



Second National Forum on Climate Change Cambodia

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Green Growth, Low Carbon Development

Aneta Nikolova, D. Eng.

ESCAP



Asia-Pacific – a Region on the Move

- ❑ Rapid economic growth = Significant gains in poverty and hunger reduction
- ❑ Associated costs:
 - ❑ Overstretched carrying capacity of the natural endowment;
 - ❑ Uneven distribution of benefits;
 - ❑ Insufficient access to and quality of social protection
 - ❑ Jobless growth
 - ❑ Economic uncertainty
- ❑ Vulnerability to external shocks:
 - ❑ High and volatile prices of fossil fuel and natural resources;
 - ❑ Food prices;
 - ❑ Natural disasters
 - ❑ Climate change

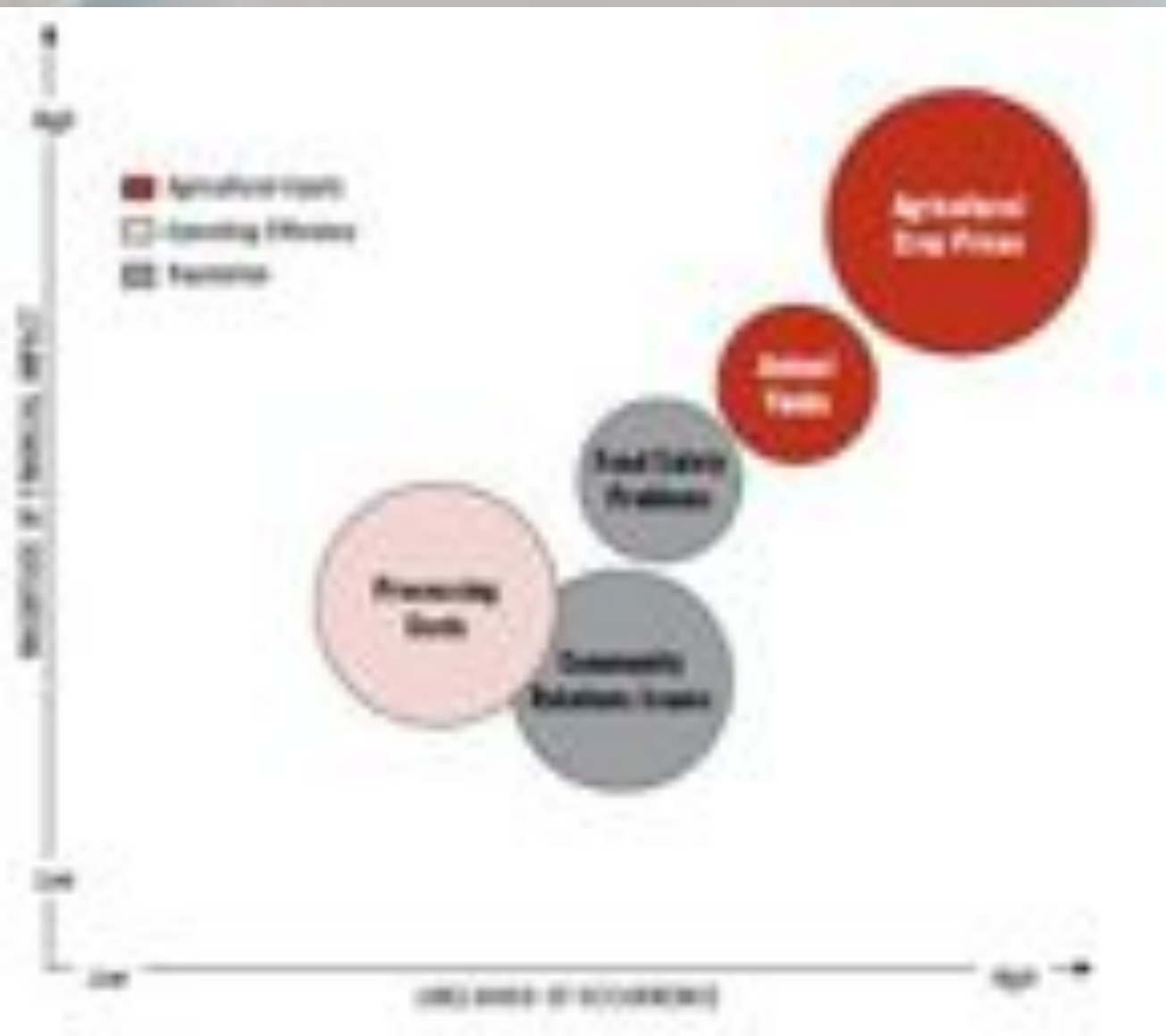
Risk & uncertainty

Rapid & accelerating feedbacks between environmental, social and economic systems - convergence

- ▣ Food, energy & commodity prices – trends closely aligned
- ▣ Environmental pressures and resource constraints - Climate change & food security – energy, water & food nexus

Resource constraints

- ▣ Rising fuel prices and approaching “Peak Oil”
- ▣ Non-fuel commodities - metals & minerals, agricultural raw materials – prices more than doubled between 2002 & 2008
- ▣ Metals – approaching & ongoing supply constraints –iron, cobalt, platinum, palladium may be close to exhaustion in 40 years; rare earth metals supply uncertainties
- ▣ “Peak water” - ?



Magnitude of Impacts of Climate Change and Water Scarcity

– Food and Beverage Sector, S. & SEA

Source: HSBC

A new economic reality

Is the return to rapid growth based on intensive resource-use really sustainable ?

- Growth constrained by resources, climate change and natural disaster
- Unemployment, agitation for change
- Basis for competitiveness >> going green

>>>> Economic growth strategies based on an unlimited supply of undervalued natural resources, resource-intensive lifestyles, and carbon-intensive fuels **are not economically, socially or environmentally sustainable**

Based on :

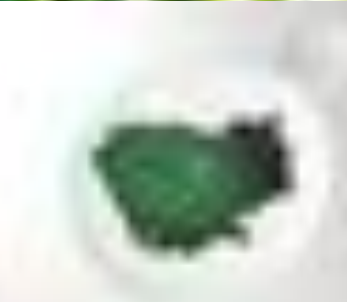
- ESCAP, ADB, UNEP publication: *Green Growth, Resources and Resilience: Environmental sustainability in Asia and the Pacific*
- UNEP *Resource Efficiency: Economics and Outlook for Asia and the Pacific* report & associated Asia Pacific Material Flows database (CSIRO and UNEP)



Resource use trends

- Regional resource efficiency decreasing, resource use accelerating
- Resource intensity 3x rest of world
- Regional countries reducing resource intensity (resources used per \$GDP) – but not fast enough
- Asia-Pacific carbon intensity (GHG emissions per \$ GDP) significantly higher than global

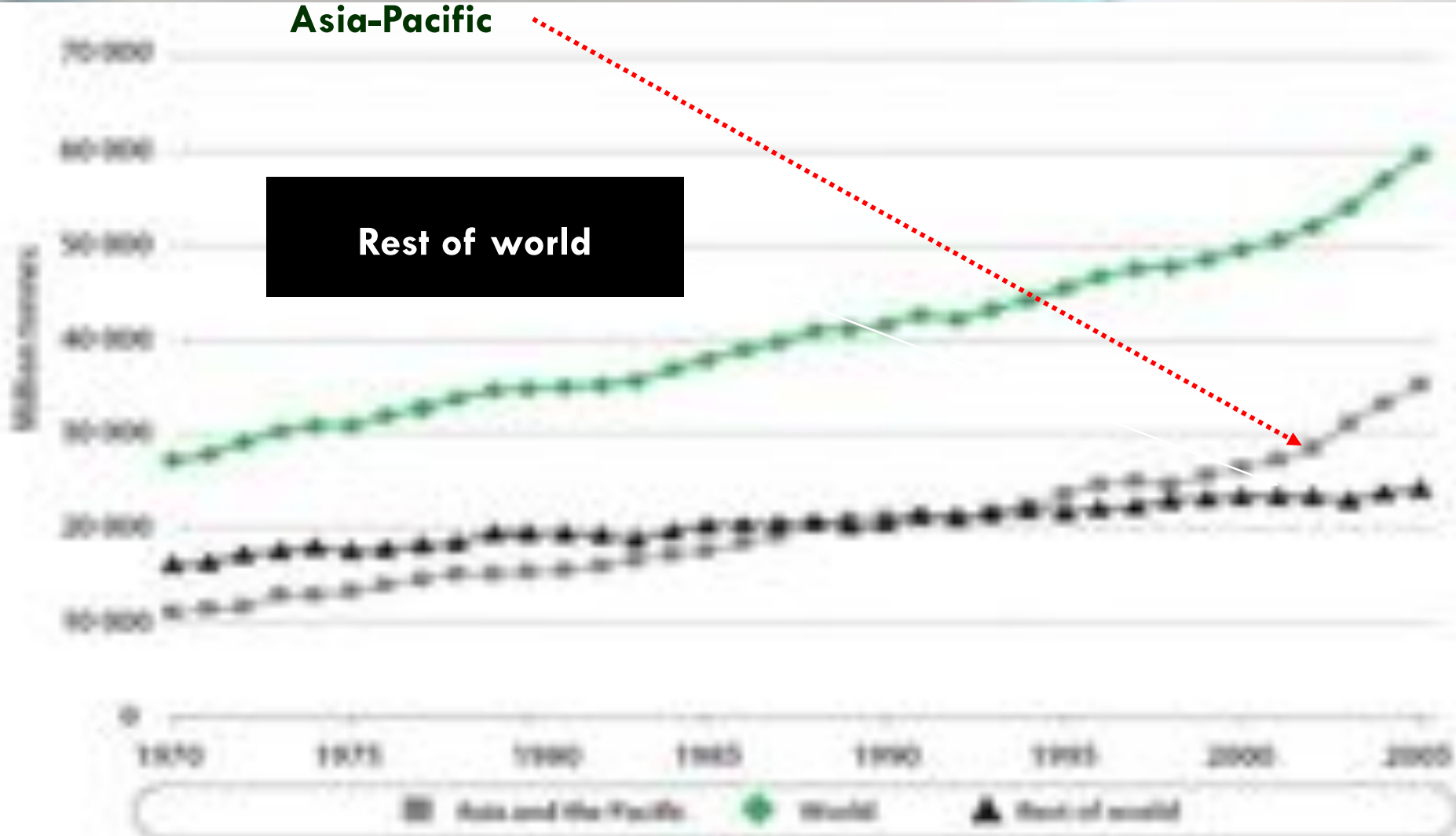
- Total A-P resource use accelerating - 35 billion tonnes
- Most important resource – construction minerals –
- almost 50% of all resources



Domestic material consumption

Asia-Pacific

Rest of world

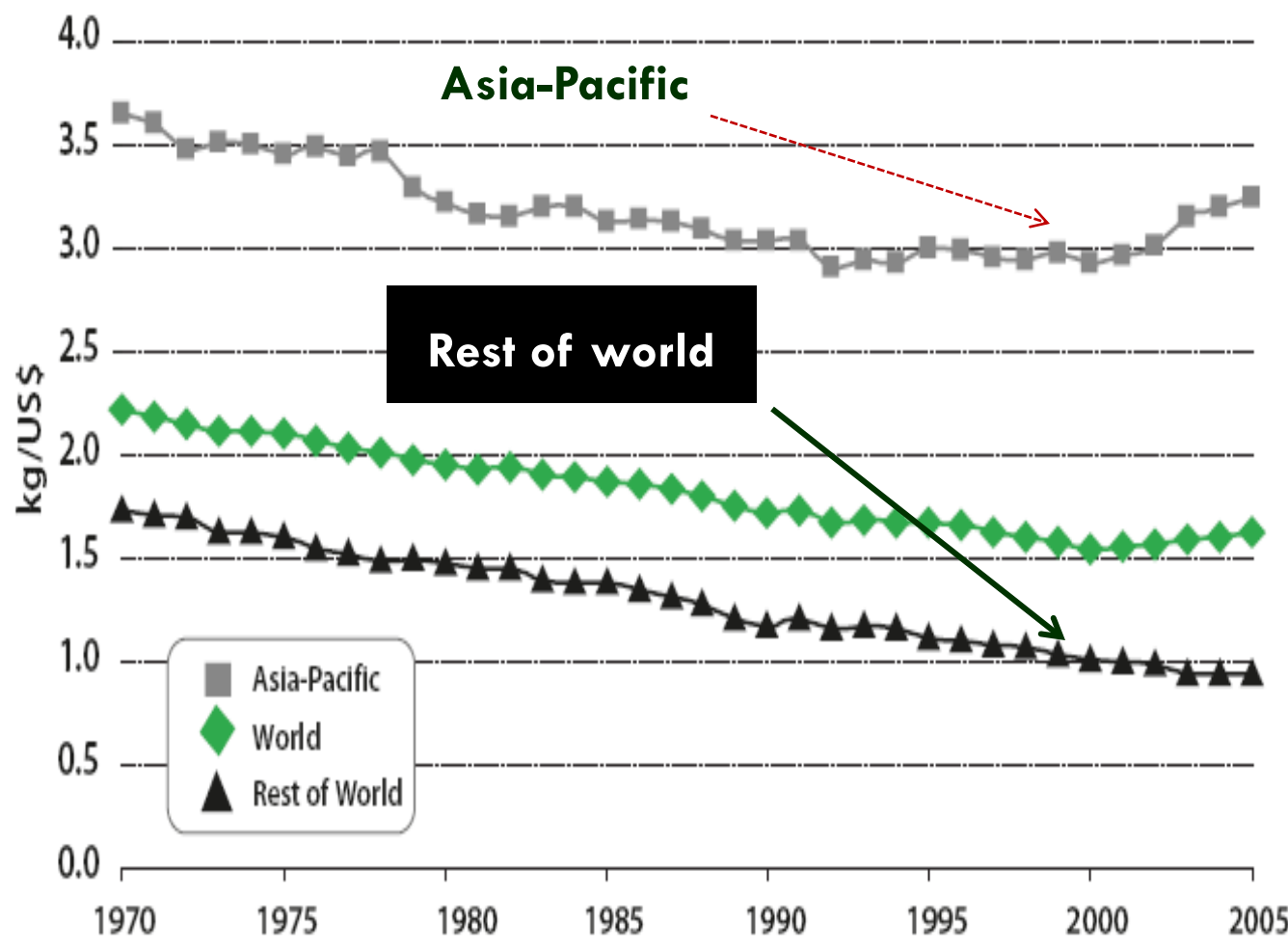


Resource intensity



Domestic material consumption intensity

- A-P uses > 3 x resources to produce \$1 of GDP, compared to the rest of the world
- Resource intensity increasing >> productivity/
- efficiency declining after 2000



A/P resources use patterns increase risks

LIMITED CARRYING CAPACITY

- Population density 1 ½ times the global average
- Freshwater available: 3,920m³/cap/yr vs. South America 38,300m³.cap/yr.
- Productive area available per capita: 60 % of the global average
- Arable land per capita: 80 % of the global average

BUT

- Production of non-food crops growing faster than food crops, even where hunger persists
- Low water productivity in water-stressed countries
- High hunger rates even where scarce water is mainly used for agriculture
- Health & productivity of ecosystems in decline even though the majority of the workforce depends on this

What does this mean for policymakers ? – policy tensions

Increasing throughputs of energy and resources >>>
increased labour productivity

high economic growth rates

BUT TRADEOFFS GROWING

- unsustainable resource use patterns
 - Vulnerability to resource risks
- increased costs to the economy and people
- reduced rates of employment creation over time jobless growth,

A better quality of growth

- **Economic Quality** high labour productivity but low unemployment, resilience to financial/oil crisis, high resource productivity, high competitiveness
- **Ecological Quality** eco-efficient, less vulnerable to climate change, healthy & productive eco-systems
- **Social Quality** inclusiveness, adaptability/resilience, high quality of life, well-being*

* Indicators?

GG: System Change

- **Economies to be recalibrated** to better fit to a new economic reality
 - **Tradeoffs >>>> synergies.**
 - **Ecological crisis >>>> economic opportunity**
- By re-designing **invisible & visible** economic infrastructure – focus on **eco-efficiency (EE)**
- To arrive at **Green Economy** where investment in renewable energies and other improvements in eco-efficiency can generate profit, employment, growth

Visible & Invisible economic “Infrastructure”

- **Invisible economic infrastructure:** the way we produce & consume: market price, regulations, cultural and social values and preferences, lifestyles
- **Visible economic infrastructure:** the way we design **built environment**, city, building, transport, energy and water systems and promote investments in **natural capital**

Jump-starting GG: political leadership

- **GG: not automatic – recent price increases will not do it - 2 gaps**
 - ▣ Time gap: short-term cost $>$ long-term benefit
 - ▣ Price Gap: ecological price $>$ market price
- **Government has to lead system change**
 - ▣ Private sector: to grasp opportunity rather than resisting as burden
 - ▣ People: to be engaged for political support and participation & to embrace lifestyle changes

Green growth applicable to developing countries?

- AP DCs most vulnerable, must take action to reduce risk
- GG: not only a matter of money & technology
but also *political commitment, vision & policy options that promote systemic, rather than incremental change*
- Easier to initiate at the early stages of development
>>> *the sooner, the better: Singapore example*

Recalibrating the economy

- Create a virtuous cycle – policy framework that acts as a **green growth engine** - shift investments to resource-savings and job creation
- **Secure a double dividend** – green tax and budget reform key
 - Increase taxes/prices/costs on the “bads” – pollution and wasteful resource use
 - Reduce taxes on the “goods” – employment, capital gains
 - Subsidize the “goods” not the “bads”
 - Recycle revenues to deal with regressive impacts or towards environmentally or socially sustainable investments
 - **Green growth policy framework needed to maintain momentum**

Green Growth



Transformation of Economy Structure



Pricing System Reform



Sustainable Technology, Industry, Low Carbon Economics

ETR



- Closing the price gap
- Shifting tax bases from 'goods' to 'bads'
- Revenue neutrality

EFR



- Closing the time gap
- Short-term investment and long-term benefits

Why environmental taxes? (1)

For environmental taxation

- Market failure leading to excessive pollution and environmental destruction

For energy taxation

- Energy demand increases with income (income elasticity +0.5)
- Energy demand decreases with price (industry elasticity -0.6)
- Market failures for some energy efficiency technologies

For carbon taxation

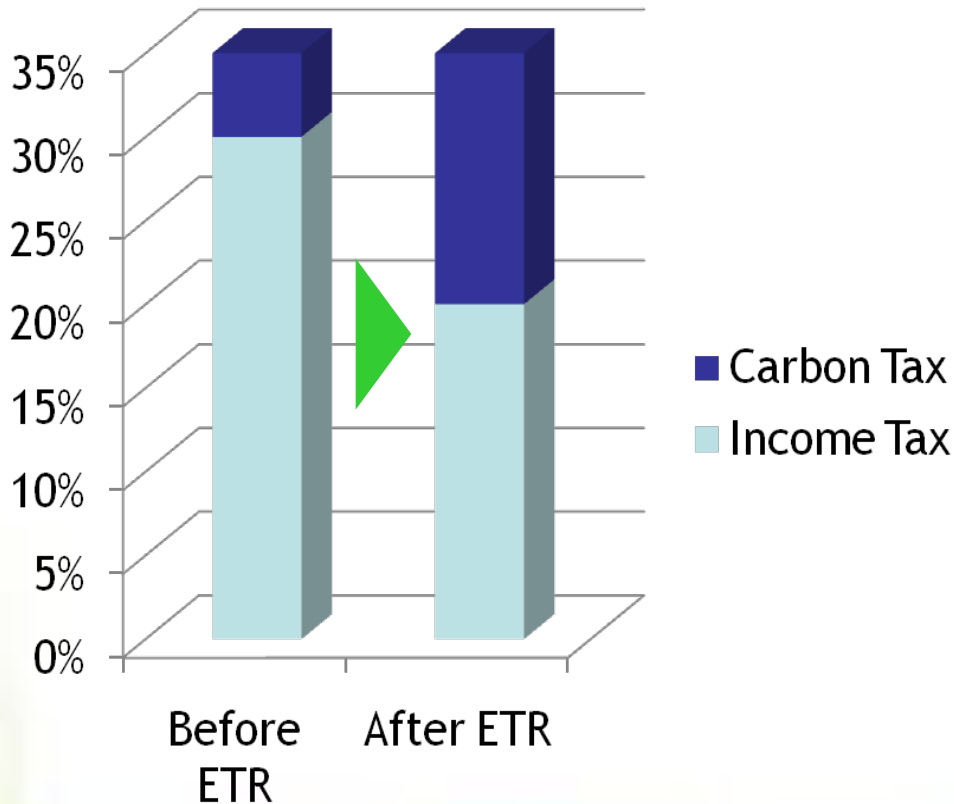
- Rich countries must achieve a minimum of 80% decarbonisation by 2050
- Only carbon pricing (taxing or trading) will stimulate the uptake and development of existing low-carbon and efficiency technologies, and reduction in the demand for carbon-based fuels

Why environmental taxes? (2)

Conclusions from the literature

- Without environmental taxation, the (macro-economic) cost of environmental improvement will be higher than it needs to be
- Without significant increases in energy prices, energy consumption will go on rising
- Where the energy is carbon-based this will lead to increased carbon emissions and a failure to stabilise the climate

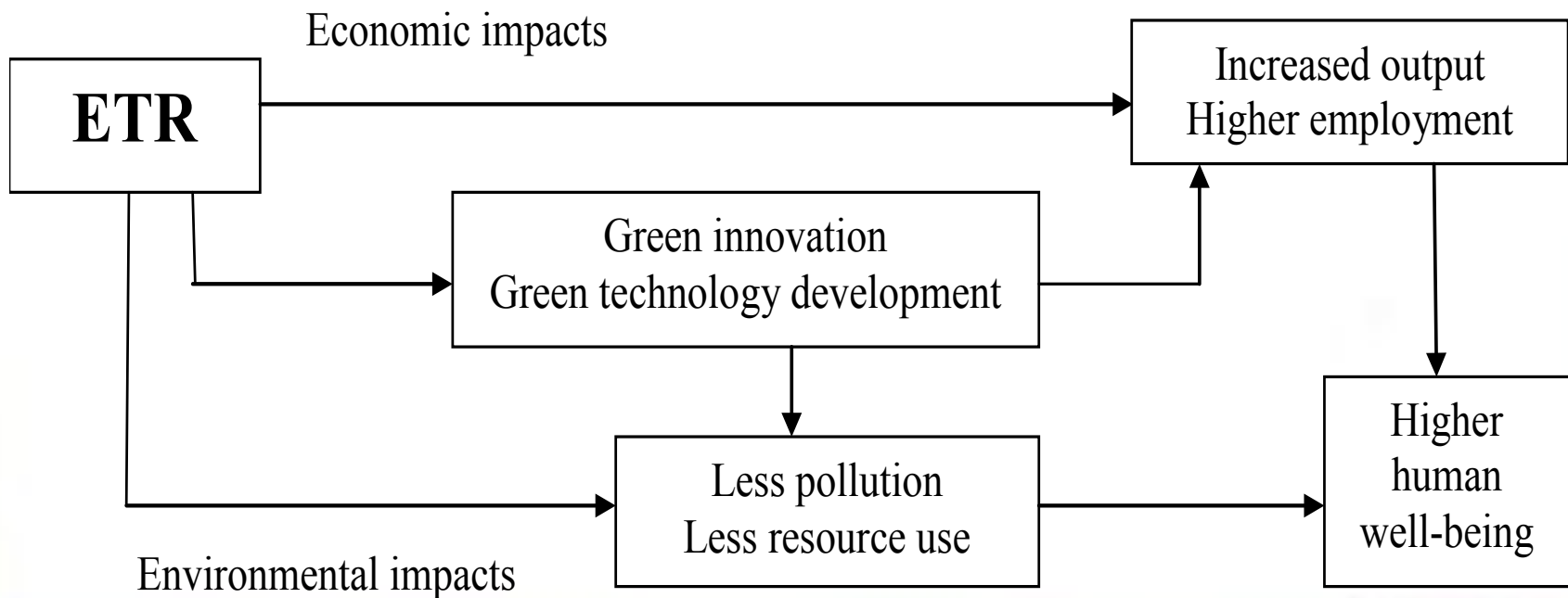
Revenue Neutrality



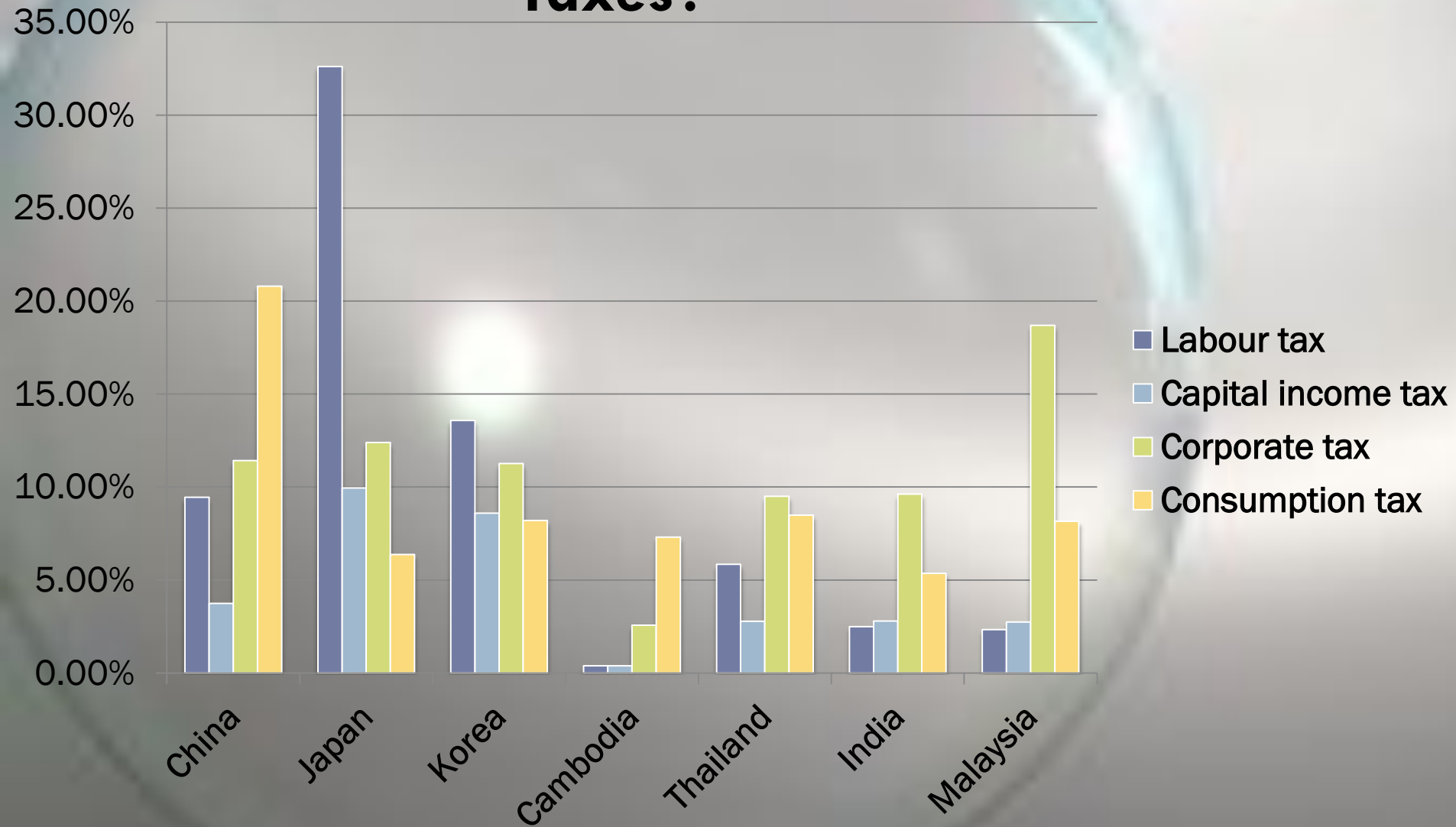
- Keeping overall tax revenues the same
- Tax Reform, Not “More Taxes”
- Political feasibility & public approval could increase

The potential of ETR/GFR:

ETR/GFR is the shifting of taxation from 'goods' (like income, profits) to 'bads' (like resource use and pollution)



A Tax Shift in DCs: Corporate or Consumption Taxes instead of Income Taxes?



ESCAP Overview

- Biggest arm of the UN system in A-P – cover 53 member countries, deals with social development, trade and investment, transport, macro-economic policy and development, environment and development, statistics

Regional cooperation for **inclusive and sustainable economic and social development**

- ▣ *Effective and inclusive and sustainable development **policies***
- ▣ *Global processes shaped by a stronger **coordinated regional voice** and support to countries*
- ▣ *Regional **cooperation mechanisms** and **institutional frameworks** and **integration and inclusive development***

Role of ESCAP

- Promotes Green Growth from 2005
- Supports implementation of Seoul Initiative on Green Growth since 2005
- Supports Implementation of Astana Green Bridge Initiative endorsed in 2010
- Provides Regional Green Growth Capacity Development since 2008
- Developing LC GG Roadmap & Compiling Policy Options for DCs since 2010

After the Asia-Pacific MCED-5 in 2005

- **UNEP: Green Economy 2008**
- **OECD: Green Growth Strategy 2009**





MCED6: Astana Green Bridge 2010 linking Europe & AP with GG



Low Carbon Green Growth Roadmap

- **Increasing demands** - some important government initiatives (Rep. of Korea, China, Cambodia, Indonesia, Malaysia etc.) **but no clear road map**
- **ESCAP-led project** - policy options and framework for system change
 - ▣ **From quality to quantity of growth**
 - ▣ **ETR/Ecological Tax Reform**
 - ▣ **Sustainable Infrastructure**
 - ▣ **Green Business**
 - ▣ **Low Carbon Economics**



Green Growth Success Stories





"Trash is Cash" BANGLADESH SRI LANKA VIET NAM



This poor and sustainable solid waste management for secondary cities and small towns.
The growth of urban populations and economies in Asia has resulted in a corresponding growth of solid wastes that municipal governments are finding difficult to dispose off, turning dumpsites and filling up and finding land for new dumpsites is becoming increasingly difficult. The solution lies in reducing the amount of waste that reaches dumpsites. This project aims to reduce, reuse and recycle solid waste in slums training citizens and change perceptions about waste. It wants policy makers to look at waste as a resource rather than refuse.



Paying for the service, not for the hardware **LAO PDR**



Solarbox - Solar Lantern Rental System Solar lanterns have been widely propagated as a solution for lighting in remote off-grid villages. Standard solar lanterns, however, have shown to fail much earlier than expected because the quality components are often used to reduce costs of manufacturing to make the lanterns more affordable. Another reason for failure is that batteries are often irregularly charged, as households engage in tinkering to use the lanterns for operating other equipment, resulting in early battery failure. The result is that lanterns still rules the off-grid lighting market.

Green Subsidy Reform Indonesia

- In 2008 the oil price reached \$120 per barrel
- The Indonesian budget for fuel subsidies was Rp135,1 billion
- The high oil price increased subsidy budget by Rp200 billion
- Took money from other programs e.g. education, healthcare, small business credit facilities, infrastructure development
- Forced to undertake subsidy reform and raised the fuel price
- Simultaneously introduced programs to reduce burden on low income families, e.g. direct cash assistance, food sustainability program – low price rice

Sustainable Transport Malaysia



Solar Tuk-Tuk Thailand



Micro-hydro Power Generation



Solar Power Company Thailand



Parabolic Solar Power Australia



Green Buildings Malaysia

- Low energy Ministry building: Malaysia

- Key data

- Gross floor area: 20 000 m²

- Energy performance index: 114 kWh/m²/year

- Addition cost to construct: 5%

- Annual energy savings: RM 600 000

- **Energy efficiency features**

- Orientation & building envelope insulation
 - Energy efficient lighting, ventilation & office appliances
 - Energy management system



Ministry of Energy, Green
Technology and Water, Putrajaya

Retrofitting Prefabricated Buildings Mongolia



- Approximately 250,000 people (20% of the urban population) live in prefabricated buildings in Ulaanbaatar.
- Pilot project of one apartment building to determine potential energy savings.
- It was found that up to 40 % of the heating energy can be saved. A potential 60% or more is also possible with consumption-oriented heating tariffs.

Green Roof and Living Wall Singapore



Beijing - Central Business District (CBD) Sustainability Plan

The amount of trees that will be planted in the CBD is estimated to remove 215,000 tons of CO₂ every year, the equivalent of planting **14 million** forest trees!

<http://www.designstores.gr/tag/master-plan>



Beijing

Super-capacitors are finally being integrated in public transport. China's buses at the 2010 Shanghai World Expo were using this system, as well as a new company in Germany.



The bus charges rapidly when it stops at a bus station and has enough power to go to the next station, where it quickly charges again and so on, along the whole route.



Sustainable Consumption and Production (SCP) Eco-Industrial Parks



The BYD Electric Bus - BYD eBUS-12

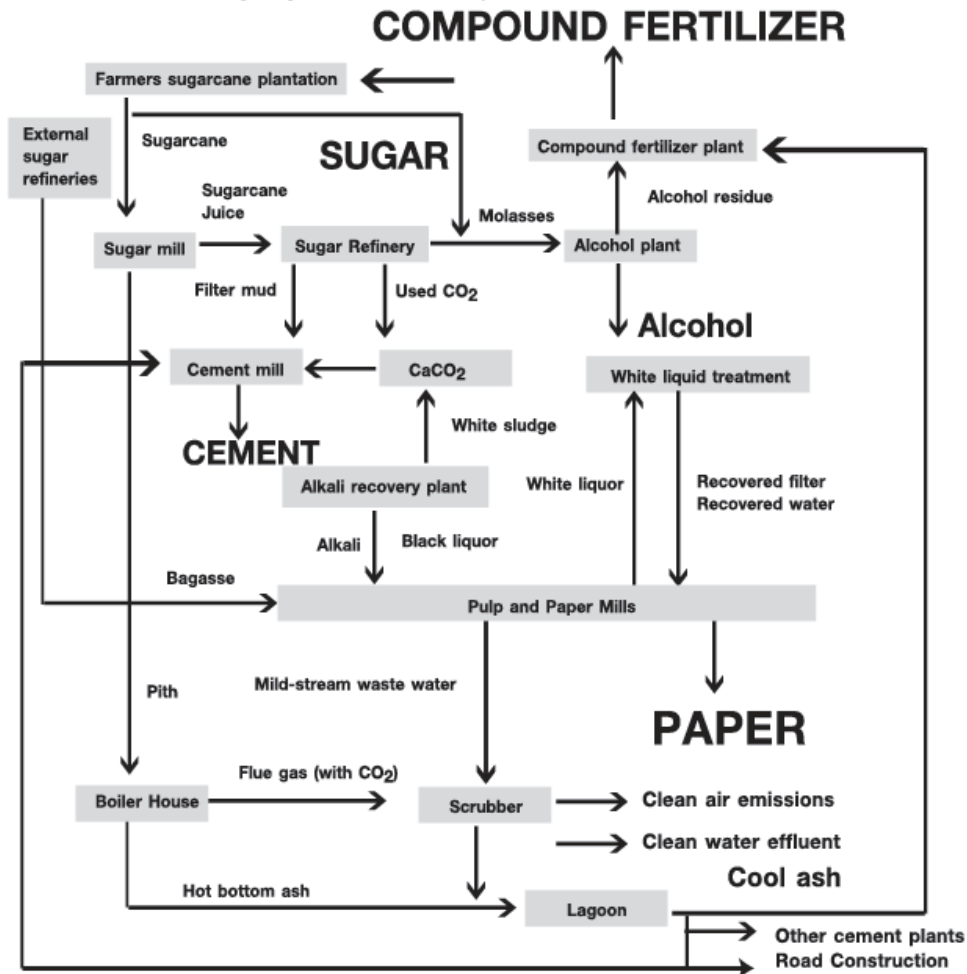
when fully charged can supposedly travel up to 300 kilometers (186.4 miles) under optimal conditions. BYD e6 taxis have been servicing Shenzhen, China for more than a year. To date, the fleet of

50 electric taxis have accumulated more than three million kilometers (1.86

million miles).



Eco-Industrial Park Guangxi, China



Eco-Industrial Parks in the World



Green Growth



Electric vehicles are appearing throughout major automakers' line-ups. Combined with renewable energy sources and production techniques, they are a real viable solution.



The Tesla Roadster sport has the ability to accelerate from 0-100 km/h in 3.7 seconds and has a range of 400 kms. There goes the myth that EV's are slow and inefficient.





The express bus system is a cost effective solutions to a growing city population.

The bus will travel just above the height of a car, but just under an overpass and be able to carry up to 1200 people at a time. The designers project traffic jam reduction of 30%, enough to save hours of commute in Beijing.



<http://www.engadget.com/2010/08/02/china-to-build-ginormous-buses-that-cars-can-drive-under-video/>

PACIFIC PILOT

**FAITH-BASED GREEN GROWTH BUSINESS MODEL ON
RENEWABLE ENERGY FOR POOR RURAL
COMMUNITIES**

Pacific Pilot – YWAM, Samoa

Utilizing waste
(human and animal)
to produce the methane gas.

Pacific Pilot – YWAM, Samoa



Pacific Pilot – YWAM, Samoa



Pacific Pilot – YWAM, Samoa



Pacific Pilot – YWAM, Samoa



CAMBODIA PILOT

PRO-POOR GREEN BUSINESS MODEL ON
RENEWABLE ENERGY (SOLAR)



Two floating villages *Kompong Prohot* and *Anlong Ta Ur* in Battambang Province,

http://www.greengrowth.org/capacity_building/capacity.asp



- Replacing home made kerosene lamps with solar charged lanterns



- Community based business cooperative – fees for services

On-line e-Learning Facility

Online version

Green Growth
Capacity Development Programme
E-learning Tools

MENU

- Background to Green Growth
- Background to Capacity Development Programme
- Sustainable Consumption and Production (SCP)
- Greening Business (GB)
- Sustainable Infrastructure (SI)
- Green Tax and Budget Reform (GTBR)
- Definitions and Glossary
- Additional Learning Materials
- Training Modules
- High Stakes - The Economics of Climate Change (video presentation)

Enter E - Learning

Green Growth is a policy focus for Asia and the Pacific that emphasizes ecologically sustainable economic growth to foster low carbon, socially inclusive development.

CD Rom version

ESCAP **GTBR** Green Tax Budget Reform

Module 1 : Introduction to Green Tax and Budget Reform

Introduction to Green Tax and Budget Reform (GTBR)

- GTBR consists of:
 - Green taxation
 - Green subsidy reform
- GTBR aims to be revenue neutral
- GTBR is a key driver for:
 - Green growth and poverty reduction
 - Sustainable consumption and production
 - Sustainable infrastructure
 - Greening business
 - Sustainable consumption and production
 - Investment in natural capital

Green Growth



THANK YOU !

For more information:

www.greengrowth.org and
www.unescap.org/edd

