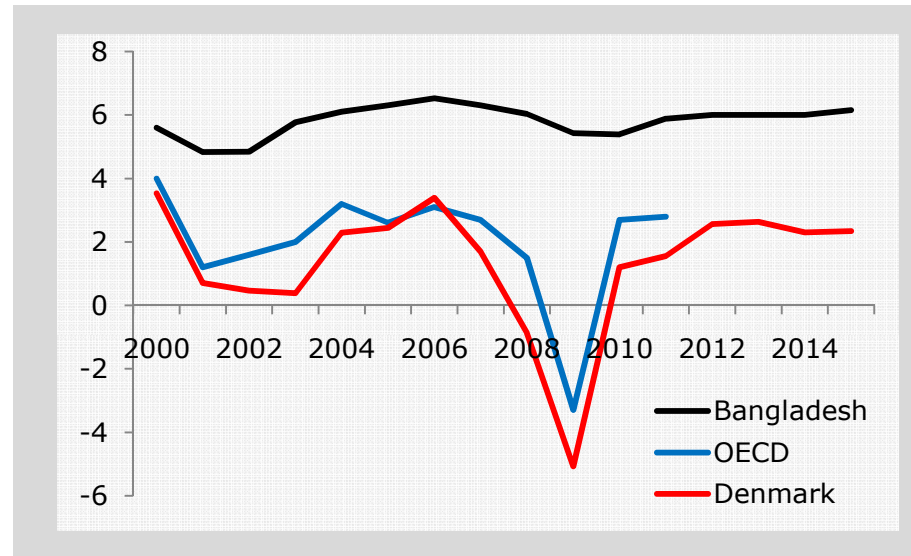
# BANGLADESH SHOWS HIGH GDP GROWTH AND TRADE IS KEEPING MOMENTUM

Bangladesh's 160 million residents have seen growth rates of around 6% annually for the last decade. In 2009 GDP growth has been estimated at 5,8% and also in 2010 a growth rates of around 6% is expected

Bangladesh was only to a limited extent affected by the international financial crisis as local banks have limited exposure to the international financial markets

The recent international economical downturn had only limited effects on Bangladesh as well. Export has actually increased due to a growing international interest for producing and sourcing in low cost Bangladesh. The country is among the absolute cheapest production hubs in the world

Export to Denmark grew e.g. 33% in January-June 2009 compared to same period in 2008. Export to the UK, France, Germany and France grew respectively 43%, 30%, 26% and 15,8% in the same period





## GAS AND ELECTRICITY CONSTRAINTS ARE MAJOR CHALLENGES FOR FUTURE GROWTH



Close to 50% of population do not have access to gas and electricity

Per capita power generation is  $\sim 183$  Kwh and it is among the lowest in the world. Energy intensity (kgoe/US\$) is only 0.29 – e.g. less than half of India

Despite high growth rates only a few hundred MW has been added to the power grid over the last 7 years. Today  $\sim 4,000$  MW is produced, while demand is soaring around 6,000 MW and growing at  $\sim 500$  MW a year

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## GOVERNMENT PLANS BILLION USD ENERGY INVESTMENTS TO MITIGATE CHALLENGES



Government of Bangladesh has announced the following projects to be undertaken in the next few years

- 3 combined cycle power plants of aggregated capacity of 1,125 MW
- 2 peak power plants of capacity of 100 MW each
- 4 coal based steam plant with total capacity of 2,000-2,600 MW
- Renewable energy based power plants of capacity of 110 MW (including one 100 MW wind park)
- One LNG terminal with 3.5 millions tons capacity
- Further off shore gas exploration and extraction

A prequalification notice for a 300-450 MW dual fuel combined cycle powered power plant was released end of January 2010 and a number of initiatives regarding setting up peak power plants and rented power plants has also been initiated



## ALSO SIGNIFICANT MARKET POTENTIAL EXISTS IN RENEWABLES

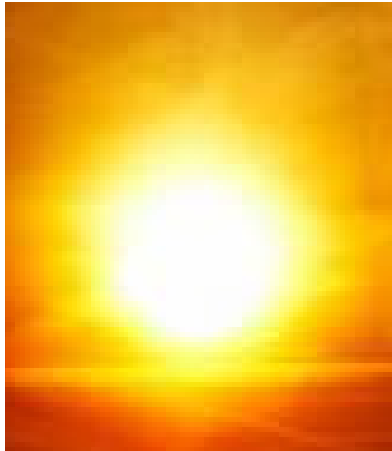


Focus on renewable energy is gaining momentum. Not least due to many donors interested in supporting this form of energy production

Government has taken a number of initiatives to promote sustainable energy by awarding foreign investors and technology suppliers tax holiday and incentives like prioritized access to loans and soft loans, land and other resources

Government vision is to have 5% of the country's power supply generated by sun, wind, biomass and biogas by 2015 and 10% by 2020

# SOLAR ENERGY HAS MOMENTUM AND ATTRACTS LOTS OF PUBLICITY



Solar energy is the most explored option amongst the renewable energy options. More than 450,000 small scale solar home systems have been installed in the country. System #1 million is expected to be installed by 2012

A number of pilot projects on solar grid power are running successfully. The first private sector initiatives to run irrigation system and telecom base stations by solar power have been implemented. And market potential is large: More than 1.2 million irrigation pumps exists of which 85% are diesel-driven consuming 800,000 tons of diesel annually.



Government has in principle decided to install solar power units in all public and semi-public offices. Installation has taken place at the Prime Minister's Office and at Bangladesh Bank. All new buildings will also be asked to prepare for solar power installation

Tendering of three 1-3 MW solar power projects is currently going on and more tenders has been announced

Due to the massive power problems it seems like more and more middle class private households are also turning their eyes to the possibility of producing their own power via solar power panels. The market is still low, but it is expected to grow significantly in the years to come

# WIND HAS OFF SHORE POTENTIAL ONLY – BUT RELIABLE WIND DATA IS LACKING



Wind is one of the least explored energy forms

Country wide wind studies in heights up to 6 meters have been carried out and indicate that onshore wind speed is too slow (3.5-4.5 m/s) to possess significant commercial potential for wind energy. The wind season is furthermore reduced to 3-4 months a year

Offshore wind parks could, however, be feasible, but no high altitude wind studies have been undertaken as of this point in time

Nonetheless, government has identified an offshore wind park area and will float a tender in 2010 to start development of a 100 MW wind park

Two pilot projects have been running over the last few years. Both are based on Chinese technology. A number of technical issues and management problems have led to disappointing results with the small scale parks either not running or running at very reduced capacity

# BIOGAS AND BIOMASS ARE WELL KNOWN TECHNOLOGIES – BUT NOT ON AN INDUSTRIAL SCALE



Biogas is believed to hold significant potential in Bangladesh. NGOs have strongly promoted small scale systems, and installation of more than 10,000 domestic biogas plants has already taken place

Very limited experience with large scale biogas systems exists. Only two minor pilot projects supported by IDCOL have been initiated – both generating 200-300 KW electricity using poultry litter

However, studies indicated that up to 800 MW of electricity could be produced in Bangladesh using organic city waste and poultry litter. 12 gasification-based biogas plants equivalent to 5 MW capacity are now being considered/planned by donor-financed IDCOL

More than 15,000 tons of waste is produced in Bangladesh each day. 70-80% is organic, and only a fraction is being recycled. In 2025 it is expected that 47,000 tons of waste will be produced in Bangladesh each day

Another significant raw material for biomass production is rice husk from the thousands of rice mills

Studies show that up to 400 MW of electricity could be produced from using rice husk alone



# PRESENT POWER AND ENERGY PRODUCTION IS BASED MAINLY ON NATURAL GAS

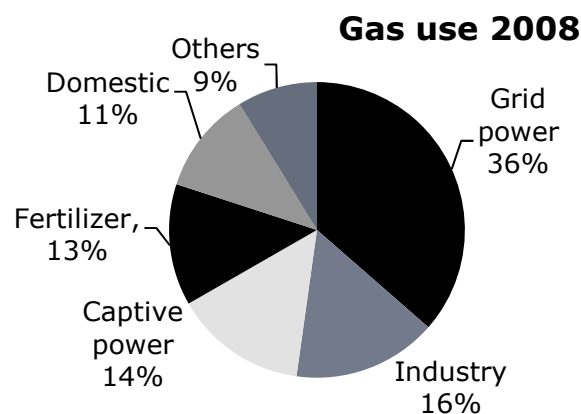
Energy and power source	Source use 2008
Natural gas	600 bcf
Oil	3.7 mil. tons
Coal	3.5 mil. tons
Hydro	1.0 Twh
Biomass	55 mil. tons
Solar PV	18 MW
Wind	1 MW

Of the ~4,000 MW electricity produced 90% is generated by natural gas

An additional 1,200 MW captive power production is taking place. Of this, 95% is generated by the use of gas

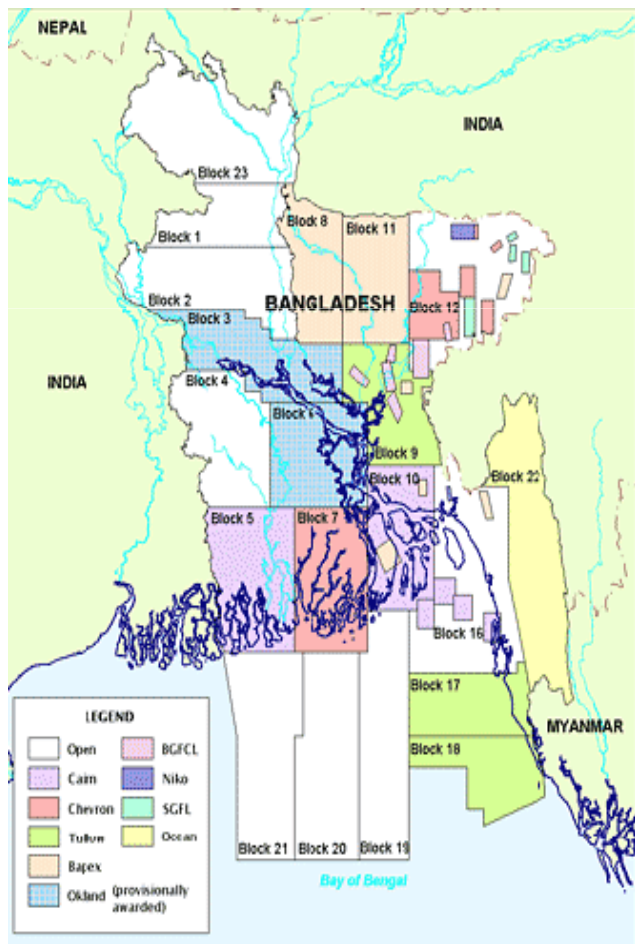
Imported oil and coal are the main two alternative sources of energy production

Renewable energy produces close to 20 MW of electricity with solar being the dominant source





# AND SIGNIFICANT GAS RESERVES EXISTS – BUT EXTRACTION IS GOING SLOW



23 onshore and off shore gas fields are know in Bangladesh. Only 12 are in operation

Remaining reserves are estimated at 12.9 Tcf, while total recoverable reserve is estimated at 20.1 Tcf

ConocoPhillips (US) and Tullow (Ireland) won tenders in 2008 to search for offshore gas in three blocks. Maritime boundary questions have, however, been raised by India and Myanmar. A seismic survey is underway to produce a delimitation report to the UN before July 2011

UK Cairn Energy have discovered offshore fields in the Chittagong area. No production are expected until 2013

Bangladesh Petroleum Exploration and Production Company has limited onshore exploration equipment and resources/know-how. Recently the company announced plans to contract with interested foreign companies to conduct onshore surveys in block 3, 6, 8 and 11 by December 2012



## BANGLADESH IS ALSO RICH ON COAL – BUT EXTRATION IN LIMBO



5 coal fields are identified in Bangladesh. Known reserves and resources are around 2,700 mil. tons.

The country still awaits the adoption of a national coal policy before any coal extraction will take place. Major political debate takes place over extraction methods etc.

One coal-fired power plant exists, but it is only running at half of its installed capacity (250MW)

Bangladesh Coal Power Company is under formation. The company has mandate to facilitate setting up four coal-fired power plants to generate 2,000 MW of electricity

Plants will be set up under PPP where government will only hold a fraction of shares for offering land and infrastructure

The four plants are expected to cost USD 3 billion and will be running on imported coal until coal extractions starts in Bangladesh



## ENERGY INEFFICIENCY AND WASTE ARE MAJOR CONCERNS – WITH ROOM FOR IMPROVEMENT

Power plants years in Operation	No of power plants	Capacity (MW)
40+	7	140
31-40	6	318
21-30	26	1399
11-20	10	1113
1-10	50	2483
<b>Total</b>	<b>99</b>	<b>5,453</b>

Years in Operation	Capacity (MW)	(%) Capacity
Steam	2638	50.72 %
Combined Circle	1206	23.18 %
Gas	897	17.24 %
Diesel	231	4.44 %
Hydro	230	4.42 %
Total	5202	100%

99 power plants exist in Bangladesh. Their averages age is around 20 years and very little updating has taken place

A study has shown that 7,090 MMCFD was used to generated 480 Gwh at two local plants. A modern plant would produced almost twice as much output (around 880 Gwh) using the same input!

System loss is estimated at 7%, while distribution losses are estimated at 14.5% (excl. bulk). On top of this come theft and bypassing of meter

Limited focus and resources have been given to energy efficiency solutions – mostly because technologies are not in place. Industries – like the textile industry, which only gets 60% of the needed power – are increasingly turning their attention to energy saving initiatives to be able to sustain their business

# GOVERNMENT IS ALSO SLOWY STARTING TO FOCUS ON ENERGY EFFICIENCY – E.G. IN BUILDING POLICY



Energy Efficiency has not traditionally been in focus in Bangladesh due to heavy subsidized energy prices

A renewed focus on energy efficiency has appeared with the current government. It has expressed a willingness to promote energy efficiency as well as green energy

One example of the slowly changing mindset is the proposed update of the current "National Building Code", which contains provisions targeting energy efficiency in Air Conditioning, Heating, Ventilation, Lightning, and several other areas

Together with the World Bank the government has also initiated a project promoting energy efficiency in Bangladesh e.g. by phasing out the production of incandescent bulbs, handing out fluorescent bulbs and government has taken steps to replace dated and inefficient power plants





## TO SUM IT ALL UP: MARKET POTENTIAL FOR DANISH COMPANIES EXISTS ON ALL LEVELS



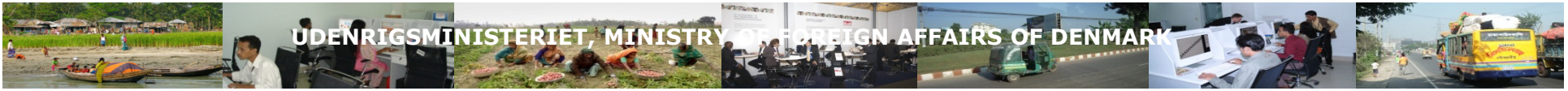
Focus on the energy problem will only be intensified in the years to come. After less than one year in office, government is already under significant pressure from especially the private sector and local associations to take further measures

Government will have to prioritize energy production and international donors will undoubtedly also have to pay more attention to allocating support to the sector

Estimates indicate that more than USD 9 billion will have to be invested in the sector in the next few years

Opportunities and approaches for Danish companies wishing to explore the energy market are many:

- “Reactive strategy”: Wait and participate in upcoming large scale tenders (construction of power plants etc.)
- “Proactive strategy”: Aggressively market energy saving/efficiency solutions towards energy hungry companies and towards government where focus and knowledge on energy saving methods have been limited



# INTERNATIONAL INVESTMENT BANKS ALSO BELIEVES IN BANGLADESH IN GENERAL



Bangladesh among seven "hottest" emerging markets (2008)

J.P.Morgan

Bangladesh named as one of the "Frontier Five" (2007)



Bangladesh included in "Next 11 countries to watch" (2006)

*"The scale and potential for Bangladesh is obvious – a population of 150m, strong demographics, a hard working people and the early signs of an emerging middle class."*



# DANISH INVESTMENTS CAN POTENTIALLY BE SUPPORTED BY DIFFERENT INSTRUMENT



**The B2B programme** supports setting up longterm partnerships between Danish and Bangladeshi companies with up to DKK 5M in different phases ([www.b2bprogramme.com](http://www.b2bprogramme.com))



**The Industrialisation Fund for Developing Countries** offers risk capital in form of soft loans and/or shareholder capital to investments in developing countries ([www.ifu.dk](http://www.ifu.dk))



**Innovative Partnership for Development** offers support for CSR initiatives and projects focusing on including the poorest segment of society as either producer, distributor or buyer ([www.ipdprogramme.com](http://www.ipdprogramme.com))

MIXED CREDITS  
PROMOTING GROWTH



**The Mixed Credit Programme** offers interest free or low interest loans for large and medium sized investments in developing countries ([www.um.dk](http://www.um.dk))



**Eksport Kredit Fonden** offers reinsurance, working capital guarantees and export loans for company transactions in developing countries ([www.ekf.dk](http://www.ekf.dk))



## AND LOCALLY A NUMBER OF FUNDS FOR ENERGY PROJECTS ALSO EXIST



Besides general government finance and project ad hoc financing a number of large scale funds exists for especially renewable energy projects:

- USD 100 million declared as climate fund by the government for climate related initiatives
- USD 40 million set aside by Bangladesh Bank in soft loans for all kinds of renewable energy projects
- USD 135 million IDCOL fund for solar installation projects (funded by World Bank and others)
- USD 23 million IDCOL fund for biogas/biomass related projects
- USD 29 million IDCOL fund for other renewable energy projects
- USD 245 million IDCOL fund for larger infrastructure, conventional energy and renewable energy projects