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Low Carbon Development Path for Asia

*Challenges and Opportunities for
the Energy Sector*

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Green
Growth



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Overview

1. Key challenges in Asia-Pacific region
2. Low Carbon Green Growth
3. Low Carbon Development Path for the Energy Sector
4. ESCAP's Focus Areas

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UN-ESCAP: Overview

- ▶ 53 members of UN-ESCAP
- ▶ 9 associated members
- ▶ Rapid economic growth
- ▶ High population density
- ▶ 40% of the world's land area territory
- ▶ 60% of the world's poor population
- ▶ UN-ESCAP fosters regional cooperation to address development challenges



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Overview

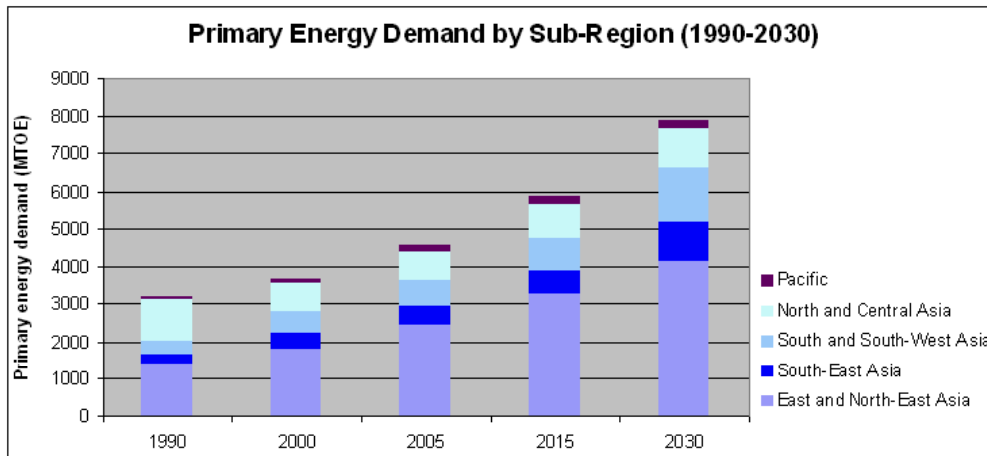
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Challenges in Asia-Pacific Region - Rising Energy Demand



Primary Energy Demand by Sub-Region 1990-2030
(ADB 2009 and IEA 2011)

Resource demand

Energy demand within Asia and the Pacific is projected to grow by 2.5% a year up to 2030 – highest growth rate in South-East Asia at 3.9%, and South and South-West Asia at 4.5%

Strong steady growth maintained in East and North-East Asia

Consumption Intensity

“Between now and 2050, Asia will be transformed as its urban population nearly doubles from 1.6 billion to 3.1 billion”

Asia is projected to surpass the OECD before 2030 to become the world’s largest energy consuming block (ADB, 2011)

Challenges in Asia-Pacific Region - *Resource constraints & climate change*

- The days of abundant resource and low fossil fuel prices are over.
- Countries in the region are particularly vulnerable:
 - In 2011 alone, 42 million people in Asia-Pacific were pushed back into poverty due to energy and food price increases
- Countries in the Asia-Pacific region are the most vulnerable to climate-related disasters
 - 85 per cent of deaths and 38 per cent of global economic losses
- **Developing countries are most vulnerable.**

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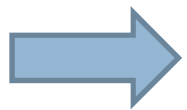


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Competing Goals for Energy System

- Sustain economic growth and industrialization
- Extend energy access to those without access to modern energy service
- Reduce environmental impacts (e.g. pollution, GHG emissions)

Think 30-50 years ahead!



- Improve the efficiency of energy system
- Shift toward low carbon and cleaner energy system

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Urgent Need for New Growth Paradigm

- Business-as-usual is no longer an option.
- Need to **shift urgently from energy, resource and carbon intensive towards efficient growth pattern**: i.e. low carbon growth pattern
→ AP countries are using 3 times more resources per GDP
- ESCAP has been developing a **Roadmap for Low Carbon Green Growth** to provide policy makers of developing countries in the Region with **concrete policy options** with the support from the Korean Government

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Conceptual framework

Low Carbon Green Growth is..

Diagnosing current **resource constraints** and **climate crisis** as key challenges for sustainable growth in AP region,

To **turn this crisis into growth opportunities**, and support achieving MDGs & make economic growth sustainable,

Provide policy strategies to steer **economic system change** to achieve double dividend,

By re-orienting our economy based on **Eco-efficiency** (economic and ecological efficiency),

: by closing **Time and Price Gap** in both **visible** and **invisible** structures of the economy

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Close Time & Price gap based on Eco-efficiency principle



- **Closing the price gap**
- Market price < Ecological costs



- **Closing the time gap**
- Short-term costs < Long-term benefits

- Integrate: economic + ecological efficiency
=> **Eco-efficiency (Green Economy)**

Key principle & Vision

Eco-efficiency & Double dividend

- LCGG promotes a system change to close the gap between economic & ecological efficiencies and achieve Eco-Efficiency

* **Eco-Efficiency**: Economic & Ecological Efficiency

- A key to achieve **Double Dividend** structures of the economy:
 - ✓ environmental sustainability &
 - ✓ new economic growth and employment





REVENUE NEUTRALITY

Total tax burden remains same

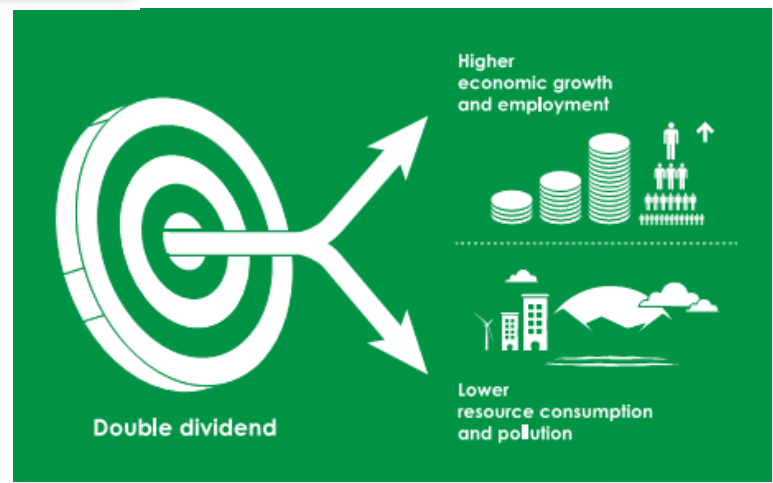
Shift taxes from “goods” to “bads”

DOUBLE DIVIDEND



Taxing resources and pollution reduces their use

Reducing distortive taxes increases GDP and employment



LCGG is more/also relevant for developing countries (in AP).

- SURVIVAL: Most vulnerable
- FEASIBLE: Not merely about money +technology - policy leverage of the government pivotal
- LCGG: as a growth strategy for energy security, resilience and avoiding poverty trap
- GREATER POTENTIAL: A strategy for leapfrogging opportunity (Avoiding unsustainable lock-in growth pattern)
- *Rio+20*: Growth Strategy not environmental conditionality

ESCAP Roadmap identified 5 tracks

1. Improving the **quality** of growth and maximizing net growth
2. Changing the **invisible** structure of the economy: Closing the gap between economic and ecological efficiencies
3. Changing the **visible** structure of the economy: Planning and designing eco-efficient infrastructure
4. Turning green into a **business** opportunity
5. Formulating and implementing **low-carbon** development strategies

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Key messages of the Roadmap (cont'd)

Improve the **efficiency** of the current energy generation, transmission and distribution, expand the **share of renewable** energies.

Invest in **next-generation technologies** & energy systems

(TRACK 3)



Key messages of the Roadmap (cont'd)

“Price volatility of natural resources, energy and climate change impacts is **increasing business risks and uncertainty**.”

Make a business case of **climate actions**- not as burden but source for further growth.

(TRACK 5)

Enabling the business turn “green” to **business opportunities**

(TRACK 4)



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On-line e-Learning: <http://www.greengrowth-elearning.org/lms/>

The screenshot shows the Green Growth e-Learning website. At the top left is the logo "Green Growth | e-Learning". To the right are input fields for "Username" and "Password", and a "Login" button. Below the header is a navigation bar with links: "ABOUT", "COURSES", "CASE STUDIES", "PARTNERS", and "CONTACT".

The main content area is titled "HOME". On the left is a "NAVIGATION" menu with a "Home" section containing links to "Site news", "Presentation", "Fundamentals Of Green Growth", "Liveable Cities", "Low Carbon Green Growth Roadmap", "Sustaining Growth", "Contact Us", "Partners", "Registration Form", and "Courses".

The central banner features a collage of images with text: "On-line e-Learning Facility for Green Growth Capacity Development". The collage includes images of solar panels, a corn plant, a city skyline, a person at a computer, and a woman. Vertical text labels include "Low Carbon Green Growth", "Resource Efficiency", "Sustainable Infrastructure", and "Green To and Beyond 2020".

Below the banner are four course thumbnails: "Fundamentals of Green Growth", "Liveable cities", "Low Carbon Green Growth Roadmap", and "Sustaining Growth".

At the bottom of the main area is a three-step process bar: "1 Find your course" (with a magnifying glass icon), "2 Register" (with a clipboard icon), and "3 Start the session" (with a book icon).

On the right side, there are two sections: "ONLINE USERS" showing "(last 5 minutes)" and "Panut Manoonvoravong", and "LATEST NEWS" with three news items: "Green Growth Training: Week 3 more...", "Linking to green trade more...", and "Green Growth Training: Week 2 more...".

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Investments Required for Low Carbon Development Path

Estimated Investment Required:

At least \$515 billion invested annually in clean energy over an extended period

- ESCAP: In 2006, global investment in clean energy alone reached \$100 billion
- REN21 2012: Global new investment in renewables rose 17% to a record USD 257 billion in 2011

Strategies for Low Carbon Development Path

Reduce Energy Demand through Efficiencies and Lifestyle Changes

Shift to New Technologies

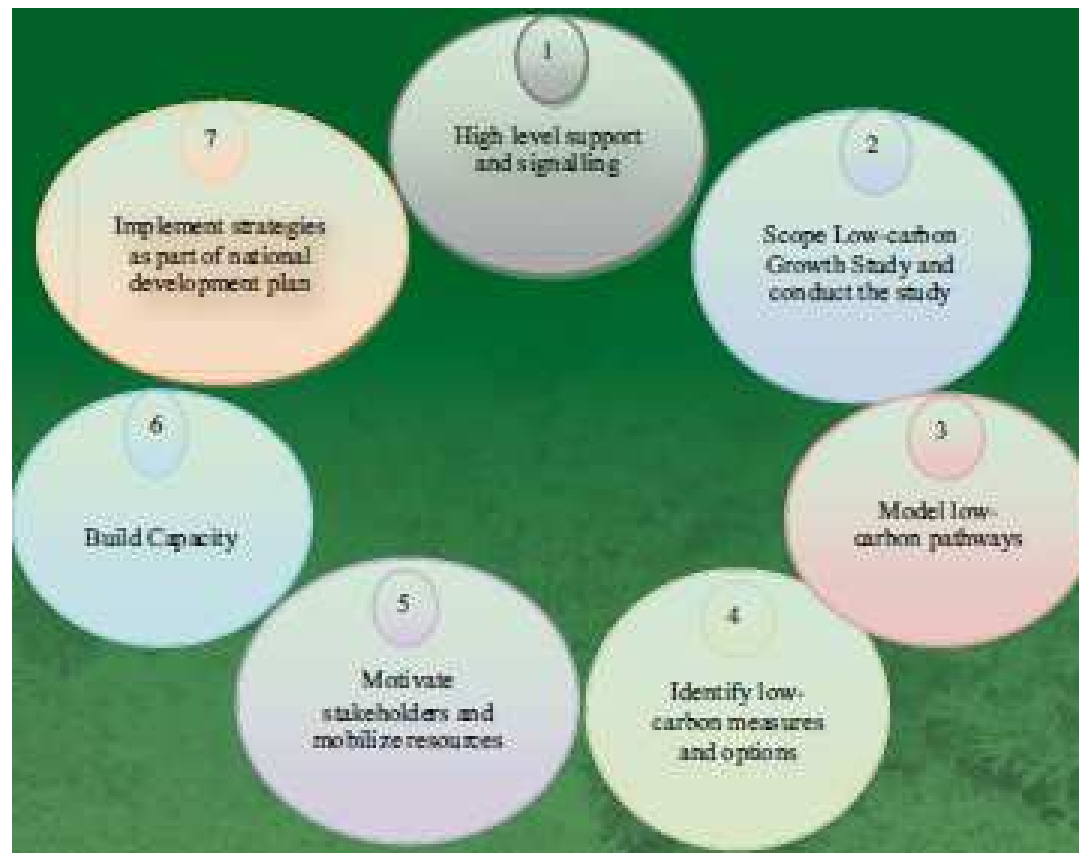
Promote Carbon Capture and Storage

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Steps to Establish & Implement Low Carbon Development Path



Roadmap for Low Carbon Development Path: Three-part Framework for Energy Sector

Establish long-term
vision for energy
security and low-
carbon development

Improve the energy
system to promote
low-carbon
technologies and
practices

Build an enabling
environment for the
transition to low-
carbon development

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Policy Recommendations (1 of 4)

- Integrate energy security and climate change priorities into all aspects of domestic and international policymaking
- Consider the different stages of industrialization when shaping national low-carbon development strategies
- Enhance energy efficiency and renewable energy utilization
- Provide financial and investment supporting channels for low-carbon energy system

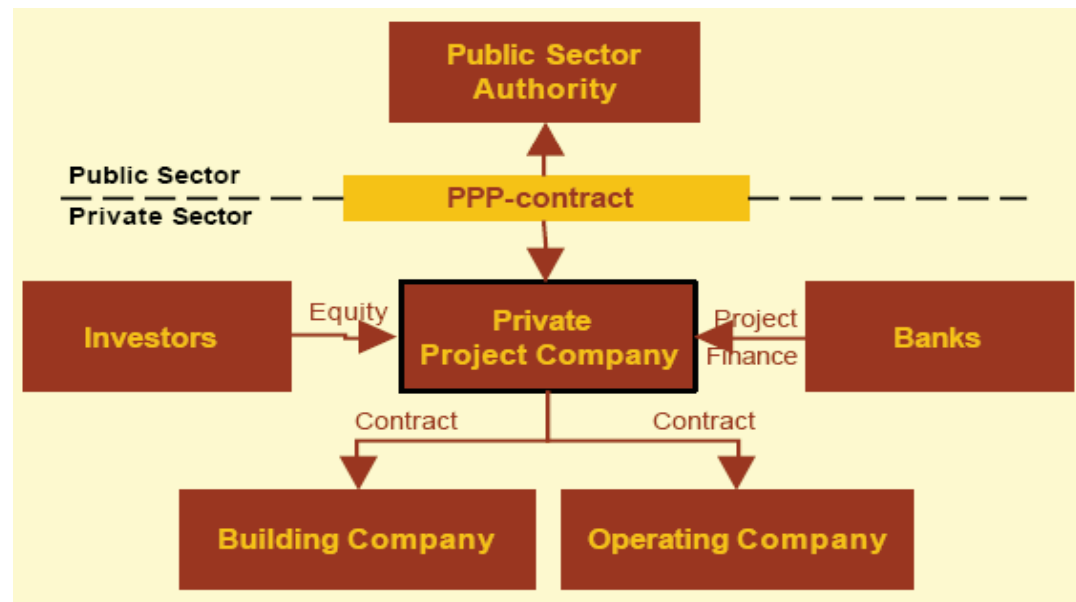
Policy Recommendations (2 of 4)

- Encourage research and development of clean energy technology
- Build an appropriate policy and regulatory framework for low-carbon development
- Enhance institutional mechanism to support low-carbon development
- Enhance institutional mechanism to support low-carbon development



Policy Recommendations (3 of 4)

- Make full use of public and private partnership to promote the transition of low-carbon development



Policy Recommendations (4 of 4)

- Enhance public awareness on low-carbon development through public education



2012 INTERNATIONAL YEAR OF
SUSTAINABLE ENERGY
FOR ALL

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Green Growth Roadmap

- Roadmap remains the backbone of ESCAP's policy advocacy, technical cooperation and capacity building programmes
- Roadmap Presentation at Rio+20
- The Roadmap will be the basis for “Quality of growth” and a post-2015 MDGs development framework



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ESCAP's Focus Areas: Pro-Poor PPPs (5P Model)

Case: Cinta Mekar, Indonesia



Hydro power plant
Operational Since 2004

Case Details

- Implementation Agency (Partnership): Private Sector, NGO, Community
- Generates about 72,000 kWh of electricity per month and uses a PPA
- Revenue used for social development (education, health, etc.)



ESCAP's Focus: Regional Cooperation for Energy Security

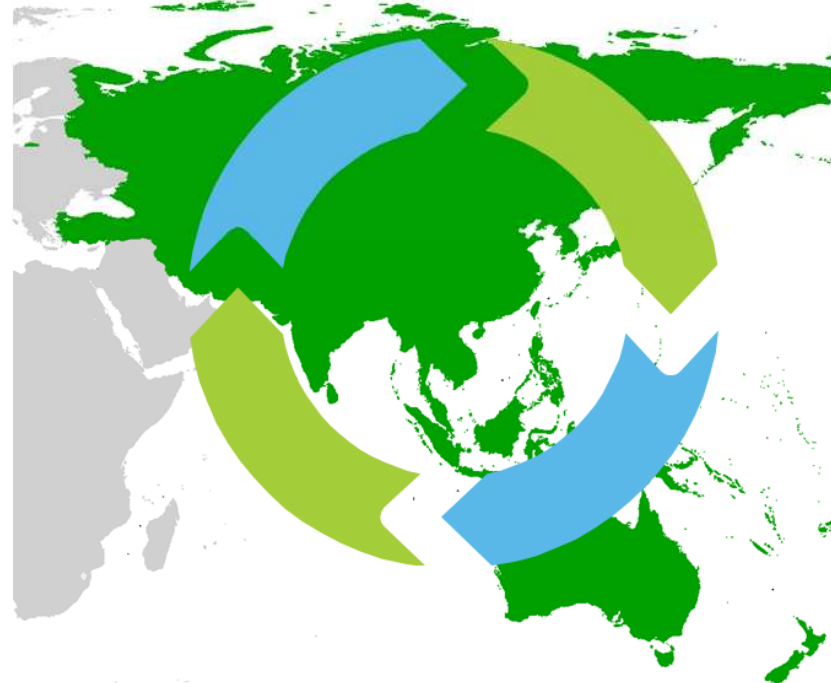
Energy trading is currently occurring within the Asia-Pacific region but is primarily limited to bilateral agreements between neighboring states

Sub-regional recognition of need for greater cooperation:

- ASEAN Power Grid
- CASA 1000
- GMS Energy
- SAARC Energy Ring

Regional Integration

The economically sound allocation of energy resources is likely to be more efficiently accessed and equitably distributed using regionally integrated energy planning and trading



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ESCAP's Focus: Asian Energy Highway (AEH)

A Game Changer

Advancements in electricity transmission technology are increasing the capacity for long-distance transportation of power. Access to remote energy resources is becoming more viable from a regional planning perspective.

Concept

- Promote regional energy planning to enable efficient allocation of resources
- Promote interconnections of electricity infrastructure and harmonization between institutions to enhance trading opportunities
- Enhance resource security through diversification of supply and a dynamic capacity to adjust to developments in generation sourcing
- Enable a capacity for regional load balancing and smart metering, thereby increasing efficiencies in resource consumption
- Promote competitive trading energy trading policies and power pooling-electricity marketplace



ESCAP's Focus: Asian Energy Highway (AEH)

Integrated regional markets

- Integrated regional energy markets are successfully functioning in Scandinavia, with additional trading to neighboring states (e.g. Russia)

- Cross-border trading can induce price convergence between countries, correlated with market power



Nord Pool Spot – Regionally integrated energy market

Long distance HV transmission

- High capacity transmission is already being employed within Asia to enable access to remote sources of energy

- Similar technology could be used to access currently remote sources of energy and transport to demand hubs within a regionally planned Asian energy market



Xiangjaba-Shanghai, China: 800kV HVDC (1980km) (ABB, 2012)

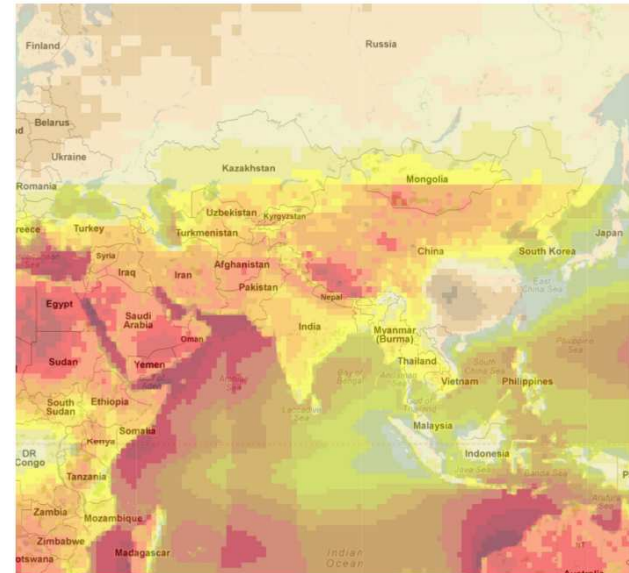


ESCAP's Focus: Asian Energy Highway (AEH)

Complement decentralized capacities to reduce energy demand and provide for less intensive demand centers by providing framework to support bulk renewable injection to urban and industrial centers for baseload supply

Benefits

- Create an economy of scale and demand for bulk renewable generation facilities
- Enhanced intermittent generation smoothing through broader geographical coverage
- Regionally balanced supply/demand management
- Enhanced geographical access to energy storage opportunities



DNI solar resource mapping (NASA, 2008)

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Questions for discussion

- **Q1:** What are the main challenges in relation to resource constraints and climate change and what is the relevance of a low carbon green growth strategy for India? How do you think the comprehensive strategy to be developed to cope with the volatile international oil market?
- **Q2:** What kind of role the regulatory body could play to promote sustainable energy in order to turn these challenges into economic opportunities?
- **Q3:** What are your views about the emerging ideas on Asian Energy Highway (AEH)?

