



Dii

Enabling
DESERTEC
in EUMENA

Dii – Enabling DESERTEC in EUMENA

Energy is one of the crucial elements for life on earth. The main sources of energy that we use today are exhaustible and have an impact on our natural environment. In order to secure living conditions for present and future generations a reliable and sustainable supply of energy will, thus, be one of the major challenges of mankind.

The DESERTEC vision points at the enormous amounts of energy that is being delivered every day by the sun to the deserts of our earth. They receive in six hours as much energy from the sun as mankind consumes in one year. In addition, some deserts have very good wind sites. The deserts would enable a secure, sufficient and affordable energy delivery for a world of 10 billion people from clean and inexhaustible sources. Plenty of electric energy can be generated from these sources and existing technologies would be able to deliver this energy to over 90% of the world population each day and night. This would include emerging applications such as energy for sea-water desalination and power for electric mobility.

On the long term the DESERTEC concept could in a controllable way complement all the other available sources of renewable energies as necessary for a secure and sustainable energy future. As a result of an expanding energy cooperation Europe (EU), the Middle East and North Africa (MENA) now have a unique chance to start a new era which is based on partnership and which could contribute to their joint prosperity.

Industries – engine for sustainable development

Dii is a unique industry initiative which has been launched as 'Desertec Industrial Initiative' in July 2009. We aim at creating the conditions for an accelerated implementation of the DESERTEC concept in EUMENA. Dii was founded under German law as a GmbH (limited liability company) in Munich on 30 October 2009.

Our joint venture was founded by 13 founding signatories. The shareholder base and the company network will be broadened as further companies from north and south of the Mediterranean area will join this industry initiative as shareholders or associated partners.

Dii is a private sector initiative. We seek and welcome all forms of collaboration with leading or complementary international political and institutional initiatives such as the Mediterranean Solar Plan (MSP) or the World Bank's Clean Technology Fund (CTF) that are like us devoted to developing the markets for large scale sustainable energy production and transmission.

Dii's activities focus on power generation from the sun and wind in the deserts of the MENA countries and transmission to local demand and partly to the European interconnected grid. Dii will objectively investigate and identify suitable technologies for power generation and transmission. As a consequence all field proven, feasible technologies for sun and wind energy conversion and long distance power transmission will be candidate for selection. This would for instance include CSP and PV technologies, AC and DC transmission and also different concepts for wind power. Dii aims to facilitating and encouraging investments in the framework of the DESERTEC concept, including knowledge transfer to the MENA area and the establishment of local industries.

Deserts – a paradise for energy generation.



It's about connecting people, cultures and continents.



Our Mission

The deserts of the Middle East and North Africa (MENA) offer excellent irradiation ('sunshine') conditions for large scale solar power generation. Additionally, some MENA regions are known for their good wind conditions, particularly along the Atlantic coast and the Red Sea.

Our mission is to enable the roll-out of the DESERTEC concept with the target of supplying MENA and Europe with power produced from these sun and wind energy sources. The long-term goal is to satisfy both a substantial part of the energy needs of the MENA countries and to meet about 15% of Europe's electricity demand by 2050.

All Dii shareholders have agreed on common objectives for this joint venture.

Our core objectives are to

- analyze and develop a technical, economic, political and regulatory framework for feasible investments into renewable energy and interconnected grids
- originate some early reference projects to prove the feasibility of the concept
- develop a long term roll-out plan for the period up to 2050 providing investment and financing guidance
- conduct in-depth studies on specific subjects, e.g. siting issues, technology developments or specific conditions in order to provide answers to key questions that will come along on our path

Dii will work on these objectives in close cooperation with the DESERTEC Foundation, a non-governmental organisation that acts as the worldwide promoter of the DESERTEC concept. For detailed information see www.desertec.org

The core elements of our mission

- The focus of our activities will be on the sun and wind as renewable sources of energy and transmission. We are not biased to any particular technology. Any technology selection shall fulfill objective criteria.
- Our regional focus will be on EUMENA, i.e. Europe, the Middle East and North Africa.
- All of our activities up to 2012 will be aimed at creating conditions for viable business and investments.
- From the very beginning the aim will be to start supplying electricity to the European Union and to generate sufficient power to meet the needs of the producer countries as soon as possible. The aim is to supply around 15% of Europe's electricity by 2050.
- Our work will not be limited to individual aspects of the DESERTEC concept. The approach adopted in investigating power generation, transmission and sale will always be a holistic one, and will also take into account the political and social parameters and the development needs of the producer and transit countries (for example, combination with seawater desalination)

Dii Shareholders

Dii's shareholder structure stands for a unique broad bundling of international industrial expertise on high-level standard in all relevant fields:

- Project development expertise
- Power generation from wind, sun (e.g. CSP/PV) and potentially biomass and geothermal energy
- Plant construction
- Grid technology, HVDC transmission, super grids and system studies e.g. 'solar grid'
- Power system control
- Energy trading and long term contractual arrangements
- Renewable Energy Certificate Systems (RECS) and/or feed-in subsidy systems in Europe and beyond
- Financing and risk management, risk control and risk analyses for investments
- Insurance of high-tech large scale assets during construction and in operation
- Legal expertise
- Knowledge transfer, education and training

Providing this, Dii can utilise not only operational industrial expertise but also a high level network of political, scientific and society contacts in EUMENA region. Dii benefits from global DESERTEC studies which are basis for the implementation plan in EUMENA region.

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We are preparing for a new solar energy era



Mr van Son, you are the CEO of Desertec Industrial Initiative. Can you describe your overall 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 hand. 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. So far German, Spanish and Algerian companies have teamed up together with the DESERTEC Foundation to make this happen. 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 don't do this alone, but we will work in close cooperation and partnership with the authorities, local communities, international industries and many other initiatives.

Why are the deserts of the Middle East and North Africa so attractive to you?

I regard the deserts as landing places for energy from our 'big remote nuclear fusion reactor', the sun. Although the global energy mix will most likely continue to remain very divers in this century we believe that large scale use of solar energy from the deserts will become one of the most important climate friendly and economically attractive components of energy supply. We foresee a continued growth on energy demand in the upcoming decades. This will be true for North Africa, the Middle East and to a minor extent also for Europe. The presently used fossil fuel options have their long term limitations, they are subject to geopolitical volatility and they produce CO₂ emissions. It seems, thus, very logical to me to investigate the feasibility of substantial use of the energy from the deserts. The deserts offer a huge energy potential which so far remains widely unused and nowadays modern technologies make it possible to harness this energy in an environmentally sound way. This all looks very attractive to me. This is where I wish to dedicate all of my forces to.

How are you approaching this mission?

First of all by building trust. The countries in North Africa and the Middle East are the owners of the sun and wind energy on their territory and, hence, they are free to decide what will happen with that energy and how they want to benefit from its use. The countries in Europe will become importers and, hence, they will have to compensate for that and of course they shall also benefit. We are very aware that this process will take place in a context of many different countries, cultures and people everywhere. They all will have their questions, interests and expectations. Our concept must of course be clear and sound. What investments do we foresee in the coming decades? What conditions do we need to ensure feasibility? What will that mean to stakeholders in all areas? We have to convey clear answers. We must gain acceptance throughout and show the benefits that our plans will deliver to each stakeholder. We will seek open dialogues, listen carefully, but we are convinced that we are able to create win-win-situations. DESERTEC can only be successful if there are benefits for all. I am confident that we will jointly make that happen.

Benefits for all

Will the MENA countries benefit from DESERTEC?

Clearly yes. Just think about the numerous investments and economic activities that will be triggered by DESERTEC. 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 offer access to clean energy. Along with the implementation it will bring technology transfer. For some countries it can lead to the reversal of capital flows in the energy sector. They will get the opportunity to sell power and to generate income rather than having the need to buy coal, oil or gas. Other countries do not longer have to exploit their fossil resources now and they create the option to leaving these resources to future generations without loss of income. By 2050, the demand for electricity and drinking water in the MENA region is estimated to become as high as in Europe. 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.

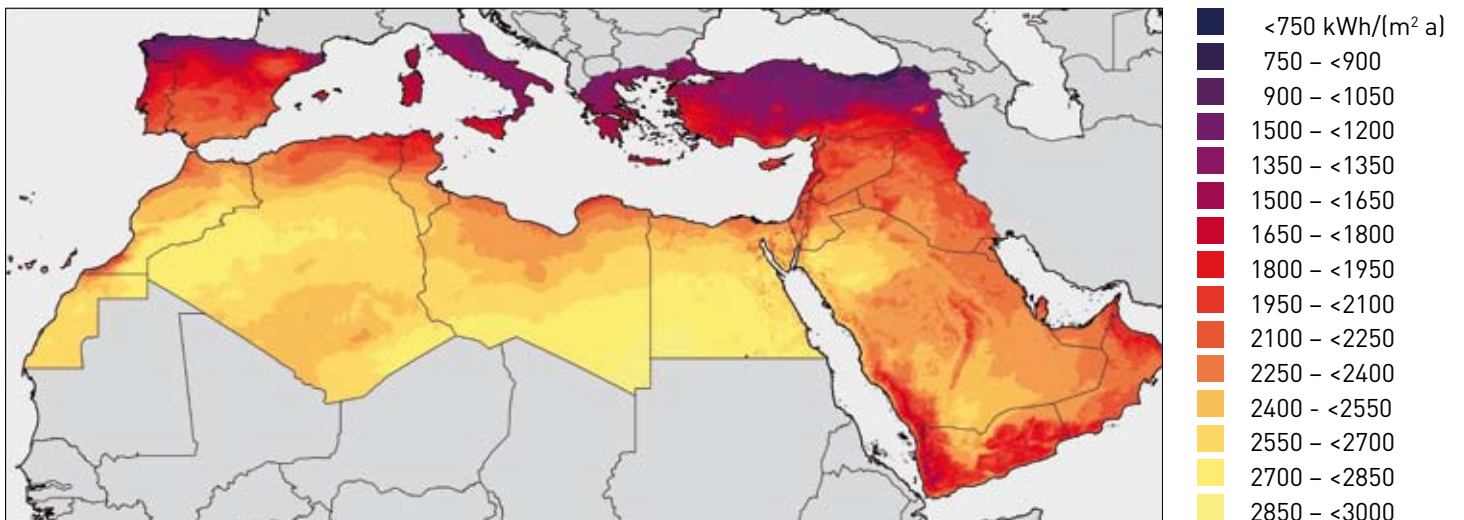
Our vision demonstrates how business potentials can be aligned with sustainability goals.

Aside from business opportunities for all parties and countries involved, DESERTEC offers a vast potential for economic, political, ecological and social development, particularly in the MENA region:

- Growth, development and employment opportunities in MENA region as a result of substantial private investment and the establishment of local industries
- Transfer of know-how
- Greater energy security in the whole EUMENA region
- Utilisation of excess energy in seawater-desalination plants
- Improved cooperation and synergies between North and South including coupling and/or integration of energy markets
- Reduction of carbon-dioxide emissions and thus a significant contribution to climate protection targets
- Long term stabilization of energy prices
- Further economic diversification and regional integration for MENA countries including various spin-offs (e.g. small businesses, R&D, education and training)

An abundance of space and sun

The MENA region has vast resources of solar energy for its economic growth and as a valuable export product, while the EU can provide technologies and finance to activate those potentials – for the benefit of the people on both continents.



The map shows solar electricity potentials north and south of the Mediterranean Sea and their geographic distribution (annual sum of direct normal irradiation in kWh/m² for 2002).
Source: MED-CSP 2005, German Aerospace Center DLR.

Associated Partners

DESERTEC has attracted a lot of companies and institutions who expressed their interest to get involved in our initiative. The Dii – being the enabler of DESERTEC in EUMENA – has therefore created the opportunity for companies and institutions to become an Associated Partner.

As an Associated Partner your company will become a part of a fascinating international venture and a strong industry network. Associated Partners will be kept up to date about all relevant developments of the project. You will obtain useful information from studies or participate in working groups to contribute to the project. It may be in your interest as well of that of Dii to include the specific expertise of your company. Moreover, you will be invited to the annual Dii conference at no admission fee.

To demonstrate your dedication in the Desertec Industrial Initiative externally you will be able to use the Dii trademark in combination with the adjunct 'Associated Partner' and of course with reference to enabling the DESERTEC concept. Your company logo will be displayed on our website and all official Dii brochures and publications.

Prepare the ground for future business and contact us to become an Associated Partner of Dii.

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Abengoa Solar, DLR
ABB, SCHOTT Solar
Siemens, Solar Millennium
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