

## FINANCING GREEN GROWTH

Marianne Fay, the World Bank, July 2010



Development deficit  
greater than  
adaptation and  
mitigation gap

Energy R&D  
remains modest

Innovation and  
leapfrogging in  
developing countries  
requires many  
complementary actions

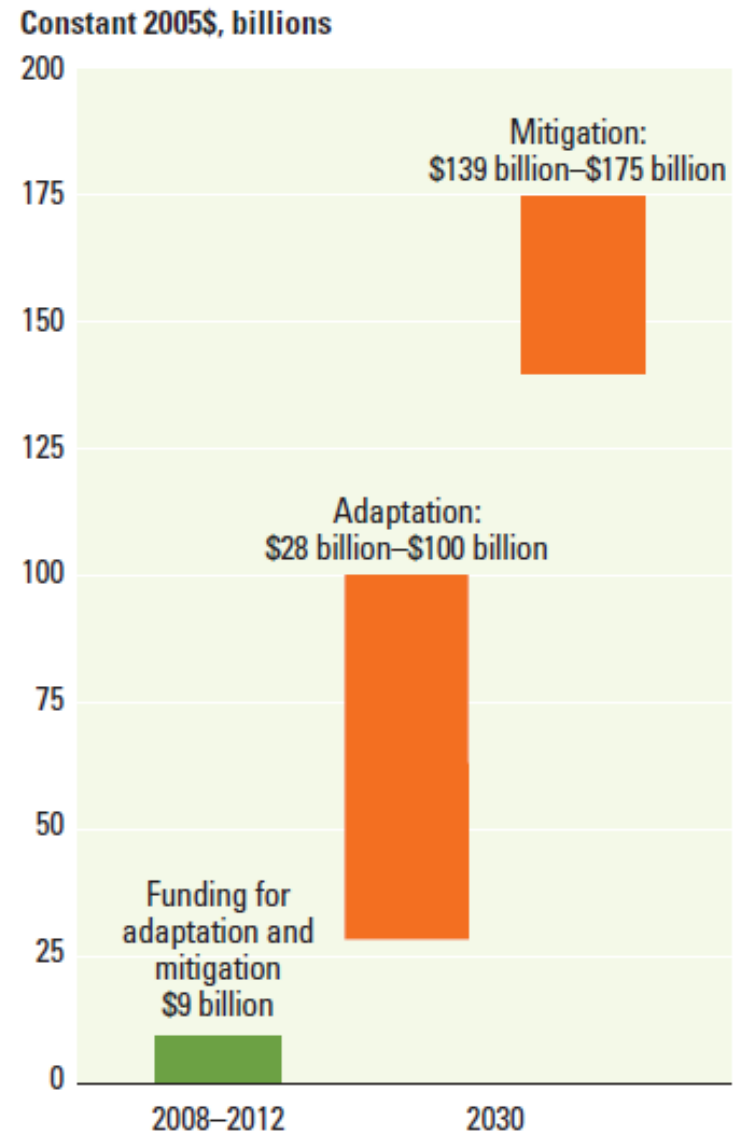
Financing  
design



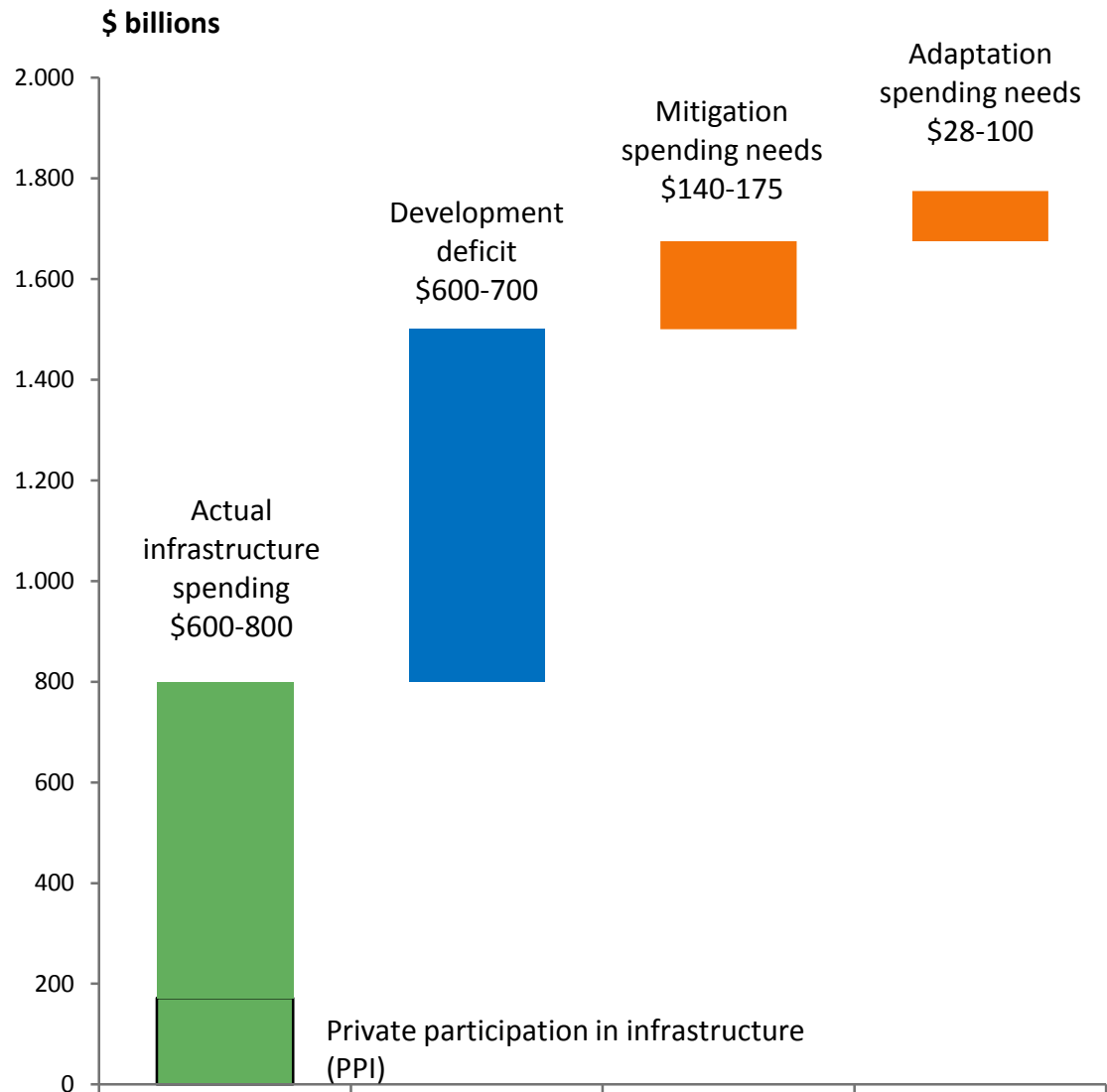
# MITIGATION AND ADAPTATION COULD COST \$200-275 BN BY 2030

Massive scaling up needed:

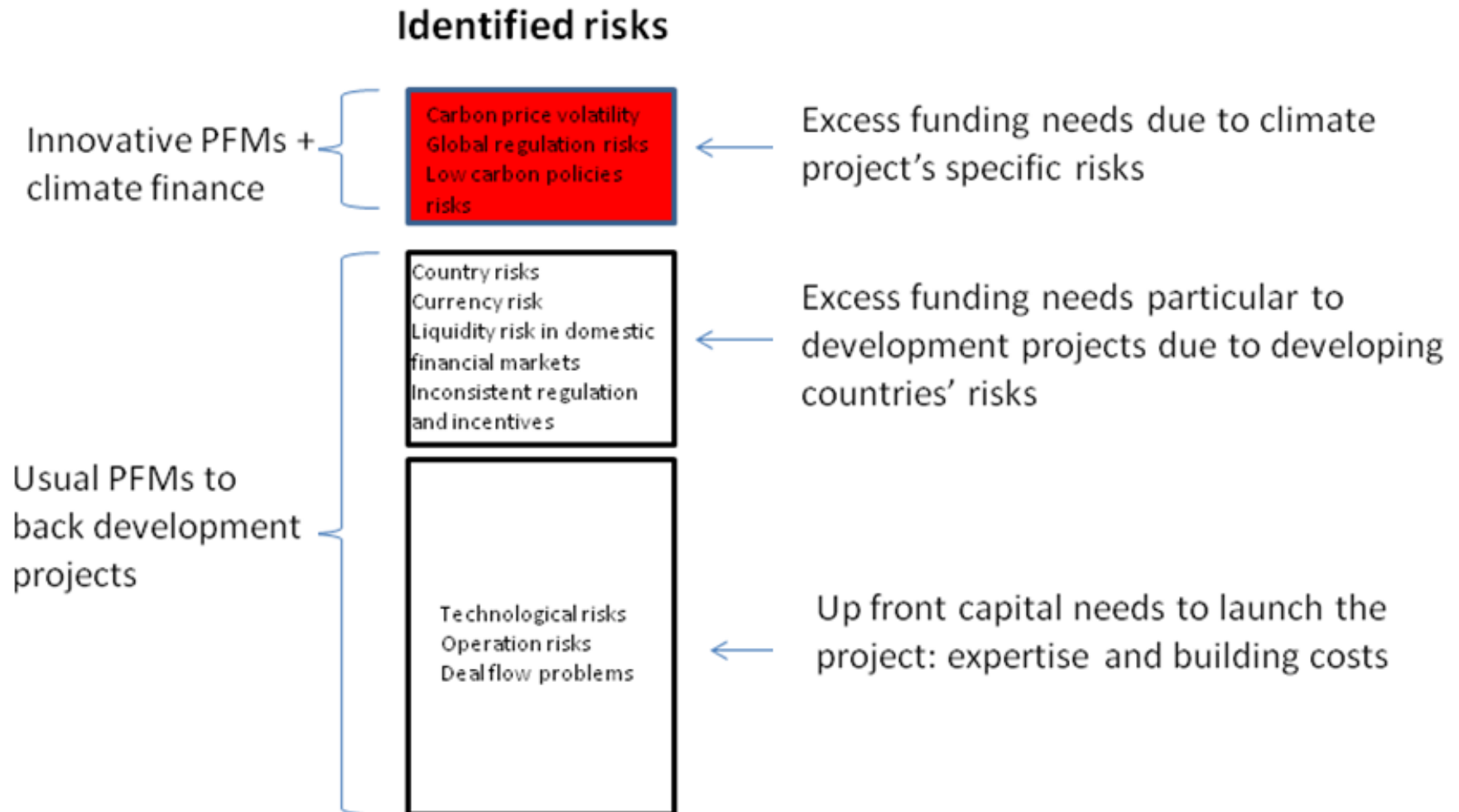
- From \$9 bn to some \$200-275 bn in 2030
- A financing challenge: up to \$550 bn in associated mitigation finance



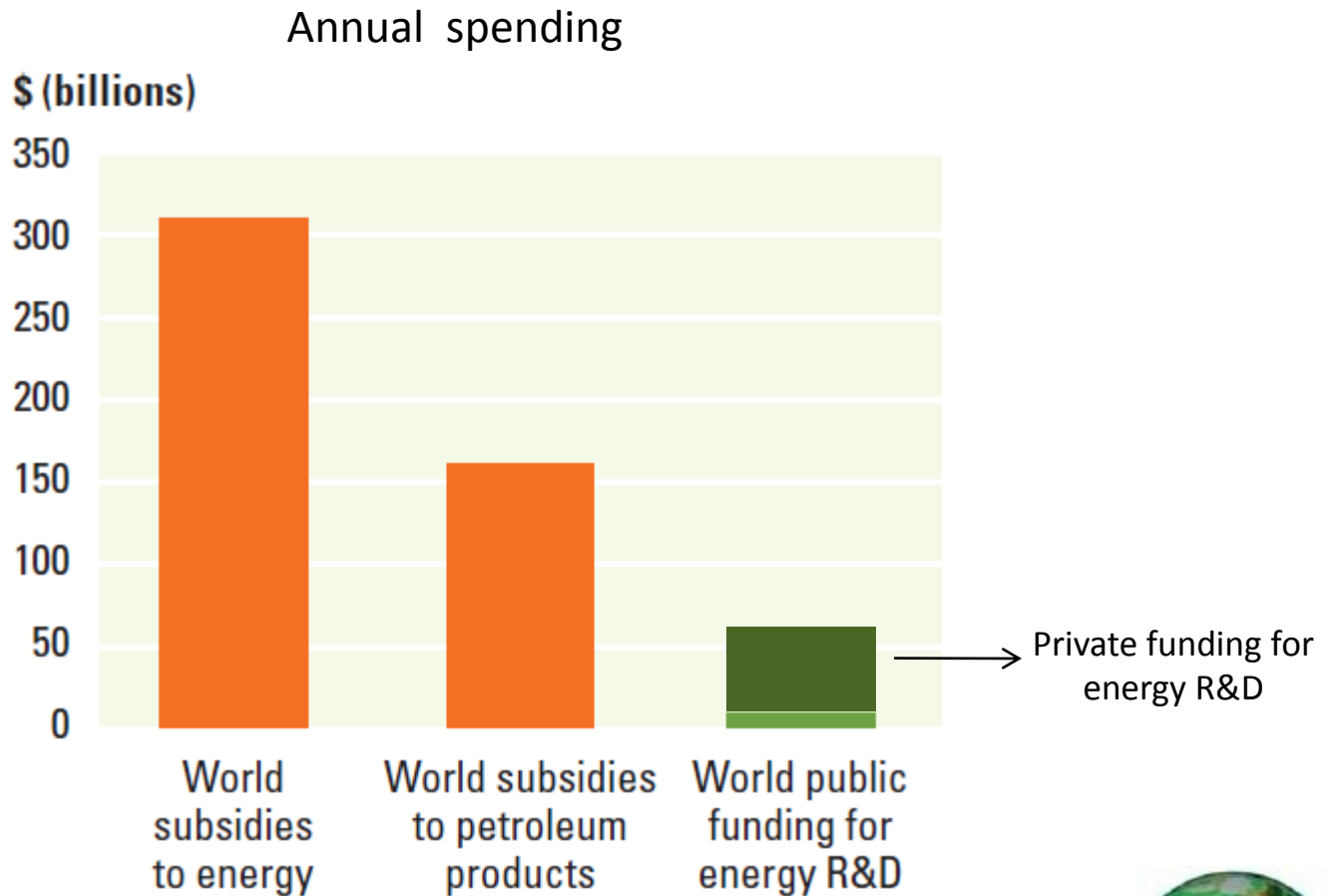
# BUT THIS IS SMALL RELATIVE TO THE DEVELOPMENT DEFICIT



# IMPLICATIONS FOR CLIMATE PROJECT FINANCE

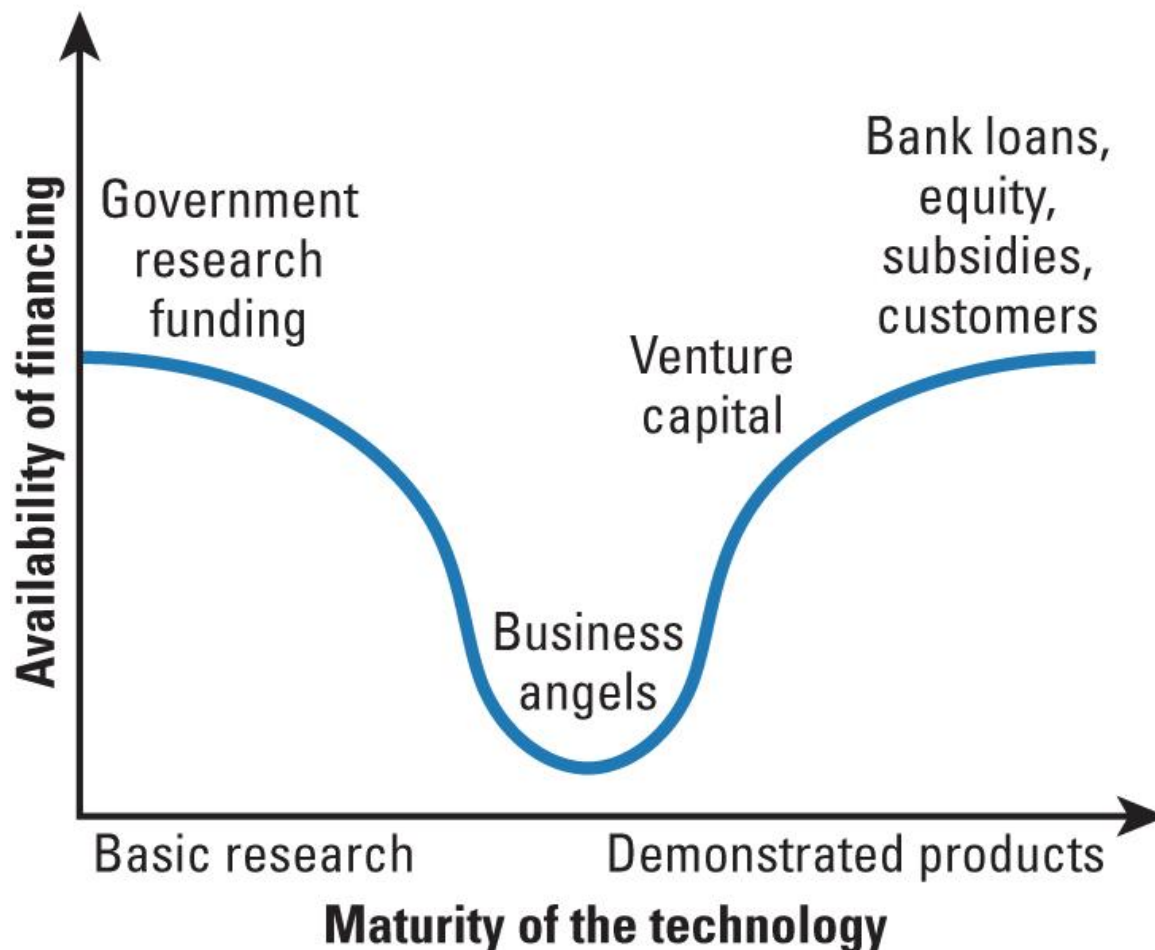


# ENERGY R&D REMAINS MODEST

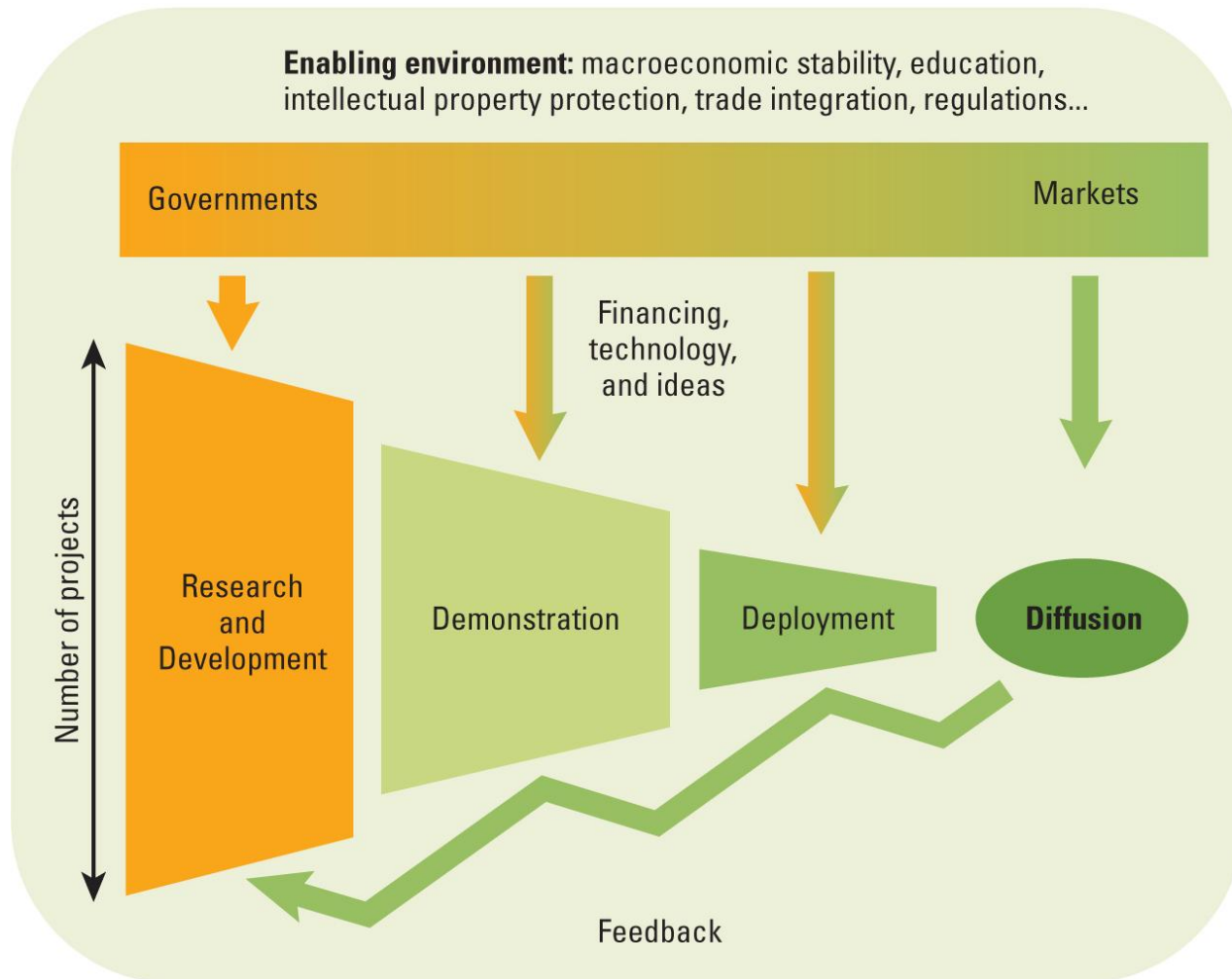


# INNOVATION

## FINANCING MECHANISMS NEEDED TO BRIDGE THE “VALLEY OF DEATH” BETWEEN RESEARCH AND THE MARKET



# INNOVATION NOT A LINEAR PROCESS - POLICY AFFECTS EVERY LINK OF THE INNOVATION CHAIN



Source: Adapted from IEA 2008a.



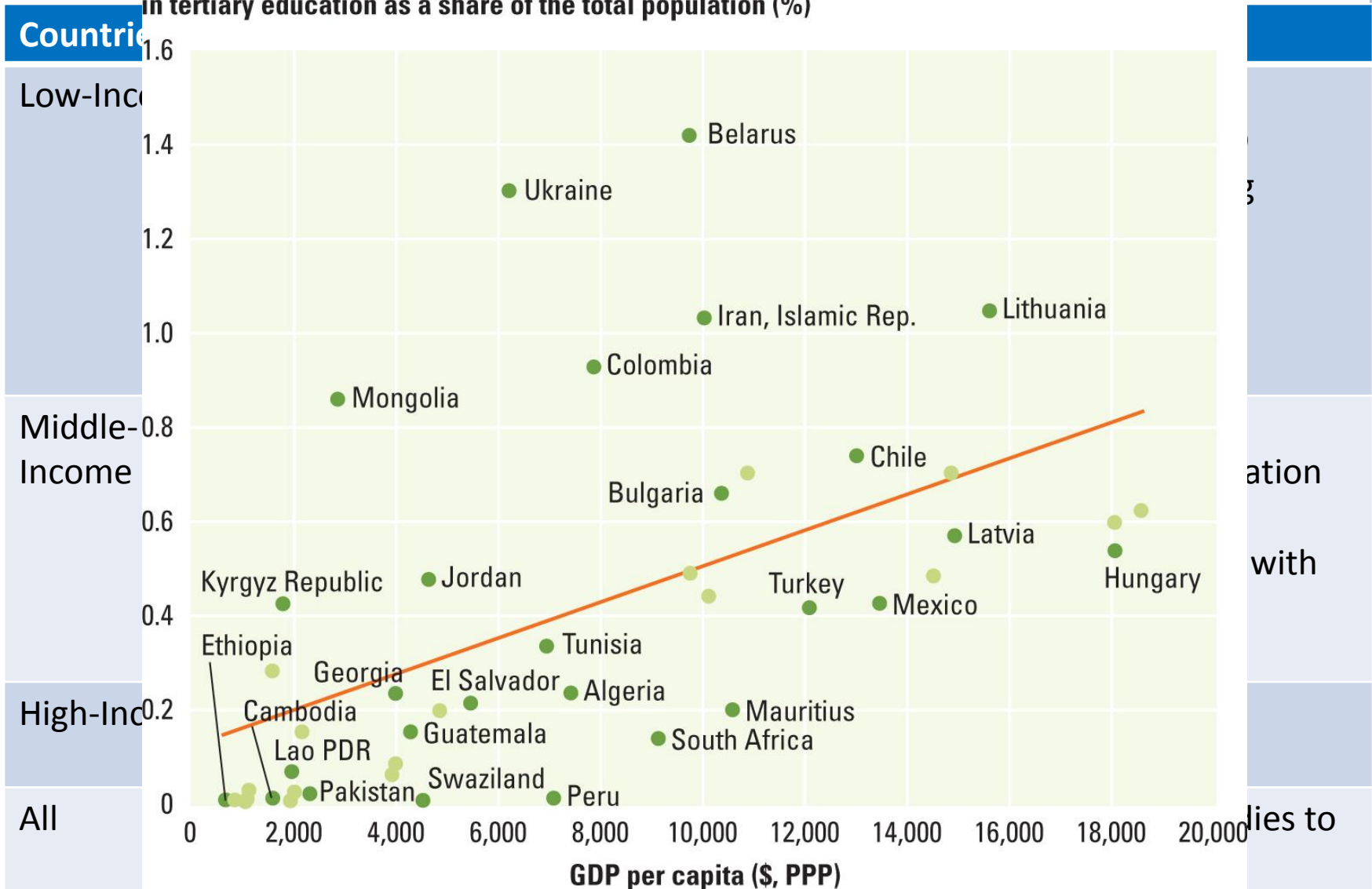


## ACCELERATING INNOVATION AND TECH DIFFUSION REQUIRES INTERNATIONAL ACTION...

Type of agreement	Existing	Potential impact	Implementation
Legislative and regulatory harmonization	Very few (mostly EU)	High	Difficult
Knowledge sharing and harmonization	Many (IEA, EnergyStar)	Low	Easy
Cost-sharing innovation	Few (tech push/ITER; market pull/Xprice; Bridge-the-gap)	Medium to high	Moderate
Tech transfer	Several (CDM, GEF)	High	Moderate

# ...AND DOMESTIC EFFORTS

Enrollment in engineering, manufacturing, and construction in tertiary education as a share of the total population (%)

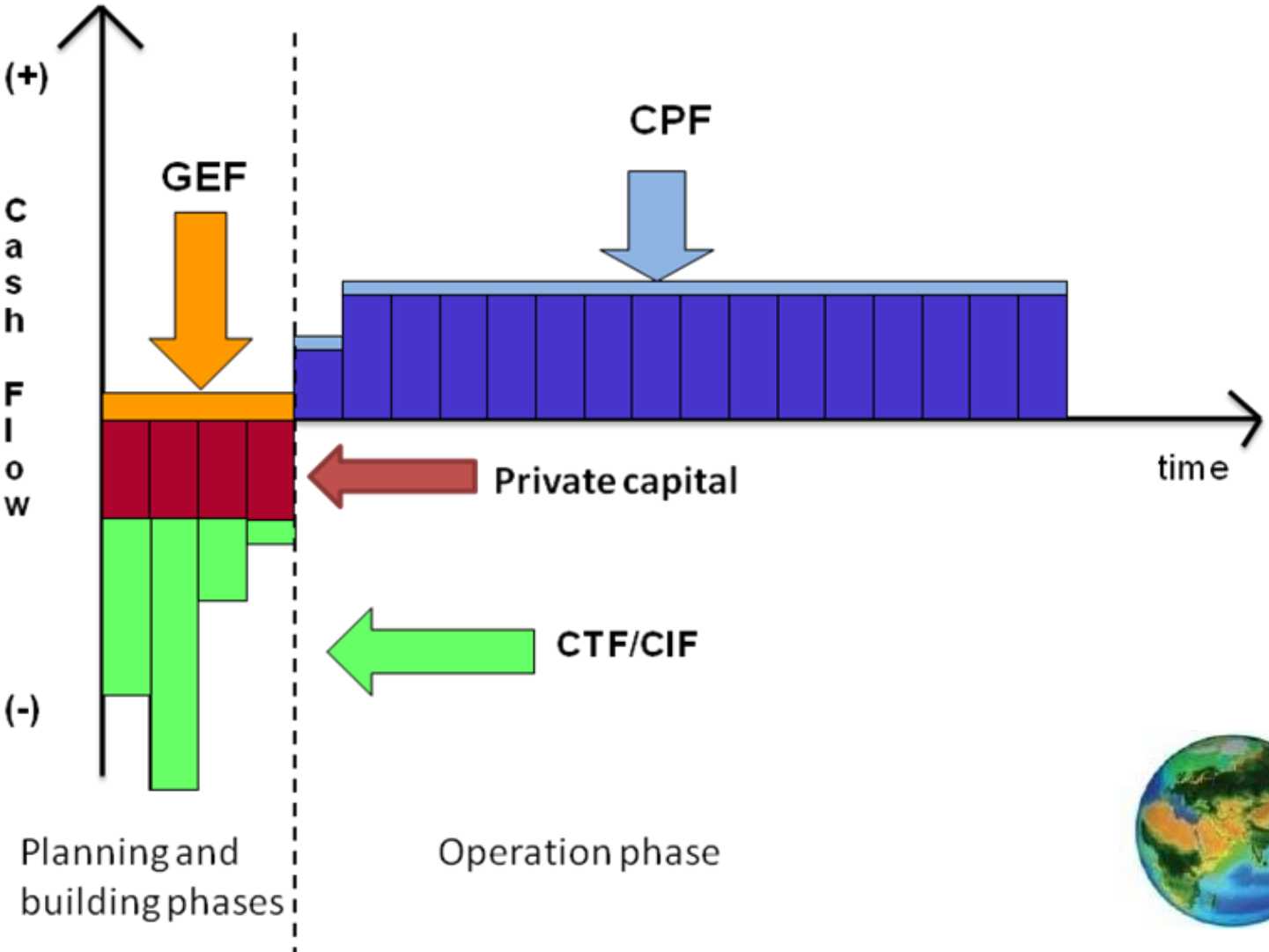


# FINANCING INSTRUMENTS FOR DEVELOPING COUNTRIES

- Carbon Markets
  - Clean Development Mechanism
  - Forest Carbon Partnership Facility
- Specialized Funds
  - Global Environment Fund – Piloting Mitigation
  - Clean Technology Fund – Demonstrating Transformation at scale in middle income countries
  - Scaling Up Renewables for the Poor – focusing on least developed countries
- Leveraging Public and Private Sector finance key



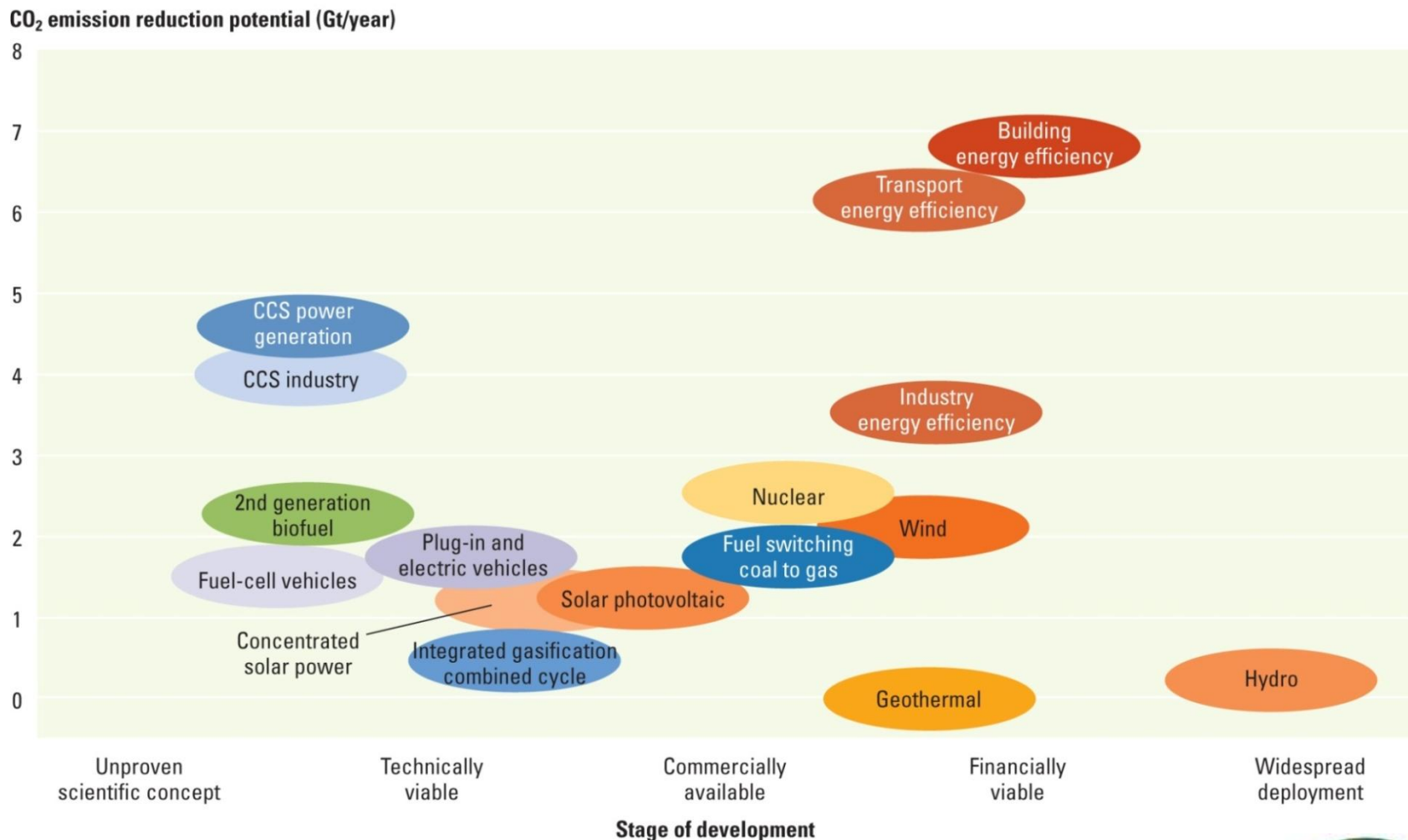
# Making the whole bigger than the sum of the parts



*INCENTIVES AND INFRASTRUCTURE*  
CLEAN TECHNOLOGY FUND



# CTF GOAL IS TO PUSH LOW-CARBON TECHNOLOGIES FROM TECHNICAL VIABILITY TO WIDESPREAD DEPLOYMENT AND TO HIGHER EMISSION REDUCTIONS

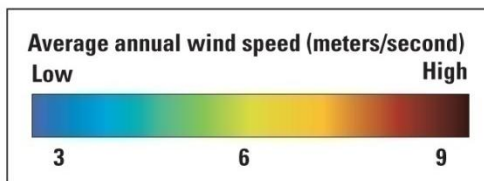
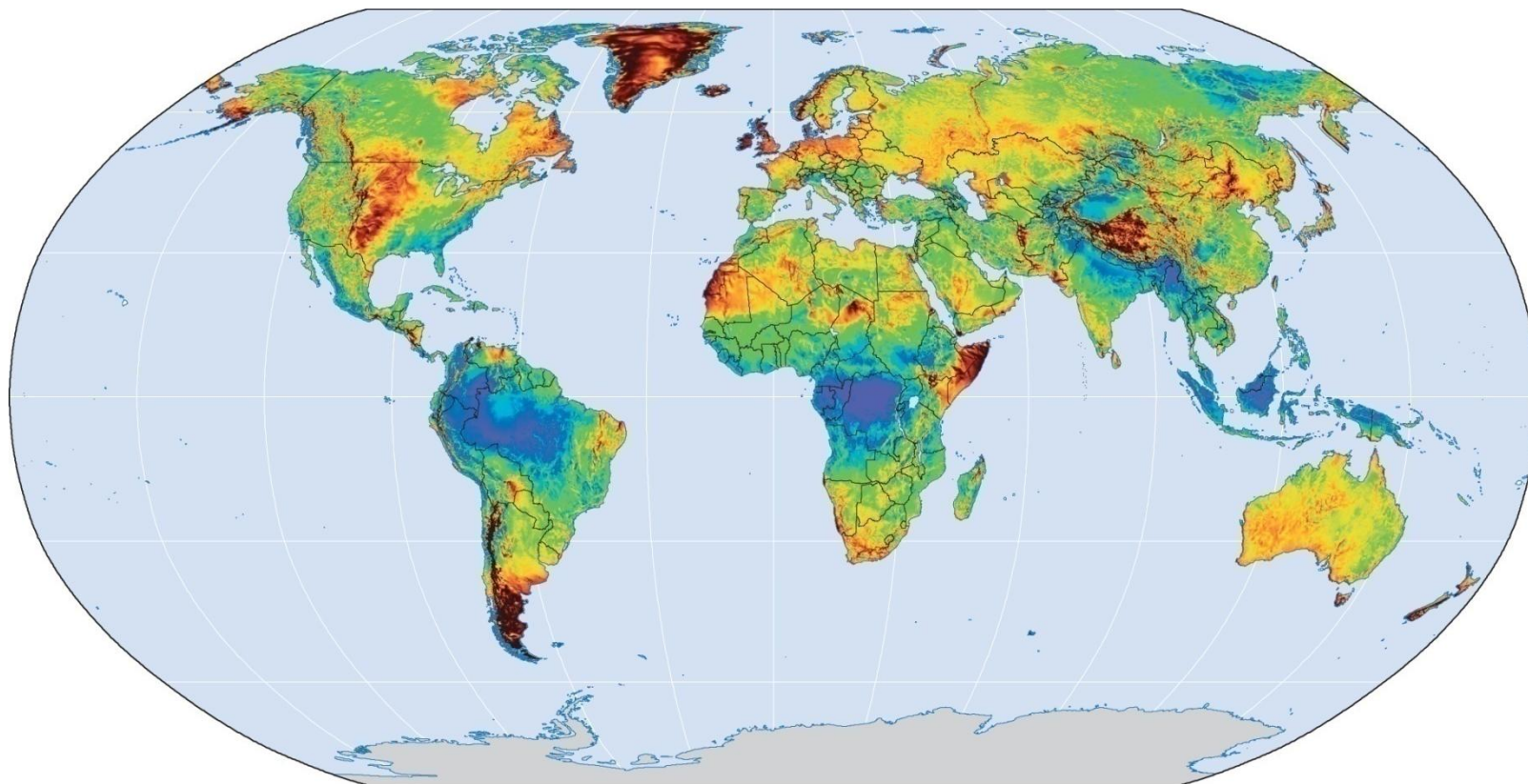


Source: WDR team, based on data from World Bank 2008a and IEA 2008a (mitigation potential from IEA Blue Scenario in 2050).



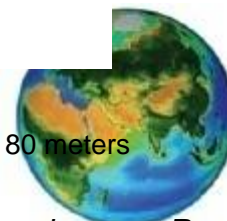
# TRANSFORMATION: WIND POWER

## ADVANCES IN WIND MAPPING OPEN UP NEW OPPORTUNITIES



Source: Data provided by 3 Tier Inc.

Note: This is a 5-kilometer resolution map of average annual wind speed, with the average measured at a height of 80 meters (the height of some windmills), across the world's landmass.



# EGYPT: WIND POWER DEVELOPMENT PROJECT

- Government pursuing a wind commercialization program with competitively-tendered Build, Own, Operate projects for 2,500 MW
- **Substantial investments in transmission infrastructure condition for private investment in wind generation**
- CTF/IBRD concessional funding makes public investment in new transmission infrastructure for wind power financially viable

## Financing Plan:

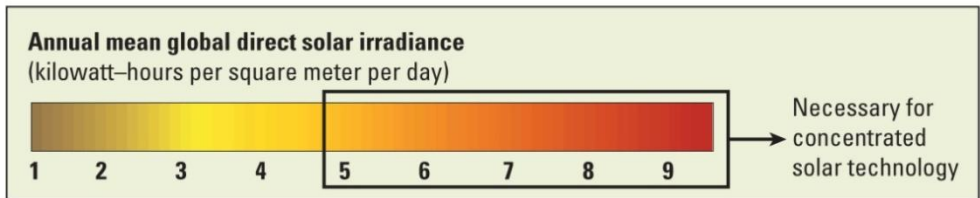
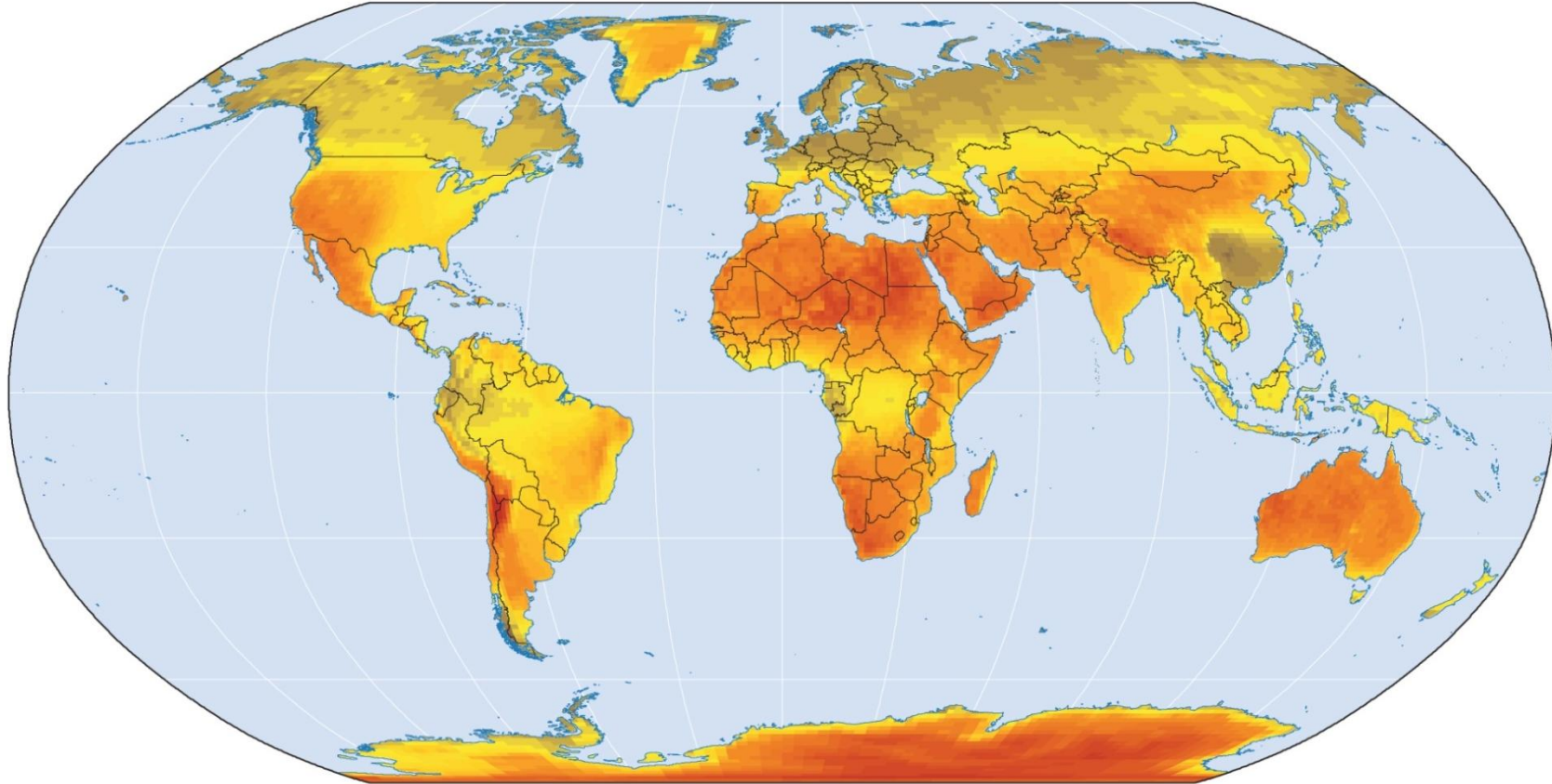
Financier	Amount
IBRD	\$70 million
CTF	\$150 million
EIB/KfW	\$70 million
<b>Private Sector (for first BOO wind farm)</b>	<b>\$450 million</b>
Government	\$55 million
TOTAL	\$795 million





# TRANSFORMATION: SCALING UP SOLAR

GLOBAL DIRECT NORMAL SOLAR RADIATION (KILOWATT-HOURS A SQUARE METER A DAY)



Source: United Nations Environmental Program, Solar and Wind Energy Resource Assessment, <http://swera.unep.net/index.php?id=metainfo&rowid=277&metaid=386> {accessed July 21, 2009}.



# CONCENTRATING SOLAR POWER (CSP) IN MIDDLE EAST AND NORTH AFRICA

- Accelerate global deployment of CSP by investing in transformative programs of five countries in Middle East and North Africa: Algeria, Egypt, Jordan, Morocco and Tunisia.
- Support deployment of 1 Gigawatt of generation capacity– doubling current global installed capacity
- Support associated transmission infrastructure to permit scale up through regional energy market integration
- **Leverage over \$3 billion in public and private investments for CSP power plants, tripling current global investments in CSP**

## Financing Plan:

Financier	Amount
CTF	\$750 million
MDBs	\$1,516 million
Equity/Government	\$740 million
<b>Commercial/other debt</b>	<b>\$1,290 million</b>
Official Development Assistance	\$1,308 million
TOTAL	\$5,604 million



# ACTION IS POSSIBLE, EVEN WITH CONFUSING SIGNALS



**[www.worldbank.org/wdr2010](http://www.worldbank.org/wdr2010)**

**[www.worldbank.org/climatechange](http://www.worldbank.org/climatechange)**

**[www.climateinvestmentfunds.org](http://www.climateinvestmentfunds.org)**

