# Financing Renewable Energy

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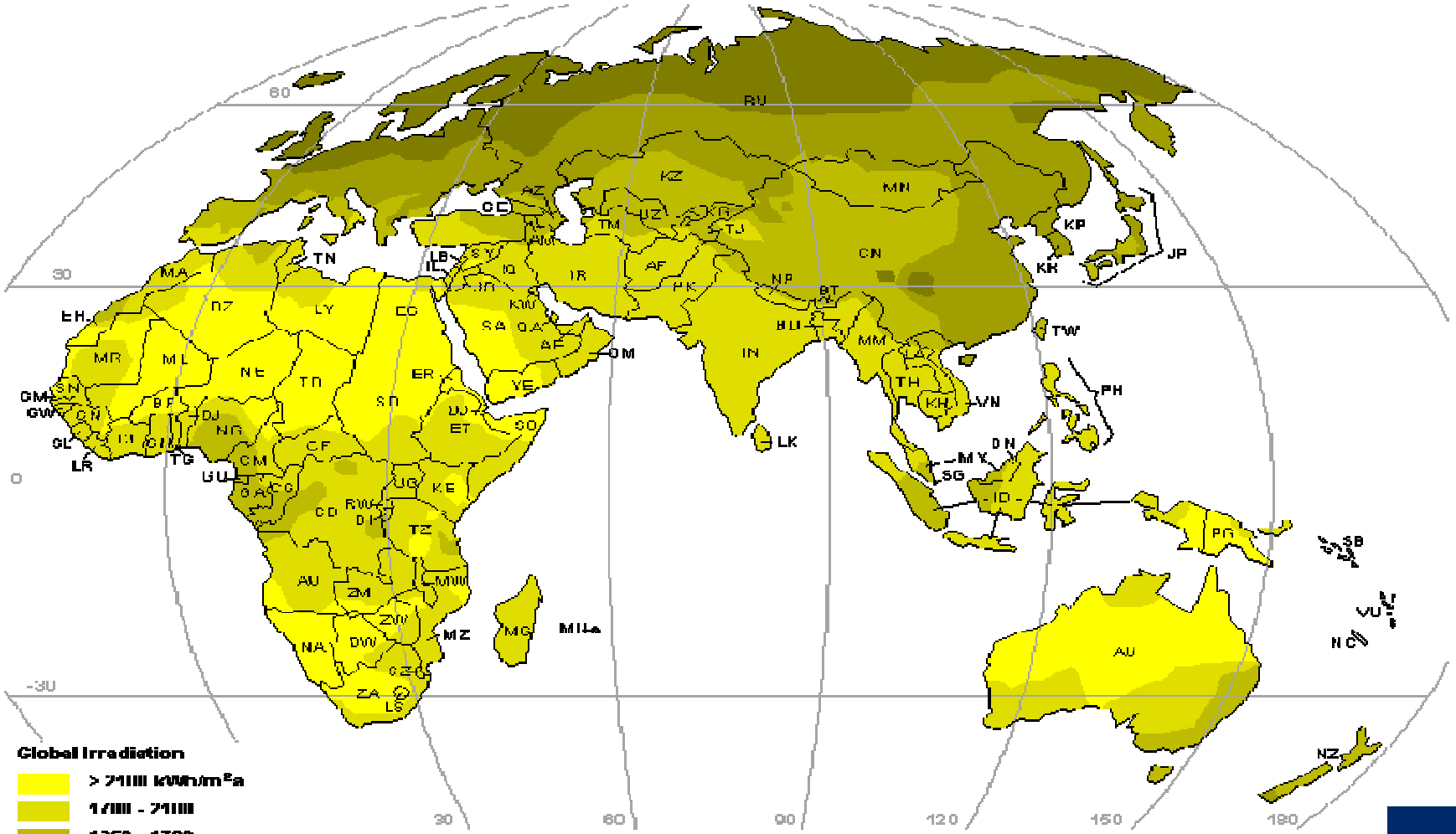
# Dispersed Sources

## RE potentials are high in many different parts of the world



# Renewable energy:
## *Physical, technical, socio-economic potentials*
## *[EJ, per year]*

| | *Physical (theoretical)* | *Technical* | *Socio-economic?* | *Current use* |
|---|---|---|---|---|
| Hydro-power | 147 | 50 | 28 | 10 |
| Biomass | 2,900 | 276 to 446 | ? | 50 |
| Solar | 3.9 mill. | 1,600-50,000 | ? | 0.2 |
| Wind | 6,000 | 640 | 231 | 0.2 |
| Geothermal | 140 mill. | 5,000 | 500 | 2.1 |
| Ocean energy | 7,400 | 10 | ? | 0.002 |
| Total | >143 mill. | >7,500 | ? | 62.4 |

*Source:* UNDP (2000 and 2004). World energy assessment. R. Schock (2005)

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# Renewable energy challenges and opportunities

Opportunities:

- Low import dependency & diversified sources – energy security
- Reduced exposure to energy price volatility & reduced pressure on international prices
- Decentralized potential for rural development
- Low emissions on a life cycle basis – local & GHG

Challenges:

- Intermittent – weather-climate dependent & require storage/backup
- Space intensive
- Expensive – high development costs & front-loaded costs – require loans with long maturity
- Less proven – financially risky
- Small scale projects – significant transaction costs, numerous PPAs
- RE projects are often disadvantaged by
  - Explicit/implicit subsidies for conventional fuels
  - no internalization of RE's positive externalities that benefit society

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# Market Challenges for RE Investments

- Financial sector needs to design suitable instruments that address the technological and financial barriers for small and large projects
- Need to unlock huge potential of small projects
- Financial institutions (FIs) need to build capacities
- Need to bring down the cost of new technologies

# Renewable energy targets

## *Examples in Asian developing countries*

| | |
|---|---|
| Bangladesh | 5% of demand met by clean energy by 2010 and 10% by 2020 |
| China | 10% of electric power capacity and 5% of PE by 2010; 15% of PE by 2020 |
| India | 10% of added electric power capacity during 2003-2012; full use of cogeneration in the sugar industry; substitute 10% of oil consumption |
| Indonesia | >5% biofuels; >10% other new and RE by 2010 |
| Malaysia | Add 350MW RE generation capacity by 2010 |
| Thailand | 8% of PE by 2011 |
| Viet Nam | 2% of total PE by 2010 and 3% by 2020 |

*Source:* UN ESCAP (2008). Energy Security and Sustainable Development in Asia and the Pacific.

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# Opportunities for Developing Countries

- Large capacity expansions in DC:
  - Capacity additions in China 90 GW in 2008 @ of 3 power plants per week;
  - India added 11.5 GW @ 2 power plants per month in 2007
- DCs well endowed with RE resources
- Globally coal remains the main fuel for power generation till 2030 (IEA 2008)
- Potential for investment, job creation and profits

# New Strategy to Exploit RE Potential

- Given the risks and uncertainties additional international capital and new instruments required
- Global strategy and policy for promoting RE
  - DCs require technical and financial support
  - The international community is strongly advocating RE to address climate change
- Economies of scale have to be exploited
  - Scale of investment has to move from kW/MW to GW
- Efforts for promoting RE need to be scaled up to capture the full technical & economic potential & create a competitive RE market

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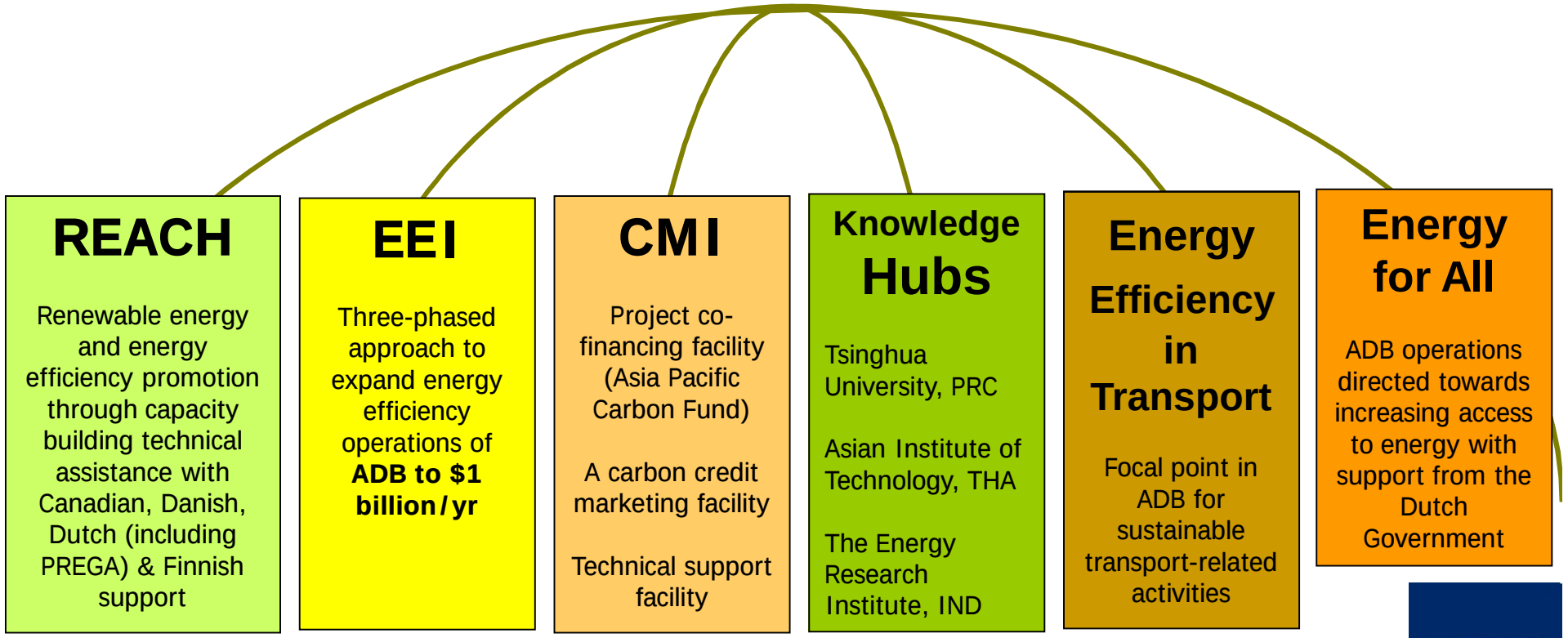
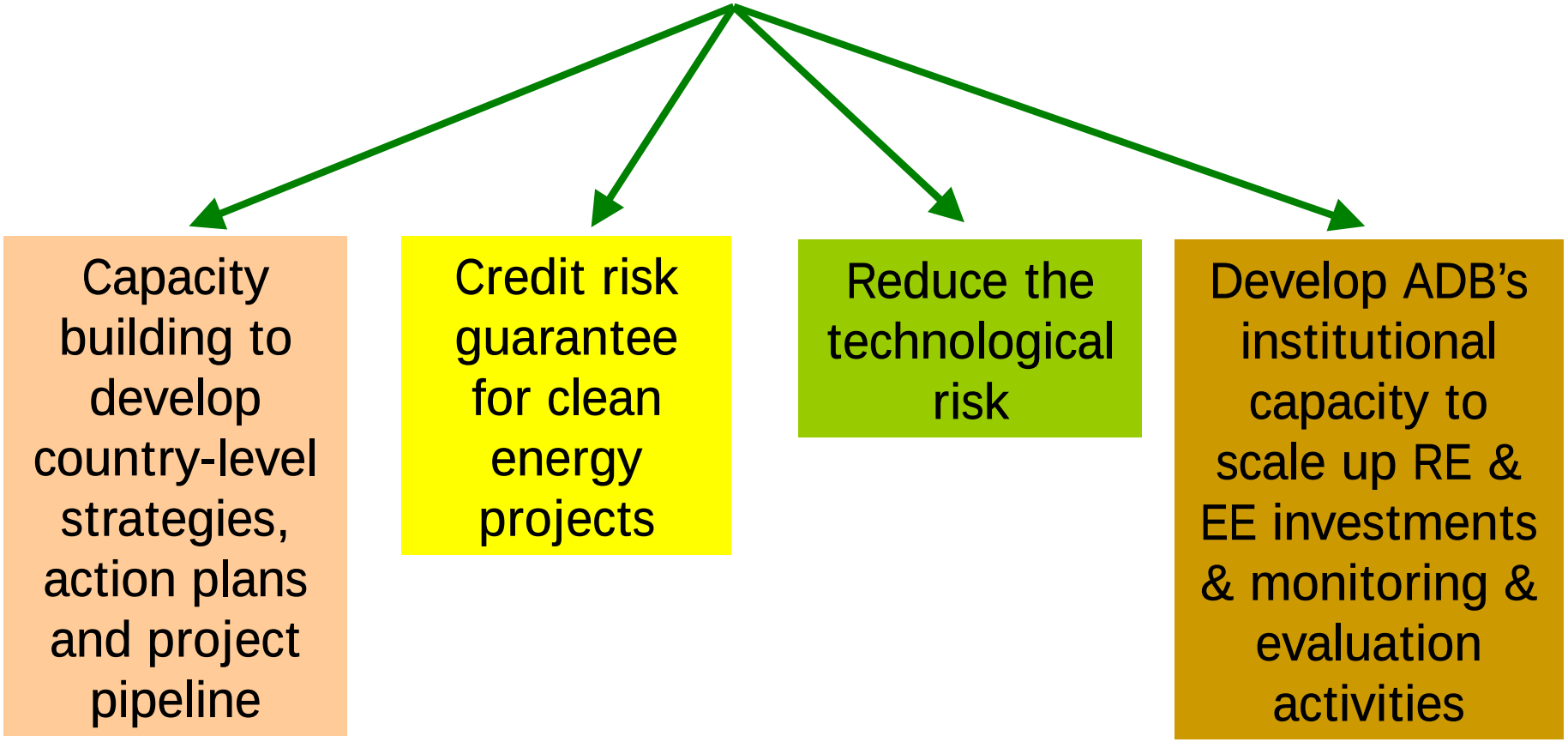
# ADB's Response: Clean Energy and Environment Program

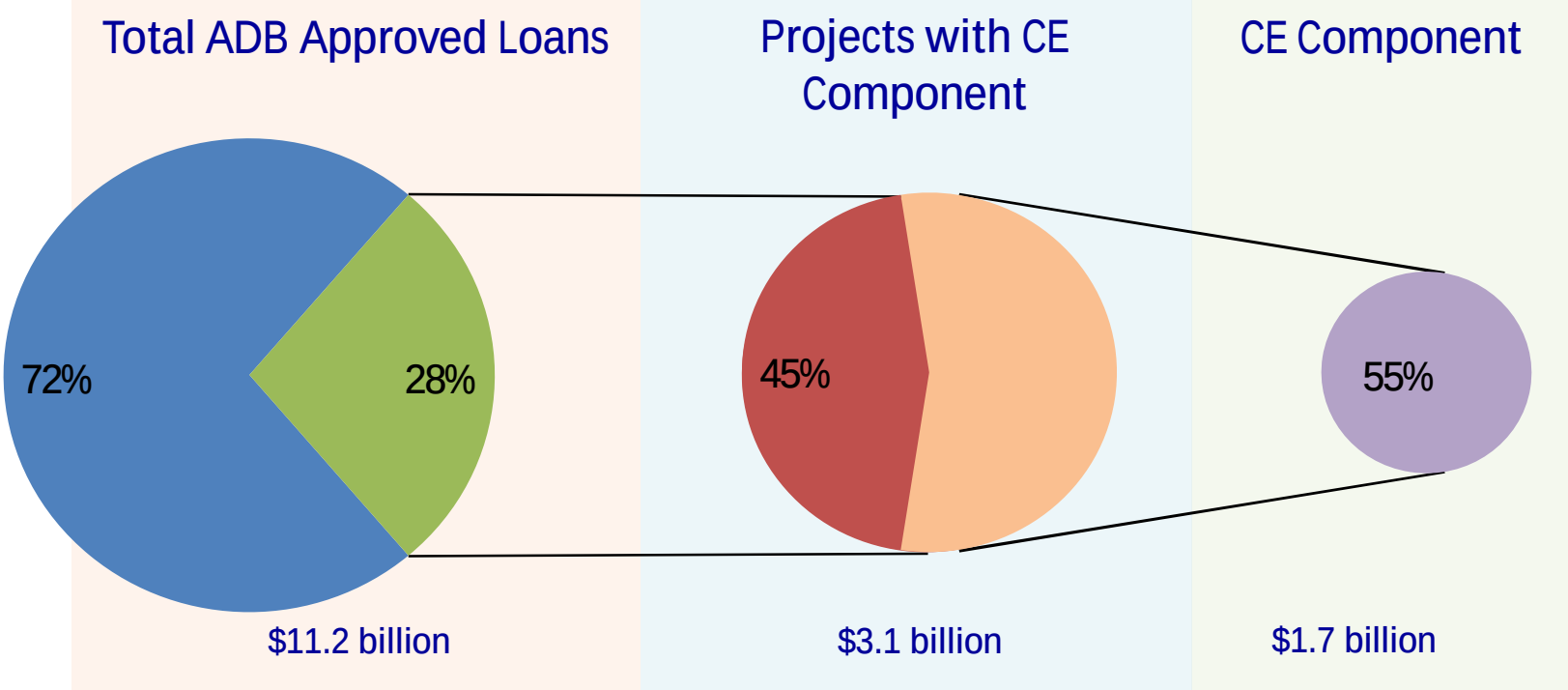
Comprehensive strategic program to assist developing countries achieve measurable change in their energy use patterns and secure a low-carbon sustainable energy future



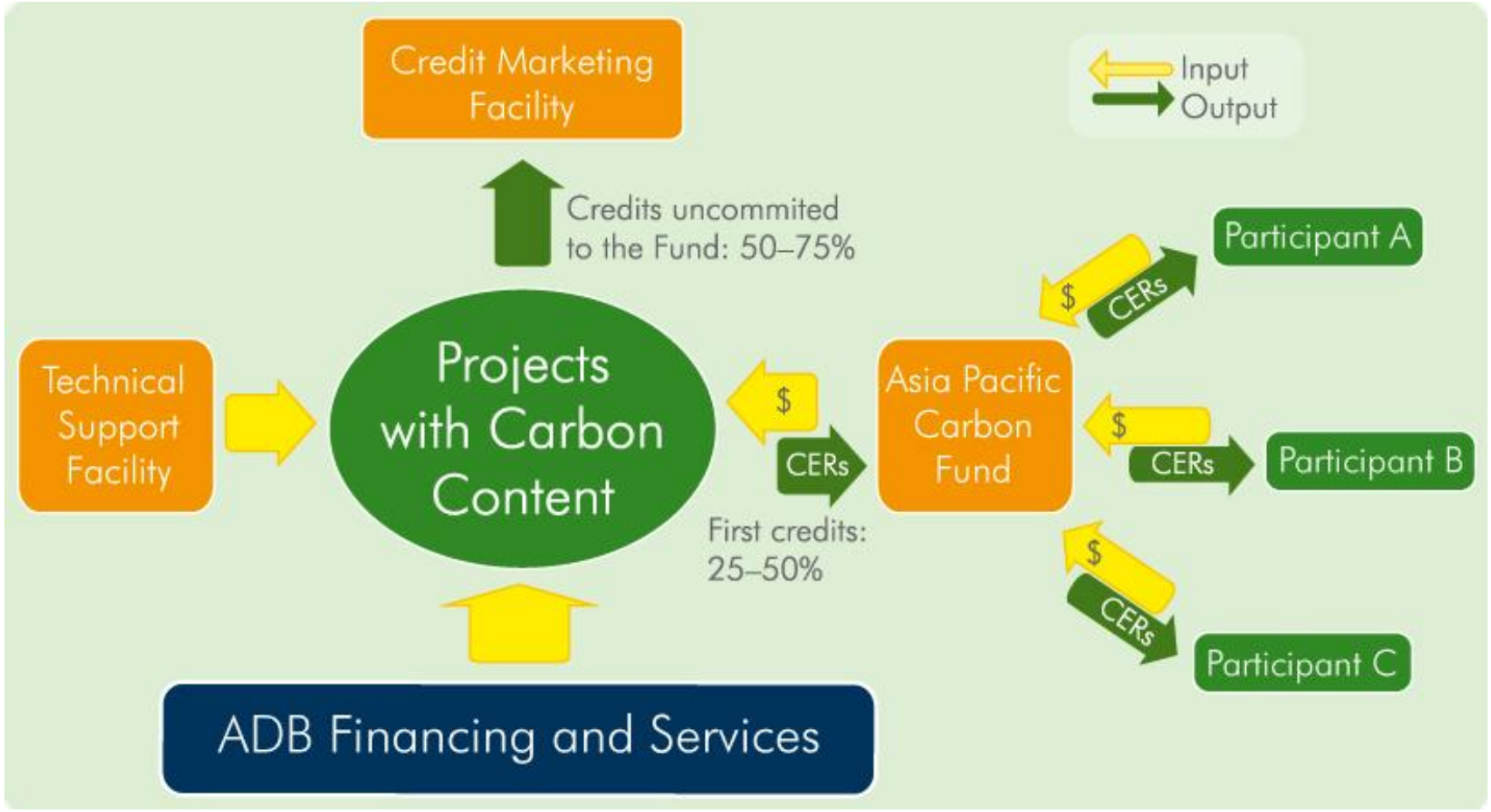
# Clean Energy Financing Partnership Facility (CEFPF)



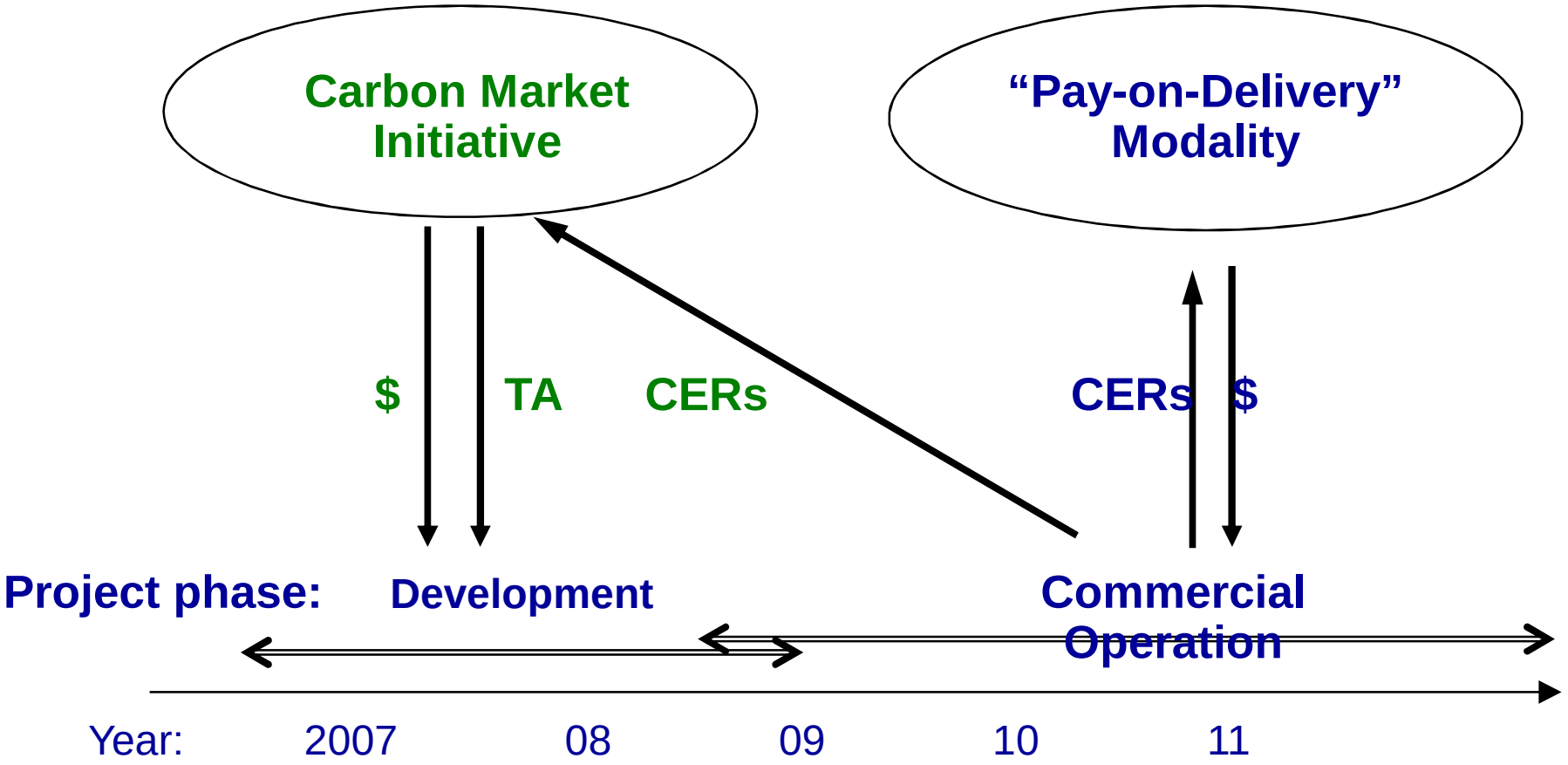
# ADB's CE Investments 2008



# Carbon Market Initiative: 3 Components



# ADB Risk Sharing Model



# Issues to be Addressed Internationally

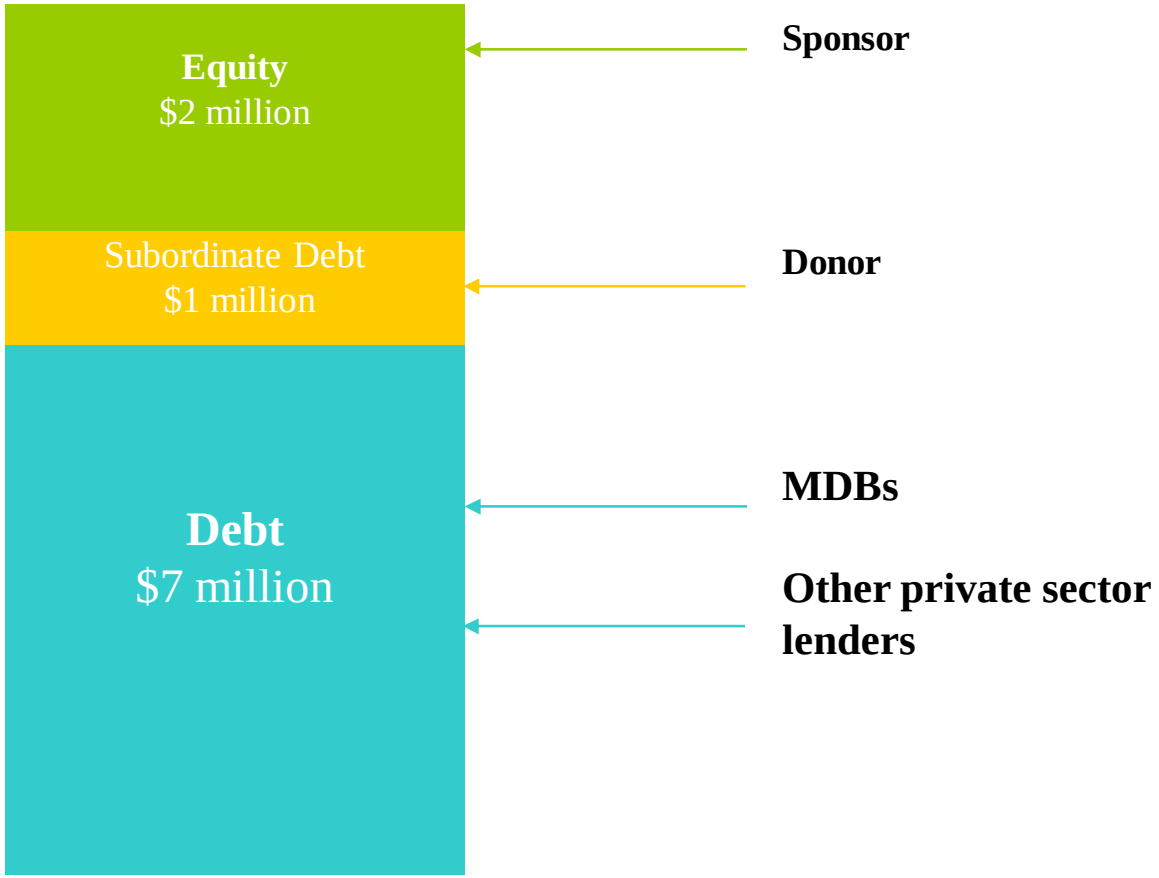
- Technology identification, accelerated commercialization of leading choices
- Establish suitable financing models that help blend private & public funds to implement RE projects
- Increase in concessional lending by FIs to support risk mitigation, technology transfer and non-investment support

# Project Finance Instruments – Engaging the Private Sector

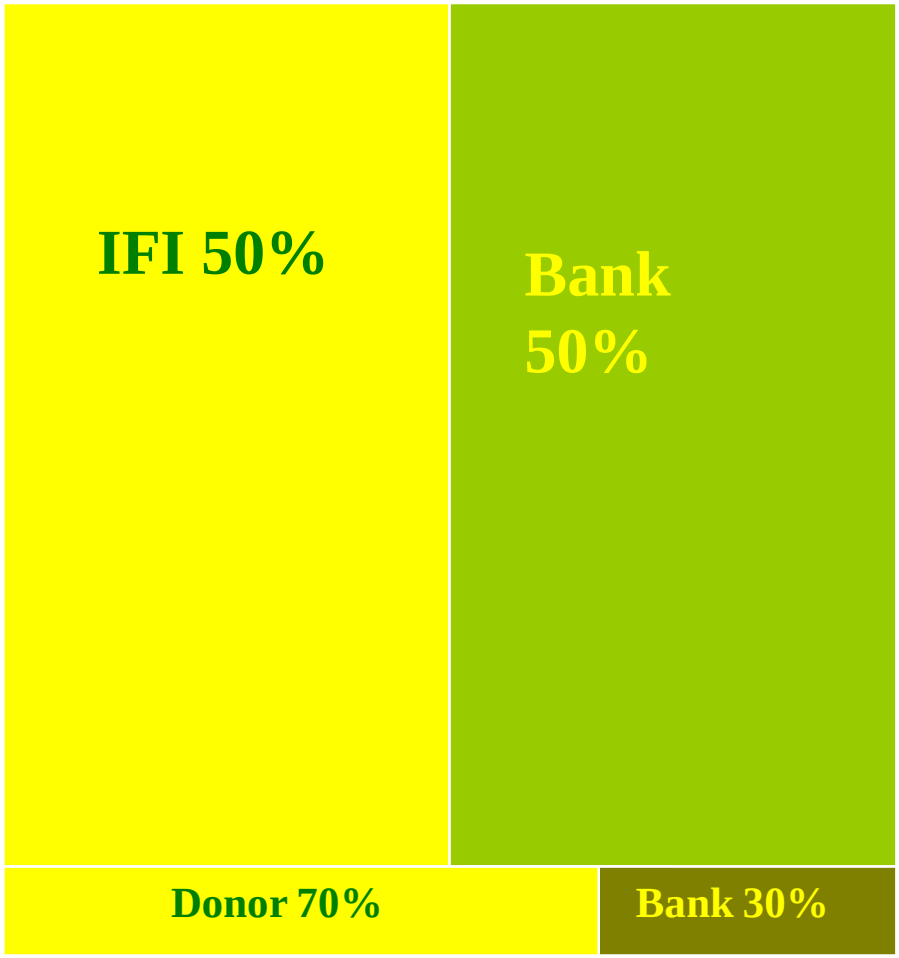
- Equity to support implementation, testing of new technologies & to attract commercial funding
- Subordinated Debt enables/encourages a local bank to provide senior debt financing
- Credit lines & loans with built in incentives such as performance bonuses or interest rate step downs if certain milestones or targets established are reached
- Risk Sharing MDBs guarantee part of the repayments to local banks for its financing
  - Cover the losses from the first few defaults (if any) which occur in a portfolio of projects (first loss)

- Risk reduction, bonus or interest rate reduction are financed by donor funds

# Subordinated Debt



# Risk Sharing a Bank's RE Portfolio




95%

5%

# Conclusions

- Energy is a pre-requisite for poverty alleviation
- Renewable energy is a better and sustainable alternative
- Think Big and Beyond
  - Renewable energy improves access and enhances energy security, but a massive "scale-up" of interventions, investments and business is required for renewable energy to make a significant contribution or be a serious alternative to conventional energy
- ADB – innovative financing mechanisms to support RE technologies – RE funds, credit lines, first-loss guarantee

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# Thank you!

## For more information

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