



DESERTEC – Clean Power from Deserts

Dr. Oliver Steinmetz

Co-Founder & Member of the Supervisory Board

Oliver.Steinmetz@desertec.org

Workshop on “Solar Energy (Concentrated Solar Power)”
Academy of Athens & the European Academies Science Advisory Council (EASAC)
Athens, 9 December 2011



Agenda

- DESERTEC: A global concept
- DESERTEC Initiatives

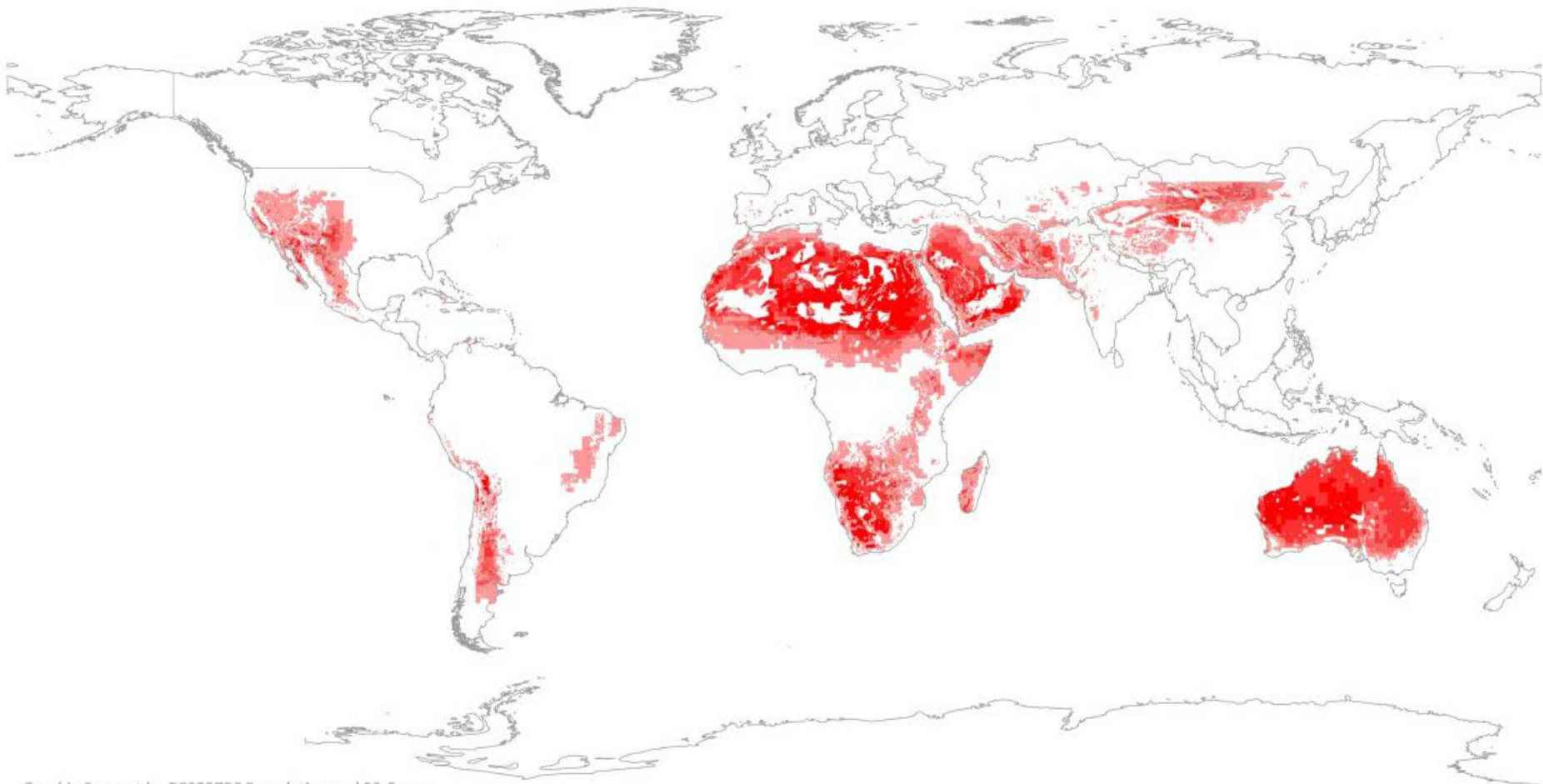
Challenges of the 21st century

■ Energy supply AND climate protection

How can 10 billion people live in a **sustainable** way on this planet that's already overburdened by 5 billion people?

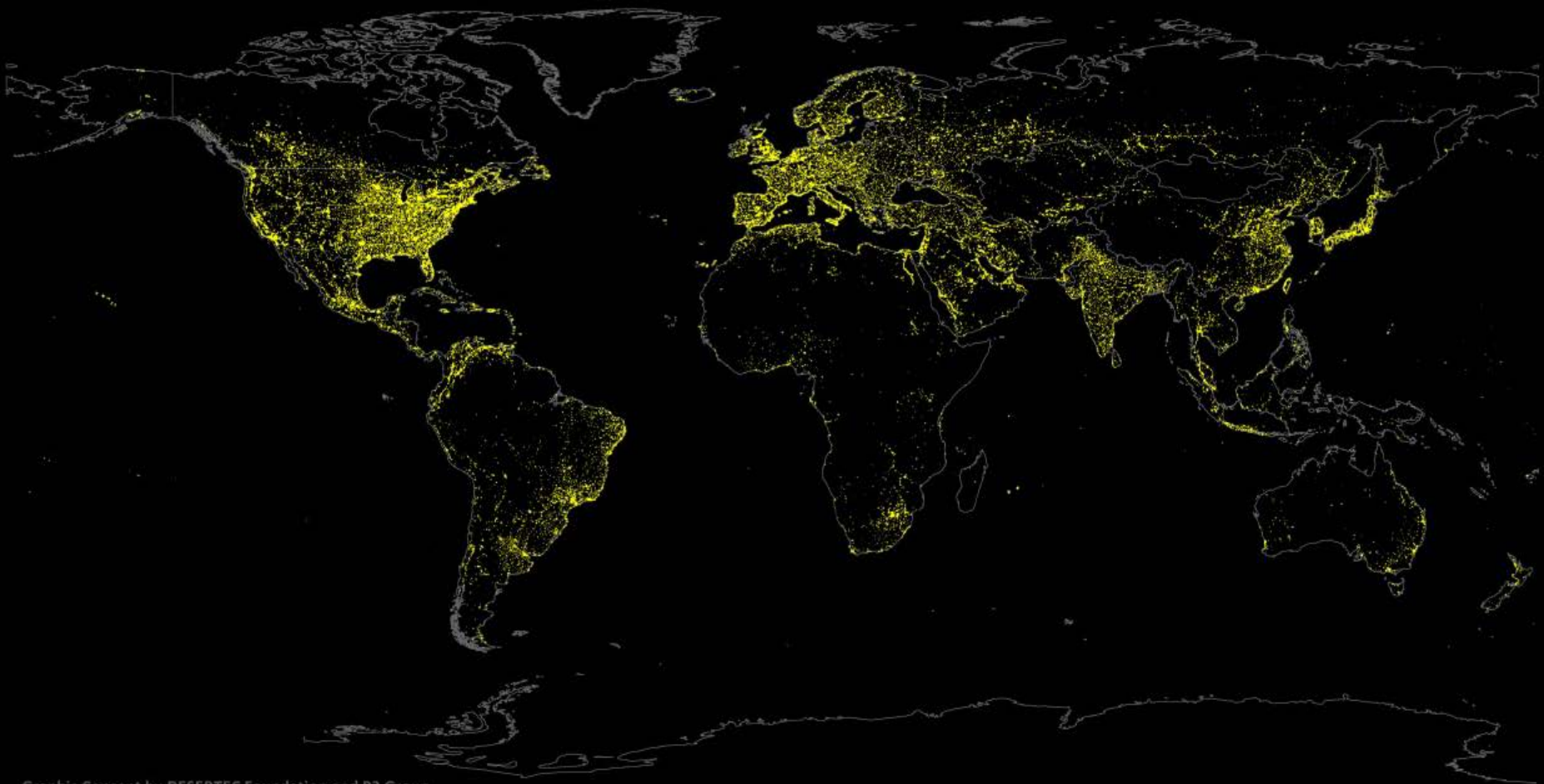


Desert Regions with Solar Energy Potential



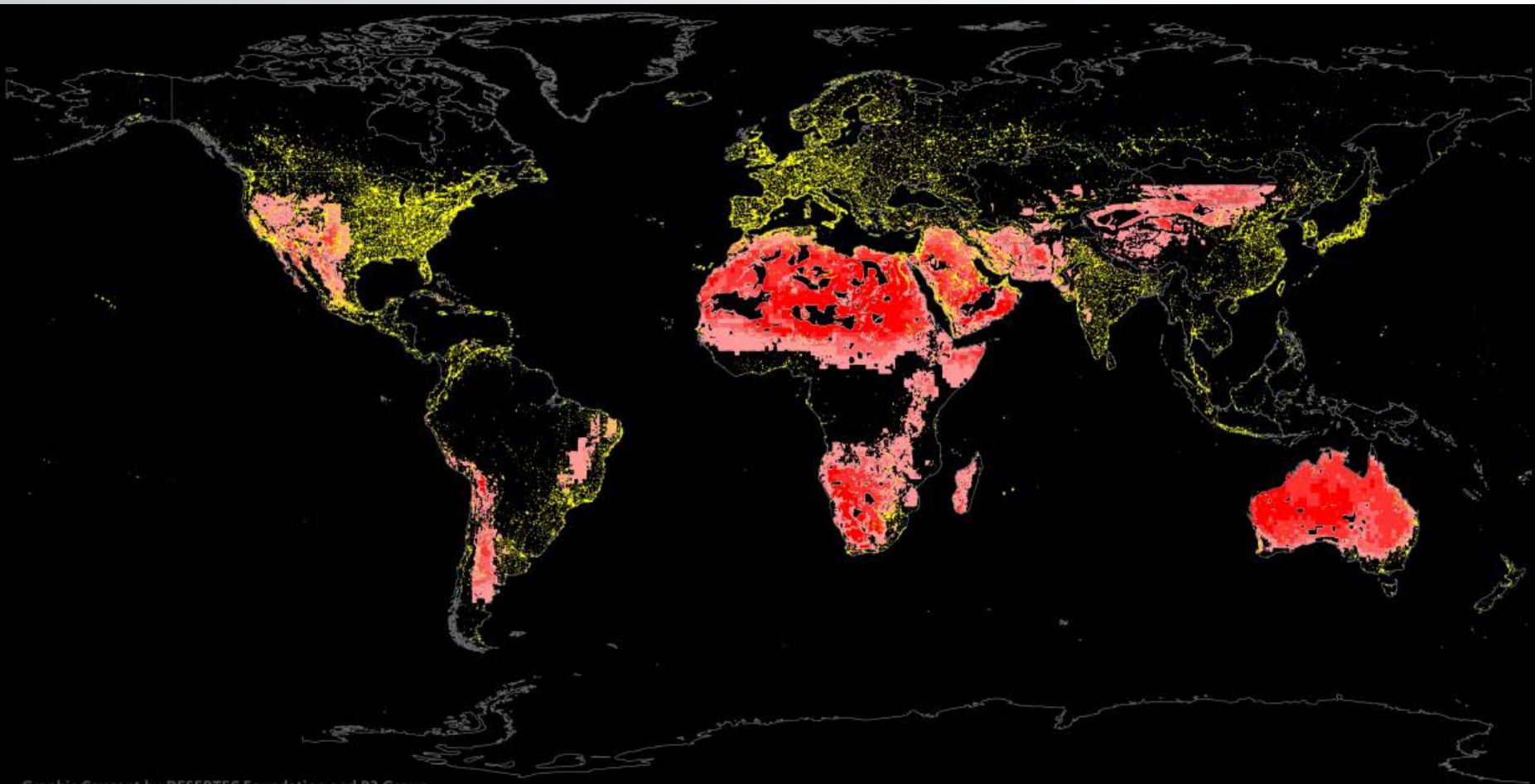
Graphic Concept by DESERTEC Foundation and P3 Group
Based on Data from NASA and German Aerospace Center (DLR)

Energy Consumption: Light



Graphic Concept by DESERTEC Foundation and P3 Group
Based on Data from NASA and German Aerospace Center (DLR)

Power Supply (Deserts) vs. Demand Regions



Graphic Concept by DESERTEC Foundation and P3 Group
Based on Data from NASA and German Aerospace Center (DLR)

Solar power generation

■ Basic idea behind DESERTEC

Within 6 hours deserts receive more energy from the sun than humankind consumes within a year.

Dr. Gerhard Knies



The DESERTEC Concept integrates CSP with other renewables and HVDC



EU-MENA = Europe - Middle East & North Africa • CSP = Concentrated Solar Power • HVDC = High-Voltage Direct Current

The symbols for power sources are only indicators of potential locations.

Sources: Clean Power from Deserts • White Book 4th Edition • DESERTEC Foundation • February 2009 • www.desertec.org • www.dlr.de

O. Steinmetz - DESERTEC - EASAC Athens, 9 December 2011

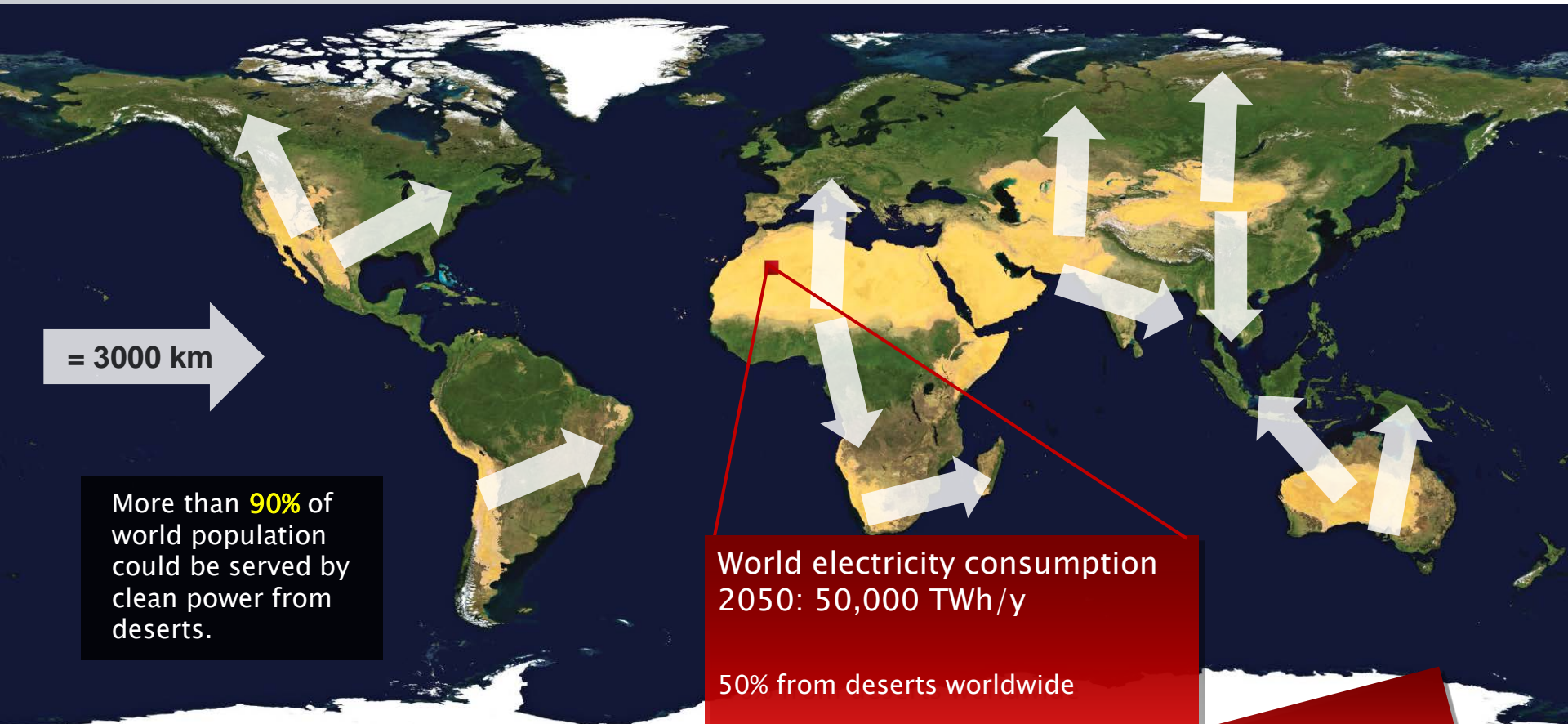


DLR



DESERTEC-World

Clean Power from Deserts for a World of 10 bn people



= 3000 km

More than **90%** of world population could be served by clean power from deserts.

World electricity consumption 2050: 50,000 TWh/y

50% from deserts worldwide

= 25,000 TWh → 10,000 GW capacity from 360 x 360 km² (130,000 km²)

= 0.31% of Earth's deserts distributed across "10,000" sites

NB: Deserts grow by 60,000 km² / year!



Role of DESERTEC Foundation

■ Promote the Vision

■ Networking & Coordination Hub

– Partnering Strategy

- Industrial Partners
- Academic Partners
- Individual Partners

■ Roadblock Remover

Industrial Initiative



2009:

2010: MedGrid

2013-15: Dii Reference Project in Morocco



**TREC
Scientific Studies
2004-2006**

**Charitable Foundation
by private citizens
est. 2008 / 09**

Public Initiative

2011:

- Awareness-Raising with young people in Egypt & Tunisia

2012: Web 2.0:

- Knowledge Platform
- Crowdsourcing

Political Initiative

2007: EU Parliament

2008: Med. Solar Plan

2009: Morocco Solar Plan

2011: Greece?

Academic Initiative



2010:



Where DESERTEC Foundation can help

- As an NGO we can open doors
 - Non-profit, citizens' initiative → credibility
- Connections to partner countries
 - Citizen-to-Citizen communication
 - Consulting for governments
 - Acceptance in the civil societies
 - Own coordinators in the countries

Why a University Network?

- Question from the Desert Countries:
 - “What’s in it for Us?”
- → Maximise “local content”
- → “Human Capacity Building” is Key!
 - Exchange Best Practices (Curricula etc.)
 - Exchange Researchers & Students

Socio-Economic Consequences

■ The wealth, well-being and peace of our partner countries in and near desert regions depends on

- Access to energy
 - ← DESERTEC power
- Access to water
 - ← DESERTEC desalination
 - Conflicts, e.g. Jordan river:
Israel / Palestine / Jordan ...
- Access to food
 - ← even in currently arid regions?!
- Birth rates are inversely proportional to wealth!



Dii – l’iniziativa industriale di DESERTEC 55 partner provenienti da oltre 12 paesi



20 Shareholders



35 Associated Partners



Cooperating with institutions, associations and other initiatives :
MSP, UfM, IRENA, RECREE, ENTSO-E, ESTELA, OME, MEDRING, MEDGRID, etc.



MedGrid / Transgreen - Concept Sketch





Greece: A Special Case?

- A Marshall Plan for Greece? Solar plants as part of that?
- Mediterranean Climate Initiative (Greece & Turkey & 12 other Eastern Med. States)
- Greece: Relatively small solar thermal potential compared to Spain: (“economic” = all non-excluded areas with $DNI > 2000 \text{ kWh/m}^2/\text{y}$)
 - Greece: 4 TWh/y = 500 MW of plants = 10 ANDASOL-type plants = 2 bn € Investments
 - Italy: 7 TWh/y
 - Spain: 1,278 TWh/y



“Clean Power from Deserts”

“The ultimate test of human intelligence”

www.DESERTEC.org

Oliver.Steinmetz@DESERTEC.org

Charitable Foundation – Volunteers & Donations Welcome

GLS Gemeinschaftsbank eG
IBAN: DE92 4306 0967 1100 1105 00
BIC: GENODEM1GLS