

Indicators for Sustainable Energy Development (ISED)

Alan McDonald

Department of Nuclear Energy, IAEA

Partnerships Fair

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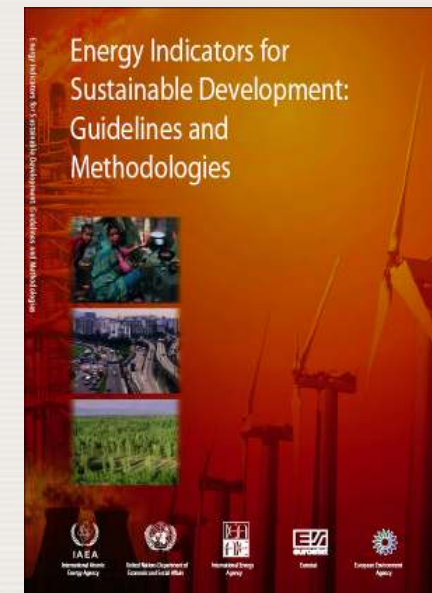


IAEA

International Atomic Energy Agency

Downloadable from the web

- http://www-pub.iaea.org/MTCD/publications/PDF/Pub1222_web.pdf
- <http://www.blackwell-synergy.com/toc/narf/29/4>

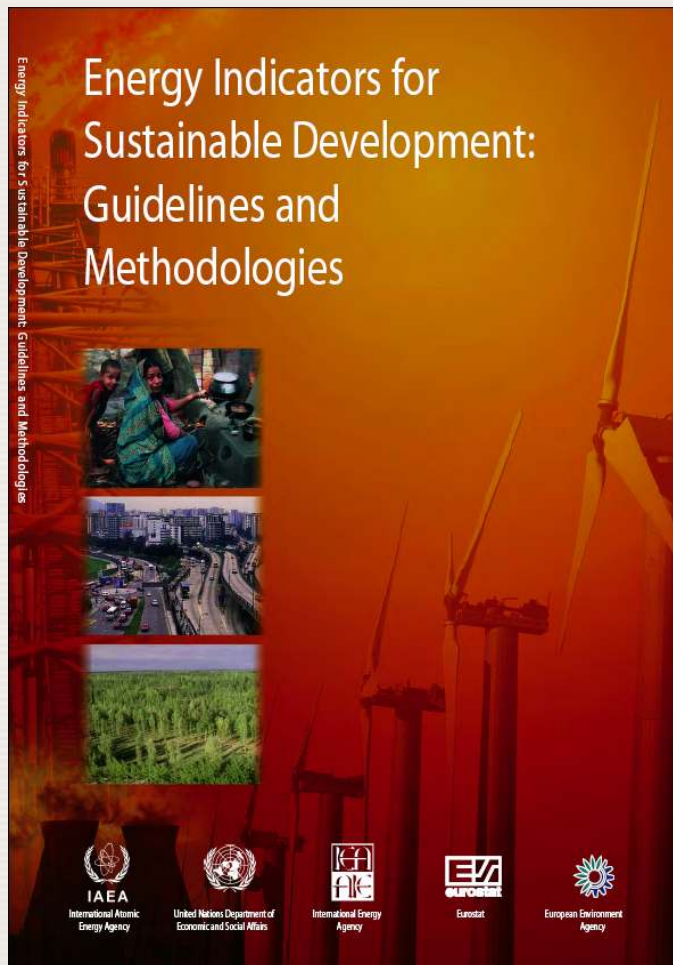


Genesis of EISD

- 1995 work initiated by DESA
- Agenda 21, Chapter 40
 - Development and promotion of indicators for sustainable development
- 3 energy indicators
 - Annual energy use per capita
 - Share of consumption of renewable resources
 - Intensity of energy use



ISED



- 5 agencies
 - UNDESA, OECD/IEA, IAEA, Eurostat, EEA
- 7 countries
 - Brazil, Cuba, Lithuania, Mexico, Russia, Slovakia, Thailand

Design objectives

- Match UN format
 - Main themes, sub-themes
 - Social, economic, environmental, institutional
- Match data availability in most countries
- Clarity and consistency
- Relevant to policy assessment for sustainability
- Pilot testing / adjustment for usability

30 indicators

- 4 social
- 16 economic
- 10 environmental

Social (SOC1)

- **Theme:** Equity
- **Sub-theme:** Accessibility
- **Indicator:** Share of households (or population) without electricity or commercial energy, or heavily dependent on non-commercial energy
- **Components:**
 - Households (or population) without electricity or commercial energy, or heavily dependent on noncommercial energy
 - Total number of households or population

Social (SOC2, 3 & 4)

- Share of household income spent on fuel and electricity
- Household energy use for each income group and corresponding fuel mix
- Accident fatalities per energy produced by fuel chain

14 Economic indicators

- Energy use per capita
- Energy use per unit of GDP
- Supply efficiency
- Reserves-to-production
- Resources-to-production
- End use efficiencies by sector
- Fuel mix (overall, non-carbon, renewables)
- Prices
- Security (imports, strategic stocks)

10 Environmental indicators

- GHG emissions
- Air quality
- Water quality
- Soil quality
- Deforestation
- Solid waste (including radioactive waste)

Not a test or a contest

- Unlike some other indicators, ISED are meant to be used for national analyses – UN system.
- They are not meant to set up pass-fail situations or international benchmarking, although others do use indicators in this way.
- Indicators judge according to established criteria – they do not judge between good and bad
- Intended to motivate the question, “Why?”

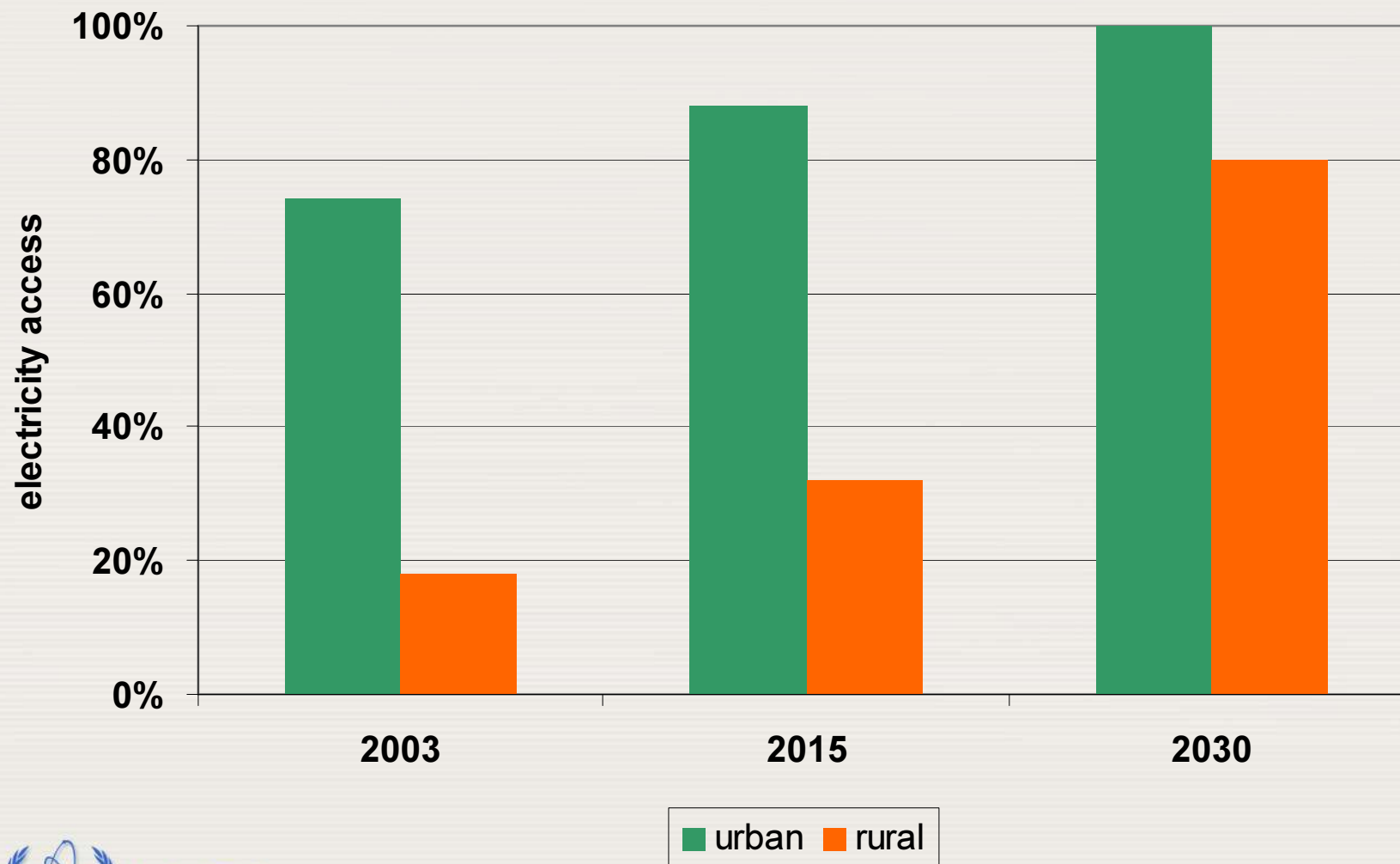
Indicators need context

- Each ISED gives an indication of one aspect of energy use
- Each needs to be read together with other indicators
- Need to be read in the context of each country's economy and resources
- Indicators have proper applications and limitations

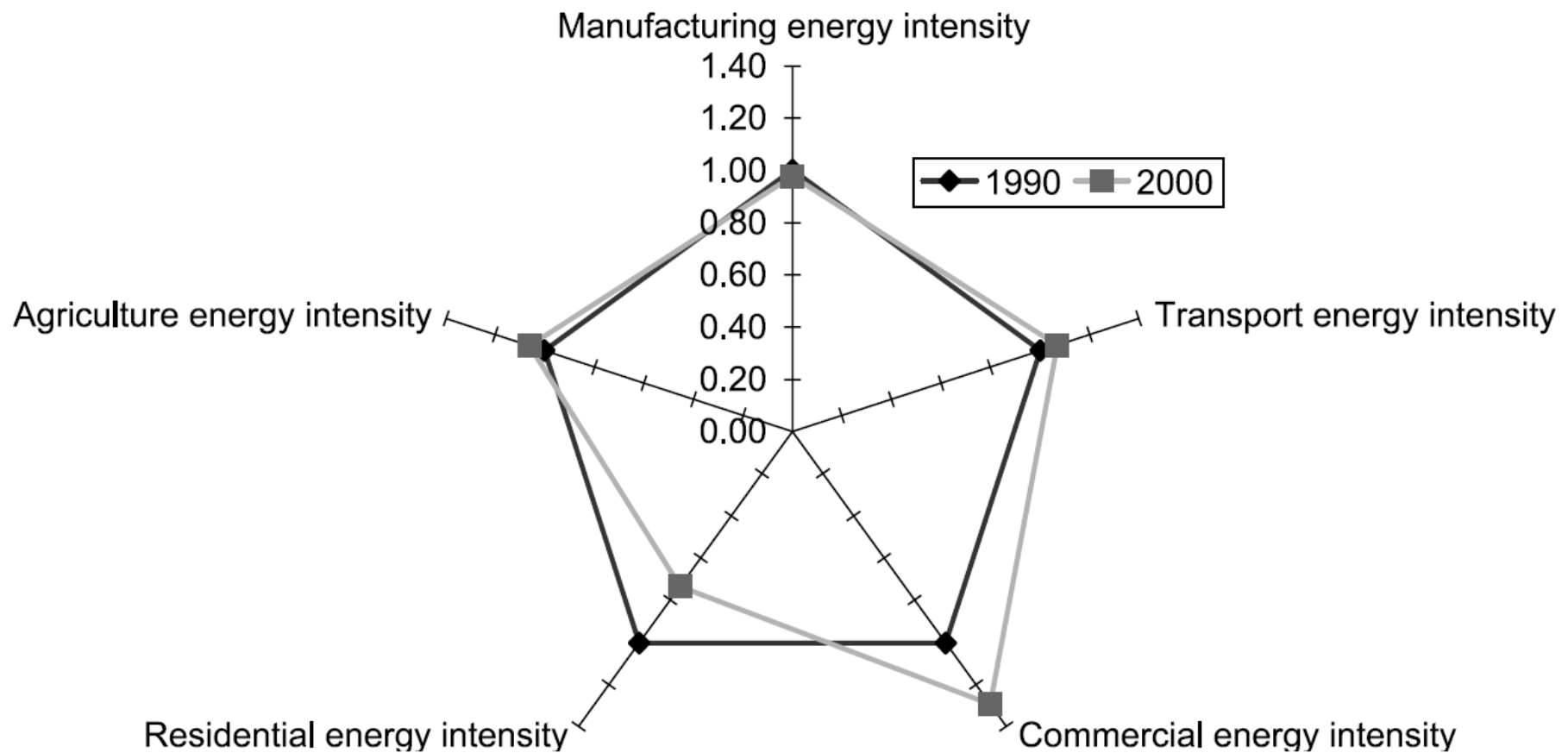
Indicators as a tool

- Indicators are not magic, do not generate magic numbers or magic answers
- Need thoughtful interpretation in context to avoid false identification of causality, etc.
- Can inform policy decisions, help gauge policy effectiveness and unintended consequences

Electricity access in Ghana

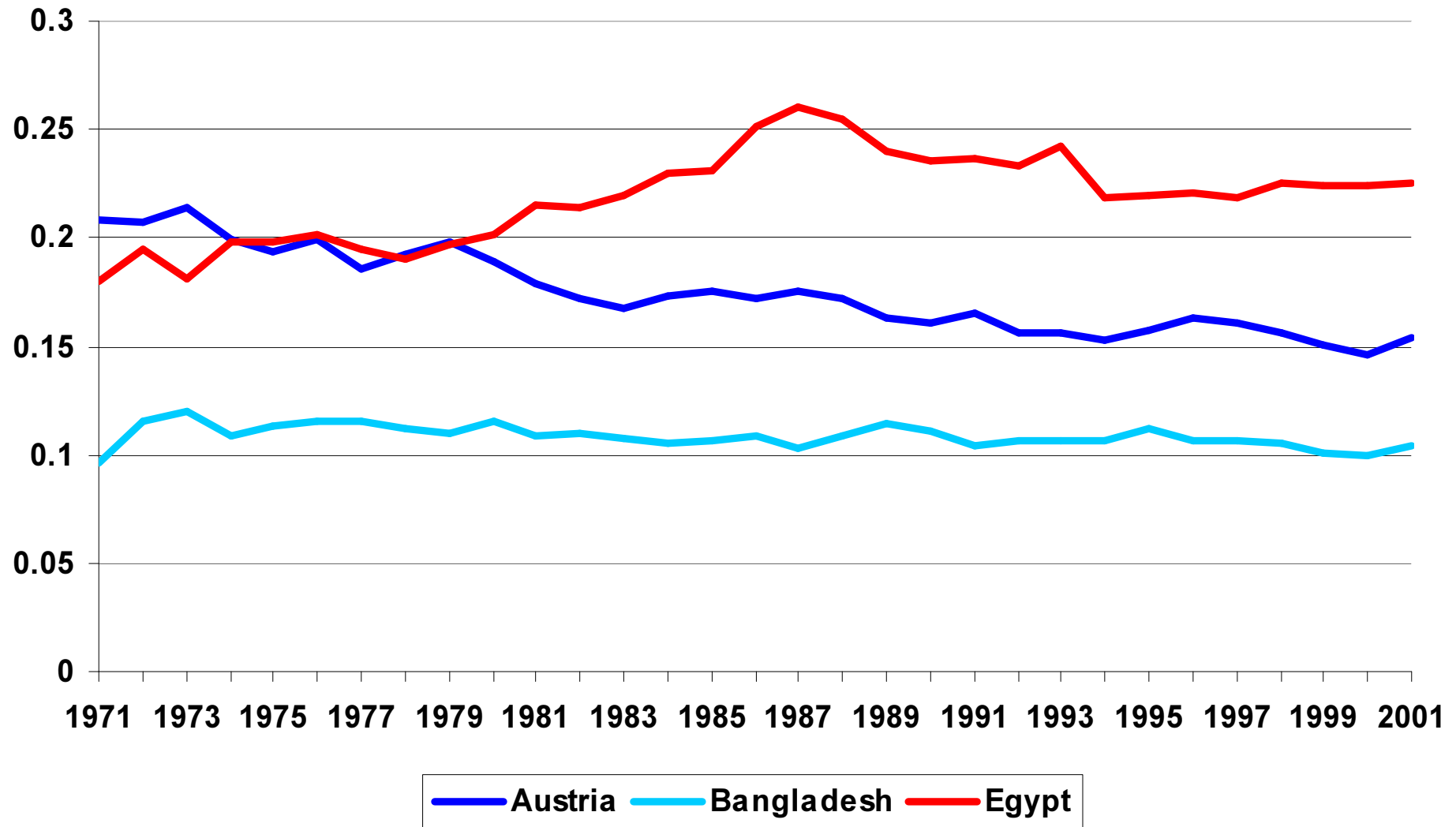


Energy intensities in Thailand



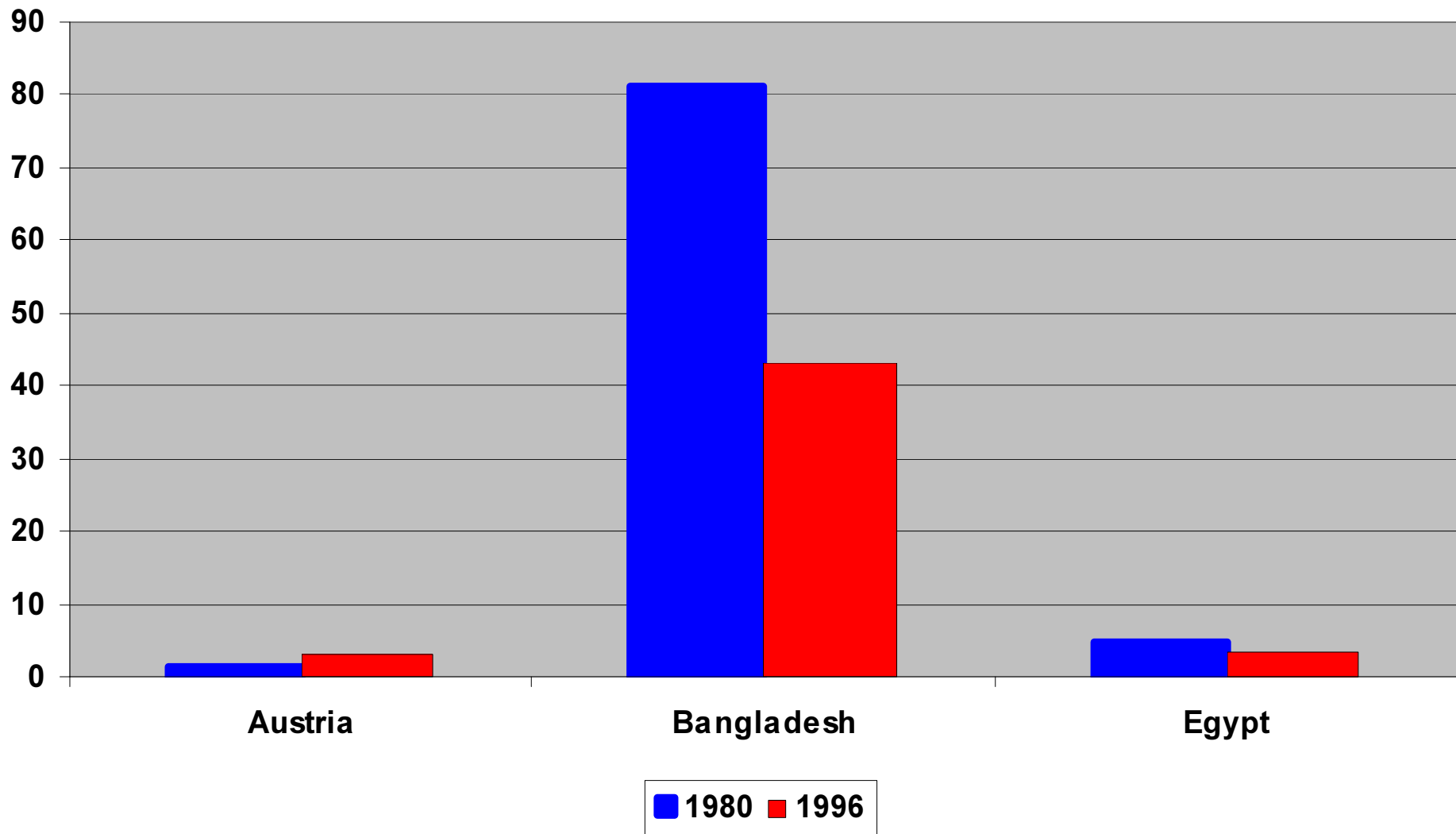
Energy intensity of GDP

TPES/GDP (toe per thousand \$)

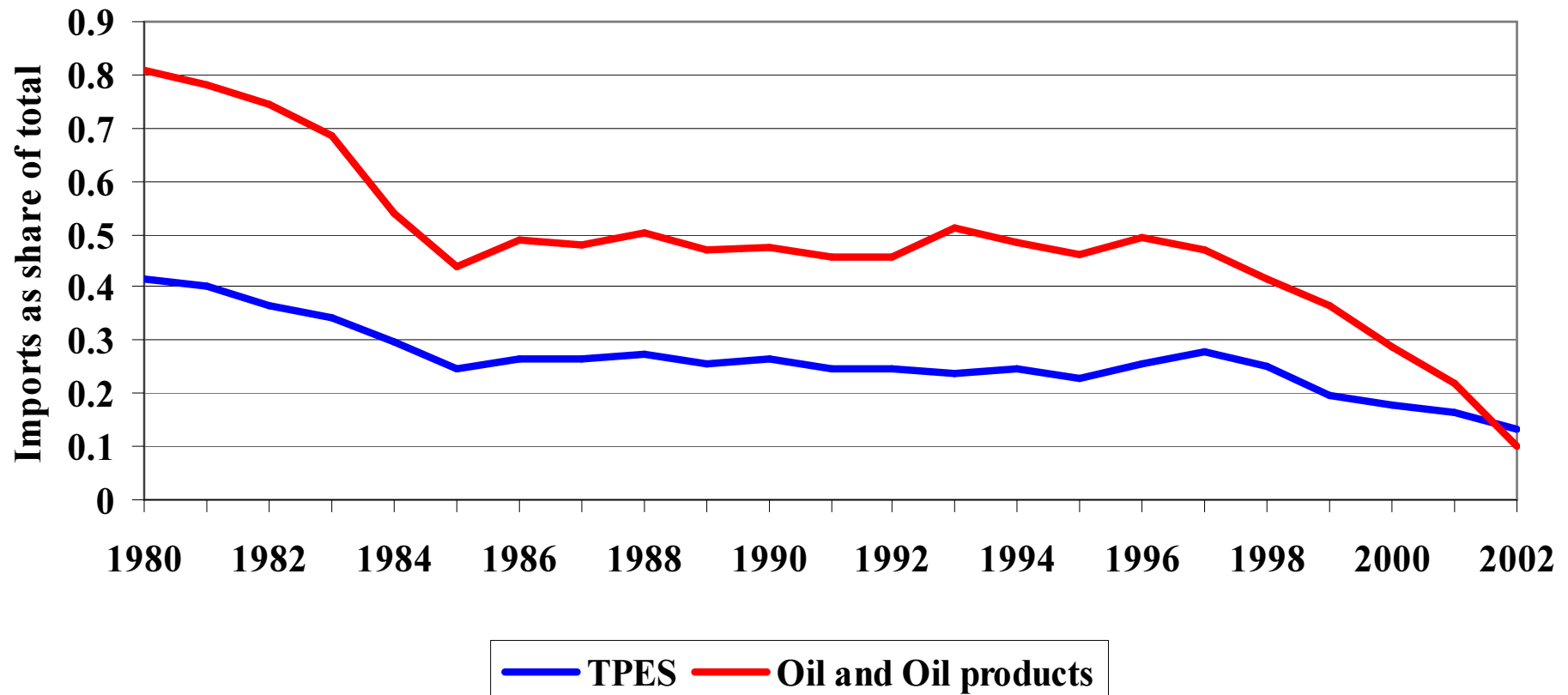


Traditional energy use

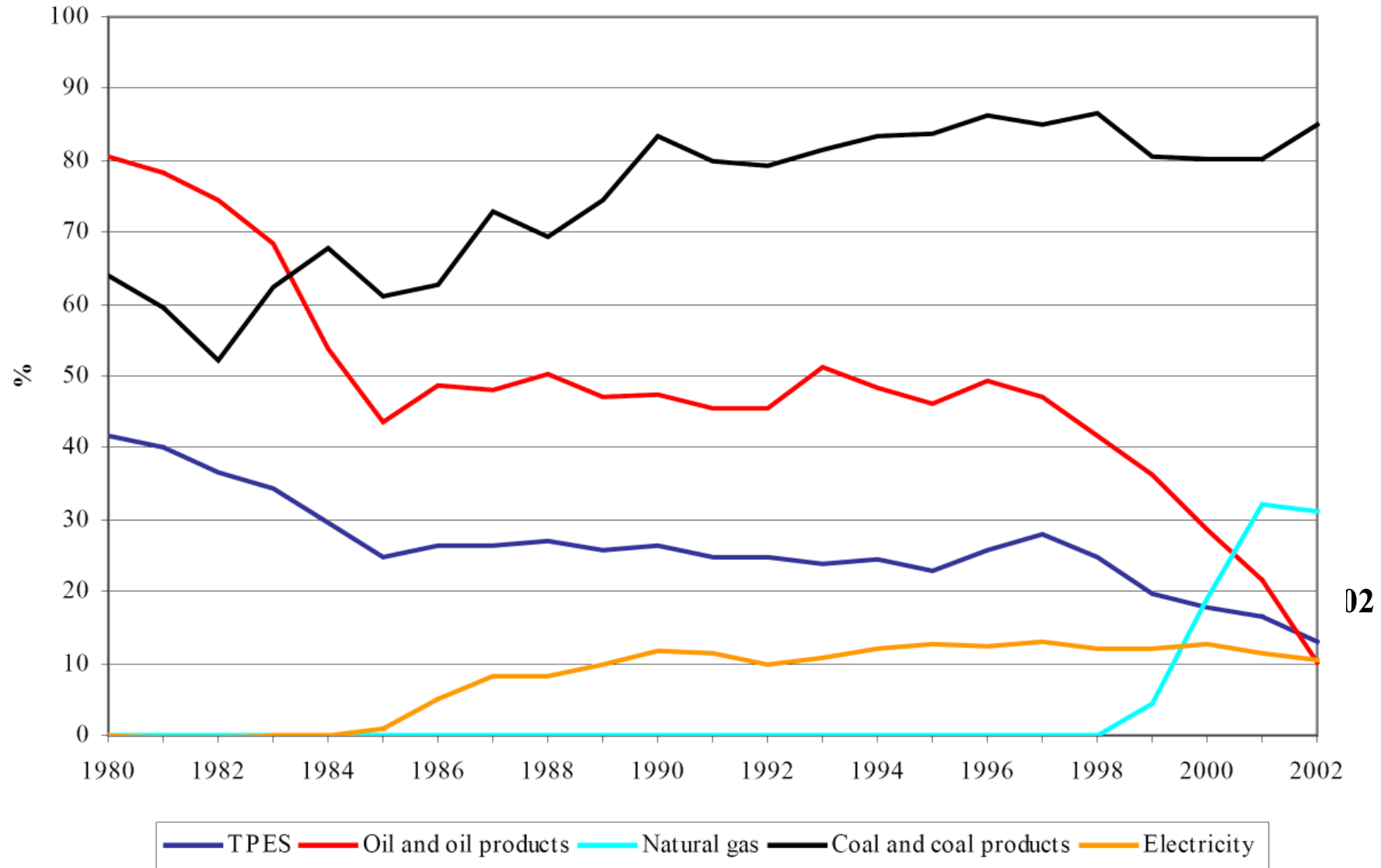
Share of Traditional Energy Use in Total Energy (%)



Brazil net import reduction (1/2)



Brazil net import reduction (2/2)

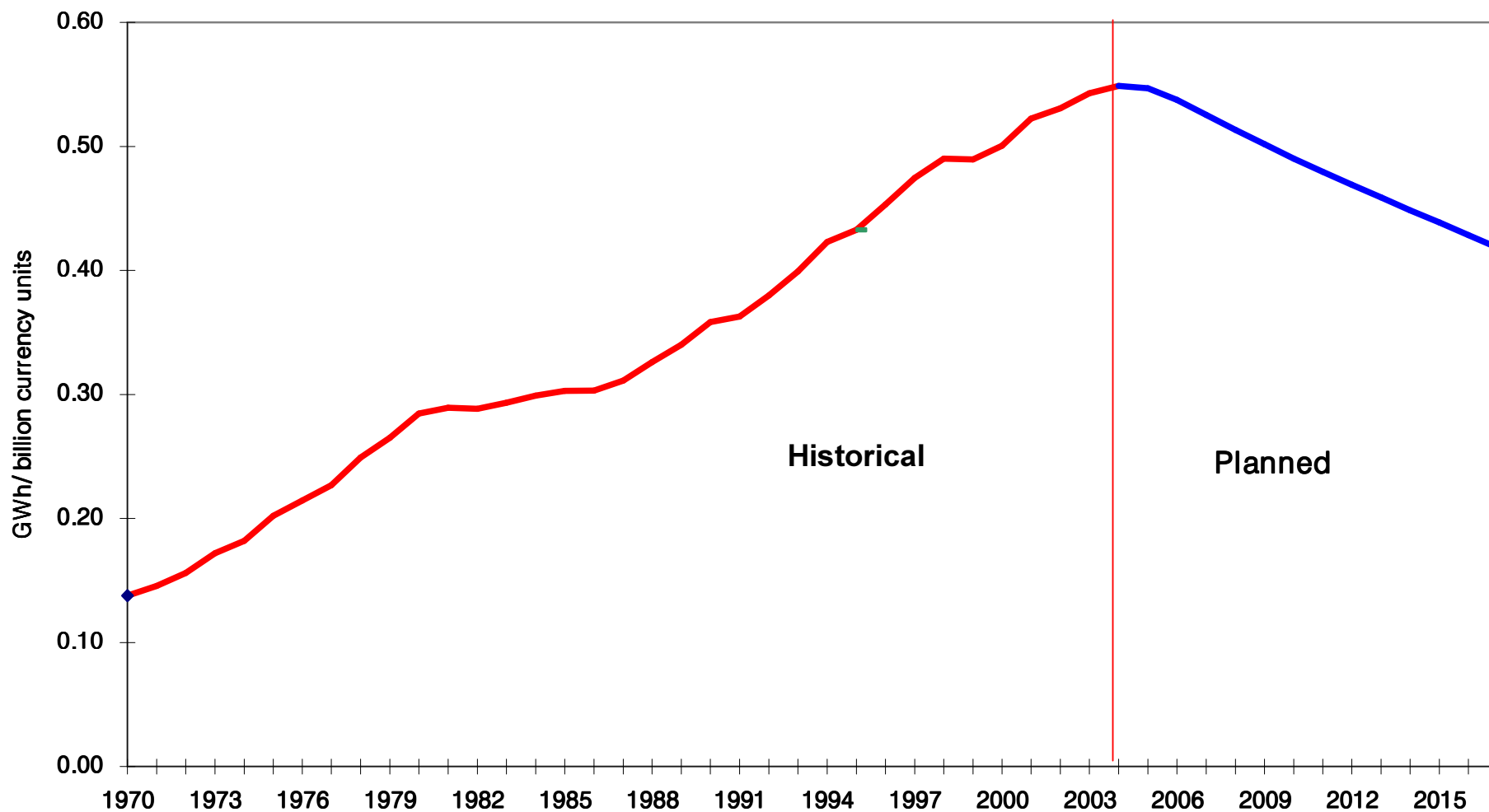


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FIG. 8.1. Net energy import dependency (EISD ECO15) [10].

Electricity intensity of GDP

Electricity/GDP

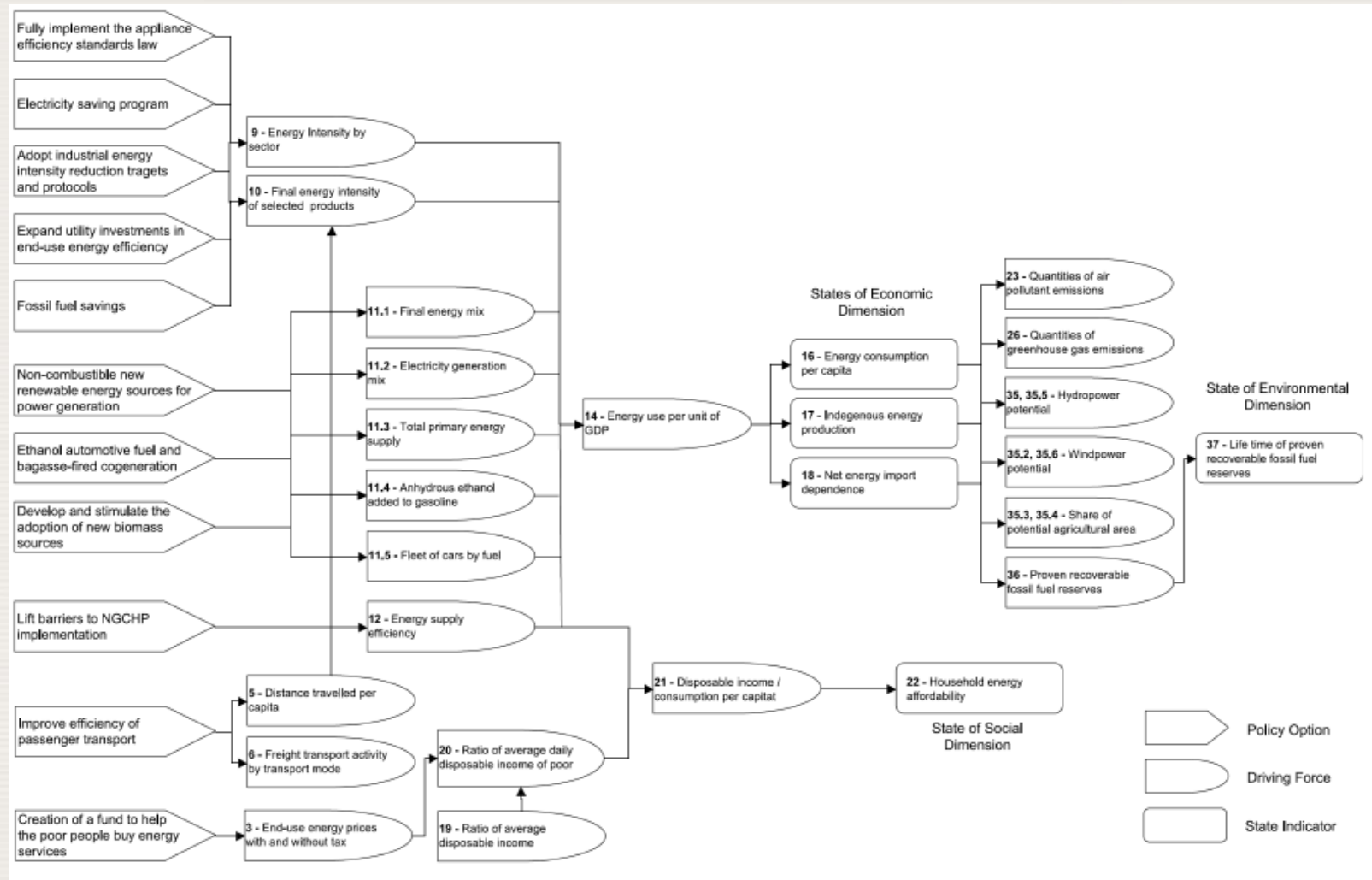


National Plan - Implied Decoupling

- Current National Electricity Plan
 - Ratio of growth rates 0.43 between 2011 & 2015
 - Low compared to Japan & U.S.A

	GDP growth rate (A)	Electricity demand growth rate (B)	Ratio of growth rates (B/A)	U.S.A	Japan
1971-1980	7.5	15.6	2.09	1.03	1.13
1981-1990	8.7	11.2	1.29	0.78	0.95
1991-1995	7.5	11.6	1.55	0.77	-
1996-2000	5.0	8.1	1.64		
2001-2005	5.1	5.4	1.05		
2006-2010	5.0	2.7	0.54		
2011-2015	4.0	1.7	0.43		

Brazil: matching indicators to policies



Capacity building for energy analysis

- Transfer analytic tools tailored to developing countries
- Transfer data on technologies, resources and economics
- Train local experts
- Jointly analyze national options
- Help establish continuing local expertise



Current implementation

- Add indicators to IAEA analytic tools
 - Models calculate indicators
 - Include in databases
 - Include in transfer and training
- Two more possibilities
 - CDM assessment by countries
 - Used by individual partnerships where appropriate

IAEA



...atoms for peace.