

Dr. Tidu Maini speech

All Energy Conference, 20 May 2009

Qatar's Investment in Research & Development for the Post-Carbon Era

Good morning everyone.

I'd like to talk today about Qatar's investment in research and development as we move towards a post-carbon era. The Qatar Science & Technology Park-QSTP- plays an important role in applied research and development in the country's expanding energy sector and is also working with the Planning Council, The Ministry of Energy and the Ministry of Business and Trade to create new industries, which have a technological thrust.

Qatar is a small country with a population of 1.6 million and has the world's 13th largest proven oil reserves. We are the world's 3rd biggest gas producer with 15% of global reserves. These reserves will last 100 years if managed properly. In 2006, Qatar became the world's largest exporter of LNG globally. These gas exports are generating huge wealth for the country (\$24bn in 2008). In the third quarter of 2008, its revenues from gas production overtook oil for the first time. Qatar's share of the global LNG market is expected to be 29% by 2012.

Qatar is seizing an extraordinary opportunity by laying a foundation of an ambitious educational and research program to become a world leader in specific technologies. We have established 6 Research led universities where the degree level is identical to the home campus as are the entry conditions. These universities include Cornell, Texas, Carnegie Mellon, George Washington and Northwest University. The Emir has further decreed that 2.8% of the GDP will go towards an endowment for research. Research will be carried out both at the University campuses including Qatar University and 6 I have mentioned and at the QSTP. We recognize research takes long time to bear fruit and have thus created QSTP with major industrial partners to act as an engine for accelerating our research. QSTP will focus on- Energy, Environment, Health sciences, and ICT, which are areas of national priority and where we have value to add to the effort.

QSTP will provide an environment for companies to develop and commercialize their research. We believe that we can accomplish our strategy by working with blue-chip companies and the top international academic and research institutes. The partnership strategy runs through all of our capacity building programmes.

Currently we have a mixture of 22 international corporations and technology companies that represent our 4 sectors and they have committed \$225m of R&D investment. Energy is our biggest sector and our partners are major international oil companies such as Shell, Total, ExxonMobil, and Chevron. To give you a snapshot of the scale of business: Chevron will spend \$20 million on research at QSTP (over 5 years). Shell will spend up to \$100 million at QSTP over the next decade (to 2018). ExxonMobil has, at QSTP, their only research facility outside of the US. Along with these key upstream players, we have with us Qatar Petroleum who are making huge investments in both the upstream and downstream segment.

We are also making large investments in healthcare and the environment and that is a story for another day.

So what can I tell you about Qatar's alternative energy strategy?

Investment in alternative serves a few additional purposes for Qatar: it is a proactive move to help us meet increasing demand for power over the coming decades; it will also help us make more efficient use of our gas reserves; and it will help us meet the international limits that have been set for CO₂ emissions. On this last point, you will no doubt be aware that we have the unenviable title of having the world's highest per capita CO₂ emissions. We do not agree with the criteria that are used to make this judgement nevertheless we are looking very seriously at clean energy.

I'd like to tell you about the role that QSTP is playing in this energy landscape.

Our strategy is to focus on the 2 main strands I have been talking about. On the one hand is our hydrocarbons research. On the other hand, we are engaging in renewable energy research in a serious manner. What we are creating is an energy mix that will serve the needs of future generations.

We have set up the *Qatar Carbonates & Carbon Storage Research Centre* at QSTP as part of a 10-year research agreement with Qatar Petroleum, Shell Qatar, and Imperial College London with a commitment of some \$70m. The Centre will carry out R&D in geosciences & reservoir engineering, CO₂ capture and sequestration, and demonstration. The Centre addresses key local challenges especially, optimization of production and recovery from Qatar's reservoirs.. I should highlight that the Centre is an example of QSTP's commitment to building the local research infrastructure. By linking Imperial College with universities in Qatar, it will allow critical expertise to be transferred to the region.

Shell opened its Research & Technology Centre at QSTP a little over a year ago and was the first company to be installed in the QSTP premises. Quite remarkably they have already filed their first patent from Qatar related to GTL and I heard that a second one is on its way related to Sulphur research.

We are also launching in collaboration with Shell, two exciting research projects on the benefits of Synthetic Jet Fuel for aviation engines and these projects are backed by an investment of \$780,000 per year over three years. The first project will study the combustion performance of synthetic jet fuel in current and future gas turbine engines. Our Qatari academic partner is Texas A&M University in Qatar and we also have onboard a European research institution, DLR (German Aerospace Centre). The second project will look at (fit-for-purpose) properties of synthetic fuel. Here we are working with Shell and two academic institutions, Texas A&M University in Qatar and the University of Sheffield.

You will see here evidence of an important element of our partnership strategy, which is to integrate with the world-class universities that are co-located with us at Qatar Foundation. QSTP provides the technology companies that come here access to research-led academics and quality graduates as well as like-minded companies and local institutes. It is the mix of on-the-ground infrastructure and the operating environment that QSTP offers that is making Qatar's project such a success.

You will also see in the GTL work that I just mentioned that Qatar is taking seriously the environmental impacts of its use of gas for electric power production and desalination. So the evolving energy sector is visible.

Now that I have given some examples of the hydrocarbons research at QSTP, let me tell you about the alternative technology cluster we are creating.

Our focus at this stage is on supporting the development of the solar industry in Qatar. We are active in carrying out feasibility studies to see if we should enter the upstream end of the value chain such as Polysilicon production and also the downstream end by creating a demonstrator for testing different solar technologies for power production.

In order to create Qatari human capacity and a national company we have made a significant investment in the creation of a company at QSTP called *GreenGulf*. GreenGulf was created to do two things: to be a test bed for solar technologies and to be a champion for building power stations and deploying solar technologies in the region and eventually internationally. The company will work on developing an end-to-end commercial strategy to confirm the viability of solar as an energy supply in Qatar. Fundamentally, it will be supporting with a demonstrator for several leading solar technologies such as Photovoltaic solar (both organic and inorganic) and Concentrated Solar Power. We are fortunate that *Chevron-Qatar* will work closely with QSTP in this

endeavor. Chevron's Sustainable Energy Efficiency Centre at QSTP is studying the application of renewable power as well as lighting and cooling technologies. Total which has almost 20% shares in US high technology Konarka Technologies – who hold the class record in organic cell efficiency will also support our efforts.

Finally an important company for us at QSTP are design engineering services consultants from the TATA Group. They have committed \$12m over 5 years to develop integrated software for green buildings using green engineering concepts, among other technical developmental work in energy and water sectors.

So I hope these give you a picture of how we are transitioning into renewable energy and the drivers behind this. So what does the future hold for renewables for us:

We have recently launched a small project to examine the feasibility of producing aviation fuel production using Algae. We are blessed in Qatar with seawater, CO₂ and heat – which algae need to grow. So we are interested here on creating an R&D platform to strengthen local capacity and we also want to leverage international R&D work that is focused on assessment and improvement of 3rd generation biofuel technologies, sustainable production and the supply chain.

We have taken a small step by assisting two academic institutions to undertake research in the application of solar-cracking of methane as a source of hydrogen generation. These institutions are proposing to establish a Solar-Hydrogen Furnace to produce clean hydrogen and pure carbon via solar cracking of natural gas. The outcome of this area could be of immense interest.

I think that I have come to the end of my time and I hope that I've managed to convey the exciting work that is going on in Qatar and the shift that is occurring towards renewable energy. I look forward to sharing perspectives and ideas with you on the conference sidelines. I'm pleased to announce that this conference will be in Qatar in 2010 and I hope to see many of you there. Thank you.