TIME TO *SHINE*

As the hunt for renewable energy sources heats up, an initiative that could change the face of North Africa and the Middle East introduces itself to the world. By Nick Pryke

Africa has suffered from poverty and a critically poor infrastructure for longer than many of us would care to admit. Its constant portrayal in the media as a struggling continent battling against the current is unfortunately largely one of truth. As other less economically developed regions slowly begin to take the strain and pull themselves upward, Africa, as a generalisation, seems to merely survive.

There are many philanthropic organisations currently working to help people in various parts of Africa build a more positive future. But for all the hard work and dedication that these large hearts pump into the cause, it just hasn't been enough. Africans need something to offer the world that its former exports couldn't – and they may have just found it.

With the earth's desert regions receiving more solar energy in six hours than humankind consumes in a year, Africa has the potential to offer its population – and the rest of the world – a big bite of the renewable energy apple that is solar power. More specifically, certain African countries have the privilege of owning some of the world's finest sun-harvesting land, affording them the opportunity to invite organisations and investors onto the continent to do precisely that: harvest the sun's power to produce a renewable energy source that can then be delivered around the world. The jaw-dropper? It would take up less than one percent of the Saharan desert to do so.

The Desertec Industrial Initiative

Gerhard Knies, co-founder of the Trans-Mediterranean Renewable Energy Cooperation (TREC), helped set up the Desertec Industrial Initiative (Dii) in 2008 to realise the 'Desertec concept' of obtaining a sustainable supply of electricity for Europe, the Middle East and North Africa up to the year 2050. It consists of a consortium of 12 companies, headed up by Munich Re and incorporated under German law. The concept showed that a transition

to a competitive, secure and compatible supply is possible using renewable energy sources and efficiency gains, with fossil fuels being used as a backup for balancing power.

Paul van Son, CEO of Dii, describes their objectives: "Our aim is to pave the way for large scale production of electricity from sun and wind in the deserts. Of course, this shall be both for the benefit of the MENA countries and Europe on the one hand and for our shareholders and partners on the other. Energy from the deserts is inspired by the Desertec concept. Our initiative has emerged from the private sector that is determined to bring this concept into reality and to create new business chances.

"What we ultimately aim for are substantial, feasible investments in this field in order to contribute to security of energy supply, climate protection and socio-economic development. We won't do this alone, but instead will work in close cooperation and partnership with the authorities, local communities, international industries and many other initiatives."

According to GreenPeace, "If the solar industry continues to develop at its current rate, concentrated solar power (CSP) could meet up to seven percent of the world's power needs by 2030 and one quarter by 2050." The organisation also claims that the solar power sector could step out of the shadow of other renewable technologies and establish itself in the sustainable power generation industry as one of the big players.

Talking to CNN, Knies couldn't have agreed more: "We need a new, so-called 'operating system'; a survival strategy for growing humanity on a finite planet. In a word: sustainability. Of course the earth can support 10 billion people with food and shelter, but not with energy from fossil fuel sources. That is why we need the security of a complete transition to near-infinite and clean energy systems. The most powerful and fastest possibility lies in using the biggest, but least used, source of clean and unlimited energy on the earth. That is solar radiation and the deserts.

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"I think it's insane to organise collective suicide. The fossil fuel system and our economy are doing that right now. We cannot survive in this way. My guess is that solar energy will be 40 to 70 percent of the total energy consumption, 30 to 60 years from now." Knies also has an unequivocal belief in his mission to help poorer countries, such as those in North Africa, by offering them the chance to develop a new source of income by selling clean electricity. "For Europe, this would be one of the cheapest sources of clean electricity. It's a win-win situation between the two," he said.

While this isn't the first attempt at creating a large scale, commercial CSP plant – the first being opened in Seville, Spain, in 2007, followed by a more recent plant in Rwanda – the Dii proposes to serve a significantly larger population base. It aims to do so by also bringing into play all relevant social, political, industrial and regulatory aspects pertaining to both the concept and the continent alike. Not only will this bring Africa into the spotlight in terms of what it can do for renewable energy worldwide, but perhaps more importantly, it will form bonds with multinational organisations who can hopefully advise and aid Africa in setting itself up for the future.

Of the dozen multinational founding companies of the initiative – with their comprehensive technological prowess and dream portfolio – Siemens seems to have taken on a significant role in the context of planning, due mainly to its expertise in long-distance power transportation.

Rene Umlauft, CEO of the Renewable Energy Division of Siemens AG Energy Sector, highlighted just how much experience they have in this discipline: "What was only a vision 30 years ago is at most only a technological challenge today; a challenge we can master. We can generate energy in the desert. Today, we can transport power over the power-highways over long distances with relatively low losses. We would not be Siemens if we couldn't face such jobs and challenges – both economic and technological.

"We want to – and we will – make power from wind and the sun affordable in the future. We are currently designing such a project in China, transporting power over 1400 km from a hydro-electric power plant to a large city, with only a few percent in power loss."

Indeed, Siemens will have an important role to play, not only in exporting power from North Africa to Europe, but also in linking up the relative individual sites; while the 'plant' is referred to in the singular, it is in fact a network of smaller sites scattered across a plethora of North African countries. It is here that the importance for integration and understanding at a national government level will need to prevail.

Jamila Matar, a representative for the League of Arab States, spoke at a convention in Munich in July of last year: "The League of Arab States is very confident that the Desertec initiative will certainly add to the previous contributions in the field of promoting renewable energy, reducing carbon dioxide emissions and reducing the gap between conventional resources of energy and renewable ones." Laila Georgy, representing the Ministry of Energy for Egypt, further backed the initiative, stating: "Egypt enjoys the very high potential of renewable energy sources, especially with wind and solar. We very much appreciate this initiative and wish all the best of success and fruitful outcomes to all involved."

Scepticism

Despite such positive feedback, the involvement of a consortium of powerful global companies leads to questions about whether they are using the initiative for their own benefit rather than that of the Middle East and North Africa region. But the Dii has remained as transparent as possible on the subject, and admits that while the MENA region is currently being exploited for its oil and gas, solar energy is practically boundless and harnessing it will contribute to the technological development of the region.

The Dii makes it explicitly clear that it is left to the sovereignty of the producing countries as to whether they decide to use the clean energy to meet their own demands first and finance this energy supply through the profits that they earn from selling or dispensing with the fuels that are thus saved, or sell the energy to Europe and wait until the relevant technology becomes cheaper. In the light of the enormous potential that solar energy entails, it would be relatively easy for the countries in question to take advantage of both possibilities at the same time.

Conversely, others question the dangers of depending on economically unstable countries in MENA for such a large project, to which the Dii replies: "It is more likely that parties which are not mutually dependant would become involved in conflicts with one another than parties which are interdependent on one another. By 2050, the South Mediterranean region will have roughly the same economic power and population as Europe and hence similar energy requirements.

"Isolating this region would be much more dangerous for Europe than a joint effort towards a sustainable energy supply system. On a global scale, there will be a change of paradigm in terms of political security, which will replace the conflicts increasing worldwide over limited resources with a joint international effort to harness renewable resources."

Under the proposal, CSP systems, photovoltaics systems and wind parks would be located on 6500 square miles of the Sahara Desert, surrounding the outer perimeter of the Saharan, with fewer sites located in the central Saharan linking up to form the solar grid. However, taking into consideration the cheaper costs of wind power over those of solar, why isn't wind energy being given the spotlight?

Balancing out wind's cost advantage is the disadvantage of control. Wind energy is not controllable according to demand, making it less valuable than solar energy. In addition, wind energy potential is not nearly as large as solar energy potential: its most common use is as a cheap source of energy for local energy requirements in MENA, and it can't fulfil enough of the potential for a site as large as Desertec is planning. Considering the supposed 'cheaper price' of wind energy, the project would ironically become more expensive if it was to utilise wind plants as the high-voltage direct-current (HDVC) transmission lines being used would only run at around 50 percent capacity.

The same can be said of photovoltaic energy as an exportable power source: only 25 percent of the HDVC transmission capacity would be utilised. It then becomes clear that together with European domestic sources, solar-thermal power plants can deliver the controlled energy required as well as the basic supply, thereby dramatically increasing the utilisation of the HDVC transmission lines. The bottom line for Desertec: wind plants should be integrated as part of a larger solar-thermal plan if the renewable energy resources of the Saharan are to be fully tapped into.

And so it is. While wind energy sites would be inefficient on their own in a project of this magnitude, Dii also understands their importance in the grand scheme of the concept, and areas along the Atlantic coast and the Red Sea are perfect regions for wind plants to thrive. There is no bias based on solar over wind however, rather the environment dictates the methods – something Dii is all too aware of.

The Desertec industrial initiative supergrid proposal

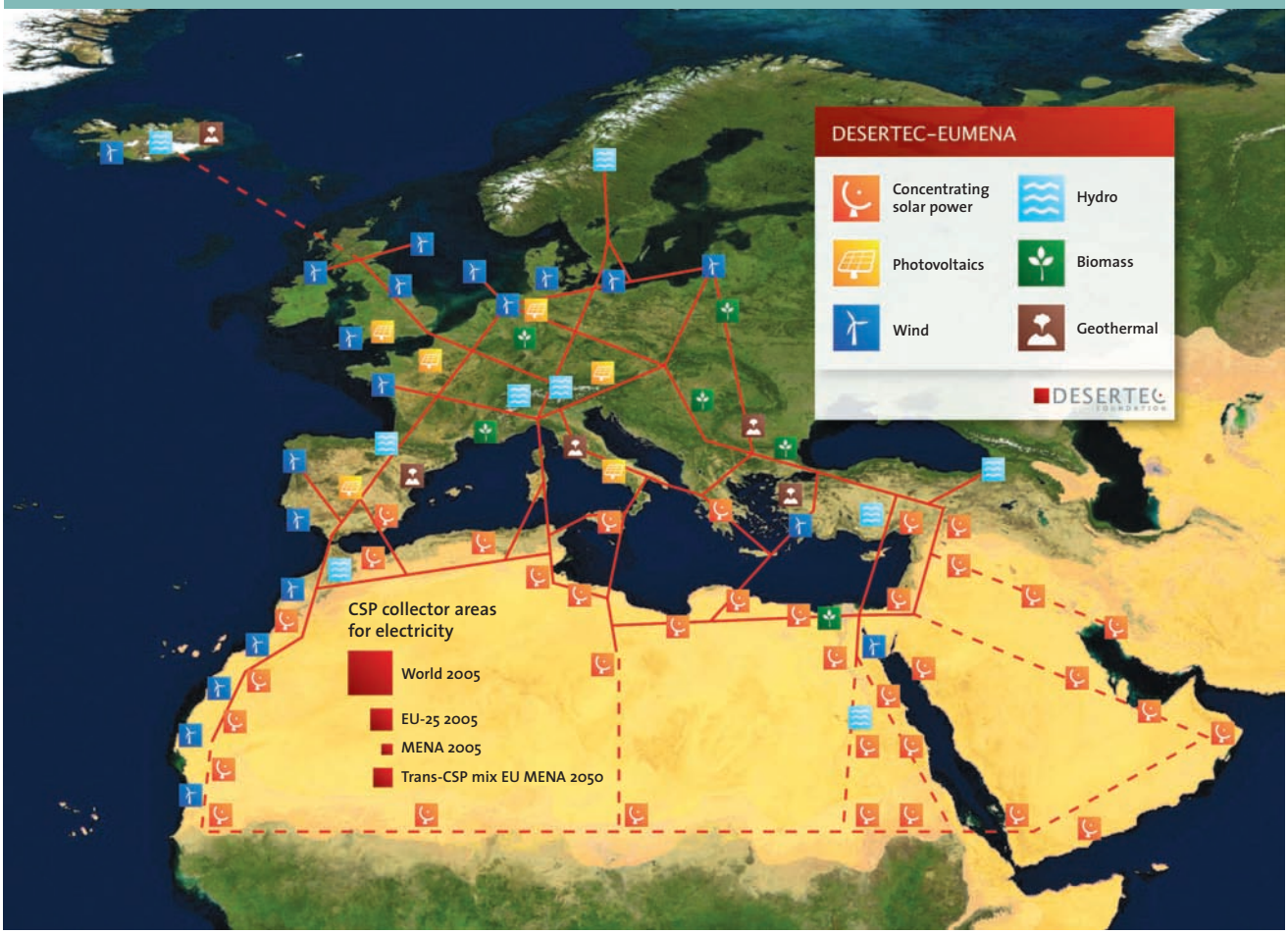

Image: TREC

Helping the people

If the logistical elements of the initiative are half the battle, then the socio-economic elements certainly remain the other half. "Just think about the numerous investments and economic activities that will be triggered by Desertec," asserts van Son. "The construction and maintenance of many power plants, grids and related infrastructure will create jobs in the MENA region and they will add to prosperity.

"This will bring new perspectives for many people. Our approach with Desertec will of course in the first place to offer access to clean energy. Along with the implementation, it will bring technology transfer."

For some countries, this will lead to the reversal of capital flows in the energy sector, which will afford them the opportunity to sell power and generate income rather than having the need to buy coal, oil or gas. Other countries will no longer need to exploit their fossil resources, and thus create the option of leaving these resources to future generations without loss of income. While Africa is still long off the mark in this context, it is a hope of the Dii that at some point in the future Africa will also be able to achieve a similar situation.

"By 2050, the demand for electricity and drinking water in the MENA region is estimated to become as high as in Europe," continues van Son. "Large amounts of energy will be needed to meet this demand. Desertec will, thus, ensure a substantial part of this energy need and it will contribute to improved living conditions for many people."

But the question still remains: does it make sense for Europe to be promoting the development and expansion of renewable energy sources in MENA? Ultimately it remains largely irrelevant whether the carbon dioxide emissions arise or are avoided in Europe or the MENA region. In the end, the speed of the carbon dioxide reduction is the decisive factor; this is after all one of the main reasons for finding and forging a future for renewable energy. In addition, the MENA region would also gain from the avoidance of further human and financial losses through environmental catastrophes that are triggered when fossil and atomic fuels continue to be combusted to harness energy.

These are merely two good reasons in a sea of advantages: Europe can offer plenty to the MENA region in return for imported clean power. Perhaps one of the most important socio-economic factors is the development of an economy based on know-how and technology, thus allowing these countries to overcome underdevelopment and poverty in the mid- to long-term.

So what about the rest of the world? What about Central and Southern Africa? How would the introduction of Desertec to the North affect the South? These are all questions being asked by locals and CEOs alike. And the answer is simple: Desertec hopes to provide for all in the long term. Renewable sources of energy in general and solar-power plants in particular are just as suitable for the rest of Africa, which can also profit from the cost reductions in the North. The Desertec concept is also being promoted in China, Australia, America and India for the realisation of "clean power from deserts".

But means are limited for the Dii, so in order to provide wherever possible, it is building regional Desertec networks worldwide that can profit from its know-how and research. Indeed, while the focus is currently on MENA, the Dii hopes that the future of renewable energy will be inspired by the Desertec concept on a global scale – a hope that will be one step closer when contracts for the Desertec supergrid are signed in 2012. Sceptics and critics of the programme are sure to remain and battle the biggest initiative of its kind, but for North Africa it could very well be time to shine. ■