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**Desertec: Does Africa
stand to benefit?**

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Desertec: Does Africa stand to benefit?

Bonn, 3 August 2009. The founding of the [Desertec Consortium in Munich on 13 July 2009](#) had an interesting side effect: the almost “religious war” about the future energy supply has once again broken out: centralised vs. de-centralised and conventional vs. renewable energy generation are facing each other uncompromisingly. The only difference to recent years, it seems, is the fact that the advocates of conventional energies are in the situation of having to justify their positions. In times of an accelerated climate change it becomes very clear that the energy future will be renewable. In fifteen or twenty years, when electricity from coal power plants with carbon capture and storage (CCS) might be available (with higher electricity generation costs than from wind or bioenergy), it will be interesting to hear how today’s critics of renewable energy sources will justify necessary subsidies for conventional energies.

Such debates, however, are rather nonsensical for the majority of developing world, which does not yet have the luxury of choices regarding energy supply. In Africa, energy poverty is rife, with Sub-Saharan Africa (SSA) alone having 570 million people without access to electricity. The continent as a whole is currently the lowest per capita energy consumer in the world, accounting for only 3% of global primary energy consumption. It also has the highest share of traditional biomass consumption, with 59% of its population still relying on traditional, and inefficient, sources of energy such as open firewood.

Africa is, therefore, more concerned about access to a modern energy supply, in the form of electricity, than the sustainability and cleanliness of such supply. Certainly, expanded electricity access in the developing world has the potential to significantly enhance living conditions, in sectors such as health services, communication, information and education. Further, access to electricity can enhance the competitiveness of developing countries, while a lack of electricity inflates production costs and makes competition in the global market difficult. Indeed, access to electricity is a prerequisite for economic growth and sustainable livelihoods, and is thus a fundamental ingredient for the achievement of the United Nations Millennium Development Goals.

However, in the current global context of increasing awareness of climate change, Africa cannot afford to ignore its environmental challenges, and so faces the dilemma of having to meet significant development needs while taking into account issues of sustainability and cleanliness.

Energy demand per gross domestic product is much higher in developing countries than it is in the industrialised world, while subsidised electricity from fossil fuels is comparatively much cheaper. In order to fulfil their ambitious growth trajectories, African countries will continue to invest in new energy infrastructure, and in large parts, these investments are in conventional power plants rather than in renewable energy sources that still face many barriers in their implementation. There are also other challenges such as higher up-front capital costs of renewables, and in the case of Concentrated Solar Power, the technical expertise is concentrated within a small number of institutions and the technical and financial risks are perceived as being too high.

In order for Africa to successfully deal with this contradiction it needs to find alternative energy sources that make economic sense while simultaneously addressing its socio-economic agenda.



Efforts to mitigate and adapt to climate variability should therefore be complementary to the broader economic agendas of African countries. This would include an increased investment in low-carbon, highly efficient technological innovation that will improve access to energy in rural areas.

Engineers illustrate that decentralised energy production with photovoltaic, solar heat or small-scale bioenergy function best off-grid and locally (meeting the needs of a scattered rural population), while centralised options such as CSP, hydro or large-scale bioenergy will be appropriate for industrialised or densely populated areas where a continuous base load is needed.

Interestingly, low-carbon technologies, such as solar energy, are widely held to have positive socioeconomic spin-offs. Figures from Desertec, for example, indicate “240 000 new German jobs” and “2 trillion Euro in profits for European companies by 2050”. Of course, the employment and economic gains of this particular project seem largely confined to Europe.

Nevertheless, the decision to situate a large portion of the Desertec project in Africa raises the profile of the continent’s potential for sustainable power generation. Certainly, Sub-Saharan Africa shows large solar potential, with recent studies having shown that the amount of solar radiation per square meter on average is higher in South Africa, Namibia and Botswana than most other regions (2950 kWh/m²/year in the Northern Cape region compared to 2350 in the Sahara or 1700 kWh/m²/year in southern Europe). Studies have also shown that solar resources decrease as one moves north from the Kalahari Desert. A study by the German Aerospace Center (DLR) shows that 65 000 square kilometres of CSP in the Sahara Desert would be sufficient to meet the world’s electricity demand.

Africa also has the potential to deliver on some of the technical requirements for renewable power projects. For example, South Africa already uses advanced High Voltage Direct Current (HVDC) technology in its Cahora Bassa hydroelectric collaboration with Mozambique. Further, South Africa has an advanced automotive industry, producing manufactured parts required for CSP, such as glass, coatings, electric motors, gearboxes and space-frames. This has the potential to create a significant number of jobs in the manufacturing sector.

So far, the Desertec initiative is a vision to be completed by the year 2050. The next three years, which the Desertec consortium will use to develop viable investment plans, will show if this vision can become a reality. It is critical that the development needs of the South are taken into account in this planning process, not only in terms of its electricity requirements, but also in terms of its potential to contribute to the project in a manner that can enhance socioeconomic development. Under these conditions, Desertec can become a driving force in the equitable fight against climate change, and can form part of a tidal wave of innovative solutions beyond coal, gas and nuclear – both for the North and the South.