Strong disruptive trends in the energy sector – but solutions for sustainability nevertheless guide the way for attractive future business opportunities

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The energy/ utility sector has been changing very rapidly in the recent years – and much more change is directly ahead of us. The utility sector is already on track to turn itself from a regional monopolistic structure into a world of truly international and competitive players, with ongoing strong consolidation. And the changes for the oil & gas companies are very significant as well – in terms of reserves, many National Oil Companies have already overtaken the global giants ExxonMobil, Shell and BP by far, within only a few years – however, leaving them still with extraordinarily strong profits from their high production volumes. But for how long?

A large portion of other fundamental changes still lies ahead of us. Existing positions are not at all secured – there will be great opportunities for smart and quick players, even some well established giants might lose if they fail to develop new approaches and attitudes for their business.

Which drivers will have the strongest impact on the energy/utility sector and the relevant companies? And what are the requirements to create a sustainable position in the energy and utility sector? Let me highlight four important drivers in particular which impact on sustainability in the energy sector:

1) Legislation driving more competition

- Fully competitive electricity and gas markets across the entire EU
- Consequent regulation of grids with intensive cost cutting needs
- Discussion about ownership unbundling of integrated utilities
- Phase out plans for nuclear power plants in some EU countries

It is obvious that these topics will have an impact on the investment policy of the energy/ utility companies. In Germany for example approx. € 40 bn will be required until 2020 for the renewal of the grids – will there be sufficient incentive to make that happen? And who will do it – the established energy companies, new focused grid specialists or financial investors? Or will we see more black outs? Or more sunk investments? Not a particularly sustainable scenario…. appropriate solutions need to be identified.

2) Environmental protection requirements

- Most important are measures to counteract global warming – and the CO_2 emissions from the use of fossil energy sources
- Some tighter restrictions regarding other emissions, like NOx and particulates from diesel engines, need to take place as well
- Negative side effects from the large scale development of biomass as energy source (like monocultures, fertilisation etc.) are increasingly discussed

In particular the global warming topic will have the strongest impact towards a truly sustainable positioning in the energy sector. With a lot of different options: increased energy efficiency, increased usage of gas instead of coal, carbon dioxide sequestration, capture and storage, a higher share of renewables and probably a comeback of nuclear energy. Whilst CO_2 emissions are becoming an important cost component in power generation the CO_2 disposal is at the same time becoming a sizeable business in itself. Energy companies will have to review their positioning very carefully, the current status is very heterogenous today. And they need to develop their specific strategy to provide energy at the optimum balance of low costs and low CO_2 emissions. And again, significant risk has to be managed in order to avoid major misinvestment into routes without clear competitive advantages. Indeed, the investment needs in power generation are high, both to replace older and inefficient capacity but also to satisfy the increasing energy demand in many rapidly developing countries. With the costs for equipment rising and rising …sustainabillty is the right target but obviously difficult to achieve in much more volatile energy markets with at the same time long term oriented infrastructure and asset investment needs.

c) Stable and safe primary energy supply

- Mid depletion point for oil production – how far away?
- Increasing share of oil & gas production from politically instable regions, generally rising dependency from imports – what is acceptable?
- Strong increase in energy demand from developing countries, in particular in Asia
- Upcoming discussions about the negative side effects of some imported renewable energy (e.g. palm oil vs. rain forests, energy use vs. nutrition)

It is obvious that the actual supply constellation for oil and gas is showing up some significant risks and strong attempts to achieve a more sustainable supply constellation are desired. There is of course a strong interaction with the drivers in the energy sector, efficiency gains will for example help to reduce energy demand, new E&P technology will contribute to shift the mid depletion point further. This is a clear indication that a sustainable energy supply requires an integrated approach which incorporates all variables.

In addition a certain level of relaxation with regard to security of supply will be achieved by an intensified usage of unconventional resources, like oil sands and probably in the future gas hydrates. The rapidly growing LNG infrastructure may contribute to reduce the dependency on "fixed" supply streams based on pipeline infrastructures.

But all that is probably not enough in the longer term: a larger portion of renewable energy which is produced truly sustainably, a revival of nuclear power generation

and as a real long term option even nuclear fusion may be required to achieve a really sustainable supply constellation for primary energy.

The changing conditions like rising oil prices and CO_2 tax burdens are likely to facilitate strong moves in the described direction. And leading energy companies as well as new entrepreneurial players are already making use of these opportunities. And the capital markets reward companies which can demonstrate their preparedness and ability to participate in this growing and attractive field of business.

d) Technology – a potential game changer or/and a game keeper at the same time

- Carbon capture & storage – a feasible and cost effective option?
- Distributed generation – Fuel cells, micro turbines etc.
- Second generation of biomass usage
- New E&P technology for enhanced resource development

Technology can do both – securing a prolongation of the competitiveness of existing technology but at the same time to attack established positions by completely new and much better solutions. Carbon capture and storage may for example secure the competitiveness and survival of lignite fired generation capacity even in stringent CO_2 reduction scenarios. Just the opposite: distributed generation may act as a game changer – potentially reducing the value of electricity grids significantly and allowing new entrants to capture market shares in the electricity sector.

Overall, advanced technology competence regarding sustainable energy solutions seems to have a quite positive macroeconomic impact on specific countries. According to a new study by "Hamburgisches Wirtschaftsinstitut" Germany is very likely to be one of the winners of climate change since German companies can provide a broad set of advanced technological solutions for more sustainable energy supply and export them globally.

And interestingly enough, some different types of technological competencies in the energy sector may be combined to create completely new system solutions: e.g. for CO_2 free coal fired power generation, technological competence in power generation needs to be combined with geological, if not even E&P competence, for the disposal of the CO_2. And even more: such systems solutions may have very attractive economics if different margin components are added: margin from power generation plus margin for CO_2 disposal plus potentially margins from Enhanced Oil Recovery if the CO_2 is used for the production stimulation of mature oil fields.

Another impressive example, how threats can be turned into compelling business opportunities!

What are the overall conclusions?

There are indeed very big challenges ahead for energy and utility companies. And we should honestly state that these challenges are indeed real threats for some existing business models and for the capital employed in some assets.

But as described there are at the same attractive new opportunities – more sustainable energy solutions will be a huge new business opportunity. Management capabilities and smart strategic moves will make more than ever the difference

between winners and losers. However, principally there are no real reasons why there should be losers at all. Even in the future we will need to balance different sustainability aspects properly, e.g. environmental acceptability, costs and security of supply. The question is indeed how energy companies will be able to adapt their portfolio of energy supply options to create new balanced optima.

And of course politicians have to act very carefully regarding the cross subsidisation or penalising specific types of energy – sustainability also means that there is real chance for really inherent sustainability. In the end, market forces should drive the development.

I'm convinced that there are good reasons for optimism. Not only that there is now a broader consensus about the global warming challenge and the necessity of countermeasures. But also because Arthur D. Little can strongly confirm - based on our broad set of project experiences with the world's most important energy and utility firms – that most firms have already realised these new opportunities and are strongly committed to launch more sustainable energy solutions. A lot of additional power and creativity is currently unlocked, combining innovation capabilities with market realism.

For sure, even these extraordinarily demanding challenges will be managed. Not easily and not quickly – but without any doubt or alternative.

Thank you!