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# Rio+20: Implications for Energy Access and Sustainable Development in Asia


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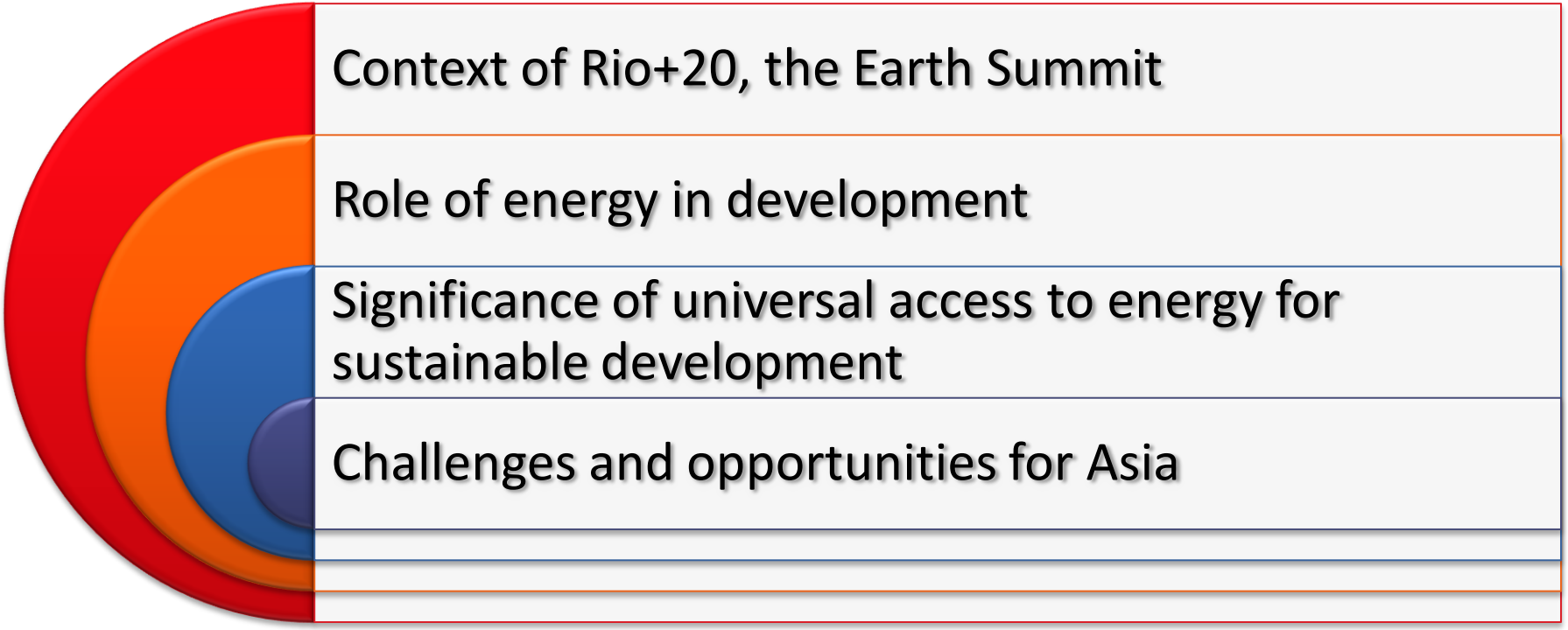



# Context of Rio+20, the Earth Summit

# The ‘Great Imbalances’ of development today

## Economic pillar

- Capitalism in crisis, with no end in sight
- Globalization in question, with protectionism resurging
- Geopolitical tensions on the rise, driven by competition for resources

## Social pillar

- Unresolved hardcore poverty: 1.4 billion poor, 1 billion hungry despite absolute declines in poverty headcount and progress with MDGs
- Widening inequality and inadequate social protection, marring economic success stories
- Continuing population growth, now expected to reach 10 billion by 2083

## Environmental pillar

- Climate change
- Rising natural disasters and their impacts on the most vulnerable
- Mounting pressure on critical natural resources, especially food, energy, water and land

# Why we are here 20 years after embracing sustainable development

Isolated pursuits of each pillar of sustainable development, with limited synchronization among them

Reluctance to compromise on the 'ideals' of each pillar, when compromise is implicit in any serious effort to strike a balance

Tendency to play the 'blame game', whereby champions of each pillar claim moral superiority over others

Uneven allocation of financial, technical, human and institutional resources, with the social pillar receiving the least

Ultimately, the persistence of 'self interest' over the 'common good'

Leading to rising tensions between the 'invisible hand' of the market and the 'visible hand' of government

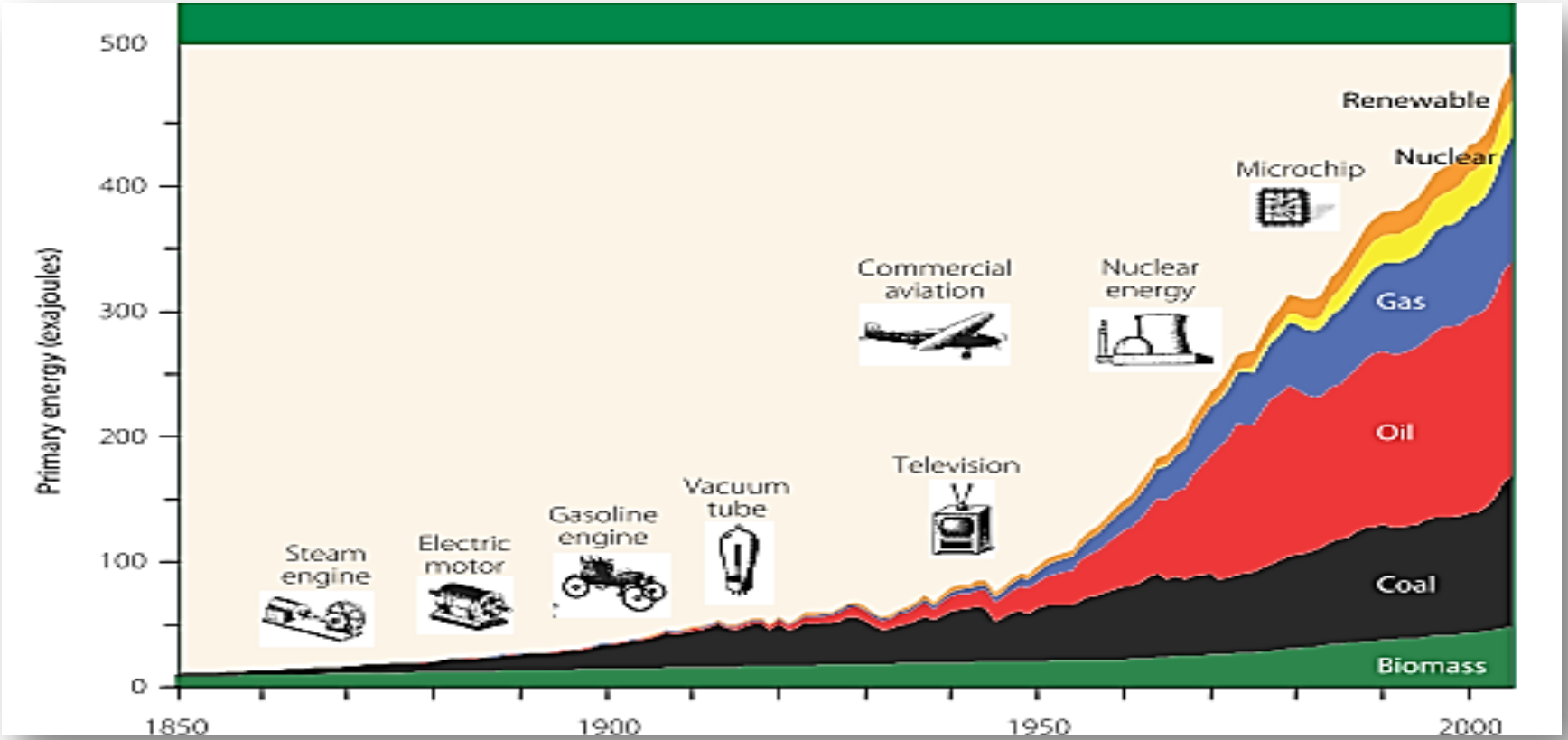
# The challenges ahead…

- Resolving the economic crisis and setting the world on a more stable path towards material prosperity
- Distinguishing between economic growth that is essential to achieve social goals and growth that is pursued obsessively for its own sake
- Providing ‘positive discrimination’ to the social pillar to make up for lost ground, by way of money and technology primarily but also in terms of intellectual and institutional commitment
- Viewing longer term durability of progress along all three pillars as more important than near-term gains along any one pillar
- Realizing the opportunities for ‘greening development’, without being opportunistic about it

**Rio+20 focuses on a Green Economy in the context of sustainable development and poverty eradication, with the awareness that “human beings are ultimately the subjects and objects of development as such”**

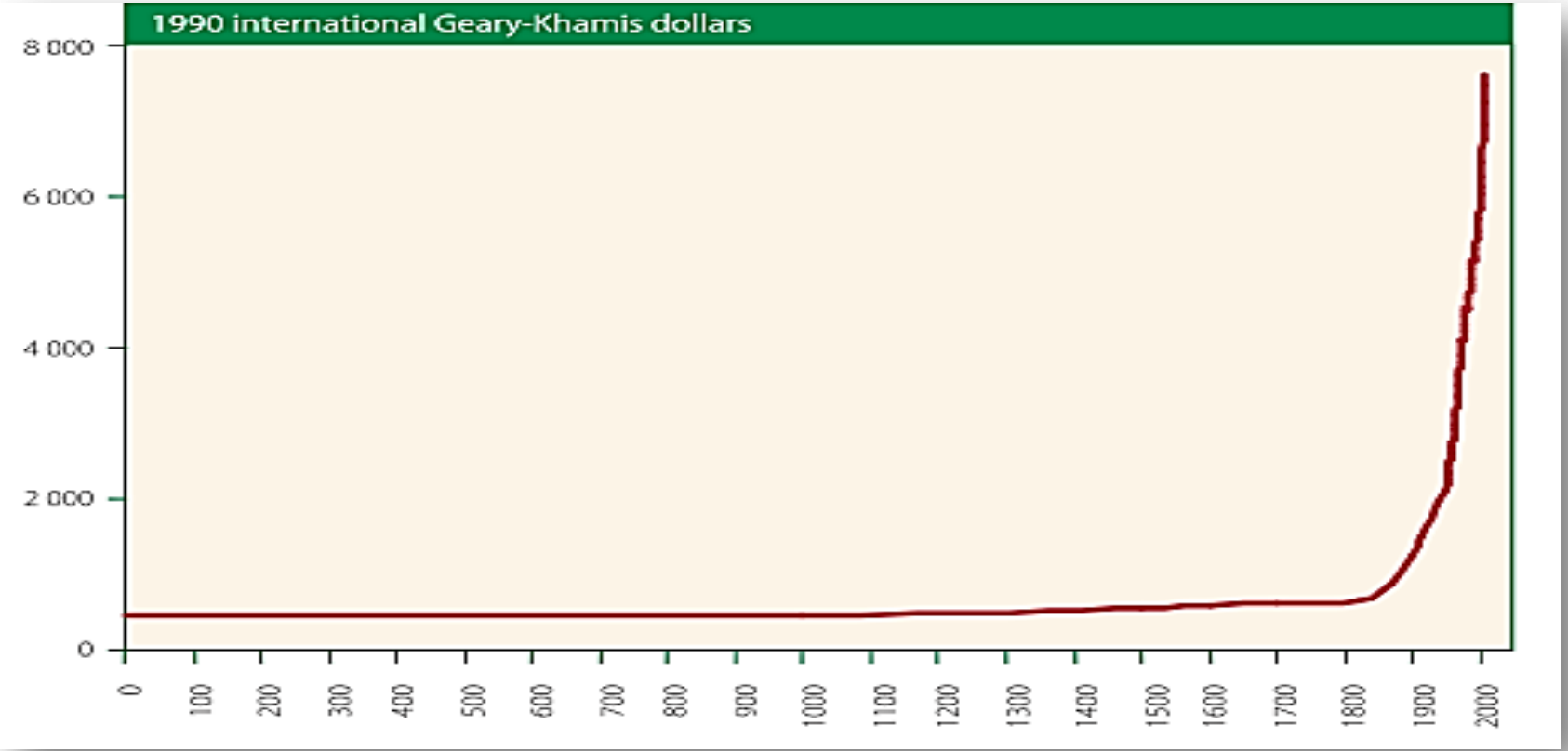

# Role of energy in development

# Rise in world energy consumption: 1850-2000



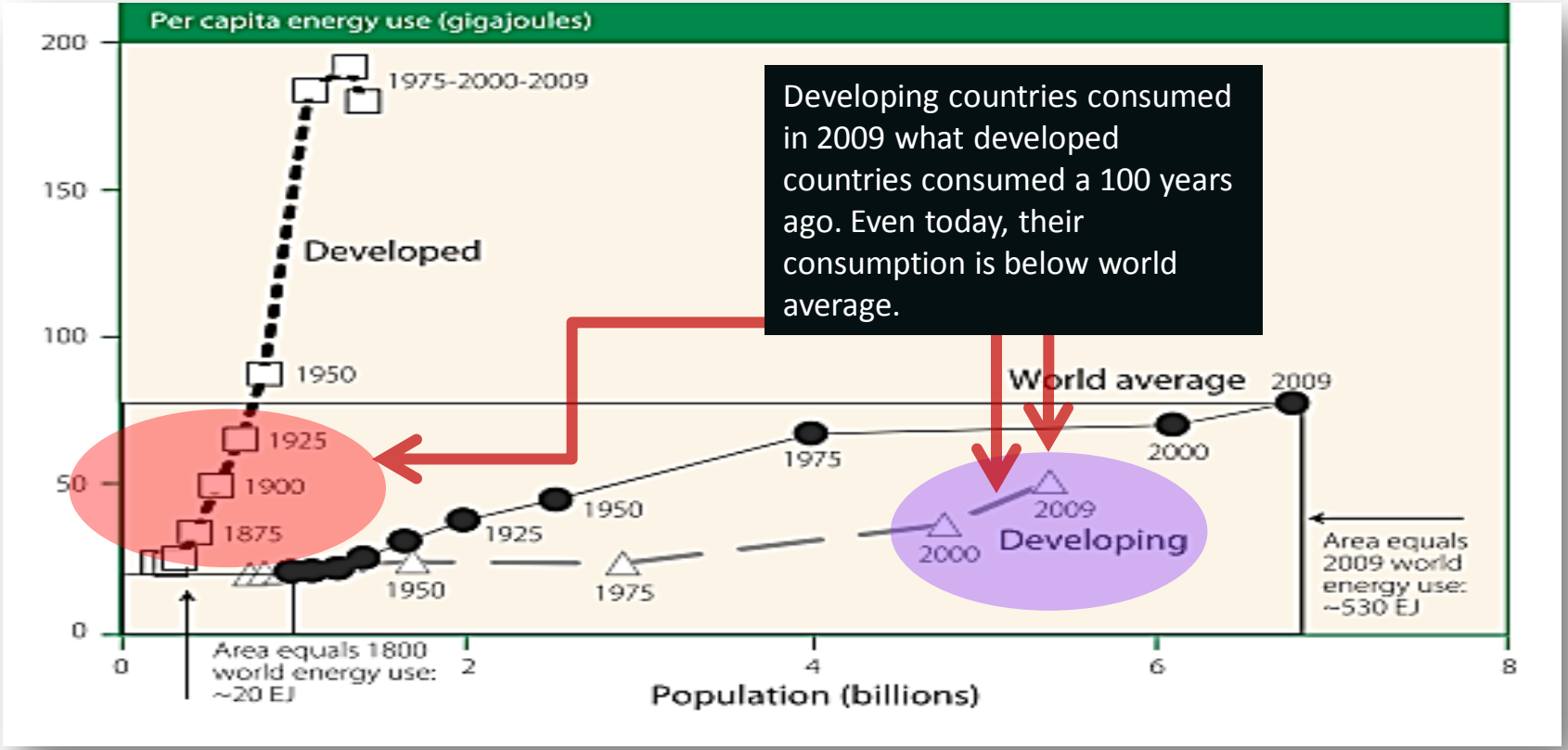

*Source: World Economic and Social Survey 2011, UNDESA (2011)*

# Surge in world per capita income during the industrial revolution: 1850-2000



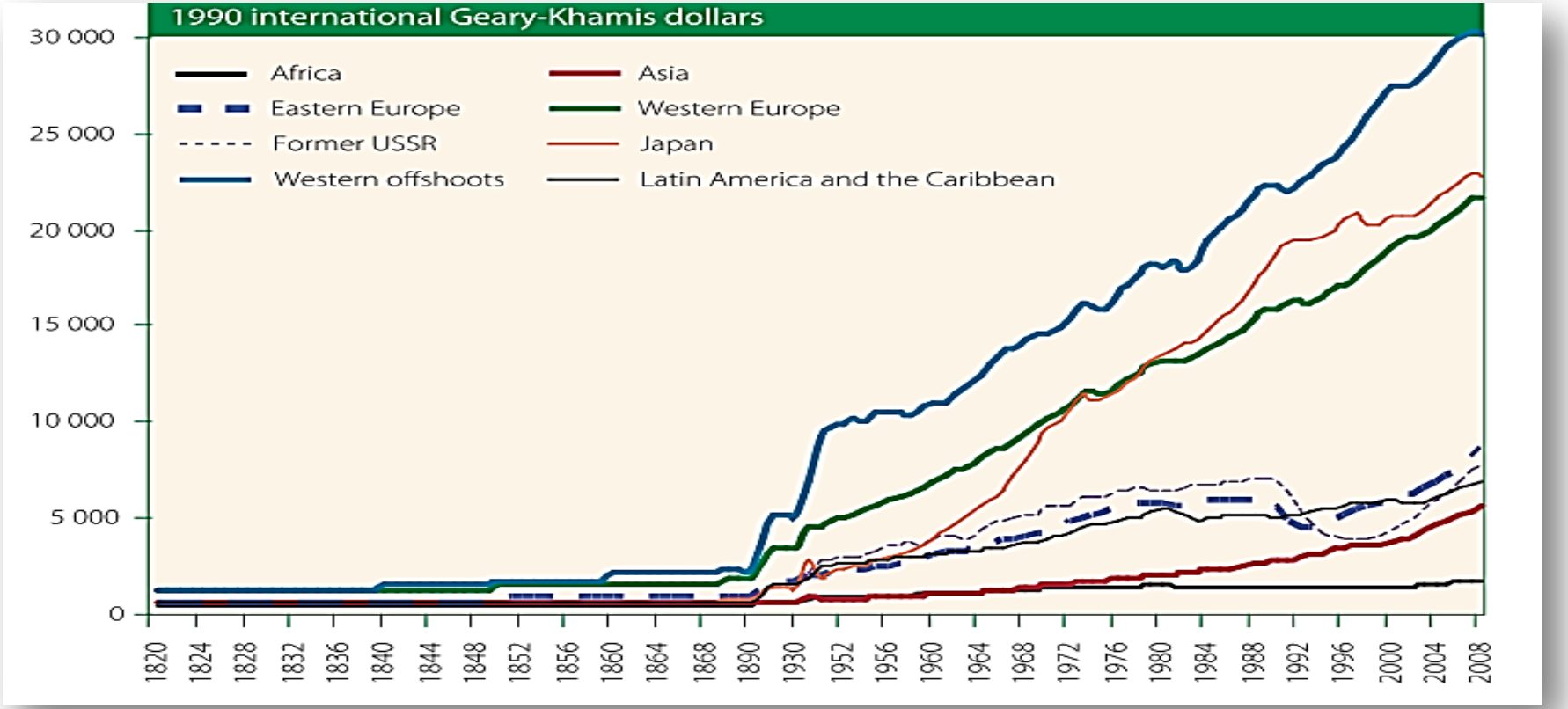

*Source: World Economic and Social Survey 2011, UNDESA (2011)*

# Global disparities in per capita energy consumption and population growth: 1800-2009




*Source: World Economic and Social Survey 2011, UNDESA (2011)*

# Developed and developing country disparities in per capita income: 1820-2008




*Source: World Economic and Social Survey 2011, UNDESA (2011)*

# The Energy-Food-Water Nexus

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## Energy and Food

- Food is metabolic energy, with inherent tradeoffs between supplies and prices of the two
- Recent rise in production of biofuels has contributed to food price increases
- Higher prices of diesel and fuel oil used in agricultural machinery and agro-processing directly impact on food price inflation
- Rise in prices of chemical fertilizers, pesticides, etc., from petroleum feedstock similarly contributes to food price increases

## Energy and Water

- Energy competes with other uses for water, e.g., irrigation and direct human and animal consumption
- Coal and nuclear power requires large amounts of water, and can contaminate fresh water supplies, e.g., Fukushima
- Recent controversy over 'fracking' for shale oil extraction revolves around impacts on local water supply
- Climate change can curtail hydropower generation due to greater evaporation and disruption of river water flows from greater precipitation

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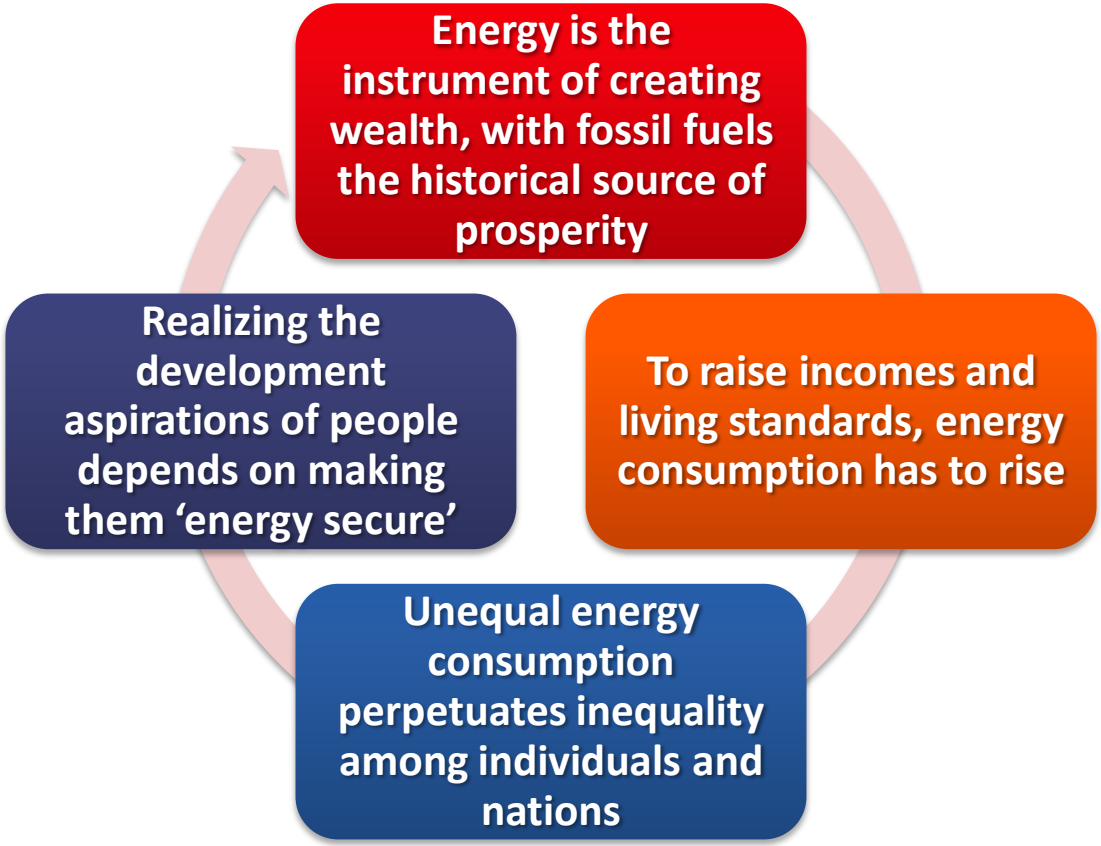



# Significance of universal access to energy for sustainable development

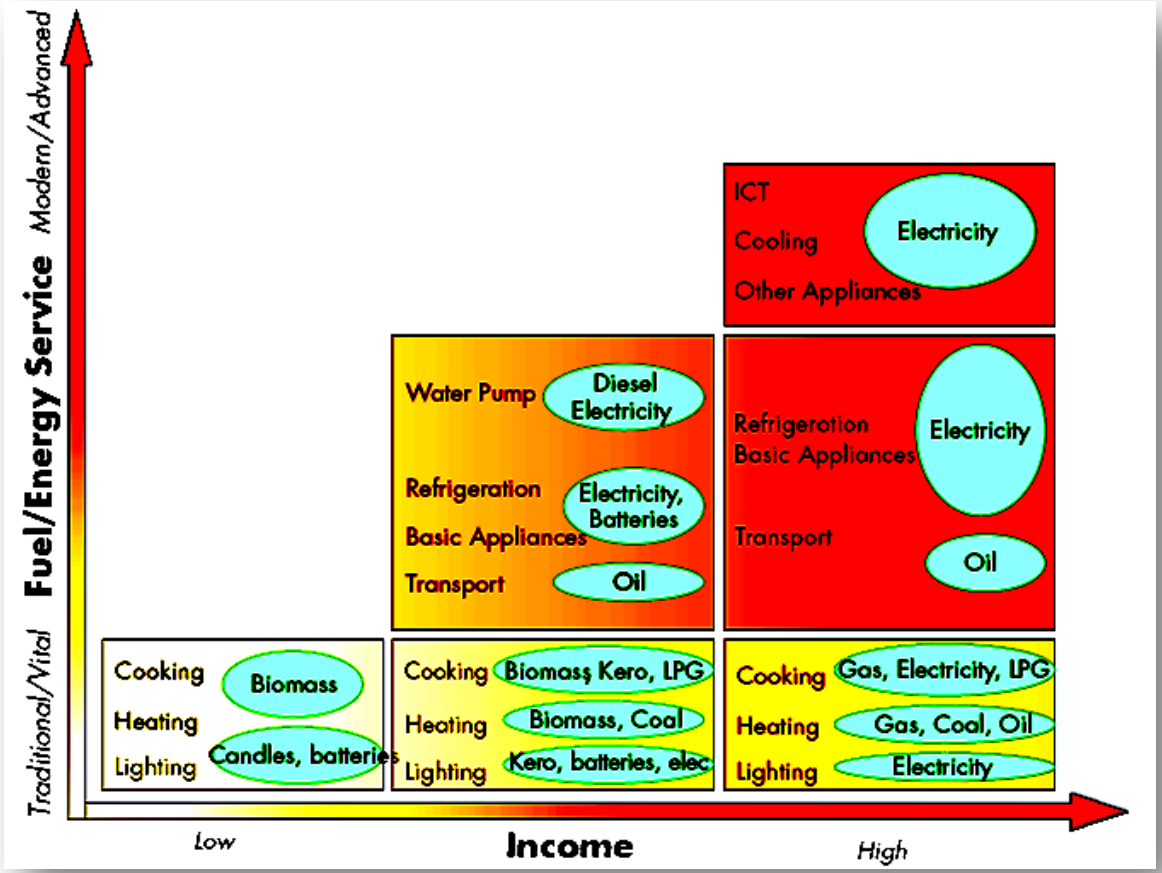
# The energy poor of the world: 2009

| | Without access to electricity | | Relying on the traditional use of biomass for cooking | |
|---|---|---|---|---|
| | Population (million) | Share of population | Population (million) | Share of population |
| Africa | 587 | 58% | 657 | 65% |
| *Nigeria* | *76* | *49%* | *104* | *67%* |
| *Ethiopia* | *69* | *83%* | *77* | *93%* |
| *DR of Congo* | *59* | *89%* | *62* | *94%* |
| *Tanzania* | *38* | *86%* | *41* | *94%* |
| *Kenya* | *33* | *84%* | *33* | *83%* |
| Other sub-Saharan Africa | 310 | 68% | 335 | 74% |
| North Africa | 2 | 1% | 4 | 3% |
| Developing Asia | 675 | 19% | 1 921 | 54% |
| *India* | *289* | *25%* | *836* | *72%* |
| *Bangladesh* | *96* | *59%* | *143* | *88%* |
| *Indonesia* | *82* | *36%* | *124* | *54%* |
| *Pakistan* | *64* | *38%* | *122* | *72%* |
| *Myanmar* | *44* | *87%* | *48* | *95%* |
| *Rest of developing Asia* | *102* | *6%* | *648* | *36%* |
| Latin America | 31 | 7% | 85 | 19% |
| Middle East | 21 | 11% | 0 | 0% |
| Developing countries | 1 314 | 25% | 2 662 | 51% |
| **World*** | **1 317** | **19%** | **2 662** | **39%** |

*World total includes OECD and Eastern Europe/Eurasia.

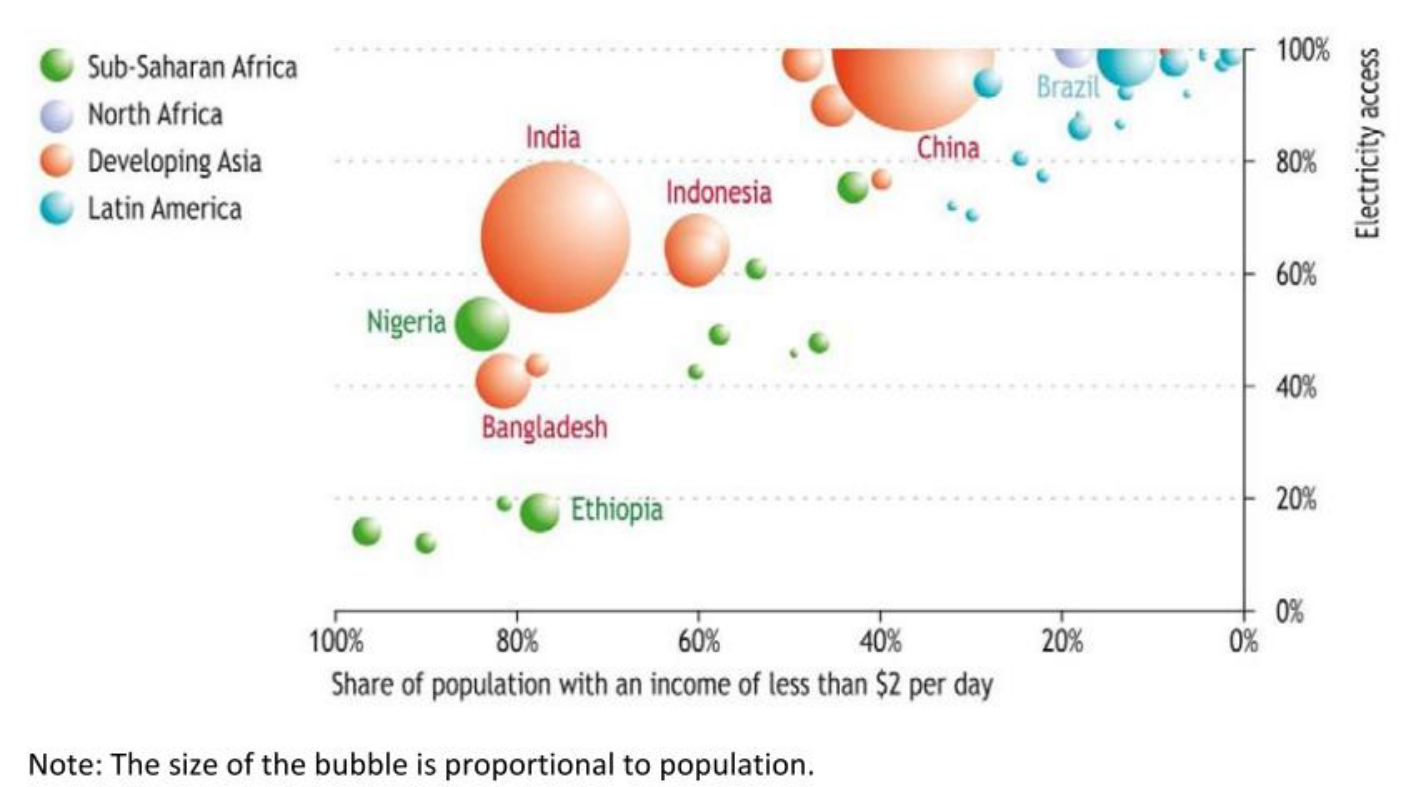
*Source: World Energy Outlook 2011, OECD/IEA*

# Correlation between energy and income



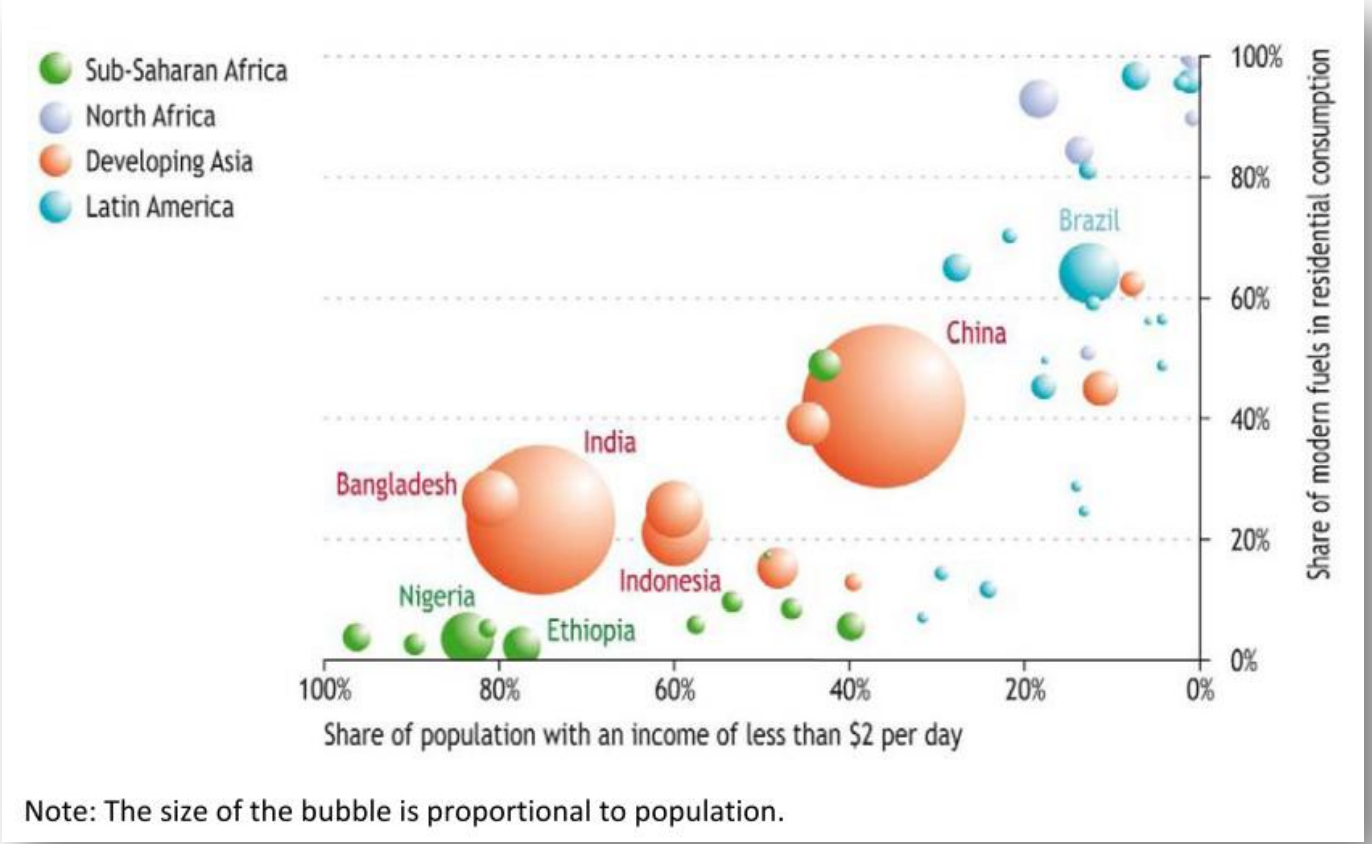

*Source: World Energy Outlook 2009, OECD/IEA (2009)*

# Low income coincides with low access to electricity



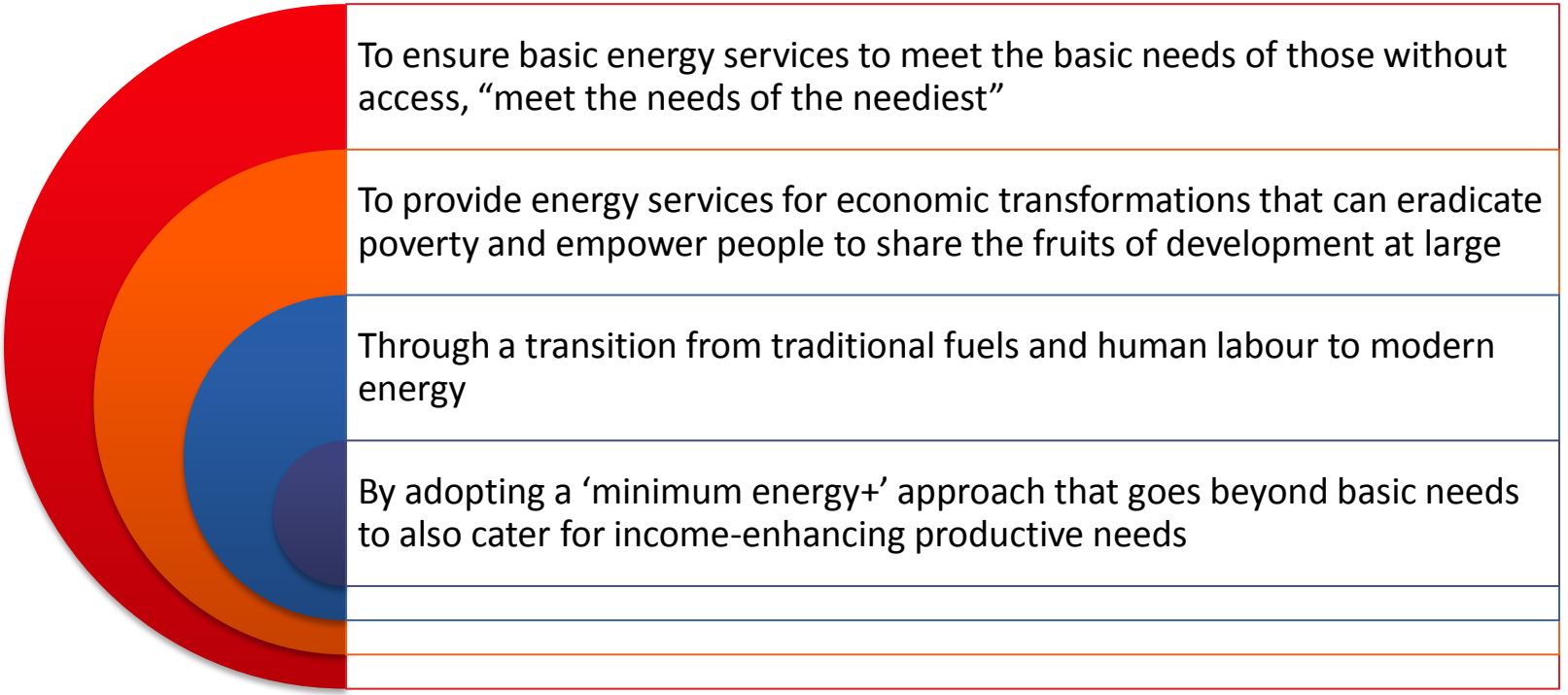

*Source: World Energy Outlook 2009, OECD/IEA (2009)*

# Lack of access to modern fuels is characteristic of poverty and low income




*Source: World Energy Outlook 2010, OECD/IEA (2010)*

# The meaning of universal energy access




# Challenges and opportunities for Asia


# The UN's vision of sustainable energy for all

## The Challenge

Defeating poverty and ensuring development that benefits everyone

## The Goal

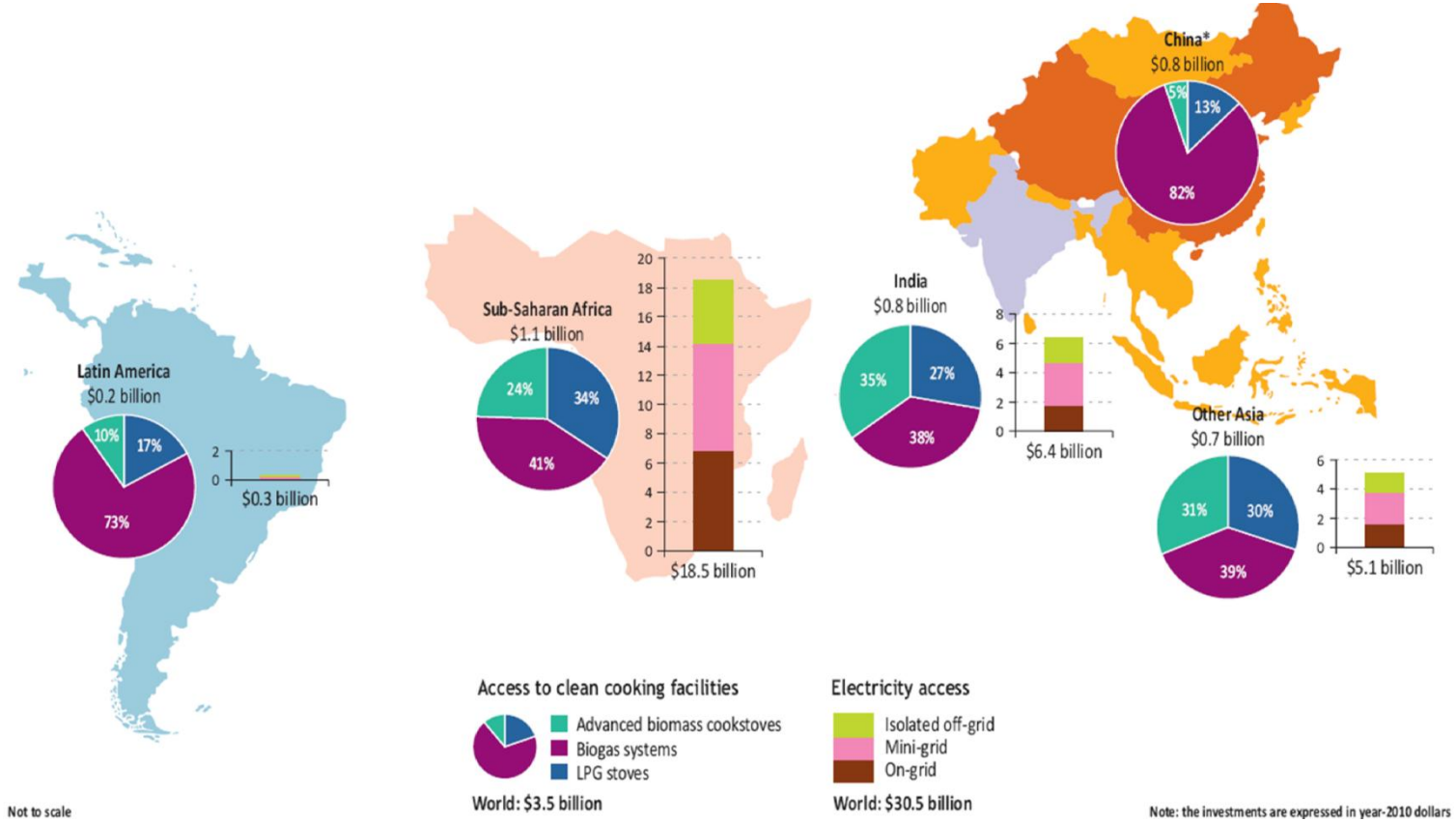
To provide sustainable energy for all by the year 2030 by:

- Ensuring universal access to modern energy services
- Doubling the rate of improvement in energy efficiency
- Doubling the share of renewable energy in the global energy mix

## The Implications

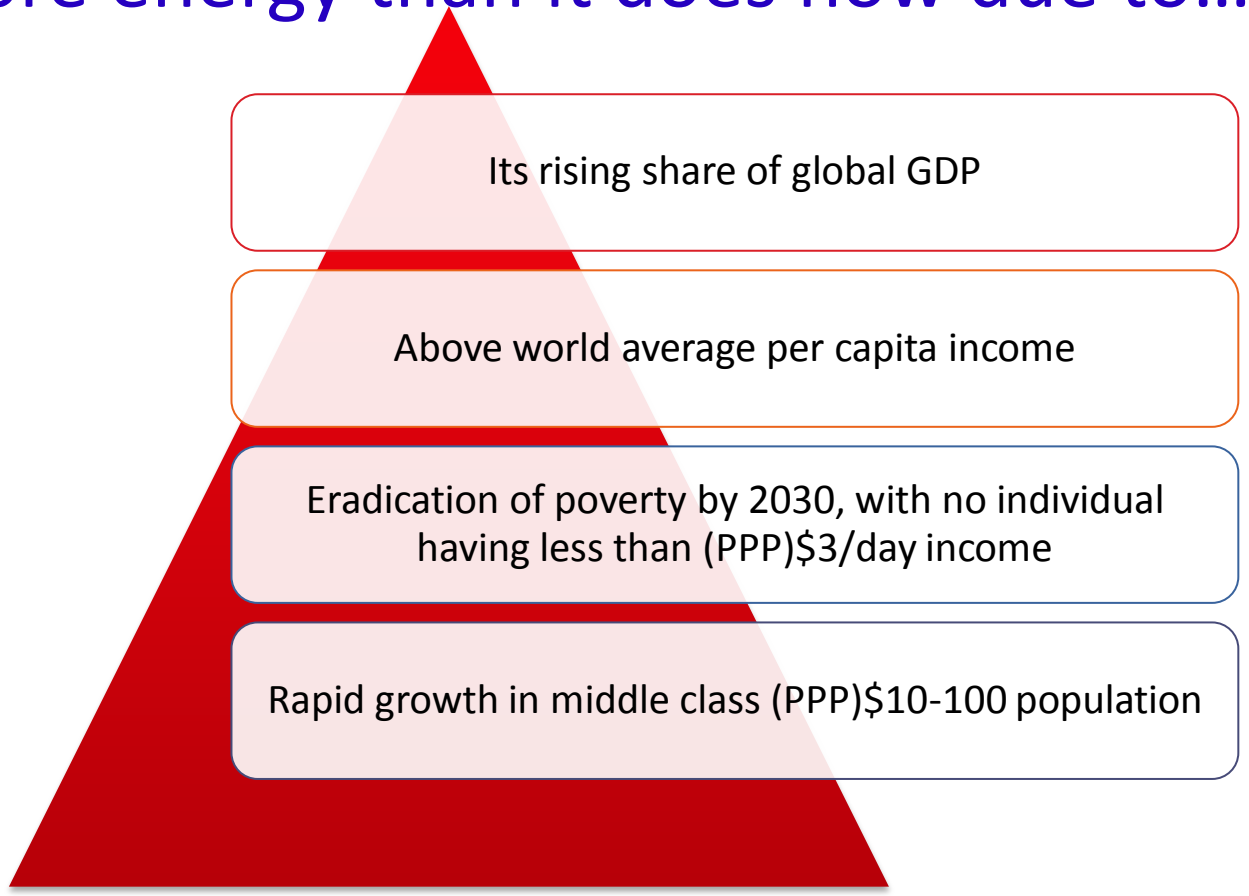
- Investment of $48 billion/year to provide universal energy access by 2030, equal to 3% of total global energy investment
- Accelerated transition from conventional energy options to low-emission technologies through new policies, financing and business models

# Initial annual investment needed to provide universal sustainable energy for all by 2030

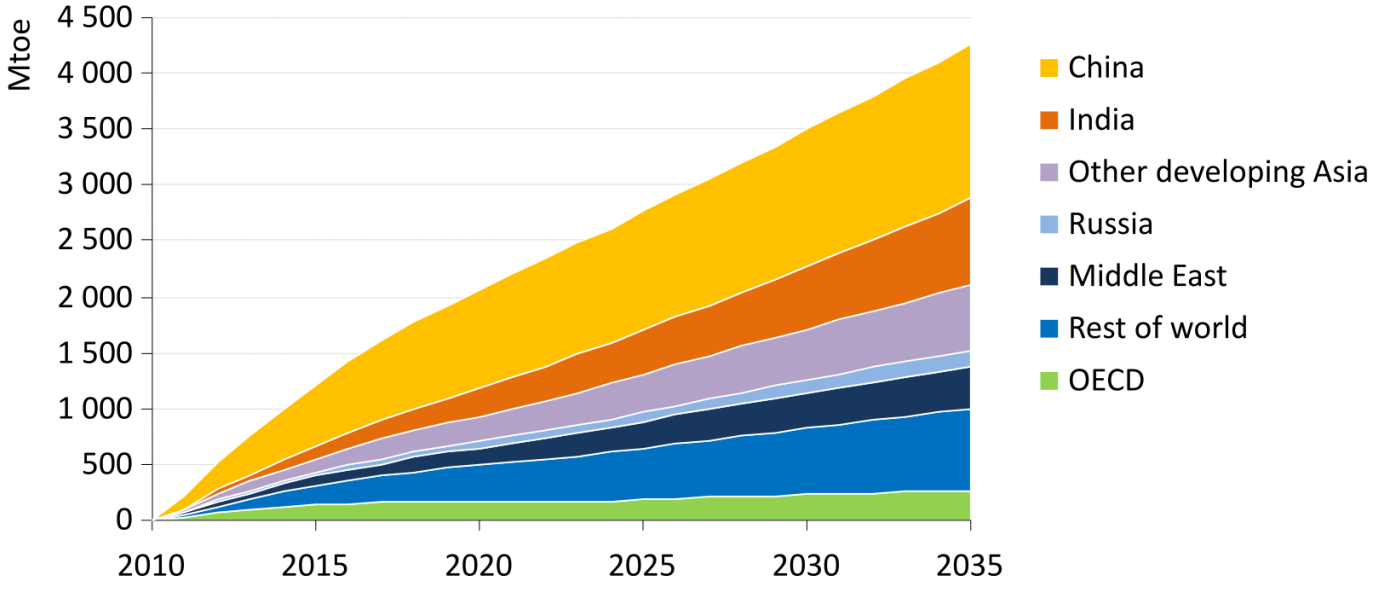



*Source: World Energy Outlook 2011, OECD/IEA (2011)*

# By 2050, Asia is expected to consume much more energy than it does now due to…



# Asia's additional demand for energy will exceed that of the rest of the world



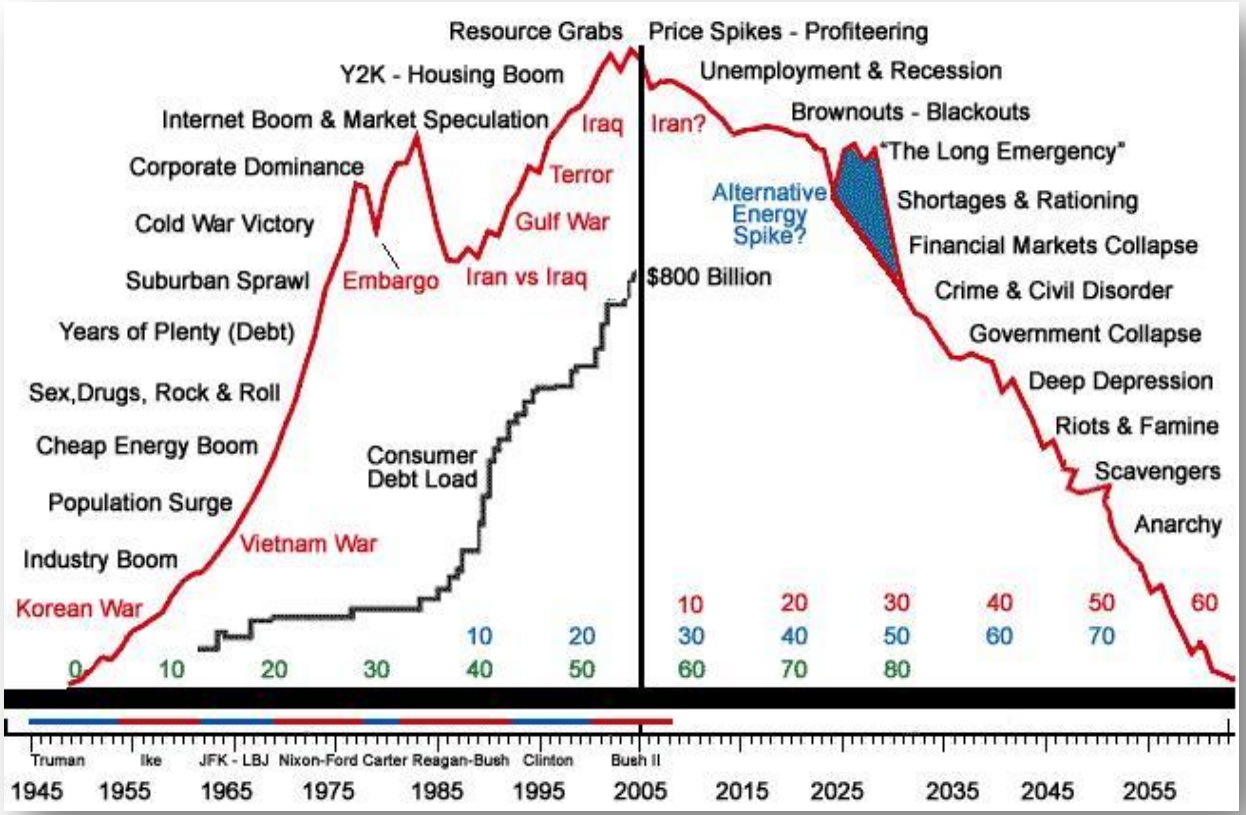

***Global energy demand increases by one-third from 2010 to 2035, with China & India accounting for 50% of the growth***

*Source: World Energy Outlook 2011, OECD/IEA (2011)*

# But our dependence on fossil fuels is overwhelming

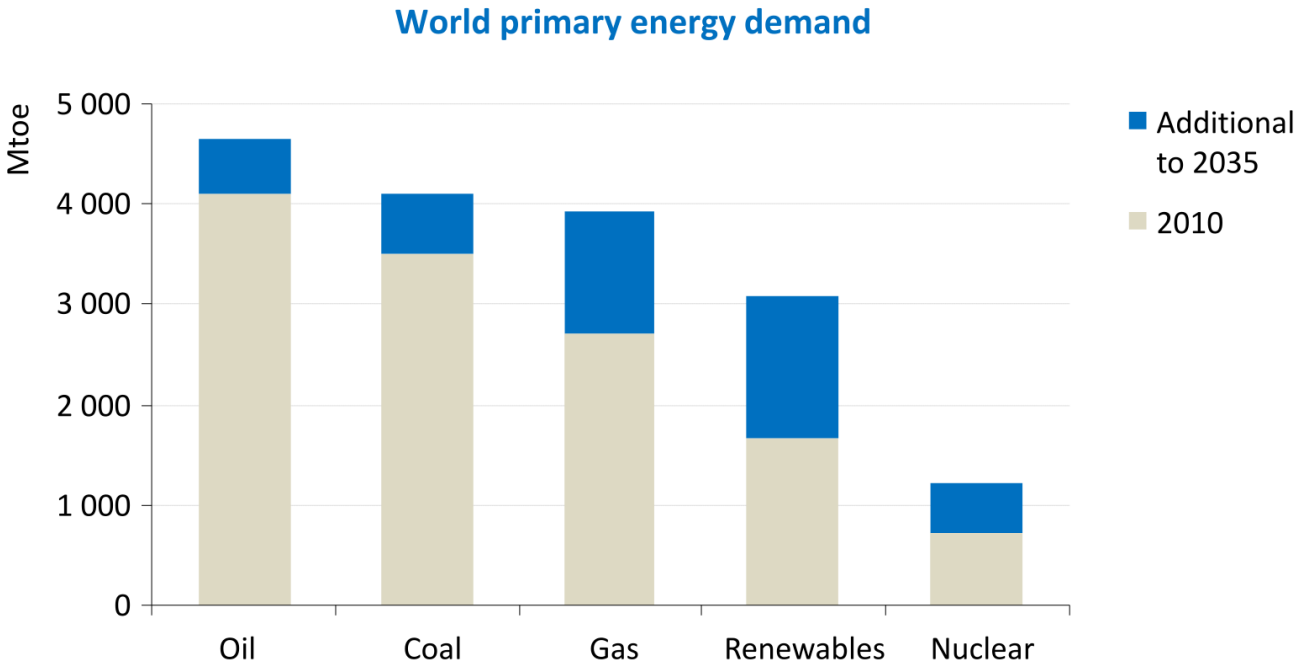
- 80% of total primary energy supply from fossil fuels
- 5-6% of supply from nuclear
- 3% of supply from large hydropower
- 11-12% of supply from renewable energy, mostly from traditional biomass

# And we face a future fraught with uncertainty about fossil fuel supply security




*Source: http://spacecollaborative.com.au/2030%20Sydney/Research/Sustainability/peakOil.html*

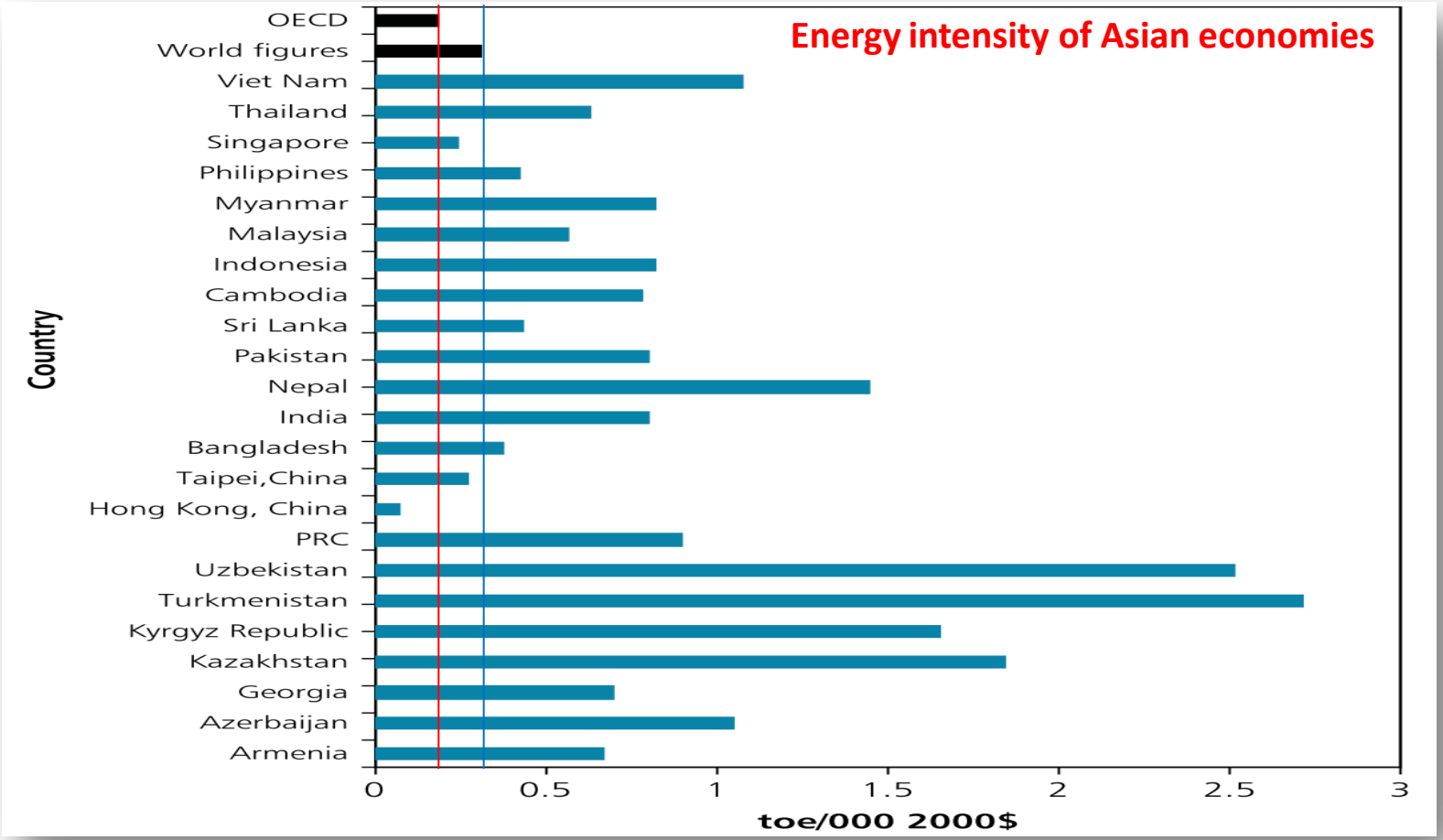
# Potential of renewable energy worldwide




***Renewables & natural gas collectively meet almost two-thirds of incremental energy demand in 2010-2035***

*Source: World Energy Outlook 2011, OECD/IEA (2011)*

# Asia's potential for energy efficiency gains




*Source: Improving Energy Security and Reducing Carbon Intensity in Asia and the Pacific, ADB (2009)*

# A sustainable energy path can help realize Asia's economic and social aspirations

**Asia-Pacific population by 2050: 5.14 billion**

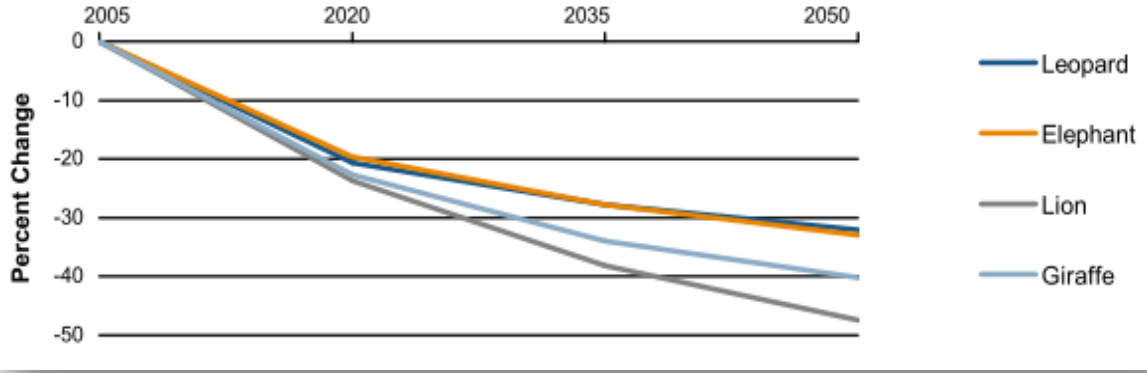
Upper income 0.77 billion

Middle income 4.37 billion

**Per capita energy consumption needed to achieve this status**

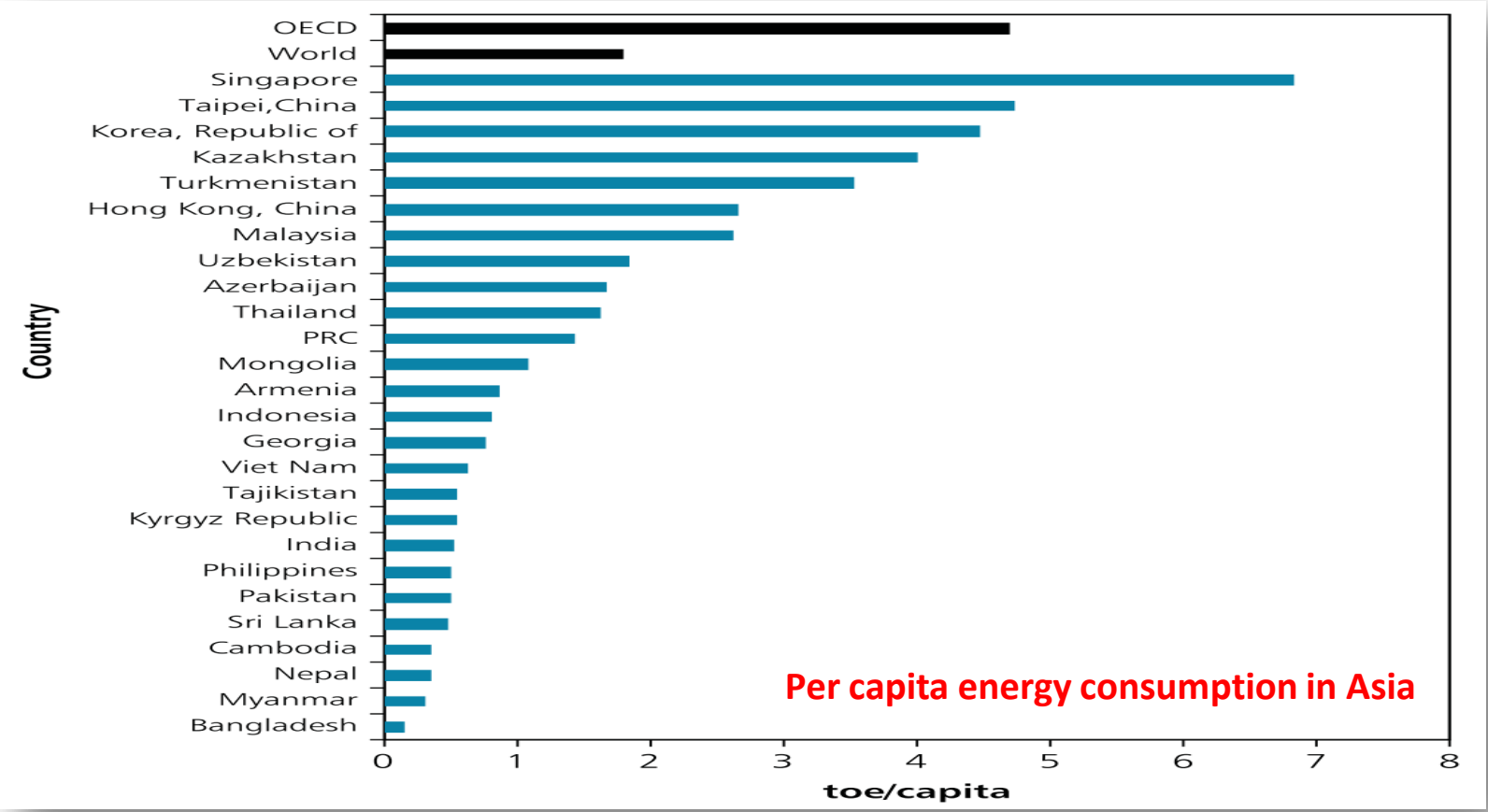
| | |
|---|---|
| 2008 developing country average | : 1.0 toe |
| 2008 LDC average | : 0.3 toe |
| 2050, current developed country average | : 4.6 toe |
| 2050, 68% of current developed country average | : 3.2 toe |
| 2050, 52% of current developed country average | : 2.4 toe |

**World Energy Council scenarios of energy intensity**




*Sources: ESCAP estimates based on (a) Energy Policy Scenarios to 2050, World Energy Council (2007) and Asia 2050: Realizing the Asian Century, ADB (2011)*

# The distance Asian countries have to cover




*Source: Improving Energy Security and Reducing Carbon Intensity in Asia and the Pacific, ADB (2009)*

# Government major programs & targets for improving access to electricity in selected countries

| Country | Program name | Description | Financing arrangements |
|---|---|---|---|
| Bangladesh | Master Plan for Electrification – National Energy | Policy of Bangladesh 1996-2004 | Electricity for all by 2020. Loans and grants from donors are passed on, under a subsidiary agreement, to the Rural Electrification Board. Domestic government funds cover all local costs of construction |
| India | Rajiv Gandhi Grameen Vidyutikaran Yojana | Electrify 100 000 villages and provide free electricity connections to 17.5 million households below the poverty line by March 2012 | Total funds of $5.6 billion disbursed between 2005 and 2011. A government subsidy of up to 90% of capital expenditure is provided through the Rural Electrification Corporation. Those below the poverty line receive a 100% subsidy for connection |
| Indonesia | Rural electrification programmes – National Energy Management | Electricity access for 95% of the population by 2025. Investment costs are covered by cross subsidies by the state owned power utility (PNL) and other costs are funded by donors. | |
| Nepal | Rural Electrification Program – National 3-Year Interim Plan | Electricity access for 100% of the population by 2027 | A Rural Electrification Board administers specific funds for electrification of rural areas |
| Philippines | Philippines Energy Plan, 2004-2013 | Electrification of 90% of households by 2017 | Funded by grants and loans from a National Electrification Fund and PPPs |

**IEA, World Energy Outlook 2011**

# Regional cooperation to enhance sustainable energy for all

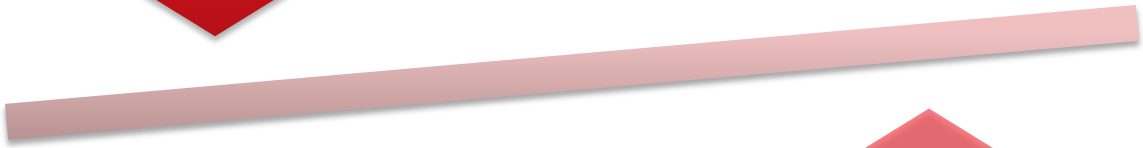
## Promotion of the Asian Energy Highway

1. **Build political commitment towards an integrated regional power grid**
   - Mapping the gaps in supply and demand at the regional level
   - Analyzing the socio-economic and environmental benefits for integration: challenges and opportunities towards realization
   - Technical feasibility (engineering) & Identifying investment opportunities
2. **Build capacity to plan, manage and deliver an integrated regional power grid**
   - Awareness raising among the policy makers, parliamentarian, electric power utilities, investment banks
   - Planning capacity of ministries dealing with electric power utilities and interconnectivities.
   - Optimization and management of the transmission system
   - Stakeholders engagement &Technology transfer

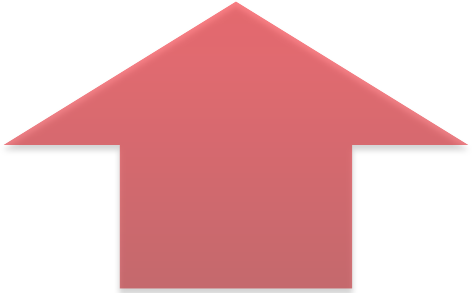
## Establishment of UN-Energy Asia-Pacific

# Our choices depend on making energy affordable to all

Affordability for countries is determined by their economic capacity (GDP, trade surplus, foreign reserves) relative to global energy/energy technology prices



Affordability for households is determined by their purchasing power (income), local energy prices and share of energy expenditure in family expenditure

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