Challenges for Renewable Energy in Asia and the Pacific

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Asian Development Bank (ADB)

- Multilateral development finance institution established in 1966
- Poverty reduction is overarching mandate
- Provides financial and technical assistance
- 67 members – 48 from Asia and Pacific region
- Financial assistance:
  - $21.57 billion approved financing in 2012
  - ADB invested US $2.4 billion in clean energy projects in 2012

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ADB's Operations : Instruments

- **Sovereign Loans** (Government Pipeline, Fiscal Guarantee, normally 25-32 years loan period with interest rate of LIBOR + 0.2-0.4%, 5-8 year grace period)
- **Nonsovereign Loans** (No requirement for government pipeline and fiscal guarantee, Government's no-objection required, LIBOR+risk premium, grace period, commitment charge and front-end fee).
- **Technical Assistance and Grants** (to assist policy studies, capacity development and project preparation)

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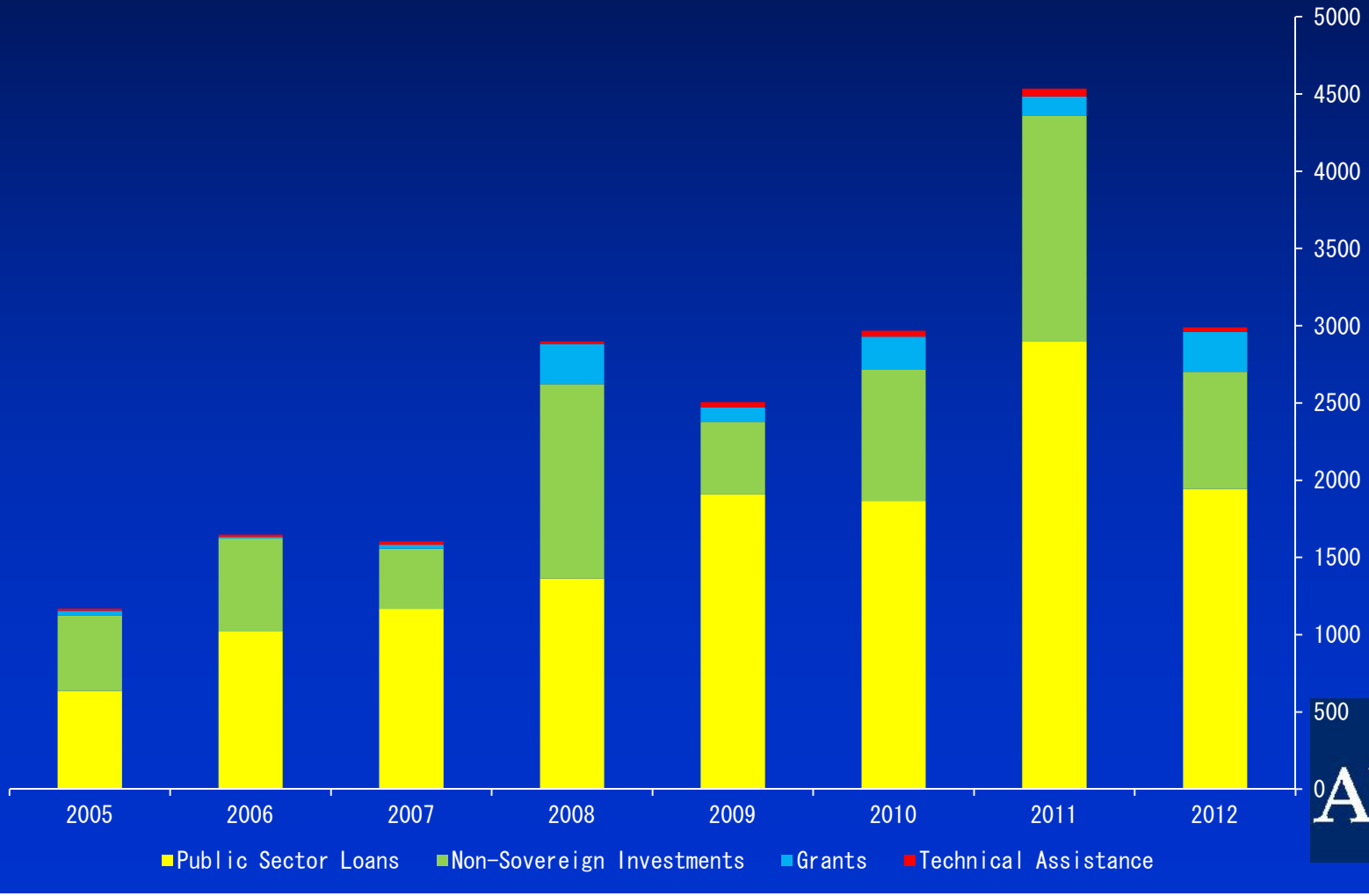
2009 ADB Energy Policy
(Three Pillars)

1. Promoting **renewable energy and energy efficiency**
2. Maximizing access to **energy for all**
3. Promoting energy sector **reforms, capacity building, and governance**

ADB Energy (total) Investment 2005-2012
($million)



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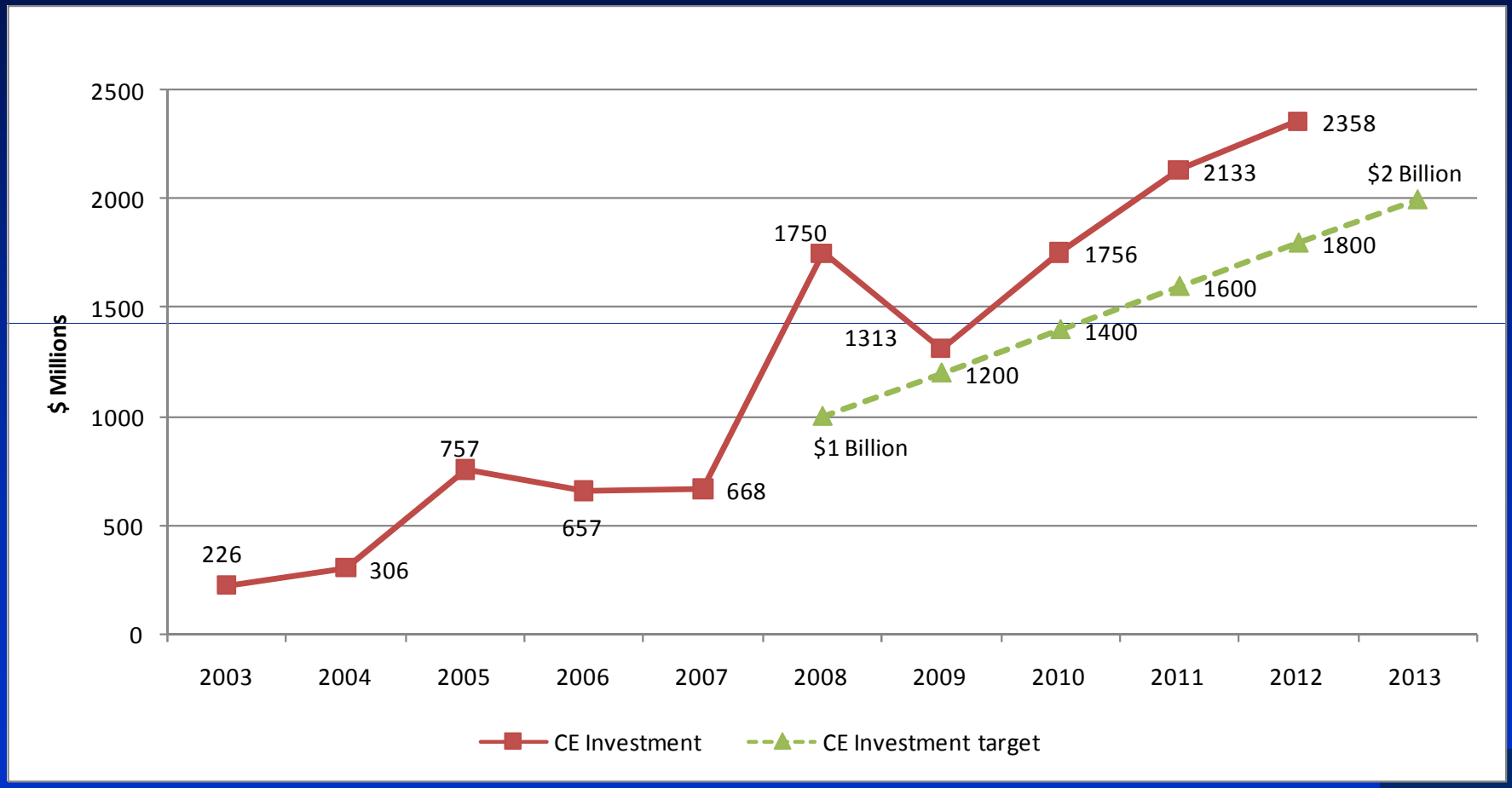
Progress Toward ADB's $2 Billion Clean Energy Target



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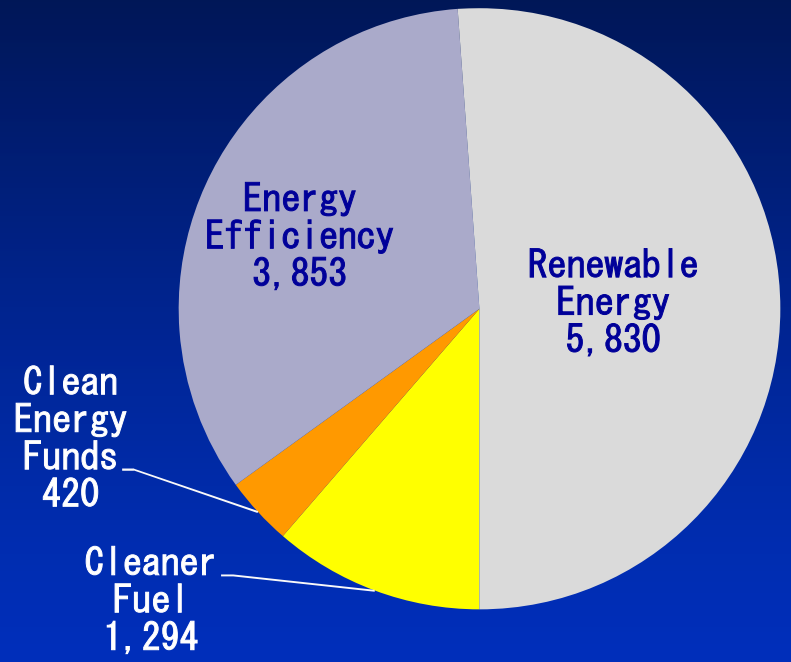
ADB's Cumulative Clean Energy Investment- By Project Type (2005-2012) in $ million



Hydro	Wind	Solar	Others
3388	832	755	855
58%	14%	13%	15%

Total Energy-related Investment (2005-2012): $23.3 Billion

Total Clean Energy Investment (2005-2012): $11.4 Billion

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Clean Energy in Asia and the Pacific

1. Asia and the Pacific is rapidly becoming the global hub for clean energy
   - nine straight years of growth in clean energy investments (2003-2012)
   - $101 billion in 2012 – 42% of total global clean energy investment
2. ADB's Energy Outlook predicts the share of new and renewable energy in Asia's power generation mix will reach 7.1%, up from 1.9% in 2010.
3. However, fossil fuels will remain primary source of energy unless greater policy and incentivizing measures are

ADB financed solar project in Thailand

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Challenges to Renewable Energy - Pacific

1. Lack of appropriate technology
2. Low technical capacity of power utilities/Government agencies
3. Lack of sector planning
4. Difficulties in grid integration
5. Lack of private sector investment
6. Difficulties with land acquisition
7. Low energy access
8. Lack of donor coordination

Barrier 1
Lack of appropriate technology

- Pacific has specific needs
  - Cyclone prone e.g. wind farms
  - Highly corrosive environments
  - Isolated - stretched supply chains
  - Low operation and maintenance capacity
- Limited technical alternatives
  - Wind – highly seasonal resource
  - Biomass - lack of industrial waste streams
  - Coconut oil/diesel – marginally financially viable
  - Geothermal - costly at small scale upfront drilling costly
  - Ocean power - Wave and OTEC not suitable to transfer
  - PV Solar – proven robust technology, integration issues
  - Markets and projects are small = limited R&D
  - Lack of financially viable storage options

Barrier 1

Example: Small scale cyclone proof wind turbines

- Some technology exists however limited competition
- Limited size of market and small project sizes has reduced available options

Coconut Oil Diesel Replacement

- Several countries are blending CNO with diesel for power generation.
- Complication of pre-heating/filtering may deter blending due to low capacity of power utilities
- CNO blending for vehicles has been unsuccessful due to technical complications
- High cost of esterification process has deterred biodiesel production

Barrier 2
Low capacity

- Power Utilities
  - Currently focused on diesel generation
  - Limited technical capacity to manage multi-source renewable energy generation or integration issues for intermittent generation
- Energy Units
  - Low capacity, generally <5 staff, limited to policy formulation
  - Often diverted by donors projects, missions and study tours
  - Lack of technical capacity to:
  - manage consultants and contractors during construction (requires expensive project management units)
  - conduct operation and maintenance (particularly for wind farms and biofuels)
  - Lack of local qualified consultants and contractor

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Barrier 3
Lack of Sector Planning

- Most countries have renewable energy targets and broad renewable energy plans
- However most lack regulatory processes for identification and prioritization of actual renewable energy projects
- Weak regulatory and policy frameworks

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Barrier 4
Grid Integration

- Recently – most grids have gained experience with integrating small intermittent solar systems
- Currently – some grids have reached saturation integration levels with solar
- Next – investments will be required to increase integration of RE in battery storage and then baseload RE

Barrier 5
Private Sector

- Private sector investment (independent power providers) is limited but necessary as:
  - Utilities lack technical capacity
  - Governments lack financing to invest
- Interested suppliers, but few investors or developers due to high perceived risk
  - Payment risk (poorly performing utilities)
  - Small size of markets and limited follow on projects
  - Perceived political risk
  - High marketing costs
  - Pacific Governments are introducing policies and legislation to encourage private investment
- Partial debundling - will be important to complete corporatized utility model:
  - Independent tariff settings
  - Full cost recovery

Barrier 6
Land Acquisition

- Land acquisition in the Pacific is a major barrier to renewable energy (particularly Melanesia)
- Issues are both during construction and operation - mainly hydropower
- Examples:
  - Papua New Guinea - existing hydropower shutdowns, project start-up delays
  - Solomon Islands - existing hydropower closed, delays in proposed projects, proposed sites cancelled

Barrier 7
Energy Access

- Largely a Melanesian issue
  - Papua New Guinea 12%
  - Solomon Islands 21%
  - Vanuatu 27%)
- Renewable energy is part of the solution, however:
  - Utilities lack incentive to extend grids as systems are generally high cost diesel - lack of subsidies
  - Lack of sustainable mini-grid models for financing, ownership, operation and maintenance
  - Absence of private sector engagement
  - Lack of supply chains for household systems (solar lanterns, solar household systems, pico-hydro etc)
  - Government/donor handout schemes distorting household solar system markets

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Barrier 8
Donor Coordination

- Sector is crowded by numerous donors (UN, MDB's, Bilaterals)
- Coordinated sector development hindered by;
  - sparodic financing of isolated renewable energy initiatives
  - tied technologies which embed inappropriate technology
  - diverted focus of limited national capacity
- Main development partners have formed Pacific Region Infrastructure Facility (PRIF)
  - Governments of Japan, Australia, New Zealand and European Union
  - World Bank, International Finance Corporation, Asian Development Bank, European Investment Bank
  - PRIF Coordination Office (6 permanent staff) based in ADB Sydney office

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Thankyou