Energy Indicators for Sustainable Development: IAEA experience

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Energy Indicators for Sustainable Development (EISD)

- International Atomic Energy Agency (IAEA), Vienna
- International Energy Agency (IEA/OECD), Paris
- UN–Dept. Economics & Social Affairs (UN-DESA), New York
- Eurostat, Luxembourg
- European Environment Agency (EEA)
History of EISD development

Development of Indicators on Sustainable Development by UNCSD

- Commenced in 1995
- Responding to Chapter 40 of Agenda 21
- Concluded with 58 ISD
- 3 are energy related

Development of EISD by IAEA

- Complementing the indicators effort of the UNCSD
- Commenced in 1999, in collaboration with other agencies
- Filling the need for consistent set of energy indicators
Outline

- Why IAEA is working on indicator issues?
- EISD in the three dimensions
- Guidelines and methodologies
- Country applications and follow-up
PESS mission

Building planning capacity in Member States

Only UN organization which is promoting energy planning and assists MSs since the mid-1970s

Why?

• Planning tools are technology neutral
• Many developing countries lack the capability and/or capacity for integrated resource planning
IAEA energy analysis tools

- EBS: Energy statistics
- MAED: Energy demand assessment
- MAWD: Water demand assessment
- EISD: Energy Indicators
- MESSAGE: Energy supply options
- WASP: Electricity supply options
- FINPLAN: Financial plan evaluation
- SIMPACTS: Environmental impacts
Energy modelling & capacity building

• Develop and transfer planning tools tailored to developing countries
• Train local experts in using the tools
• Provide support for planning activities in MS or help establish them
• Assist conducting energy assessment studies (including assessment of energy demand, supply options, environmental impacts, financial options)
• EISD: a tool to assess alternative energy systems from a sustainable development perspective
• 30 Indicators
• 3 Dimensions of SD (economic, social, environment)
• Theme, sub-theme structures
• Guidelines and methodologies
• Country applications and capacity building
Social dimension

Equity
- Accessibility
- Affordability
- Disparity

Health
- Safety (accident statistics)
Economic dimension

Energy use and production pattern

- Overall use (per capita energy use)
- Overall productivity (per GDP energy use)
- Supply efficiency
- Production (RP ratio)
- End use (sectoral intensities)
- Fuel mix
- End use prices

Security

- Imports (net import dependency)
- Strategic fuel stocks
Environmental dimension

Atmosphere
- Climate change (GHG emissions)
- Air quality (concentrations and emissions)

Water
- Water quality (liquid discharge from energy system)

Land
- Soil quality (acidification)
- Deforestation
- Solid waste generation and management (radioactive and non radioactive)
Guidelines and methodologies

- Policy relevance
  - Relevance to sustainable development
  - International conventions and agreements
  - Linkage to other indicators
- Methodological descriptions
  - Principal and alternative definitions
  - Measuring methods
  - Limitation
- Assessment of data
  - Data needed to compile the indicator
  - National and international data availability
EISD – Phases and applications

Phase I (1999-2001):
- 41 ISED were defined
- Conceptual framework developed
- Data availability survey in 15 counties

Phase II (2002-2005):
- ISED refined and reduced to 30 indicators
- Methodological guideline published

Phase II (2002-2005):
- Country application (7 countries) under the IAEA’s Coordinated Research Project framework
- Country study report published (Brazil, Cuba, Lithuania, Mexico, Russia, Slovakia and Thailand)
TOR for the country studies

- Review energy system
- Review statistical capability
- Identify priority areas
- Compile necessary time series to develop the relevant ISED
- Evaluate current situation and expected future development
- Evaluate policies
Further applications by IAEA MS

- Asian TC Regional project ‘Tracing future sustainable paths through nuclear and other energy options’
  - Bangladesh, China, India, Indonesia, Korea, Pakistan, Philippines, Sri Lanka, Thailand
  - Case study report published in 2007

- Country Profile
  - Cuba (2008)
  - Brazil (2006)
Energy and sustainable development: A central role for governments
ISED - Benefits to Member States

• To measure progress towards a sustainable energy future
• To check the progress of past policies
• To evaluate implications and impacts of different energy policies (reality check on policies)
• To evaluate future energy scenarios
IAEA’s assistance in EISD applications

- Assist countries in energy and statistical capacity building necessary to promote energy sustainability
- Demonstrate practical applicability as a policy tool
- Provide assistance in the use of ISED in formulating strategies for sustainable energy development
…atoms for peace.