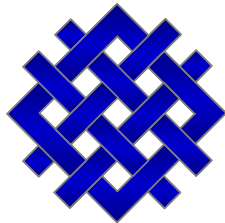


Climate, Energy and Development: Options Beyond Kyoto

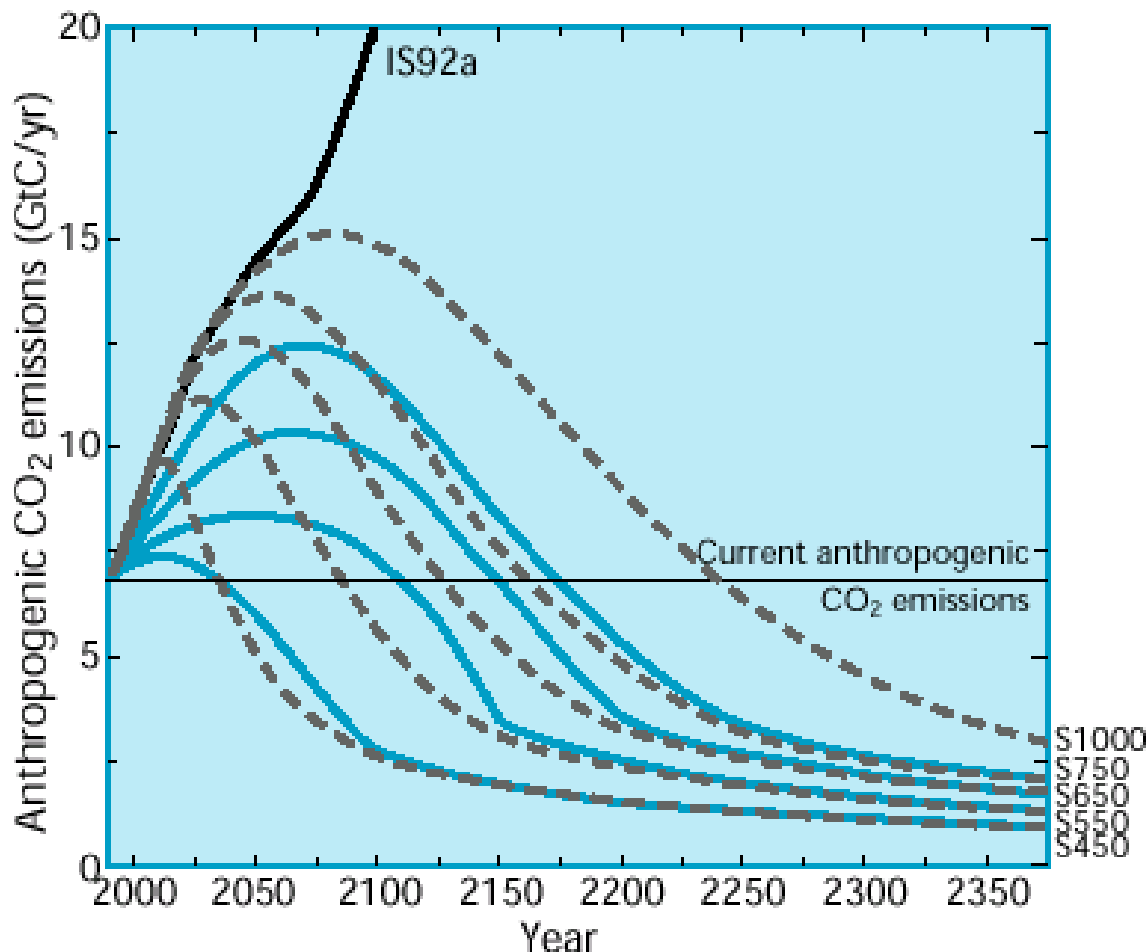
Monday, December 8, 2003
COP9, Fiera Milano



Jonathan Pershing (jpershing@wri.org)
Climate, Energy, and Pollution Program
World Resources Institute
<http://www.wri.org>

Key Question: How to mitigate climate change while assuring energy access & security and promoting development?

CLIMATE: To stabilise concentrations at ANY level, emissions must ultimately fall to virtually zero...

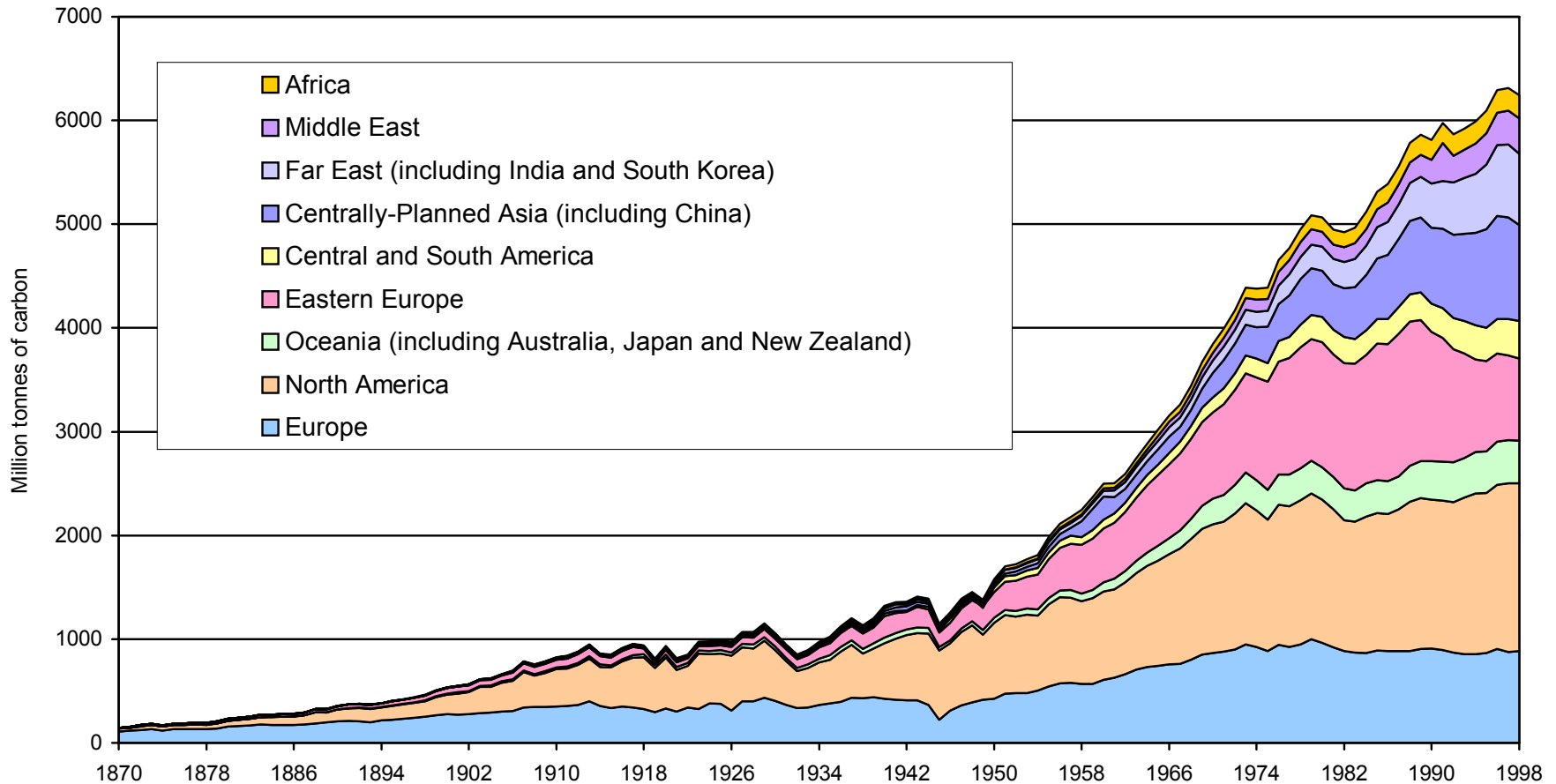


Source: IPCC TAR



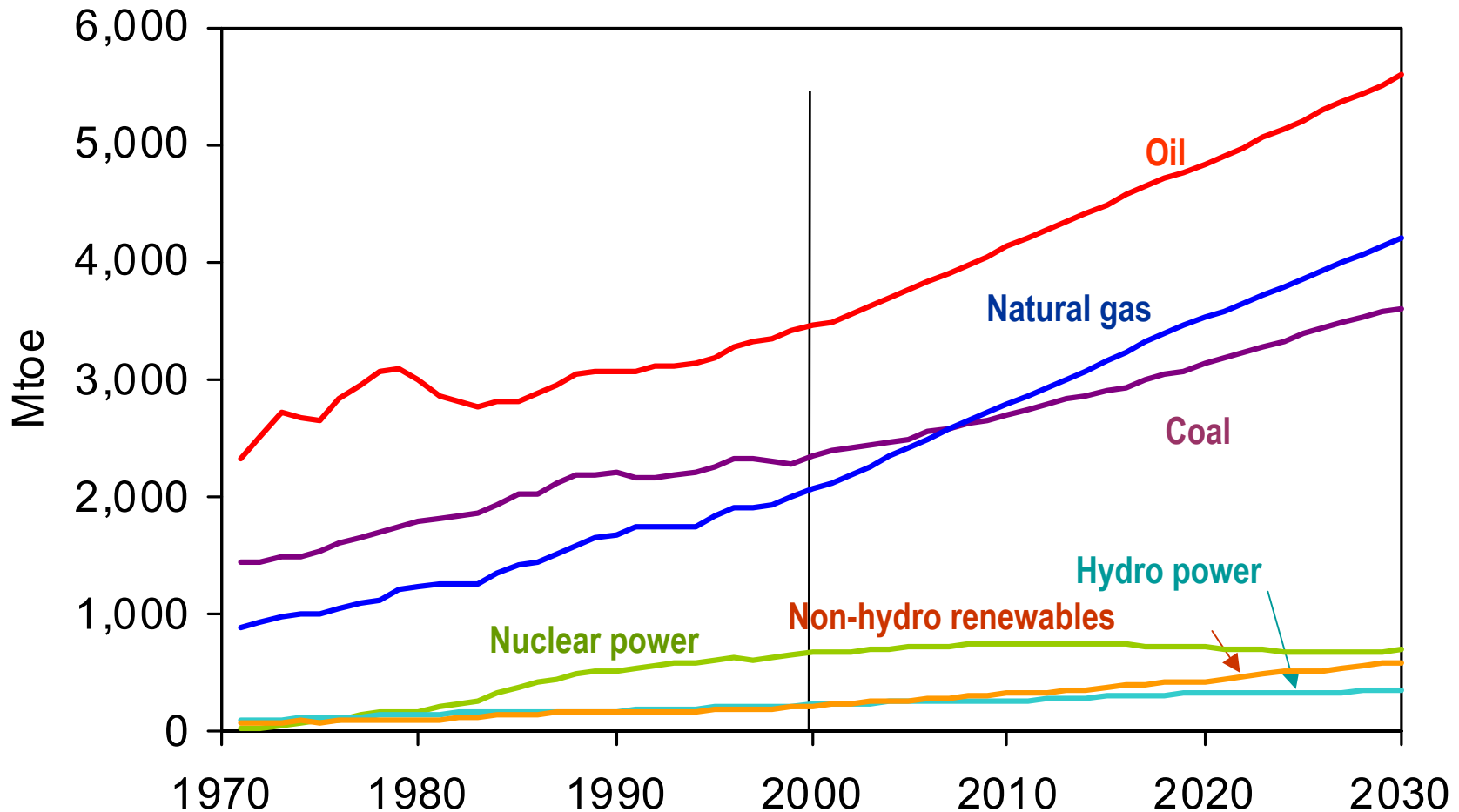
...but emissions are rising

CO2 Emissions from fossil fuel combustion, cement manufacture and gas flaring, 1870-1998



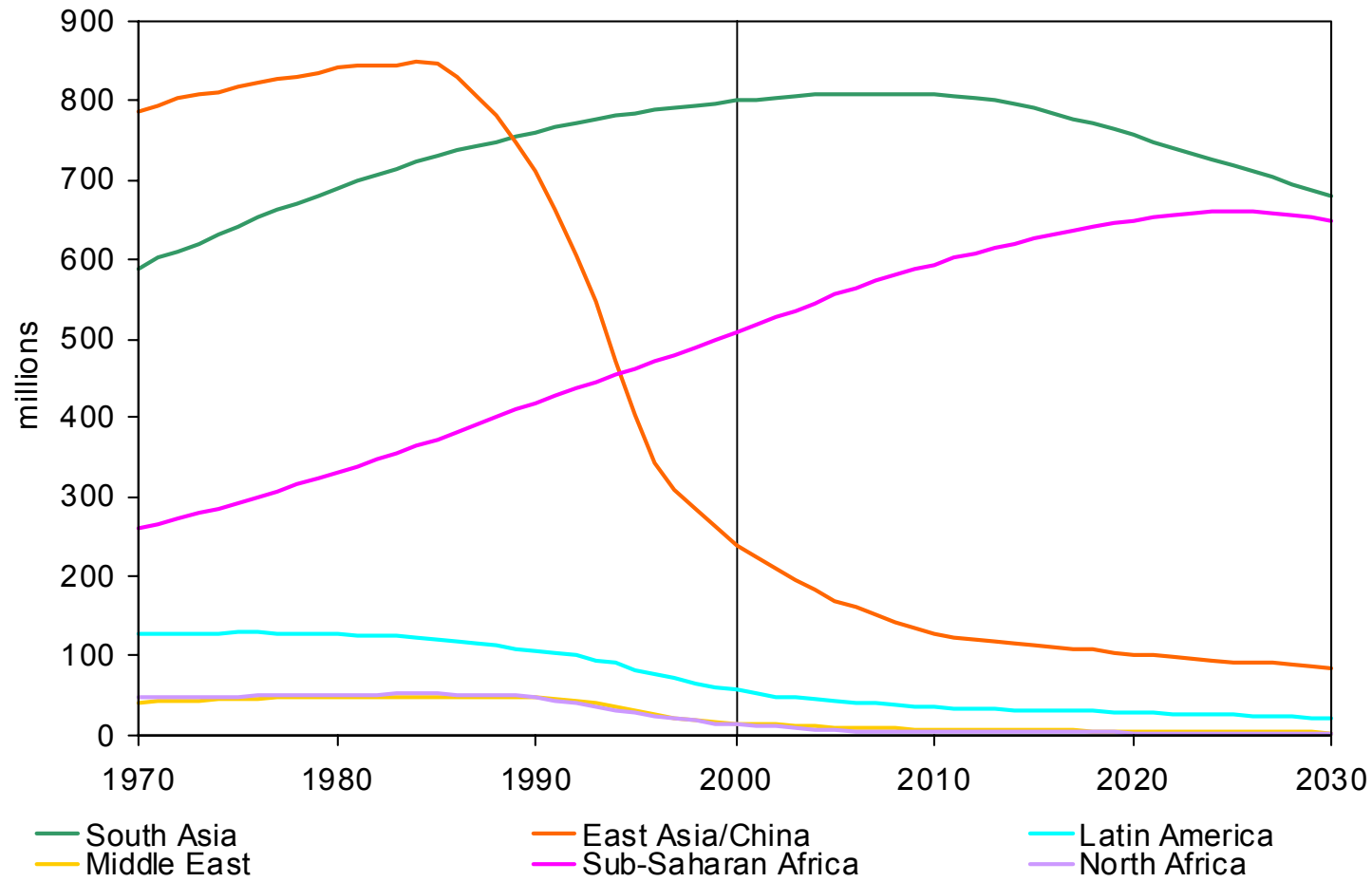
Source: Marland, G., T.A. Boden, and R.J. Andres, 2001. Oak Ridge National Laboratory.

ENERGY: World primary energy demand is rising...



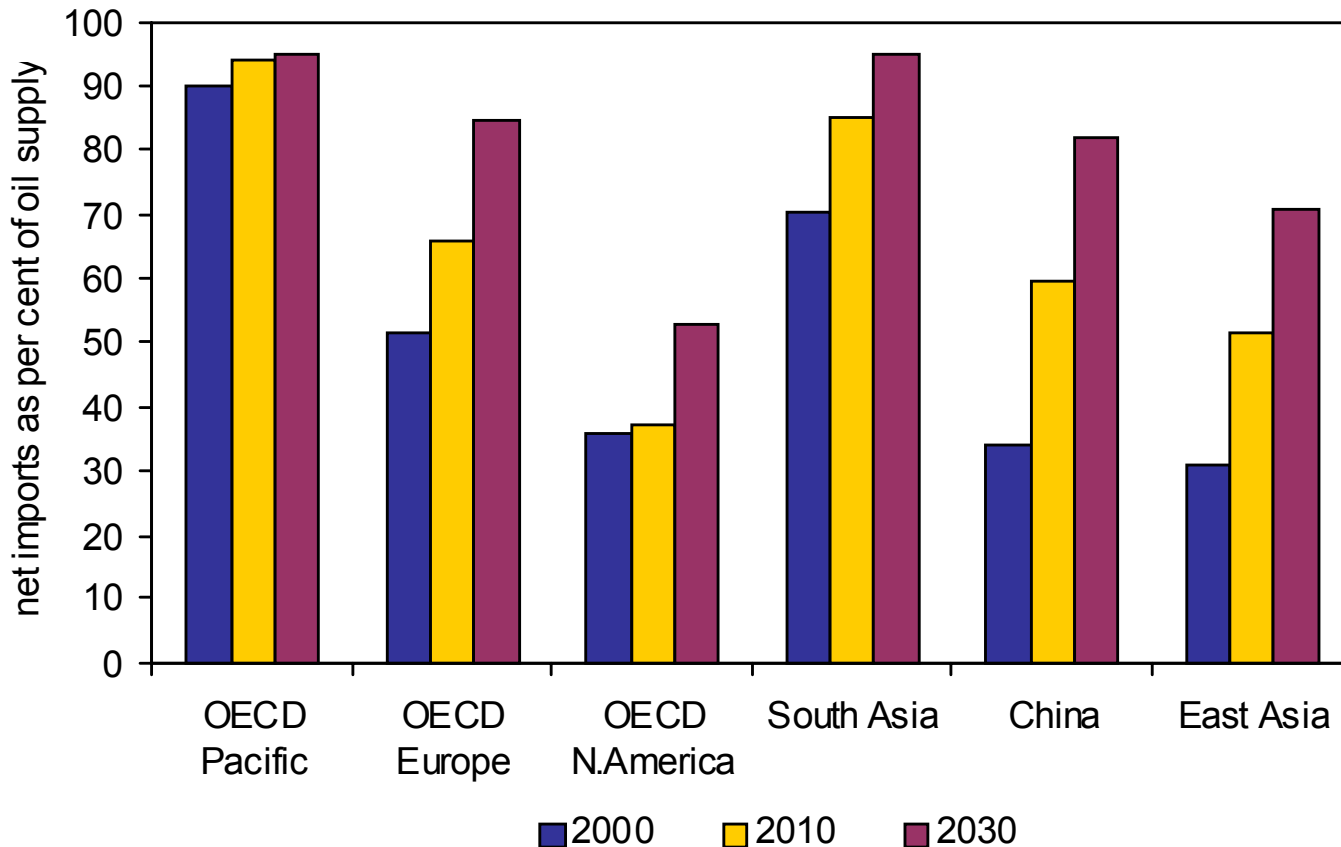
Source: WEO 2002

...but the number of people without electricity remains high...



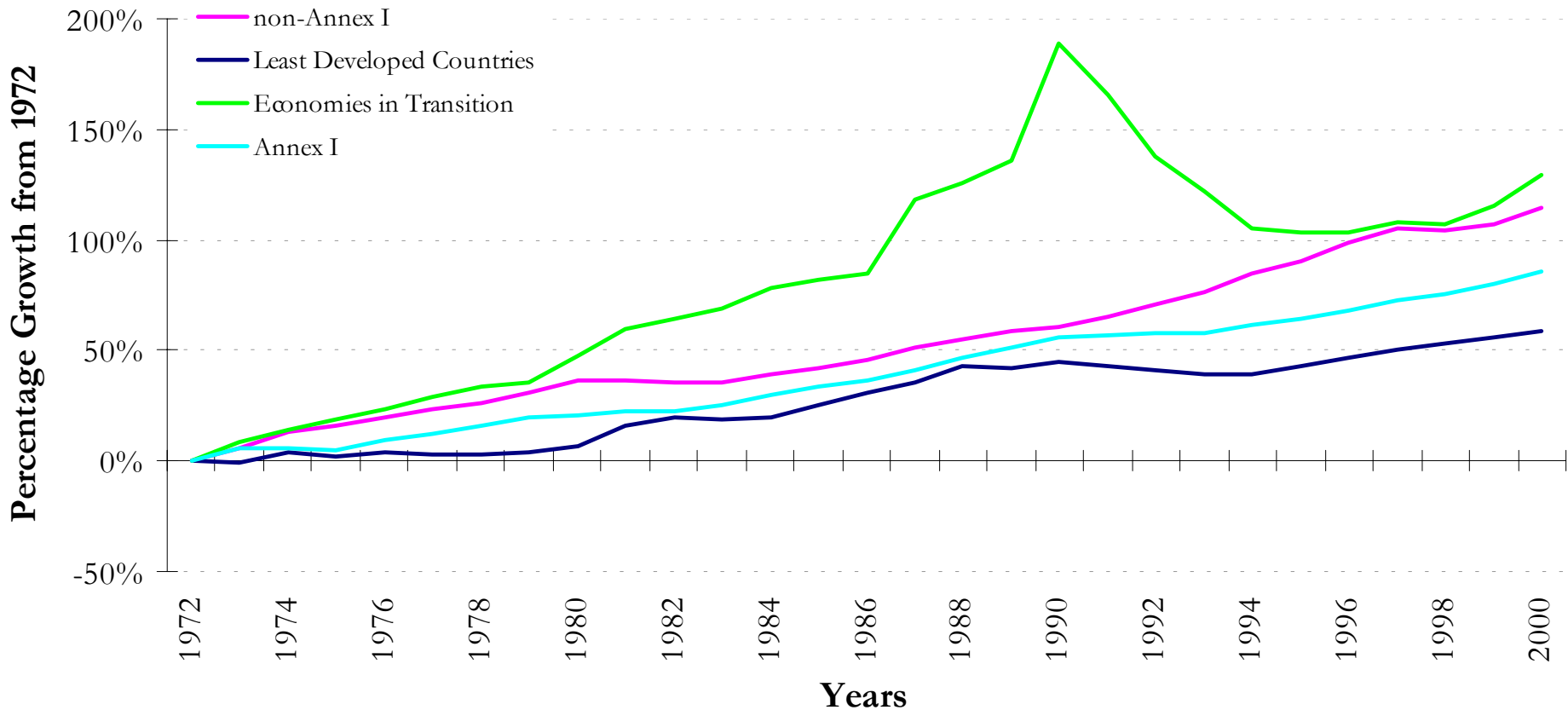
Source: WEO 2002

...and import dependence is growing



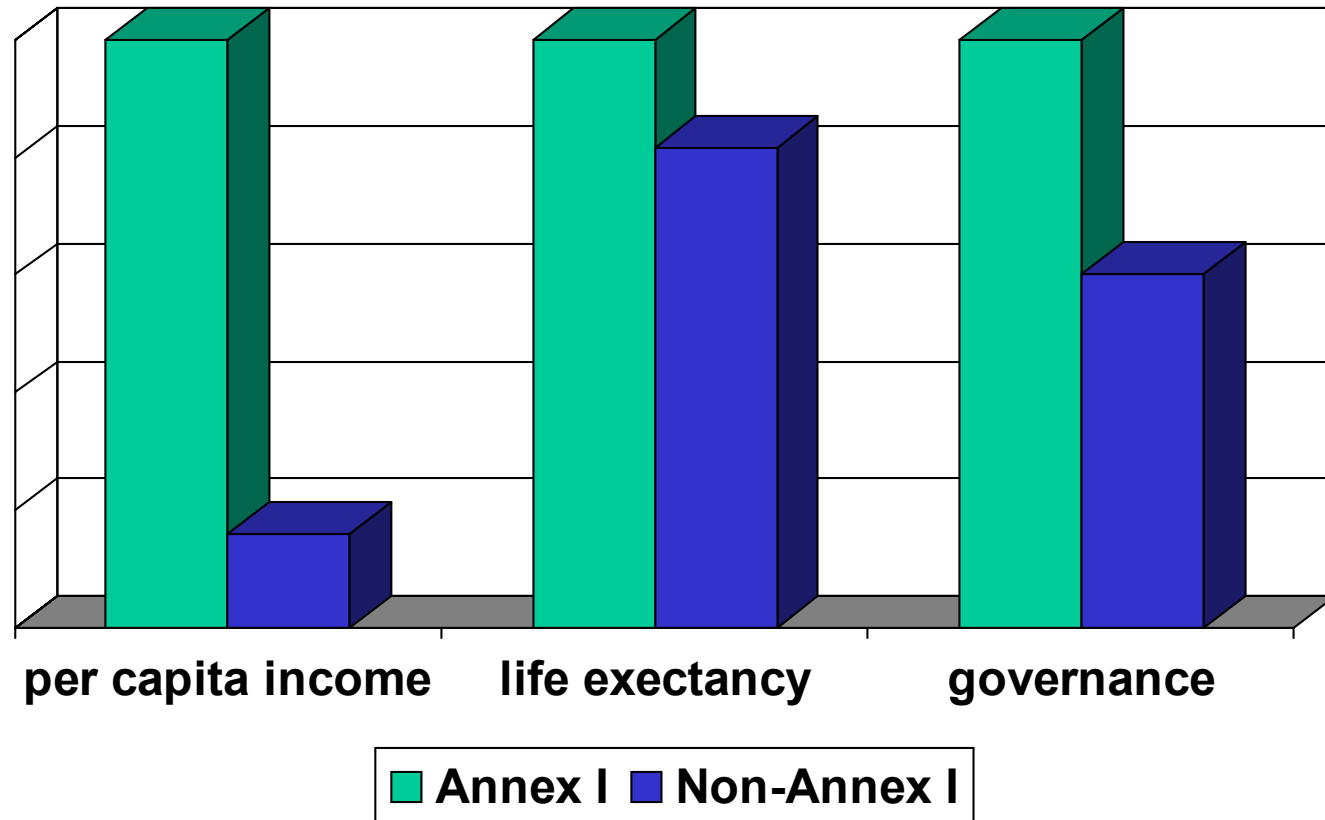
Source: WEO 2002

Development: While economies are growing...



Source: WRI/CAIT

...equity remains elusive.



Source: WRI/CAIT

Architecture Options

- “Kyoto plus”
- Technology
- Development First
- Bilateral/Regional Approaches

“Kyoto Plus”

- Structure of Kyoto is basically ok
 - Economic efficiency addressed ET, JI, CDM
 - Expected to iterate to engage all countries
- Problem for engagement and more stringent commitments is with cost and uncertainty
- “Fix” with price cap, dynamic or non-binding targets

Implications

- **Climate:** Binding cap – if stringent enough, could address climate issues. However, US (and Russia?) have not yet ratified, and agreement to undertake commitments has been rejected by developing countries
- **Energy:** Price on GHGs should decrease energy intensity of GDP. However, it may slow the progress toward full global access. Conversely, it would improve security.
- **Development:** Requirement for institutional regimes could provide ancillary benefits in governance. However, costs are estimate to be a “drag” on economies (although likely less than costs of adapting to climate change itself). Equity requires consideration of balancing development needs in setting targets and specific structural detail.

The Technology Option



Hydrogen Fuel Cell Vehicles



Zero Net Emission Buildings



Nuclear Power Generation IV

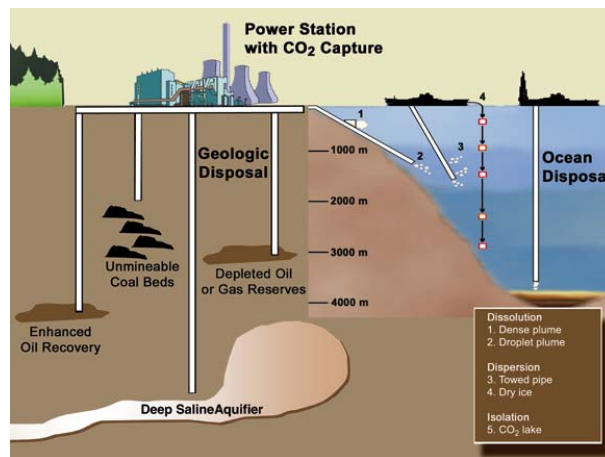
Deep cuts in emissions require advanced technologies **SOON**
No single technology can do it all



Renewable Energy Technologies



Bio-Fuels and Power



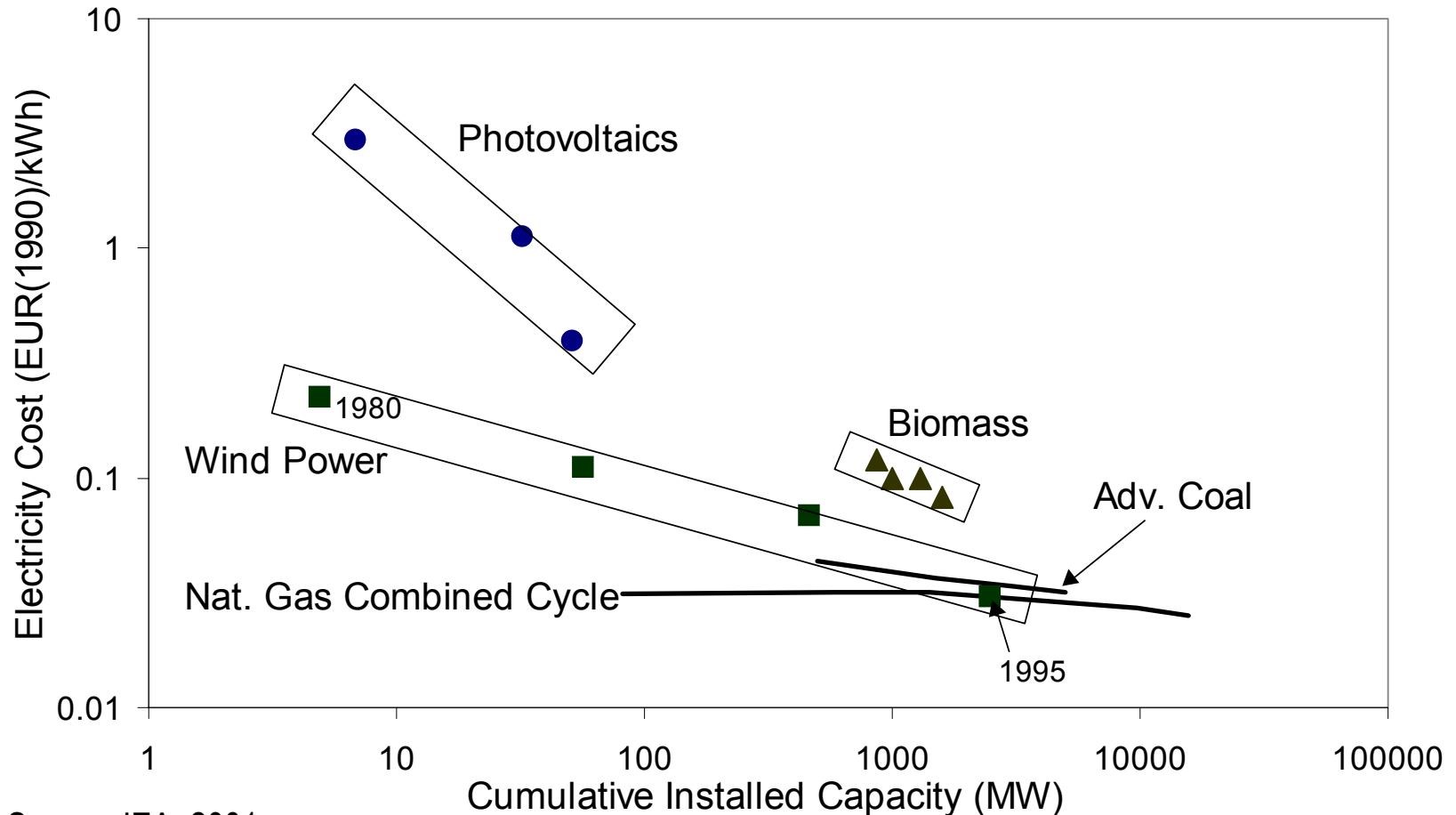
Carbon (CO₂) Sequestration



Vision 21: Zero-Emission Power Plant

New technologies are on a steep learning curve

Electric Technologies in EU 1980-1995



Source, IEA, 2001

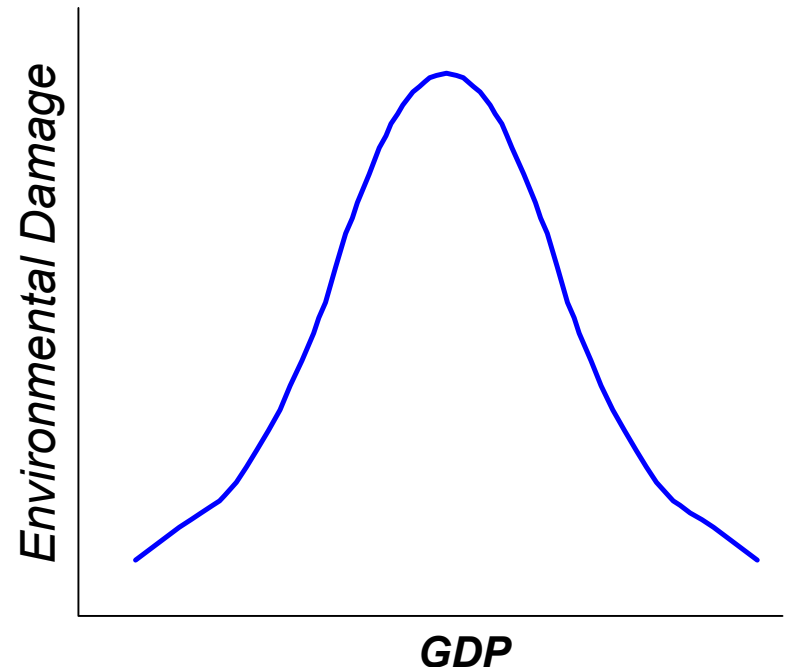
Implications

- **Climate:** Technology could provide long-term solution – if policies to promote market penetration AS WELL AS technology development are deployed.
- **Energy:** Alternatives to fossil fuels may well offset security concerns, although, particularly in the nearer term, they are likely to raise energy prices, and could have a deleterious effect on access.
- **Development:** Majority of the new technology is expected to come from wealthier developed countries – likely exacerbating the inequities between N & S. Higher prices, at least in the near term, could cost developing country economies as well. However, economies without existing infrastructure (and thus less capital stock inertia) could serve as test beds for innovation.

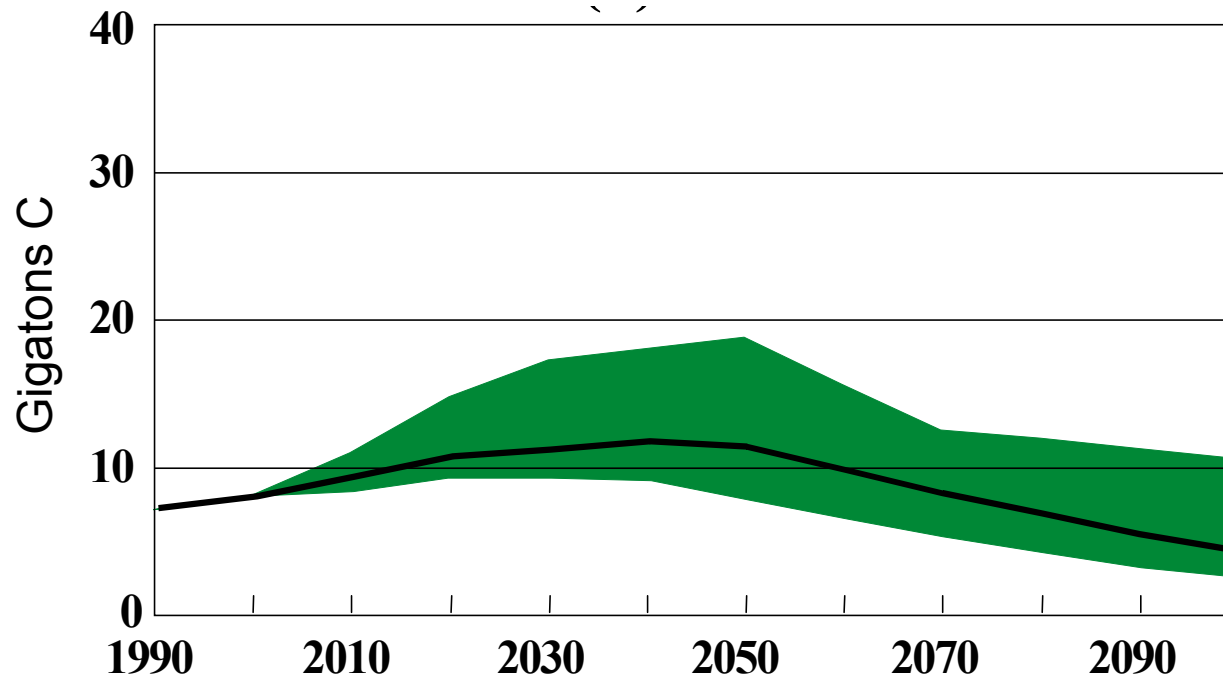
“Development First”

- Developing countries prioritize economic growth over environment
 - No climate protection without economic growth...
 - ...but growth may provide resources for environment.
- Requires development of institutions, capacity to adopt technology, etc.
- Need more environmentally benign development paths than those of OECD

Environmental Kuznets Curve



Global CO₂ Emissions in the B1 IPCC/SRES Scenario



Source: IPCC TAR

Implications

- **Climate:** If growth is “clean”, climate could be protected. However, absence of specific climate focus may delay action leading to stabilization (if achieved) at higher levels.
- **Energy:** As a key component of development, this approach likely to address energy supply from both security and access perspectives. However, doing so will likely drive the use of fossil fuels, particularly coal (at least in the nearer term).
- **Development:** The emphasis on development suggests this element will progress. However, metrics for development, if not balanced with environment, could yield wealth at a high price.

Bilateral/Regional

- Key countries group together to do something about the problem
 - Groupings based on agreed indicator (e.g., level of per capita or national total emissions, etc) or diplomatic initiative
- Actions developed and taken as byproduct of bilateral/group discussions
 - Could still use UNFCCC reporting/inventory as means of comparing and assessing action
- Non-members do not participate – although they may subsequently be allowed to join.

Choosing Partners

EU?
OECD?
ASEAN?



OPEC?
NAFTA?
G-8?

CO₂ Emissions (share of 2000 world CO₂)

United States (24.19 %)
China (12.79 %)
Russia (6.43 %)
Japan (4.93 %)
India (4 %)
Germany (3.56 %)
United Kingdom (2.27 %)
Canada (2.25 %)
Korea (1.85 %)
Italy (1.82 %)

CO₂ / GDP (kg CO₂ per 1995 US\$ PPP)

Iraq (2.4 kg)
Qatar (2.28 kg)
Kuwait (2.13 kg)
Uzbekistan (2.09 kg)
Turkmenistan (1.86 kg)
Ukraine (1.72 kg)
Kazakhstan (1.59 kg)
Bahrain (1.44 kg)
Libya (1.38 kg)
Trinidad & Tobago (1.38 kg)

CO₂ / Population (2000 t CO₂ per cap)

Qatar (59.99 t)
Kuwait (31.53 t)
U.A.E. (23.66 t)
United States (20.57 t)
Bahrain (20.44 t)
Luxembourg (18.24 t)
Australia (17.19 t)
Canada (17.13 t)
Brunei (14.95 t)
Saudi Arabia (12.58 t)

Implications

- **Climate:** If like minded countries do act, could generate major benefits – particularly if these countries are “major emitters”. However, if only a small share of the total is included, results will be limited.
- **Energy:** Depending on steps taken, energy effects could vary. Reduced demand could lower world price – and leave existing fuels more secure. New technologies could also spill over into non-Parties.
- **Development:** Resources unlikely to be transferred outside of group; thus, development could be sporadic. However, if major emitters are engaged, could also find spill-over effects. Overall, poorer countries unlikely to see significant benefits in poverty alleviation or institutional reform from such an approach.

Some Concluding Comments

- Creating a framework combining climate with energy and development policy yields obvious synergies and conflicts.
- However, unless all are addressed in any specific policy, that approach is likely to fail to be adopted (and thus, even if effective on the climate front, not a successful outcome).
- It is most likely that a future agreement will be a portfolio approach, combining these four architecture options.
- It is notable that this framework is itself still incomplete: it does not include a variety of other linked outcomes – e.g., for other economic sectors, or for adaptation