



# **Green Growth**

## **Opportunities for Bioenergy**

### **Development in Asia**

### **and the Pacific**

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# UN ESCAP

- United Nations
- Economic & Social Commission
- Outpost in Asia and the Pacific

**ESDD:** Environment & SD Div

- Integrating Env. into Socio-Economic Development

# Humans are Living far Beyond Planet's Means

- Humans will need **2 planets** every year by 2050 on current trends.
- "For more than 20 years we have exceeded the earth's ability to support a **consumptive lifestyle**. This is **unsustainable**."
- "If everyone lived as **America**, we would need **5 planets** to support us."
- **At WWF' 2006 Living Planet Report Launched in Beijing**

(WWF, 2006: 10 and 24)

# Ecological Status of the Global Economy

- **Deepening Ecological Deficit**
  - **Footprint is surpassing Biocapacity**



# Major Characteristics of Asia/Pacific

- Rapid economic growth
- Most limited ecological carrying capacity.
- High population density, 34% of global GHG emission
- 2/3 world poor in the region; 1 billion lack electricity
- Need rapid economic growth for poverty alleviation, compatible with environmental sustainability

# TIME: ASIA'S ENVIRONMENT: Visions of Green October 9, 2006

- A 2005 United Nations report warned that although one-fifth of Asians still exist on less than \$1 a day, "the region is already living beyond its environmental carrying capacity."
- But Asia can't wait for the invisible hand to grow a green thumb; The problems are too intractable. Asia's future has to become one of sustainable "green growth."

# Green Growth

- Green Growth – Achieving rapid growth without compromising environmental sustainability
- Green Growth: attaining MDG 1 & 7 at the same time.
- GREEN GROWTH: focusing on Environmental Sustainability & Ecological Efficiency (EE)
- Adopted at the 5<sup>th</sup> Ministerial Conference on Environment and Development (5<sup>th</sup> MCED, March 2005, Seoul)

# Conventional Approach

- Environment VS Economy: Zero Sum Game
- Grow First, Clean Up Later: Vicious Cycle
- Focusing **Pollution control performance**, mainly from production side, Env. Protection
- How to **minimize** pollution impact while **maximizing quantity** of GDP?
- **Considerable Progress in pollution control** as GDP grows.

# Green Growth Approach

- Economy/Environment: creating win-win synergy, virtuous cycle, positive sum game
- Focusing on improving **EE** of **Economic Performance** (Both **Prod** & **Cons**)
- Enhancing **Environmental Sustainability** by improving **ecological quality** of **GDP**
- Why **GG** approach ?

# From **Env. Protection** towards **Environmental Sustainability**

- In spite of improving **pollution control**, as GDP grows,  
**Environmental Sustainability** tends to deteriorates.
- **ESI** goes down as GDP grows,  
while **EPI** goes up generally:
- **Pollution Control** alone is not enough:  
**Ecological Efficiency** of **Economic Performance (Prod & Cons)** has to be improved

# ESI/EPI vs Eco-efficiency Indicator (EEI)

- **Yale and Columbia (Davos):** ESI, EPI
- **ESI:** Argentina(9), Brazil(11), Gabon(12), Congo(39), Indonesia(75) > Korea(122)
  - measuring env challenge a country is facing → country with large carrying capacity tends to end up with high ESI
- **EPI:** high income(Korea42) > low income countries
  - measuring env performance towards international goals  
→ country with high income tends to have high EPI
- **So far no indicator measuring EE pattern of economic growth**
- **That's why we Need to develop EEI**

# Paradigm Shift from

- **Quantity** of GDP to  
**QUALITY** of GDP
  - Ecological Quality
  - Economic Quality
  - Social Quality



# Quality vs Quantity of Growth

- Current Growth Patterns based only on “Market Efficiency” & **Quantity of Growth**
- “Green Growth”: based on the “Ecological Efficiency” paradigm.
- Quality of Growth = Quality of Life = Environmental Sustainability

# EE Patterns of Growth

- **Pattern of using ecological resources in achieving same level of GDP**
- Ratio of the ecological footprint divided by GDP

# Different **Patterns** of **Ecological Quality**

- Not all Growth has the same **Pattern** of Growth in terms of **Ecological Quality**
- Japan > Europe > US
- Asia & Pacific : Need to adopt ecologically efficient Green Growth “**Pattern**”
- **Singapore, Korea, Japan ?**

# Ecological Patterns of Growth

(global hectares per capita, 2002)

	Ecological Deficit,	Bio-capacity,	Eco-footprint
• Japan	- 3.5	(0.8 / 4.3)	
• UK	- 4.0	(1.6 / 5.6)	
• France	- 2.6	(3.0 / 5.6)	
• US	- 4.8	(4.6 / 9.7)	
• Rep. of Korea	- 3.8	(0.6 / 4.4)	
• China	- 0.8	(0.8 / 1.6)	
• Viet Nam	0.0	(0.8 / 0.8)	

# CO2 Emissions per capita

	GNI per capita 2003	1998	1999	2000	2001	2002	2003
United States	\$ 37,610	19.88	19.81	20.21	19.73	19.65	19.68
Australia	\$ 21,650	16.91	17.00	17.07	17.49	17.54	17.35
Brunei Darussalam	N/A	13.42	12.72	13.11	12.54	12.45	14.75
Chinese Taipei	N/A	8.65	8.97	9.65	9.94	10.28	10.85
Russian Federation	\$ 2,610	9.76	10.07	10.40	10.48	10.43	10.65
Germany	\$ 25,250	10.57	10.22	10.15	10.34	10.20	10.35
Kazakhstan	\$ 1,780	7.70	7.03	7.84	9.19	9.57	10.23
Japan	\$ 34,510	8.70	9.03	9.13	9.03	9.30	9.41
Korea Rep.	\$ 12,030	7.84	8.51	9.10	9.32	9.22	9.36
United Kingdom	\$ 28,350	9.12	9.00	8.96	9.18	8.92	9.10
Singapore	\$ 21,230	10.43	9.65	9.60	9.44	9.20	8.98
New Zealand	\$ 15,870	7.15	7.56	7.69	8.08	7.94	8.09
Hong Kong, China	\$ 25,430	6.08	6.45	5.80	5.65	5.43	5.94
World	\$ 5,500	3.86	3.83	3.87	3.85	3.87	3.99

# Current Paradigm: ME

- **Market Efficiency**: based on Market Price
- **Market price** < **Ecological price**
- **Market Efficiency (ME)** < **Ecological Efficiency (EE)**
- **Thus closing the gap between  
ME & EE  
is critical in improving  
Ecological Quality of Growth**

# How can Asia/Pacific do that?

- Paradigm shift: ecological quality of growth
- Choosing EE Growth pattern:
- By applying “Ecological Efficiency” paradigm to its Economic Development

\* Otherwise, A/P can not continue its growth as its ecological carrying capacity is too limited.

# Who should be the driver of EE ?

- **Market Efficiency : Market & Price**
- **Ecological Efficiency (EE): No Driver**
- **Government:** should be the main driver
- **ETR (Eco-Tax Reform):** could be the major tool in improving **Ecological Quality & Pattern of Growth**



# By improving

1. **Price-structure**: to close Gap between Market and Ecological prices
  - \* Invisible Infra of Society (ETR)
2. **Infra-structure**: to provide eco-efficient physical foundation for economic performance
  - \* Visible Infra of Society

# How to close the gap?

- Ecological efficiency



- Price structure
- Infrastructure

# EE as new paradigm: Is it feasible?

## Skeptic View:

- Internalizing ecological costs → negative impact on **competitiveness** and **growth**
- EE: applied to individual firm level by WBCSD, not yet applied to economy wide
- just environmental idea: can not be used  
as a new paradigm

# Ecological Efficiency

- Can we operationalize EE without damaging Economy?
- Any Examples ?
- Classical Failure of EE:  
Climate Change

# Areas to improve EE

- Transport
- Infrastructure: energy, water
- Demand Side Management
  - \* sustainable prod/cons pattern
- Climate Change

# Policies for Green Government

1. By **Eco-Tax Reform** (internalize env costs)
2. By Integrating “**EE**” into **Infra** (Trans, rail, water, energy etc.) investment
3. By strengthening **Demand side management** (congestion charge etc.) to improve EE of consumption pattern
4. By supporting **greening of business** (such as **business on bioenergy**)

# How bioenergy can be a green business?

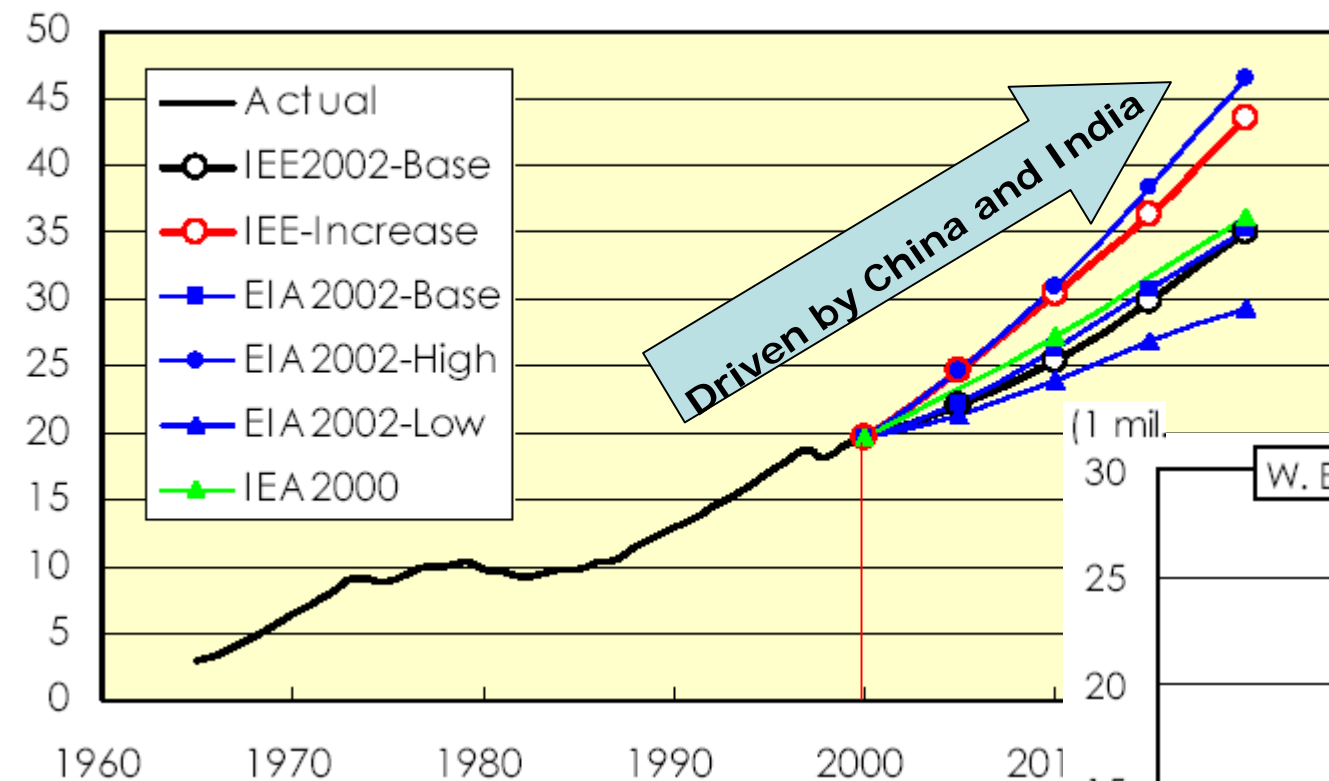
- Tremendous demand in the transport sector (bioethanol and biodiesel), widening access to clean energy (biomass modern use)
- Environmental concerns on increasing urban air pollution and GHG emission
- Wide range plants (drought-resistant, easy and quick grow) and agricultural wastes

- **In additional to urgent actions to use oil and other conventional energy resources as efficiently as possible**
- **Step up efforts to**
  - (a) improve eco-efficiency of economic growth by changing consumption and production patterns, and**
  - (b) increase investment in research and development to promote wider use of alternative sources of energy mainly RE, incl. bioenergy**



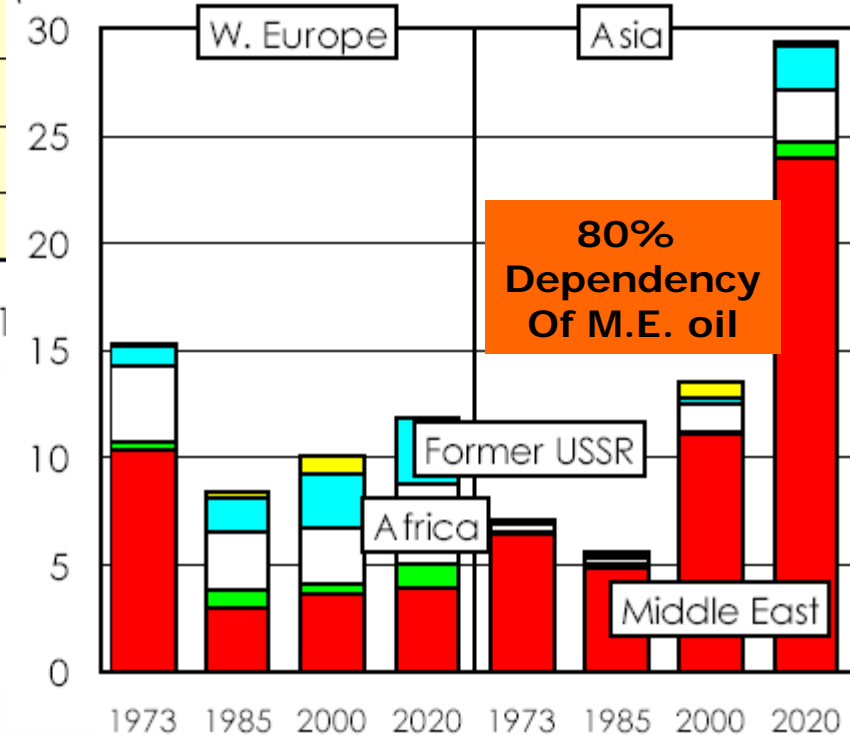
# Oil Demand in Asia

(1 mil. B/D)



**By 2010-2015 Malaysia and Indonesia will become net oil importers**

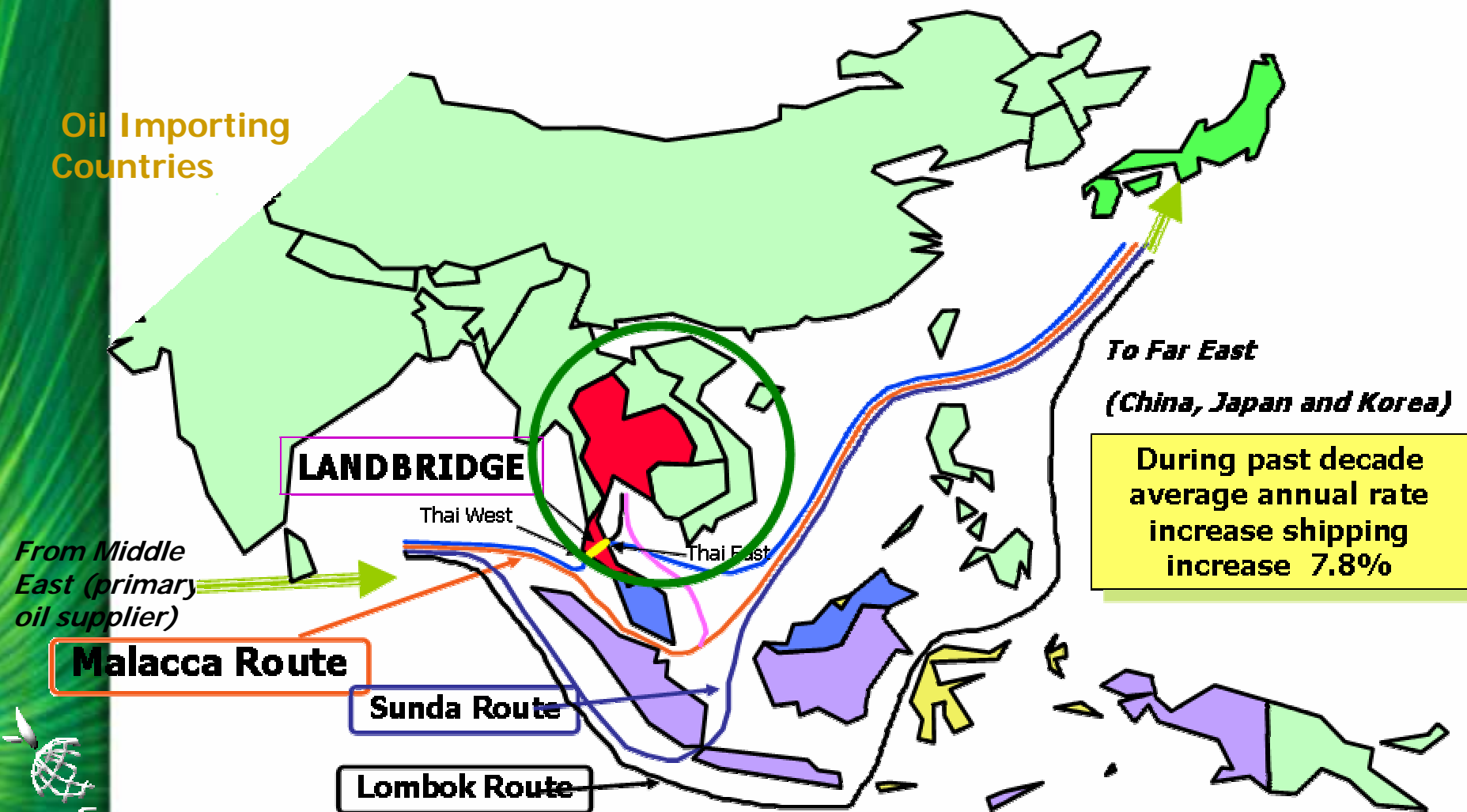
(1 mil.



- Asia's oil consumption will double by 2030 to 40 mil. B/D
- More than 80% of ASIA oil will come from Middle East

# Vulnerability of oil supply

Oil Importing  
Countries



# Oil demand projections

- **Recent ESCAP study shows that AP primary oil demand expected to grow by 2.6 % per year from 1,283 to 2397 Mtoe until 2030 (baseline scenario)**
- **Demand in developing countries will grow rapidly, with the major increase in oil demand occurring in the transport sector.**

# High vulnerability

- **Many countries depend heavily on imported oil/energy**
- **Higher oil prices hit these countries the most**

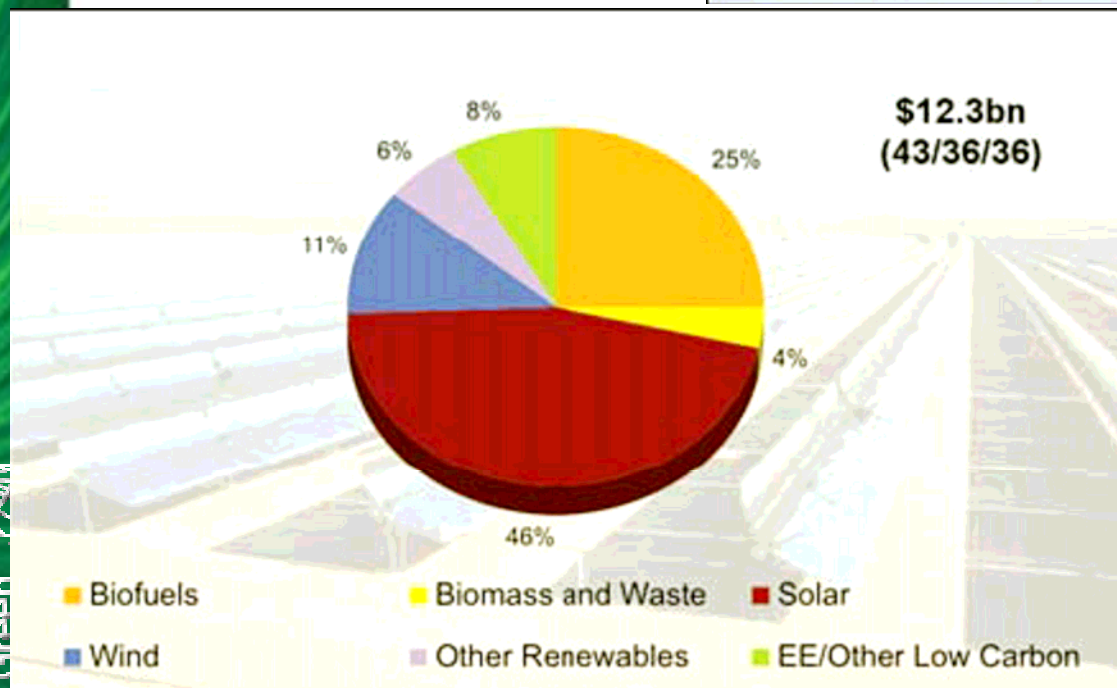
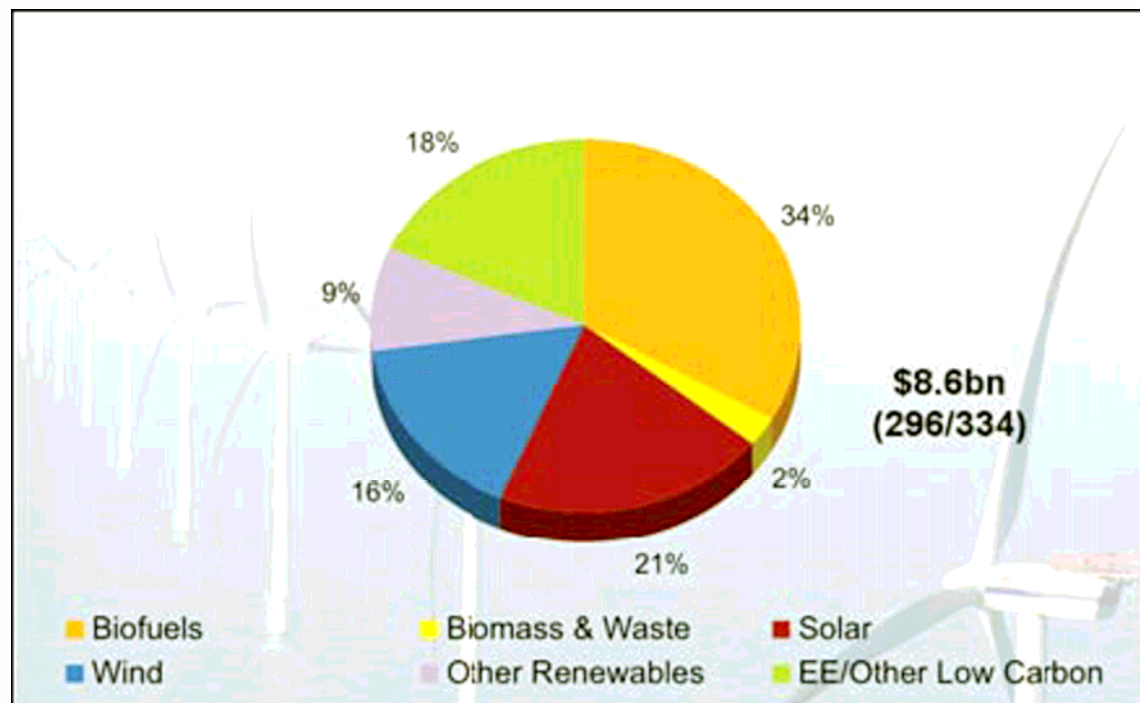
## Oil Import Dependency of selected countries

Country	Total Oil Supply (Thousand bpd)	Import (Thousand bpd)	Dependency (%)
China	5421.49	2023.96	37.33
Japan	5160.04	5224.50	100.00
India	2485.00	1710.64	68.84
Thailand	815.48	598.43	73.38
Republic of Korea	2032.33	2055.82	100.00
Philippines	316.04	318.82	100.00
New Zealand	136.55	110.44	80.88

# Rapid growing investment in biofuel

- Exceeded 2 billion U\$ in 2006
- The value of biofuels production plans exceeded 2.5 billion U\$ in USA, 3 billion U\$ in Brazil, 1.5 billion U\$ in France by 2008

# Venture capital investment activity, 2006



# Public market investment by technology, 2006



# Other bioenergy technologies are gaining the ground

- **Modern use of biomass (waste to biogas, gasification and densification, power generation etc.)**
- **R&D (cellulosic ethanol from feedstocks vs. grain-based ethanol, genetic technologies etc.)**



# ESDD/UNESCAP Focus on Energy

- **In support of MDGs and Environmentally Sustainable Economic Growth (Green Growth)**
  - **Eradicate extreme poverty and hunger (Goal 1)**
    - Access to clean and affordable energy is pre-requisite for poverty alleviation and a driver of economic growth
  - **Ensure environmental sustainability (Goal 7)**
    - Promote EE (SCP pattern)
- **Policy advocacy for energy security (Theme study for the 64<sup>th</sup> Commission 2008)**
- **Regional and subregional energy cooperation**

# Green Growth

- Is not Green GDP ( GDP – pollution clean up cost)
- Improving Ecological Quality & Pattern of Growth → Env. Sustainability
- By applying Ecological Efficiency (EE) to Prod & Cons
- AP Regional Strategy for SD



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OCTOBER 9, 2006

★ 60TH ANNIVERSARY ISSUE ★

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# TIME

## COMING CLEAN

For decades, Asia has ravaged its environment. **A SPECIAL REPORT** on what has gone wrong—and the people who are trying to put things right



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[ ASIA'S ENVIRONMENT ]

## VISIONS OF GREEN

After decades of rapid economic growth, Asia's environment is at a tipping point. A **SPECIAL REPORT** on the scale of the crisis—and how to confront it

BY BRYAN WALSH

If you want a sense of the challenges facing Asia's physical environment, just go to Beijing—and breathe. The Chinese capital's constant swirl of production, construction and transportation creates a noxious smog that blankets the city on bad days, cutting both visibility and life expectancy. At the junior world track-and-field championships in Beijing this August, young runners choked and sputtered their way to lackluster performances, a bad omen for the 2008 Summer Olympic Games. Asia has a history of holding an Olympics in a city with foul air. Tokyo, site of the 1964 Summer Games, was so polluted in the '60s and early '70s that citizens walked the streets in surgical masks, while Japanese cities like Minamata, where thousands were stricken with severe neurological damage due to industrial mercury poisoning, became bywords for ecological catastrophe. Fast-industrializing Japan was commonly expected to become an environmental dystopia. But today, Tokyo is one of the world's cleanest megacities, with the view often clear all the way to Mount Fuji. Stricter laws, tougher enforcement and a hard-earned environmental consciousness have made Japan a nation whose record is something to which other Asians can aspire, rather than a misery to be deplored.

Illustration for TIME by Leigh Wells

Green  
Grow



SPOTLIGHT

# A green foundation of cold, hard cash

## UN environment official works through Asian governments' wallets

By Thomas Fuller

**BANGKOK**

People in Asia are so obsessed with economic growth — money, money, money,” said Rae Kwon Chung, a top United Nations official here. “But not the environment. They don’t give a damn.”

This is hyperbole of course: Dirty air and contaminated water are rising concerns across the region. But Chung, who runs a UN environment program in Asia, is not averse to being provocative if it makes people listen.

It is not news to anyone who lives in one of Asia’s megacities that years of breakneck economic expansion have come at great cost to the environment. New Delhi and Beijing, two of the worst examples, both have levels of air pollution about three times as high as maximum levels suggested by the European Union and United States.

But rather than preach the virtues of cleaner air, says Chung, a former South Korean diplomat, it is more effective to aim for the wallet when trying to convince Asian governments of the urgency of the problem. Continued economic growth will not be possible if the environment is neglected, he tells officials.

“Our approach is not only to focus on the environment ministers but the finance ministers as well,” Chung said in an interview at his office in Bangkok.

His mantra is green growth: If Asia is profligate with oil, coal, timber and other commodities, prices will spiral

out of control and the economic miracle of recent years will flop, he said.

“What he’s saying is not that radical,” said Chee Yoke Ling, a lawyer based in Beijing and who specializes in environmental issues. Referring to the concept of green growth, she added, “This was discussed more than 15 years ago.”

“But it was never translated into action,” she said.

Chung said that Chung was right to spread his message among officials from finance and development ministries because that is where the money is and it is those officials who have the power and funds to change government policies.

“Environment ministries in any country are very weak,” Chung said. “They don’t have much sway.”

With the steady rise of commodity prices in recent years, energy-saving policies are being built into the government’s overall strategies. The Chinese government in April increased to 20 percent from 8 percent a tax on cars with large engines, like sport utility vehicles. Taxes on small cars were slashed.

China’s current Five-Year Plan, its outline of economic strategy through 2010, stresses energy conservation and sustainable development.

Chung’s central message is that the citizens and leaders of the region should discard any illusion that they can adopt an American lifestyle.

There are not enough resources in Asia to support it, he said. The region’s



Thomas Fuller/The International Herald Tribune

Rae Kwon Chung, a UN official in Bangkok, says Asia’s economies will not be able to grow further if the environment is neglected.

population density is 1.5 times the global average yet the Asia-Pacific region has one-tenth as much available fresh water as, say, South America, according to UN statistics.

“The region is already living beyond its means,” Chung said. “We need to move away from the ‘grow first and clean up later’ approach.”

Yet Chung is more optimistic than many of his colleagues who work on environmental issues. The world should be thankful, he said, that China is not a democracy, because a centrally planned economy can react more quickly to the challenges of the environment. “If it were a completely democratic country, it would be very difficult to control it,” he said. “I think China will be faster than any other country in improving the environment at the local level because they are centrally controlled.”

For all his diplomatic background, Chung shuns the tiptoe approach of some of his colleagues. He exudes zeal.

Chung spent 27 years in South Korea’s foreign service, with postings in New York, Paris and Jakarta.

He joined the United Nations two years ago because, he said, he wanted to do something “substantive and meaningful.”

His official title is director of the environment and sustainable development division of the United Nations Economic and Social Commission for Asia and the Pacific. It barely fits on his name card.

Chung said that part of his job is trying to change mentalities. Asians tend to think of railways as transport for the poor, so they favor building massive highways. Yet too many roads in densely populated countries is inefficient and

bad for the environment, he said.

Chung said that his native South Korea was an example of the problems associated with big cars and wide highways: “Over the weekend, the entire country becomes a parking lot.”

Governments should change their tax systems, he said, increasing levies on gasoline and cars. Rechargeable batteries should be tax-free and disposable ones heavily taxed, he said, because batteries leak damaging chemicals into the environment when they are discarded.

So, what is Chung’s ultimate wish? It involves Angelina Jolie, he said mischievously. Asia needs a star or starlet who can champion the environment as passionately as Jolie has tackled the issue of refugees and displaced people. Governments and UN officials can only do so much, he said.

# Vision for Asia-Pacific Green Growth:

Environmentally sustainable economic growth for  
the improved well being of all

For more on Green Growth see

*SOE 2005, Green Growth at a Glance*

visit our [www.greengrowth.org](http://www.greengrowth.org) portal and  
[www.unescap.org/esd](http://www.unescap.org/esd) website

