

THE SHIFT TOWARDS ENERGY SUSTAINABILITY IN ASIA: LESSONS FOR AFRICA?



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AMEU CONVENTION 2011



What is Energy Sustainability?

We can define energy sustainability as follows:

“The provision of energy such that it meets the needs of the future without compromising the ability of future generations to meet their own needs”, or more simply,

"Energy which is replenishable within a human lifetime and causes no long-term damage to the environment."

SUSTAINABLE ENERGY SOURCES INCLUDE

- Hydroelectricity
- Solar energy
- Wind energy
- Wave power
- Geothermal energy
- Bioenergy
- tidal power

THREE GENERATIONS OF RENEWABLES

First-generation: -

- hydropower
- biomass combustion, and
- geothermal power and heat

Second-generation technologies: -

- solar heating and cooling
- wind power,
- bioenergy, and
- solar photovoltaics.

THIRD-GENERATION TECHNOLOGIES

- advanced biomass gasification
- biorefinery technologies
- concentrating solar thermal power
- hot dry rock geothermal energy,
- ocean energy, and
- Advances in nanotechnology

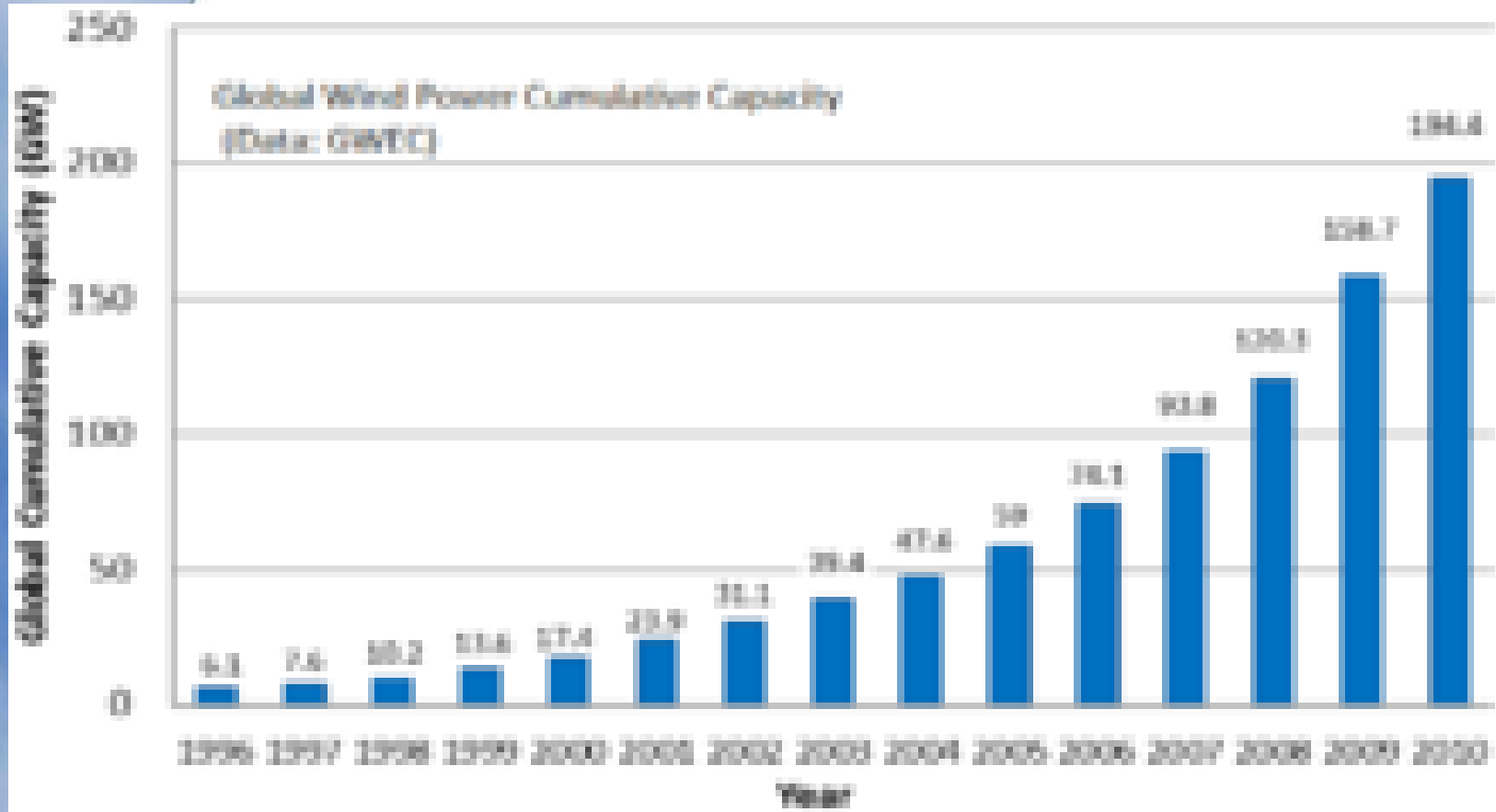
SUSTAINABLE ENERGY POLICY

Renewable energy and energy efficiency are sometimes said to be the “twin pillars” of a sustainable energy policy.

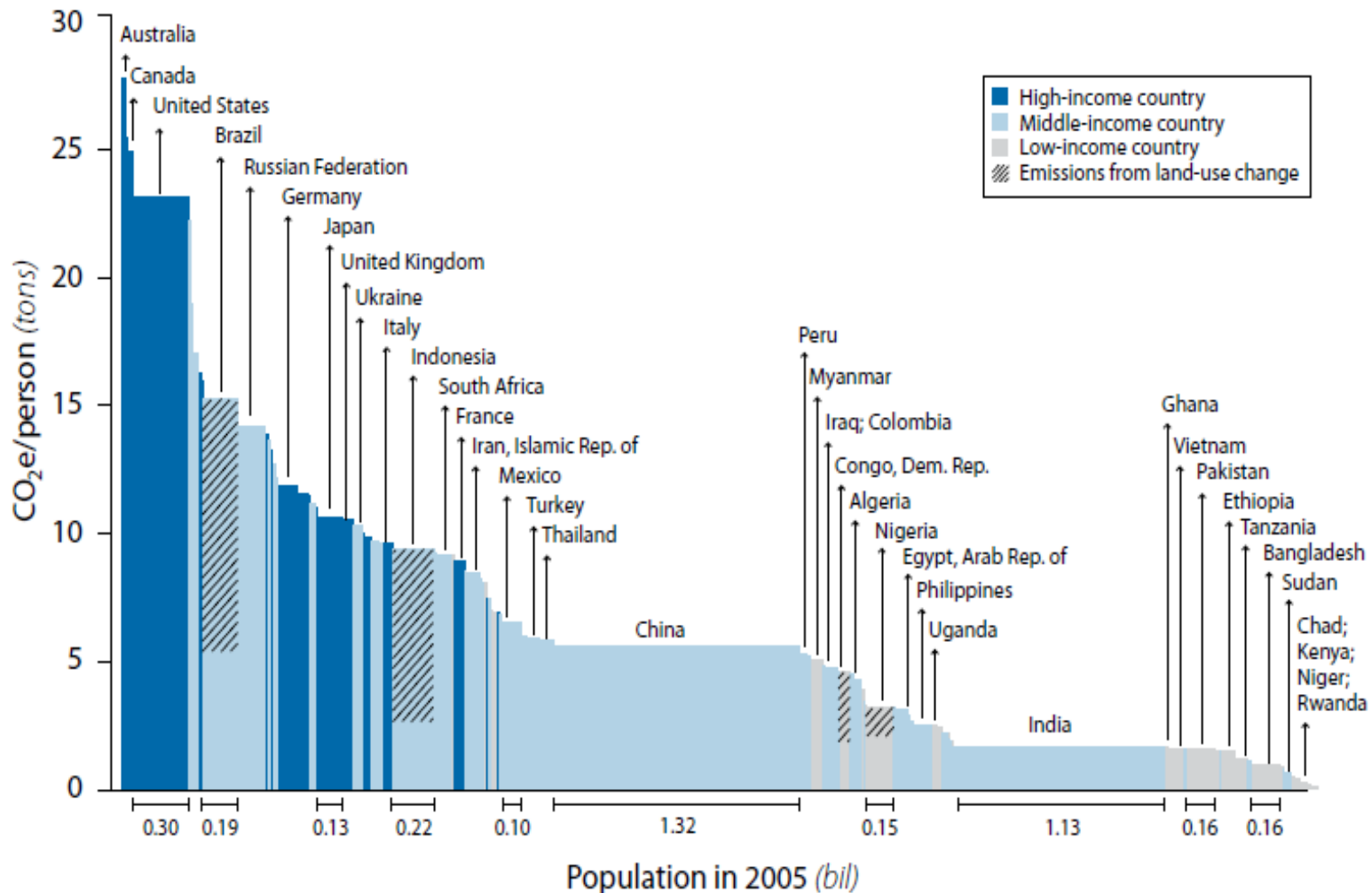
COST-BENEFIT ANALYSIS RANKED RE SOLUTIONS

- wind power combined with BEV
- concentrated solar power
- geothermal power
- tidal power
- photovoltaic
- wave power
- coal capture and storage
- nuclear energy, and finally biofuels

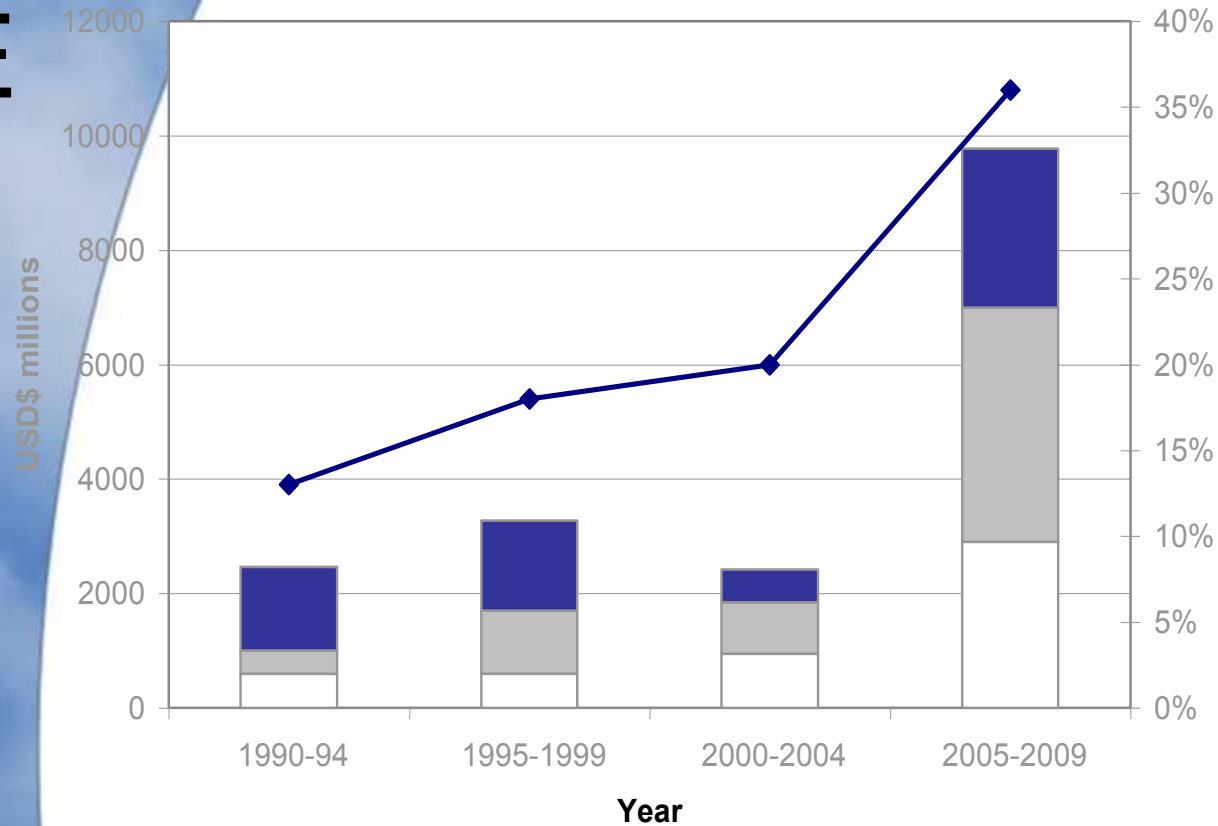
GLOBAL WINDPOWER CUMULATIVE CAPACITY



EMISSIONS PER CAPITA



WBG FINANCING OF EE AND RE



- Hydropower > 10MW
- Energy Efficiency
- New Renewable Energy
- Share of EE and RE as % of WBG lending

ASIAN POLICY LESSONS EE 1

- Low or underpriced energy - Low energy prices undermine incentives to save energy.
- Regulatory Failures
 - Consumers who receive unmetered heat lack the incentive to adjust temperatures, and
 - utility rate-setting can reward inefficiency.
- No institutional champion and weak institutional capacity - Energy-efficiency measures are fragmented.

ASIAN POLICY LESSONS EE 2

- Absent or Misplaced Incentives - Utilities make more profit by generating and selling more electricity than by saving energy
- Consumer Preferences - Consumer decisions not based on efficiency
- Higher upfront costs - low-income customers may not be able to afford efficient products.

ASIAN POLICY LESSONS EE 3

- Financing barriers & High Transaction Costs –
 - Many EE projects have difficulty obtaining financing.
 - Financial institutions not familiar with EE
 - small size of the ‘deal’, high transaction costs, and high perceived risks.
- Limited Awareness and Information
 - consumers have limited information on EE costs, benefits, and technologies.
 - Firms unwilling to pay for energy audits

HAS SA LISTENED?

Eskom

- 43-million CFLs - saving of 1800 MW and
- 144 141 Solar Water systems installed at a cost of over R750-million.
- 2010-2030 IRP (IRP) includes EE goals.
 - Energy efficiency DSM must be maintained
 - Emission constraint of 275 million tons of carbon dioxide per year after 2024 must be achieved.
- Allowance for Energy Efficiency Regs 2011
 - tax allowance for energy efficiency

HAS SA LISTENED? (cont)

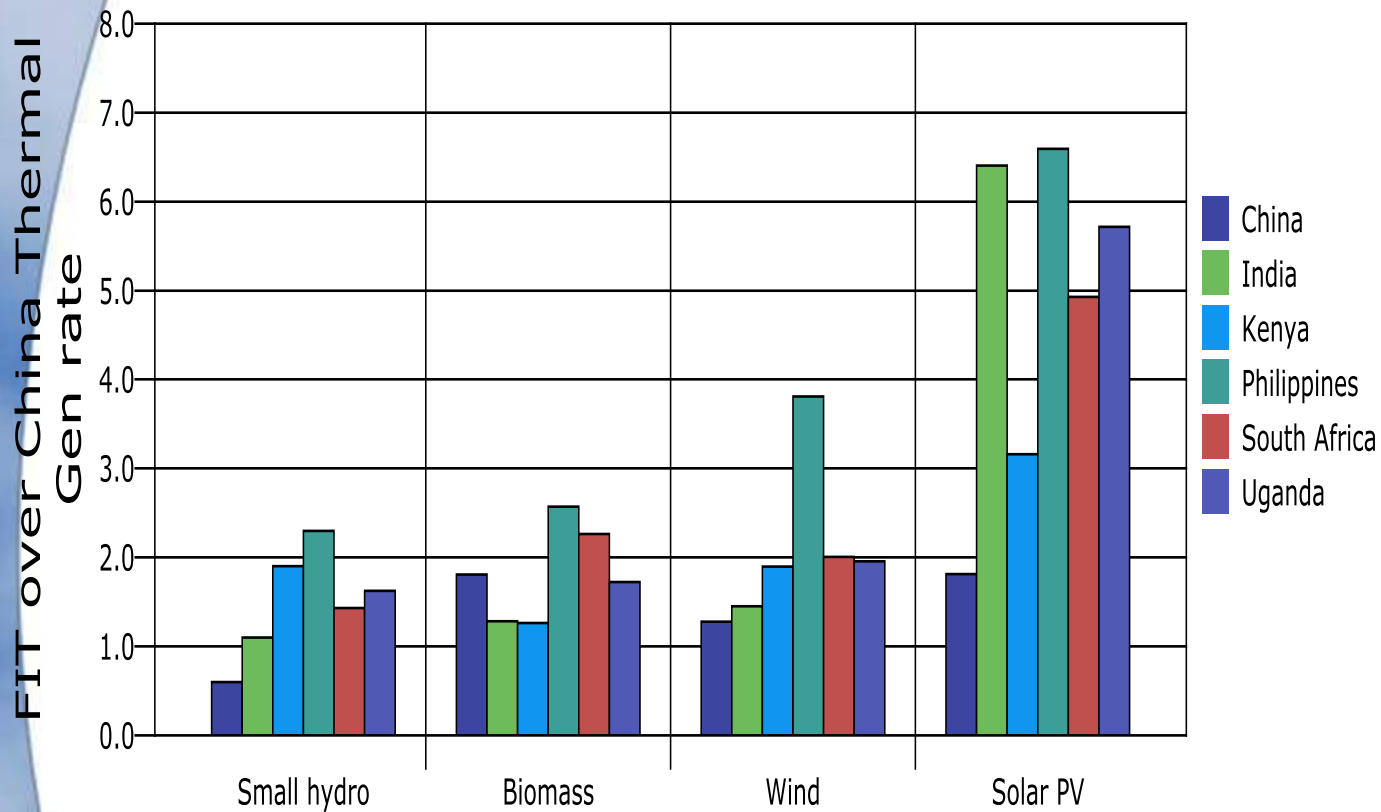
- Eskom planning to invest \$780m on DSM initiatives over the next 3years to achieve savings of:-
 - Demand 1,074 MW, and
 - Energy 4.1 TWh
- DTI currently promulgating amendments to the National Building - requirements for the energy usage in buildings.

RESOURCES & POLICY TOOLS RE

- Feed-in laws require mandatory purchases of renewable energy at a fixed price.
- RE Portfolio Standards (RPS) requires utilities to reach a minimum proportion of RE (penalties for non-compliance)
- Tendering - government-sponsored competitive bidding for renewable energy projects. Long-term contracts awarded to the lowest priced projects.

BENCHMARK COST NORMS

RE Technologies



SA RENEWABLE ENERGY

- The IRP 2010-2030 RPS targets; -
 - wind – 8.4MW;
 - solar trough – 1.0MW;
 - solar PV – 8.4MW
- 5,000 MW solar park near Upington
- Eskom's planned 100 MWe CSP station at Olyvenhoutsdrif – 2016 (R980.8 million loan from AFD)

SA RENEWABLE ENERGY (cont)

- SA Refits will be used as a ceiling price
- DOE called for proposals to build the first RE power plants (wind, solar, hydro, biogas, biomass or landfill gas).
- Goal is to purchase 1.0 GW of RE by 2013 and 3.8 GW by 2016.
- The preferred bidders will be announced on November 24 and second round of bidding begin on November 25

IS SUSTAINABLE ENERGY SUSTAINABLE?

- Technology
- Policies
- Politics
- Funding
- Generation constraints

Or are engineers just enjoying
rising to the challenge?



Thank
you