



# The Desertec concept

A vision turns into reality

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# Section 1

Deutsche Bank, climate change and renewable energy

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# Deutsche Bank has formulated its climate strategy



## Financial intermediary

Our core business wants to contribute to climate protection with high-class services and banking products and offers sustainable business opportunities.

- Clean tech
- Energy efficiency of buildings
- Emissions trading
- Infrastructure for natural resources
- Principal investments

## Eco efficiency manager

We aim to be an industry leader in how corporations should contribute to climate protection.

- Green building & IT operations initiative
- Switching to renewable energies
- Offsetting of inevitable emissions with highly regulated certificates
- Carbon neutral by end of 2012
- Best practice 'Greentowers'

## Climate ambassador

We strive for being a 'knowledge company' and are committed to bring the message across to all of our stakeholders.

- Clients/general public ('Banking on Green', DB Research, mandates)
- Proactive policy and regulatory dialogue
- Staff ('A Passion for the Planet', e-learning)
- Shareholders/investors communication
- Best practice 'Solar Impulse'

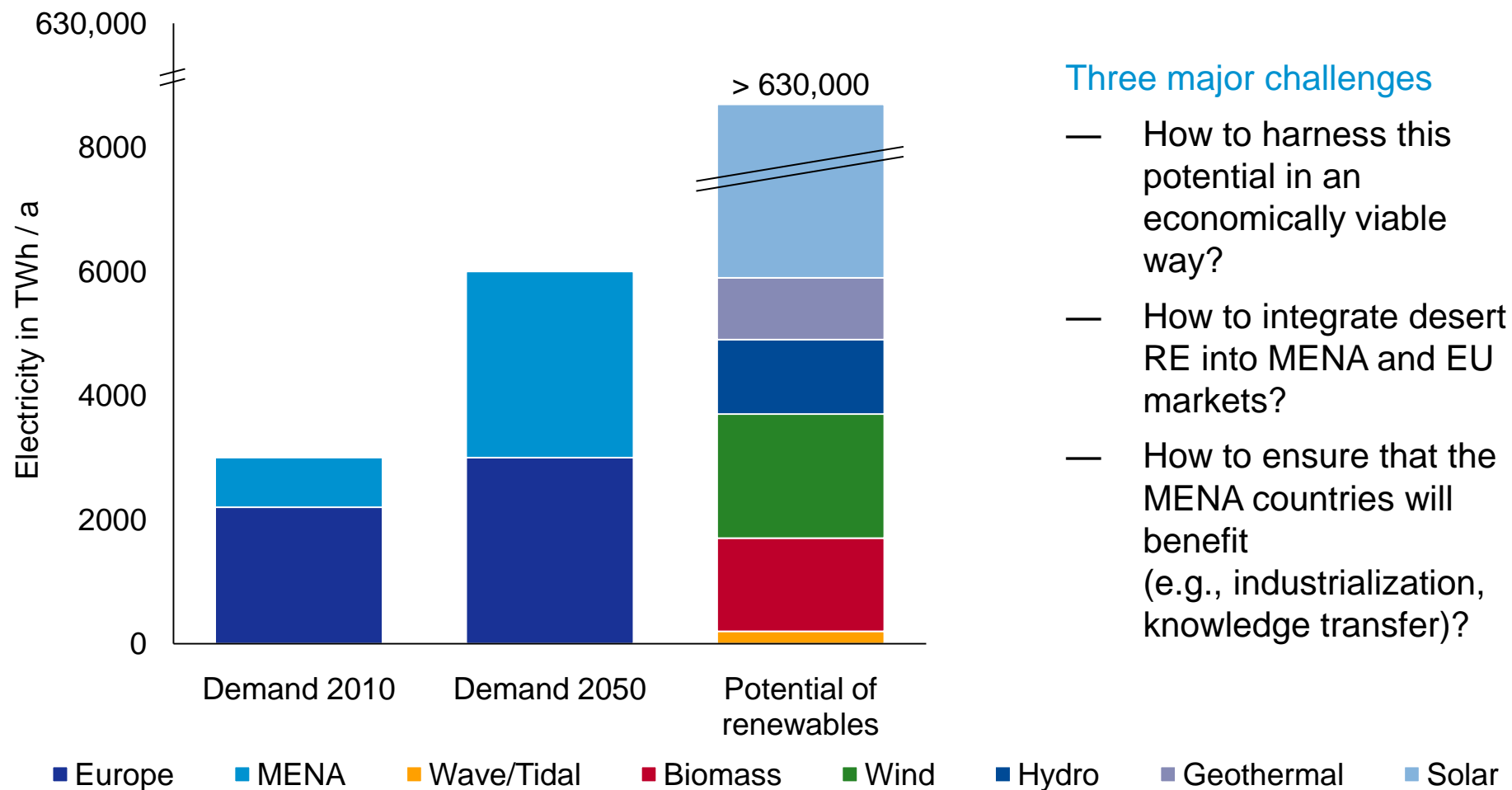
### Mission Statement

Deutsche Bank recognizes the responsibility to act on climate change and we help our stakeholders to take action – in an integrated approach across our business. We consider our climate strategy as an essential part of our forward-looking sustainable business strategy.

# Growing energy demand in MENA and EU is exceeded by renewable potential



## Electricity demand EUMENA and potential of Renewable Energy



### Three major challenges

- How to harness this potential in an economically viable way?
- How to integrate desert RE into MENA and EU markets?
- How to ensure that the MENA countries will benefit (e.g., industrialization, knowledge transfer)?

Source: DLR



# Section 2

The Desertec concept

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# The Desertec concept



## The Desertec concept...

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- ... aims at supplying Continental Europe with electricity from clean solar and wind energy sources in North Africa and the Middle East
- ... targets to supply an important share of Continental Europe's total annual electricity demand by 2050 in a multi-phased approach
- ... will supply renewable energy to the growing energy demand of the MENA countries and can hereby contribute to the economic growth of the region

## Milestones of the Desertec concept

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- **2003:** Foundation of Trans-Mediterranean Renewable Energy Cooperation (TREC)
- **2005 to 2007:** Several studies produced by the German Aerospace Center (DLR) commissioned by the German Ministry for the Environment
- **Early 2009:** Formation of the Desertec Foundation
- **July 2009:** Launch of the Industrial Initiative of Desertec, as a private sector initiative of twelve companies and the Desertec Foundation
- **October 2009:** Foundation of Dii GmbH

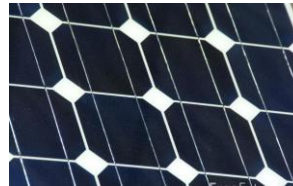
# Desertec concept plans to use a mixture of technologies



CSP



Solar PV



Wind



HVDC (1)



Global installed capacity (3)

~820 MW (2)  
Predominantly parabolic trough

~20 GW

~158 GW

~ 100 GW

Development status

Semi-commercial to fully commercial depending on technology

Mature technology  
Commercially viability without support regimes to be reached soon

Mature technology  
Commercially viable

Mature technology  
Commercially viable also in underwater installation

Several aspects of the Desertec concept have to be analyzed in detail prior project implementation

- (1) High voltage direct current
- (2) With around 2 GW currently under construction
- (3) Status 2009



# Section 3

Industrial Initiative of Desertec (Dii)

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# Dii has two forms of membership



## Voting Shareholders

currently 19, thereof 13 founding members



## Non-voting Associated Partners

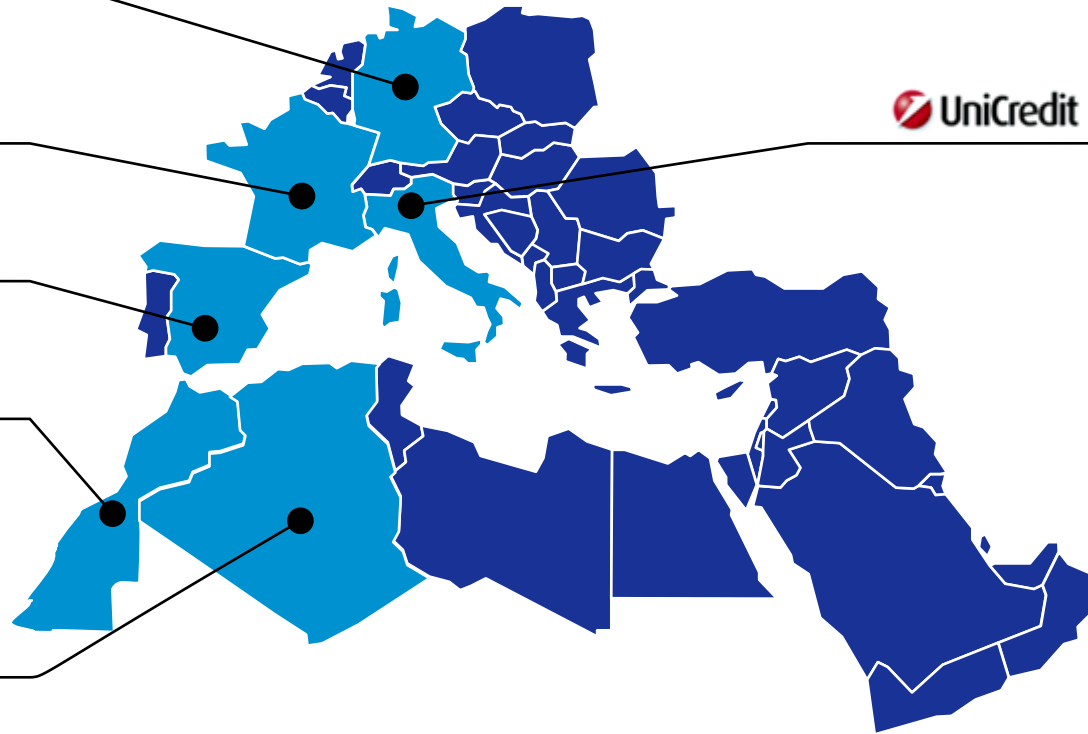
currently 32, others with interest to join



In cooperation with associations and other industrial initiatives:  
ENTSO-E, ESTELA, OME, TRANSGREEN, MEDRING, MSP, etc.

# Dii participants

Currently 19 shareholders from EUMENA region support realisation of the Desertec concept



# Dii: Development since foundation in October 2009



- Increasing support at government level in EU Commission and selected European countries (like Spain and Morocco)
- Selection and preparation of reference projects in close cooperation with MENA States started
- Support from Prof Klaus Töpfer as strategic advisor
- Dii: start of operative business
  - Paul van Son appointed as CEO
  - key resources hired
- Number of shareholders broadened by 6 companies from EUMENA Region
- So far 32 new associated partners have signed
- Deutsche Bank (and all of the other partners) actively support the work of Dii by participating in working groups, political talks, presentations ao

# Dii Stakeholder

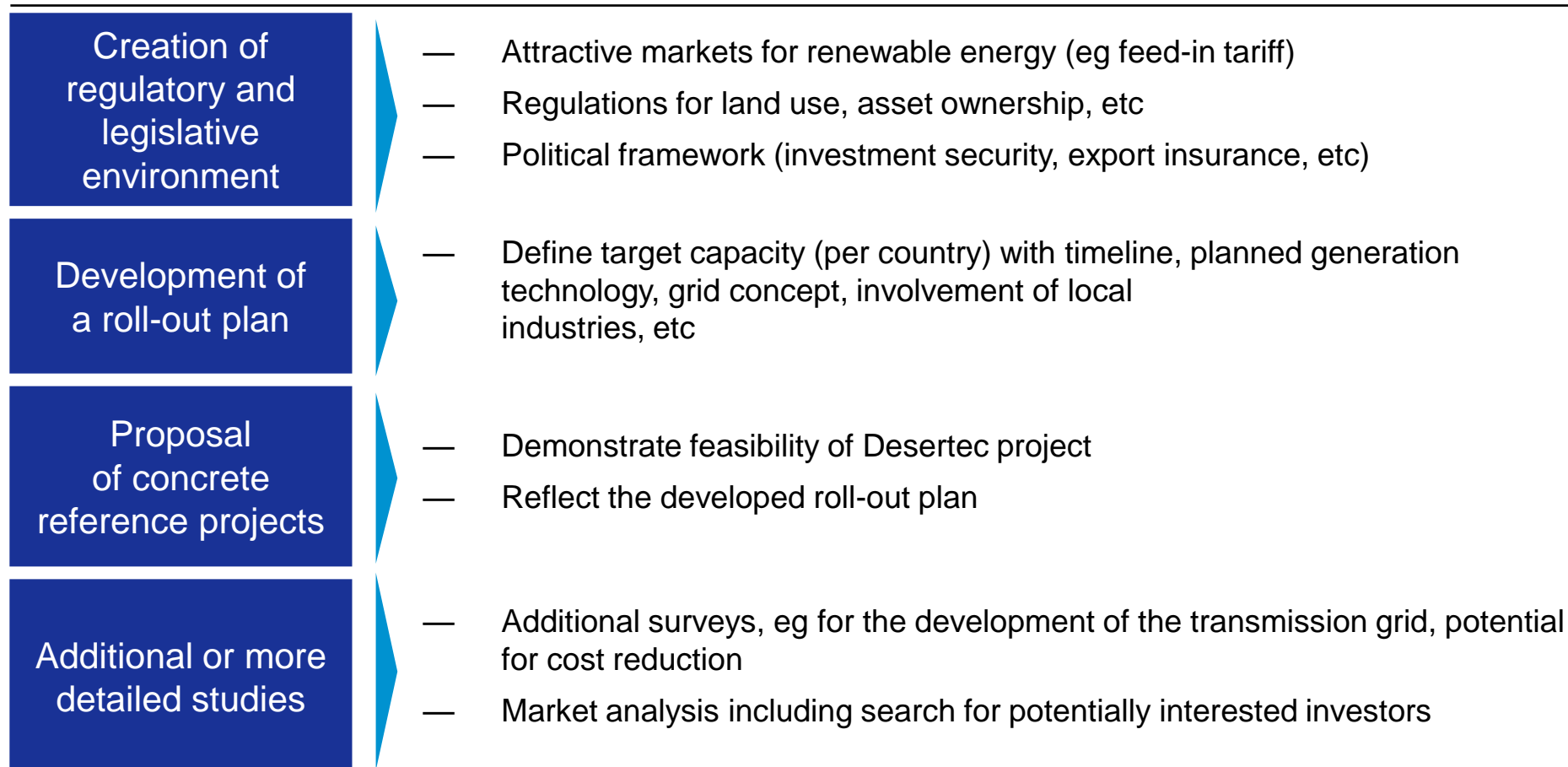


- The idea of the Desertec concept can only be realised by ensuring close cooperation between comparable initiatives (initiated privately or politically)
  
- Dii works closely together with all relevant stakeholders/partners (selection)
  - Mediterranean Solar Plan (MSP)
  - TransGreen
  - EU, national governments in Europe
  - North-African States
  - Financial sector (Worldbank, EIB, KfW, African Development Bank ao)

# Objectives of Dii



## Dii is to focus on four areas within the next three years



# Reference projects

Work out solutions for the transport to EU

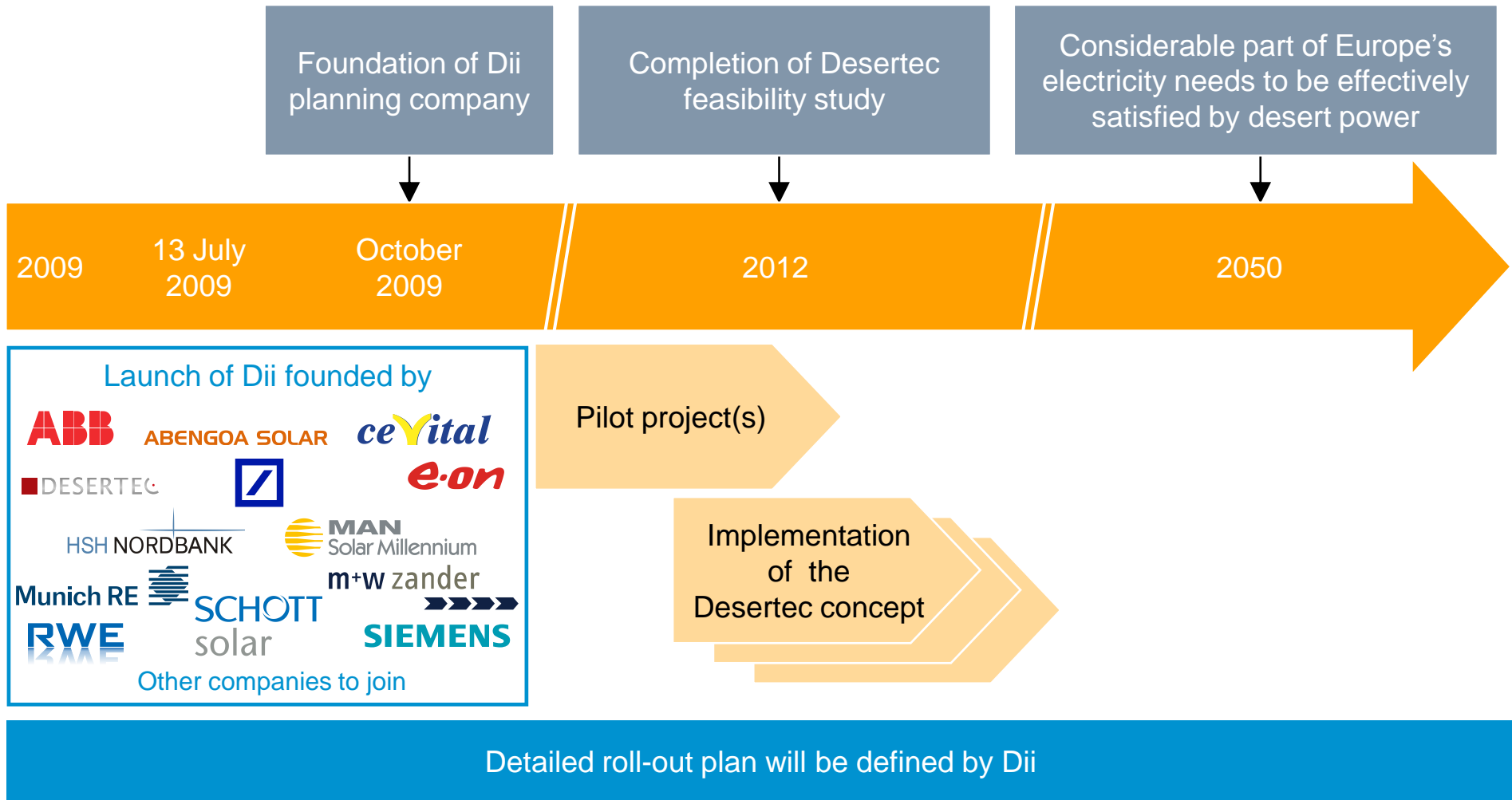
Example: Morocco



## The reference project chain

1. Plan generation site and type
2. Grid connection in Morocco
3. Energy transport and contract partner
4. Transport to Spain
5. Delivery to the EU markets
6. Relief of bottlenecks in EU grid
7. Find “off-takers” who will pay for the “gap” by utilizing the Art. 9 (EU directive) and the statistical transfer under a cooperative flexible mechanism

# Long term targets and timeline





## Section 4

‘Roadmap’ – Key success factors for project realization

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# Development 'Roadmap'



## Regulatory Framework

- Further development of EU REN Directives
- Formulating binding Renewable Energy targets until 2050
- Development of directives for expansion of grid infrastructures
- Development of combined energy politics between Europe and North Africa

## Financing

- Mobilizing private and public funding
- Coordination with multilateral development banks
- Creation of transparent risk structures and stable funding conditions for PPP projects (long term goal: funding without public subsidies)

## Realisation/ Infrastructure

- Step-by-step development of a roll-out plan for realisation of power plants and grid connections
- Realisation of several smaller projects during certain phases
- Step-by-step implementation of Super Smart Grids

# How to reach competitiveness of Renewable Energy from the deserts?



## Drivers for competitiveness of desert power

Accelerated cost depression of CSP, PV, wind and HVDC systems (“learning curve”)



Target:  
Early economic  
viability of desert  
power

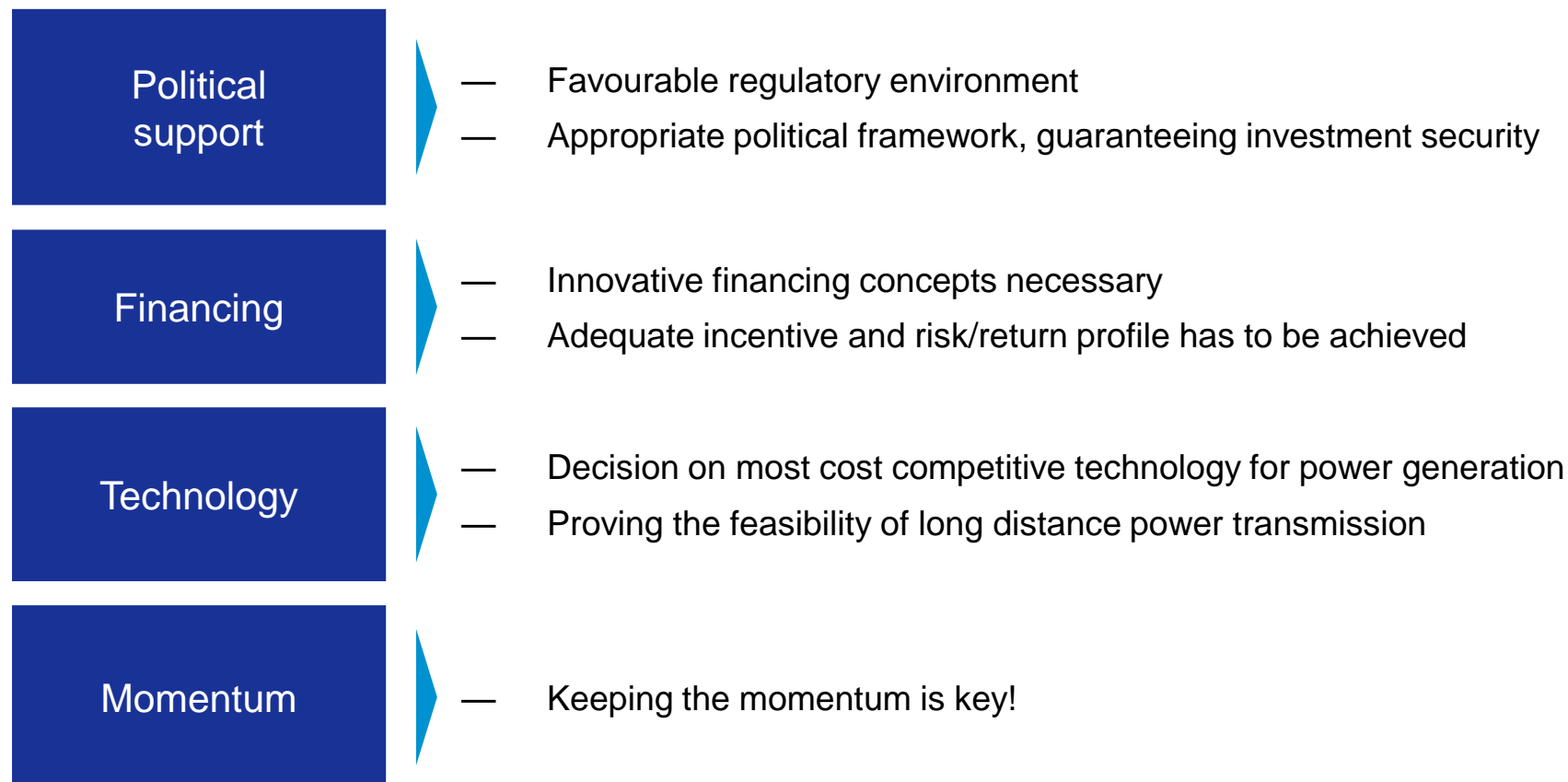
Rising fossil  
fuel prices



Rising environmental  
costs



# Key success factors/risks for project realisation



Implementation of the Dii vision will require an intercontinental public/private partnership on an unprecedented scale and the involvement of multiple sources of capital from around the globe

# Key success factors/risks: Financing



- Capital structure and investor appetite will be based on the risk profile and investment volume of each project
- The following financing groups can be considered for the Desertec project

## Potential debt/guarantee providers

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- Commercial banks
- Capital market structures, eg infrastructure bonds
- International Financing Institutions
  - World Bank
  - EIB
  - African Development Bank, etc
- Export Credit Agencies
- Investment guarantees or direct subsidies from European/MENA governments

## Potential equity investors

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- Risk investors
  - Private equity investors
  - European and MENA utilities/industrials
  - Direct investments by MENA governments
- Cash flow investors
  - Sovereign Wealth Funds
  - infrastructure funds
  - sustainable investment funds
  - pension funds and insurances
  - family offices and private investors

# Deutsche Bank Contact



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