

# **Prospects for Smart Grids in Asia and the Pacific**

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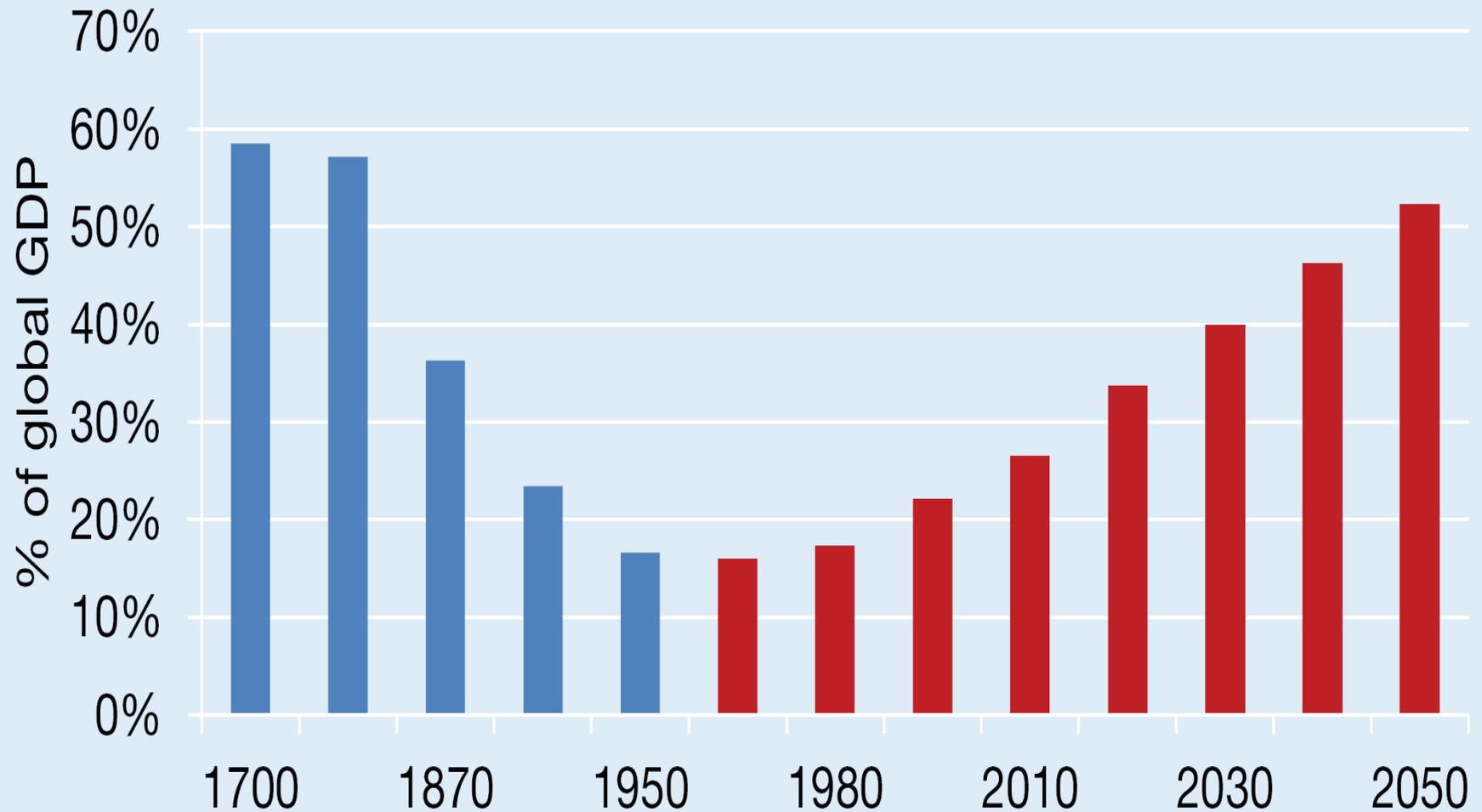


# Asian Development Bank

A regional multilateral development bank...

- Established in 1966 based in Manila, Philippines
- A partnership of 67 countries
- 28 offices worldwide
- A shared vision of an Asia and Pacific region free of poverty
- Main instruments: loans, grants, technical assistance, equity investments, and guarantees
- Has an annual lending of around \$14 billion, 30% or around \$4 billion of which is attributed to energy sector investments.

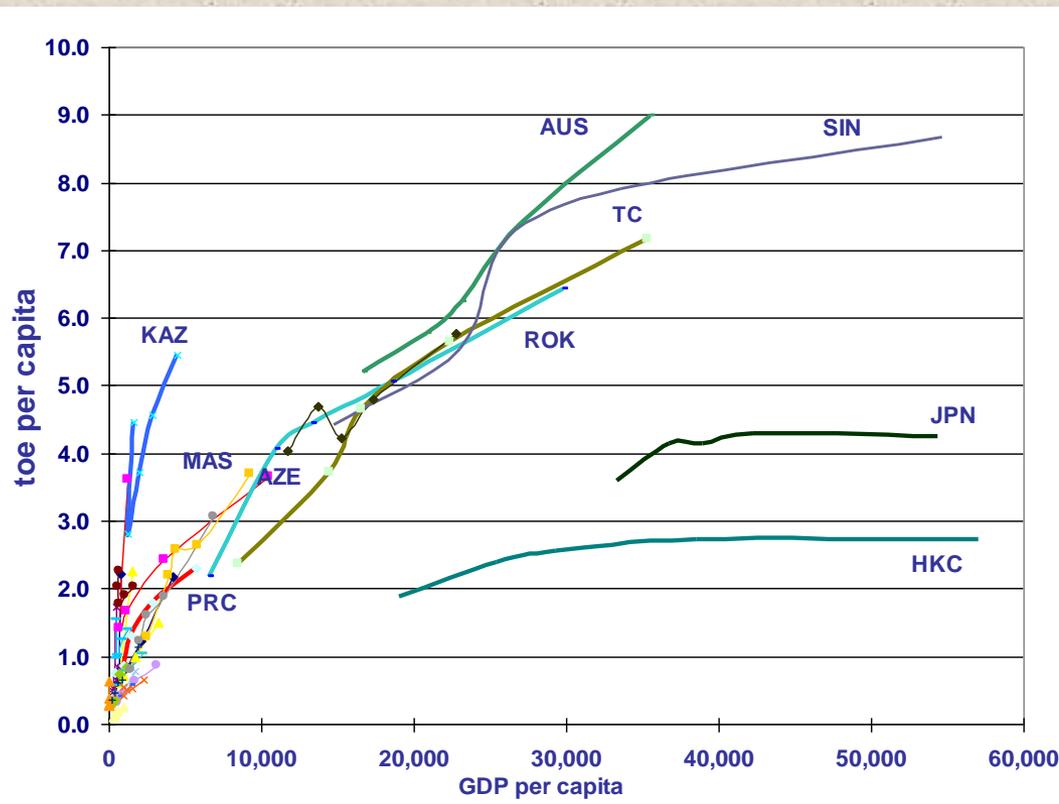
# Asia's share of global GDP, 1700–2050



Source: Maddison (1700–1950) (2007); Centennial Group International estimates (1951–2050) (2011). Data for 1750–1790 are PPP and data for 1991–2050 are in market prices.

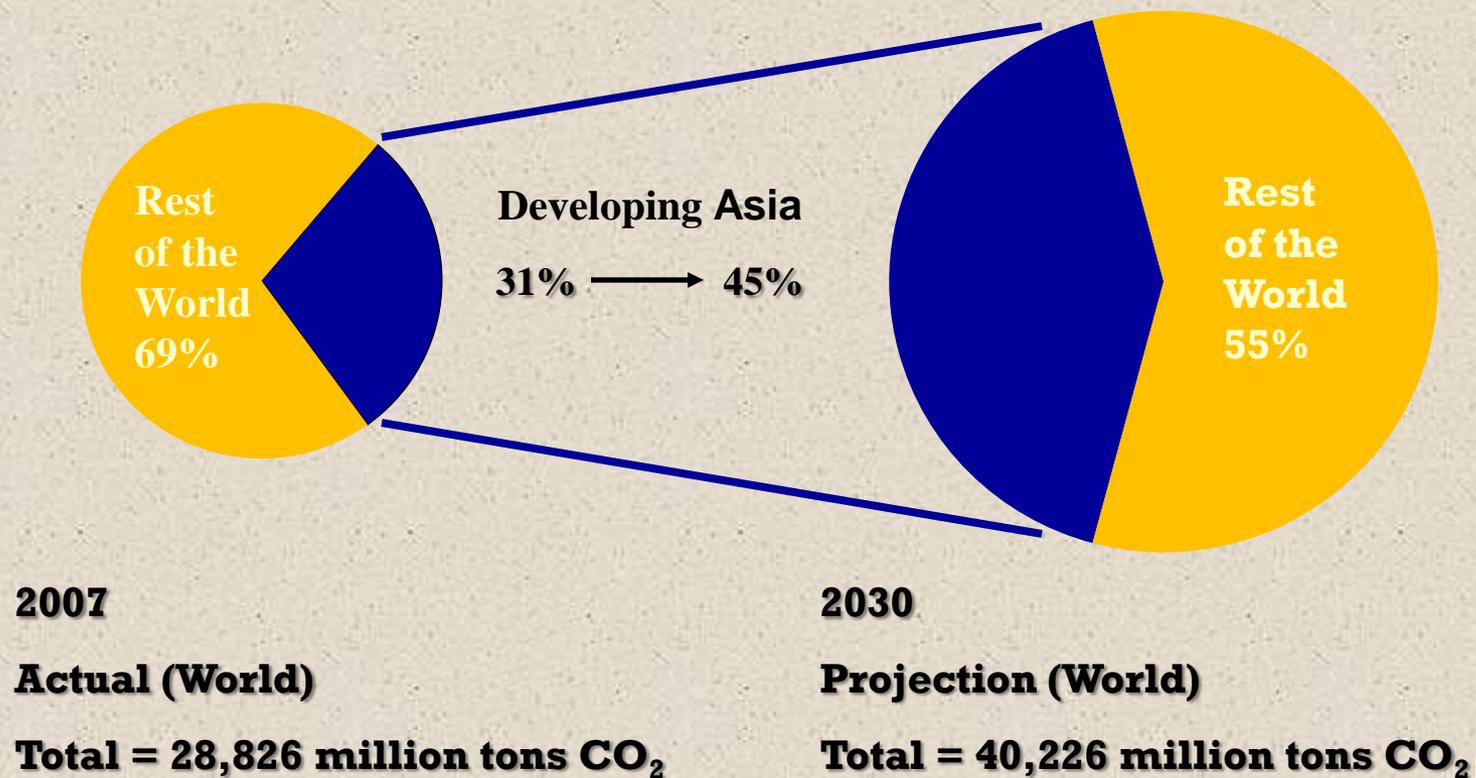
# Outlook: energy demand

- Annual energy demand growth in developing member countries until 2030: **2.4% vs 1.5% world average**
- Energy demand increase between 2005 and 2030: 92%



Asia and the Pacific will lead the world's energy demand growth,

# Developing Asia's Share in Global Energy Related CO<sub>2</sub> Emissions



# Energy poverty persists in Asia and the Pacific

- ▶ Access to energy is a critical development issue that has gained much more traction due to its role in achieving the Millennium Development Goals.
- ▶ Despite international efforts and the growing wealth of Asian economies, energy poverty still plagues the region.

**1.9 billion**

people in Asia and the Pacific depend on burning traditional biomass for energy\*\*\*

\*  
\*\*\*IEA.2011. *World Energy Outlook 2011.*

**4.1 billion**  
total population of  
Asia and the Pacific\*

\*UNESCAP.2010. *Statistical Yearbook for Asia and the Pacific 2009.*

**670 million**

people in developing Asia have no access to basic electricity services\*\*

\*\*IEA.2011. *World Energy Outlook 2011.*

# ADB's Energy Sector Operations

- ADB's Energy Sector operations is guided by the 2009 Energy Policy that has the following pillars for implementation:
  - Promotion of energy efficiency and renewable energy
  - Maximizing access to energy for all
  - Energy sector governance, reforms and capacity building



# Key issues of Asia Power Supply Systems

- Supply shortage
- Low electrification ratio
- Aging energy infrastructure
- High technical and commercial losses
- Unstable voltage and frequency
- Fast development of renewable energy
- Poor operational and financial performance of power utilities

# Smart Grids Opportunities in Asia and the Pacific

## Context

- Countries in Asia and the Pacific are diverse and in various levels of economic development.
- Needs to improve efficiency in energy production, delivery, and use – peak load management, outage management, power quality management, energy storage, synchro-phasor technology, etc.
- Needs to reduce system losses, and improve billing and collection efficiencies – reactive power control, advanced metering infrastructure, etc.
- Integration with increased share of intermittent and distributed renewable energy generation.
- Development of Off- or Mini-grid for remote villages



# Turning Challenges into Opportunities for Smart Grids Deployment

## Challenges

- Lack of knowledge and awareness
- Absence of appropriate business models
- Lack of funds to finance smart grids
- Inadequate regulatory and institutional framework

## Enablers

- Develop capacity and knowledge and transfer technology
- Initiate pilot projects to assess feasibility, scalability and replicability
- Innovative financing and PPP
- Governance and sector reforms

# Starting Points for Smart Grids in Developing Asia

## Entry/starting points

- Build on existing IT infrastructure
- May not necessarily start as state-of-the art smart system in the beginning stage
- Address commercial and technical losses
- Controlled load shedding
- Remote control of non-payment through smart meters
- Renewable energy grid integration
- Off-grid or mini-grid system



# Criteria for Smart Grids Projects

- Indigenization of technology
- Common information sharing platform
- Scalable and replicable
- High demonstration effectiveness
- Possibility of evolving policy advocacy, regulation etc. for successful replication
- Evolving a commercial model.

# Future Smart Grids Applications

## Gradual Decarbonization of Economies

- More renewable energy generation
- Sustainable Transport
- Efficient Industry
- Environmental Consideration

# Conclusions

- Smart grids can help achieve energy security, low carbon economic growth and universal access to energy
- Enormous opportunities exist for smart grids development in Asia and the Pacific
- Strong partnership is needed

# For More Information

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The logo for the Asian Development Bank (ADB), consisting of the letters "ADB" in white, bold, sans-serif font, centered within a dark blue square.

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