

## Minutes from the after hour meeting 29<sup>th</sup> of November 2007 held at the University of Copenhagen, Department of Geography

*Opportunities for Scientific Interrelation between research and the industrial sector, in the less developed world.*

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The objective of the debate was to target the linkages between public private partnership, research collaboration and knowledge sharing between industry and research. The environmental benchmark, the inadequate knowledge level in public institutions, pollution and the insufficient environmental awareness are creating a fragile sustainable develop in many developing countries. In order to debate and discuss these challenges Danish Development Research Network (DDRN) and National Environmental Research Institute (NERI), Aarhus University invited interested to participate in a meeting regarding who research could assist industry in the developed world and vice-visa.

The Public Private Partnership in the developing countries is complex and capacity needs to be developed to give a quantitative basis for decision making in the region. This decision making can form part of the transition that is required to put the developing countries on a path towards better sustainability. Increased awareness and improvement of cooperation between industry and researchers are key factors for the integration of social, economic and environmental goals.

Within this very broad context the meeting intent to consider:

1. Why the industrial sectors most enforce stronger research collaboration?
2. What are the opportunities for international partnerships to deliver it?
3. What should do to make these partnerships happen?

The meeting provide the following discussion:

1. Why the industrial sectors most enforce stronger research collaboration?

The debate centred on; capacity development; Public Private Partnership; climate change

### 1. Capacity Development

Competent capacity is a pre-requisite to support environmental quality programs. **A key issue for less developed countries is the lack of sufficient capacity for environmental management at both an industrial and government level.**

Developing countries have, in general, few industrial researchers involved in air quality related research, and, given the general lack of resources in such countries, they have to work with tight budgets. Relative isolation and modest research infrastructures make it particularly important for such researchers to become integrated into the world community of scholars.

There is a need to build collaborations that achieve a two-way flow of knowledge between the research base and industry.

A practical example bearing in mind that the cost of regulation is an important consideration in the air quality management process. Industries need to balance the cost per tonne of emissions reduced or cost per microgram/cubic meter of air quality improvement that is sustainable feasible.

Choosing to invest in an important new technology or planning for a mature one significantly impacts the future of technology based companies. R&D knowledge can help companies better create their futures in a world of increasingly complex and rapid change (RD required in choosing appropriate abatement technology for new point source standards)

Top down approach, to improve capacity development by allowing environmental quality professionals to spend short term assignments/tours at NERI/Denmark to acquire knowledge and other relevant EIA skills. They can in turn mentor other EIA personnel when they return thereby allowing transfer of knowledge.

The situation with respect to air quality in South Africa is unique even compared to many other developing countries around the world. The government here has almost no air monitoring, modelling, or source apportionment experience, and regulatory experience is limited. To address this technical gap, many large facilities in South Africa have established monitoring networks and modelling capability. This creates an unusual situation. The regulators must rely almost entirely on industry supplied information to carry out its air pollution control mission. Few companies in the U.S. monitor ambient air quality. Sasol has not only carried out air monitoring but has shared summaries of the results with the community. In spite of this, there is still concern at least at some of the NGOs that the data might be manipulated. Present governmental officials did not express this concern to us. However, steps need to be taken to get air monitoring into a situation where the results will be accepted by all parties. This raises the question if companies such as Sasol would be better off supporting a more independent monitoring and assessment program

Many South African governmental institutions are relatively new with limited resources and new regulatory authority the capacity at the national, provincial, and municipal levels of government in South Africa is low at the present time. While we met a number of very capable government officials, there are simply not enough government staff to get the job done and resources to acquire the needed computational and measurement resources does not exist. The entire national program is staffed by seven persons; although one position is presently vacant. Three persons are attempting to maintain all of the permits in the nation and check out complaints.

The number of staff in just the national programs of a few other countries with advancing air quality management programs is shown below:

- United States: 8,000 persons
- Chile: 45 persons
- Brazil: 150 persons

It is apparent why contractors will play a major role in fulfilling SAAQA requirements. This can be problematic in that contractors come and go and provide little continuity for industry, provinces, or municipalities to work with. It may well be

in industries interest to work with the national government to increase the air quality management capacity significantly.

It should be noted that in spite of the lack of capacity, the National air quality officer indicated a sincere interest at the national level to address the countries air pollution problems.

Industries must support government to reach a level of capacity such that the government can ensure a transparent and fair air quality management process.

## **2. (Industrial sectors opportunity and motivation in PPP) PPP in SA**

Motivation 1) Due to the ease at which air travel allows visits and the internet allows the transfer of information, developing countries are taking on a much stronger environmental ethic. Their citizens are not accepting the kind of air pollution that was common in the United States in the 1950s and 1960s and remains common in many developing countries today. Thus, during the past decade countries such as Brazil, Chile, China, India, and of course South Africa have taken a much more aggressive stance in controlling air pollution. It is to be expected with the realization that air pollution kills and maims that these activities will only increase in time.

- The political landscape in South Africa has been changing rapidly over the last decade. Today, Non Governmental Organizations (NGOs) are playing an important role in the creation and tightening of environmental programs. Many South African governmental institutions are relatively new with limited resources and new regulatory authority. And finally, the public is becoming more sensitive to the impact air pollution might have on their lives and welfare.

Motivation 2) improves air quality, attracts new industries and technology, creates jobs, and promotes tourism (AK- improved air quality allows for expansion/growth plans of an industry in an airshed at max capacity)

Motivation 3) numerous benefits that local governments and private businesses can achieve through partnership. EG. Sasol could benefit by much improved public relations.

Many projects also produce improvements in other areas of environmental concern, allow governments and businesses to save money by reducing energy expenditures, help utilities to better manage peak electricity demand, increase employment in growth sectors, and provide a higher quality of life for citizens. Such benefits are major motivating factors behind these initiatives and are influential in securing the support of residents in the communities where projects are implemented.

Problem:

More than half of the world's population depends on traditional biomass or other energy sources that result in unhealthy indoor air pollution and the International Energy Agency expects this trend to continue to rise. The World Health Organization states that 1.6 million people die every year from indoor air pollution, touching vulnerable groups

South Africa's urban townships are marked by sprawling slums and squatter settlements. To combat the cold, residents typically use coal or kerosene to heat their homes, resulting in poor indoor air quality, increased expenditure on fuel in the winter, and high incidence of accidental fire. It is not uncommon for poor township households to spend 25% of their income on fuels such as low-grade coal or kerosene (paraffin) that create air pollution levels seven times higher than World Health Organization limits. The indoor fires contribute to local air pollution as well as greenhouse gas (GHG) emissions to the atmosphere.

In response to this, a number of PPP have been adopted to try to find feasible alternatives.

### **3. Climate Change**

Climate change is a predominantly urban challenge. Cities account for three-quarters of the world's total energy use, either directly through the combustion of fossil fuels in power generation and transport, or indirectly through electricity use. The International Energy Agency has forecasted a massive increase in global energy demand, including a doubling of electricity demand, between 2004 and 2030. The share of oil and gas in the world energy mix is expected to rise from around 55 percent today to about 60 percent in 2030. In reality this means that even if the world is successful in considerably increasing the use of renewable energy sources, we will still be heavily dependent on fossil fuels for the foreseeable future.

In response to this challenge, cities around the world are making strides in mitigating greenhouse gas emissions from sectors they have direct control or influence over—typically power generation, transport, and buildings.

It clearly shows that there are significant opportunities available for cities and businesses working together to reduce carbon dioxide emissions, that these partnerships deliver results for the climate, and that they are financially rewarding for the city governments and businesses involved.

Climate change poses a number of challenges to both city government and businesses. Local governments struggle to adapt to the myriad effects of changing and unpredictable weather patterns, and the resulting impact on sectors ranging from agriculture to tourism. Businesses see a present and future threat to their profitability as core products and services are affected by—and threaten to exacerbate—climate change.

The scale and impact of climate change is global and must be addressed concurrently at the international, national, and local levels if the threat is to be stabilized. Partnership efforts between public and private entities at the city level are an invaluable contribution to the many efforts currently underway.

While the challenges faced are of a different nature for local governments and businesses, many have begun to understand that what they can proactively do together to reduce climate change is more powerful—and often more innovative—than what they can accomplish working separately.

#### **4. PPP Soutlion: Electrification**

- Electrification and Renewable Energy in South Africa

Parastatal company Eskom, is one of the largest utilities in the world, generates nearly all of South Africa 's electricity.

Eskom has been working in accordance with South African Government (SAG) targets, under the supervision of the National Electricity Regulator (NER), to electrify the country

The prohibitive cost of extending the grid to remote rural areas is the impetus for the development of non-grid (often renewable sourced) electricity programs in South Africa. As part of its rural electrification program In November 1998 Shell Solar South Africa, and Eskom launched a multi-million dollar project to supply solar energy to 50,000 low cost housing units.

At the end of 2000, over 6,000 solar home systems had been installed, bringing electricity to an estimated 30,000 people.

In May 2002, the German government signed a financing agreement with the SAG for a non-grid electrification project. The project, which will take place in the North West and Eastern Cape provinces, will electrify approximately 30,000 households.

French-based Electricite de France (EDF) and Total signed an agreement to supply solar energy to 15,000 rural homes in Kwazulu-Natal. Each participating household will be supplied with a solar panel and a battery capable of powering lighting, television and radio. EDF has a 65% interest and Total 35% in the electrification project.

#### **5. Challenges and opportunities in order to foster mutually beneficial relationships bet industry and government**

Challenges:

##### **1. Capacity of Government Structures**

The role of local government such as counties, district councils, municipal areas, and cities varies considerably even within a country due to local capacity and interest.

##### **2. The Cost of regulation**

- The cost of regulation is an important consideration in the air quality management process. Equally important is the cost imposed upon humans, human operations, and the ecosystem resulting from air pollution (Bentley-West) concluded that the cost of air pollution damage in South Africa is ZAR3.8 billion (\$612 million).

Businesses that compete in the market place with one another must be treated such that they have a level playing field within their sphere of operations.

**Industries need to balance the** cost per tonne of emissions reduced or cost per microgram/cubic meter of air quality improvement that is sustainably feasible.

Choosing to invest in an important new technology or planning for a mature one significantly impacts the future of technology based companies. R&D knowledge can help companies better create their futures in a world of increasingly complex and rapid change (RD required in choosing appropriate abatement technology for new point source standards)

- There are three social/political elements of air quality management that are key to a successful program. They are:

- Transparency
- Stakeholder involvement
- Fairness

## **6. Industry sector as development aid generated**

DEAT anticipates that the funds to develop the needed capacity to implement the new clean air act will come from fees assessed on sources. According to the National air quality officer, the source fees were designed such that they do not fall under the national tax laws and can thus be collected by the provincial or municipal agency. Much capacity is needed and significant licensing fees may develop over the next few years to support provincial and municipal air quality programs.

## **7. Industries roll in improving urban living environment in order to secure labour, export and image**

Compared with the world's most affluent nations, such as the Scandinavian countries, per-capita income in South Africa stands at 10% of the Scandinavian average (World Bank statistics of 1997: US\$32 430 for Denmark, Norway and Sweden, combined, versus US\$3 210 for South Africa). These developed nations enjoy total adult literacy and a higher life expectancy, as well as adequate and highly efficient social services in such fields as education, healthcare, welfare and public transport.

For as long as South Africa remains underdeveloped and deeply affected by poverty, disease, illiteracy and unemployment, among other maladies, responsible corporate citizens such as Sasol will continue to contribute substantially to a definitive spectrum of social upliftment and economic development programmes.

These initiatives are orchestrated through corporate and company-specific teams working in dynamic and constructive partnerships with local communities, educational institutions, non-governmental organisations (NGOs) and other capacity-building role players.

Most of the students are studying sciences, engineering and related technological and business disciplines. Half of the students are from historically disadvantaged groups.

The political landscape in South Africa has been changing rapidly over the last decade. Today, Non Governmental Organizations (NGOs) are playing an important role in the creation and tightening of environmental programs. Many South African governmental institutions are relatively new with limited resources and new regulatory authority. And finally, the public is becoming more sensitive to the impact air pollution might have on their lives and welfare.

The following drivers played a major role:

- *The constitution of the Republic of South Africa,*
- *Sasol's Values,*
- *An increased requirement for Ethical treatment of employees,*
- *Increased public awareness regarding the Environment,*
- *Globalisation/ Sasol's image both locally and internationally,*
- *The Legal reform process,*
- *The outcome of a study Benchmarking against international emission standards,*
- *A Heightened zealousness of authorities to enforce legislation,*
- *The Refinery sector Environmental Forum (RMEF),*
- *International agreements such as Kyoto.*

## **8. Increased public awareness**

The change in public awareness concerning the social and environmental responsibility of multinational companies is forcing companies to take note. This was borne out by the publicity around the recent *World Summit on Sustainable Development* and the use of this event by pressure groups. Recent increases in complaints and newspaper articles have highlighted this awareness. Perhaps the most controversial result of this awareness is the increase in *class actions* against companies for historic transgressions - even in our own country. Claims related to asbestos mining and processing activities and to Guernica (previously Thor chemicals) are but some examples.

## **9. Recommendation**

Investment in building long-term expertise is important to ensure the sustainability of the program. African experts (officials, consultants, researchers) would participate in ad hoc technical seminars and training sessions on issues such as environmental impact assessment, health impact assessment, pollution prevention, public outreach, economics of environmental decision-making, principles of environmental enforcement, and management of an environmental organization. Depending on professional needs and document availability, subscription to technical books or newspapers could also be financed

Industries in the less developed world need to actively engage in a dialogue with the research community to identify opportunities for mutually beneficial international partnerships.

GOAL for Scandinavian research projects should be implemented in a holistic and integrated manner, and will extend over the entire environmental cycle from "cradle to grave".

The right combination of research collaboration between research and industry cannot be achieved in isolation, and nor can it be imposed from outside or above. It can only grow out of dialogue both within and between universities and other actors

While African experts from the health, transport, and environment sectors have been working from time to time on air pollution issues, professional links between these experts have yet to be formed.

The capacity at the national, provincial, and municipal levels of government in South Africa is low at the present time. While we met a number of very capable government officials, there are simply not enough government staff to get the job done and resources to acquire the needed computational and measurement resources does not exist.

### **Public-Private Partnership Benefits**

- Save money for governments and businesses by reducing energy costs
- Improve the health of citizens with cleaner air
- Help utilities address peak electricity demand
- Increase employment in the clean technology sector
- Create a better quality of life for citizens
- Combat climate change by reducing GHG emissions