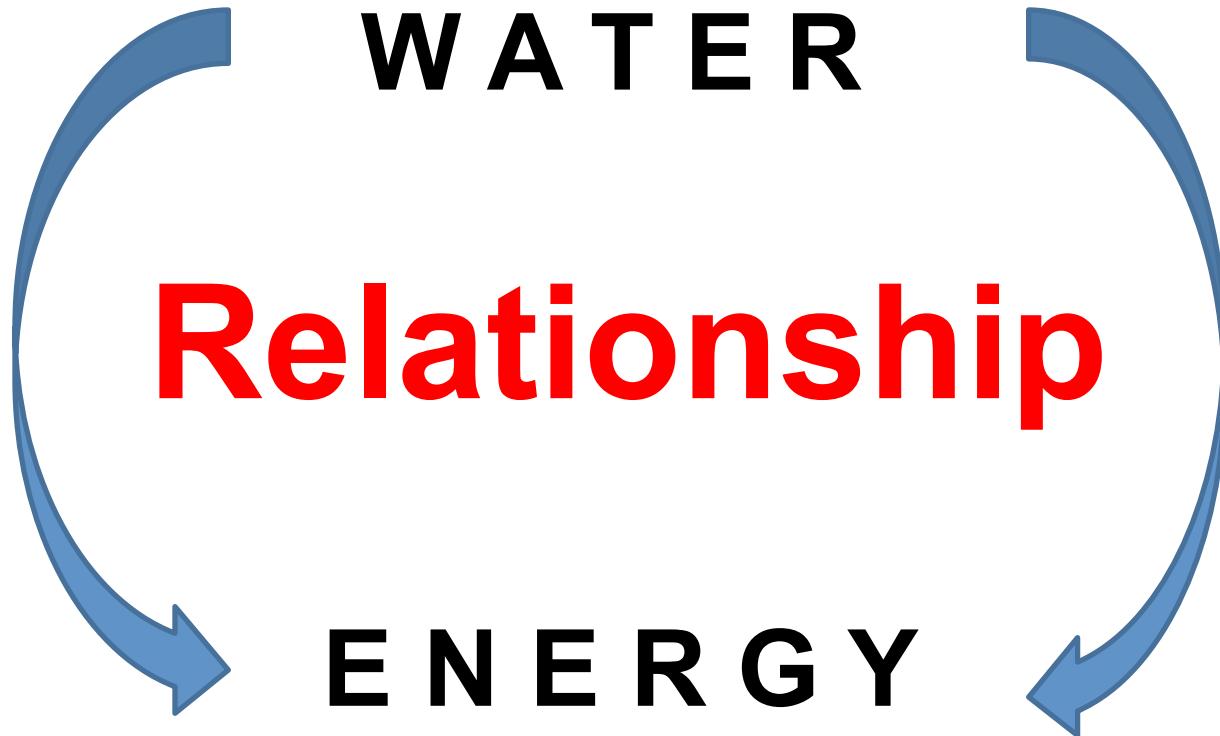




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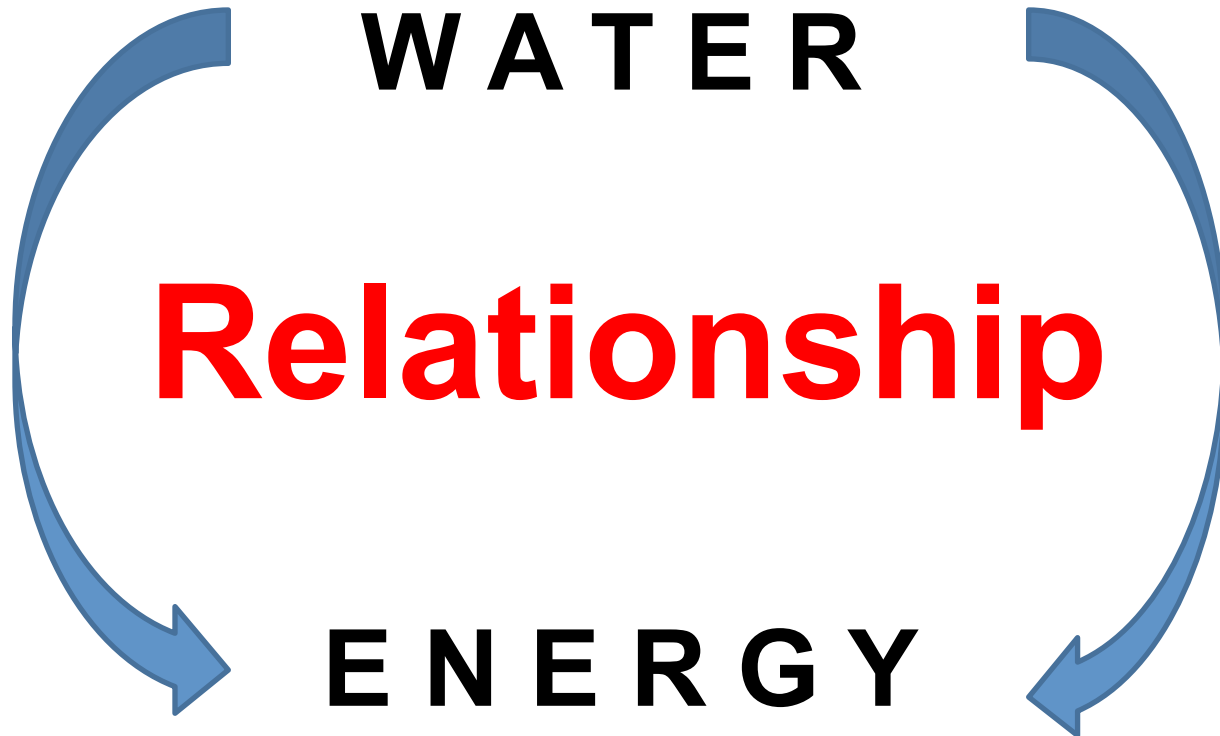


IANAS' ENERGY PROGRAM MEETING
Tucson, Arizona
24 / April / 2017



Dominican Republic

The Dominican Republic:
“A country placed on the same path as the sun.”
First stanza of the poem "There is a Country in the World",
By Pedro Mir (National Poet).



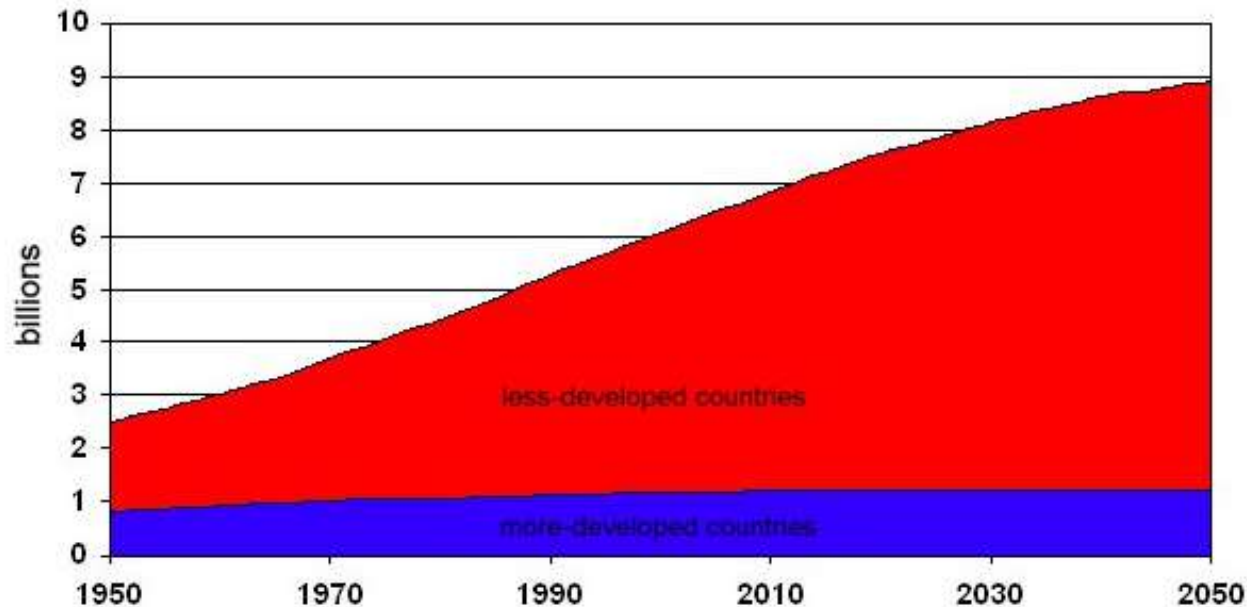
IANAS' WATER PROGRAM MEETING
Medellin, Colombia
21 -22 / November / 2016

Presentation Content.

- **Growth of World Population / Demand Water / Demand Energy.**
- **Relationship Water with Energy.**
- **Relationship Energy with Water.**
- **Integration in Rural Projects.**
- **Challenges to overcome.**
- **Support for Water Quality Book.**

Growth of World Population

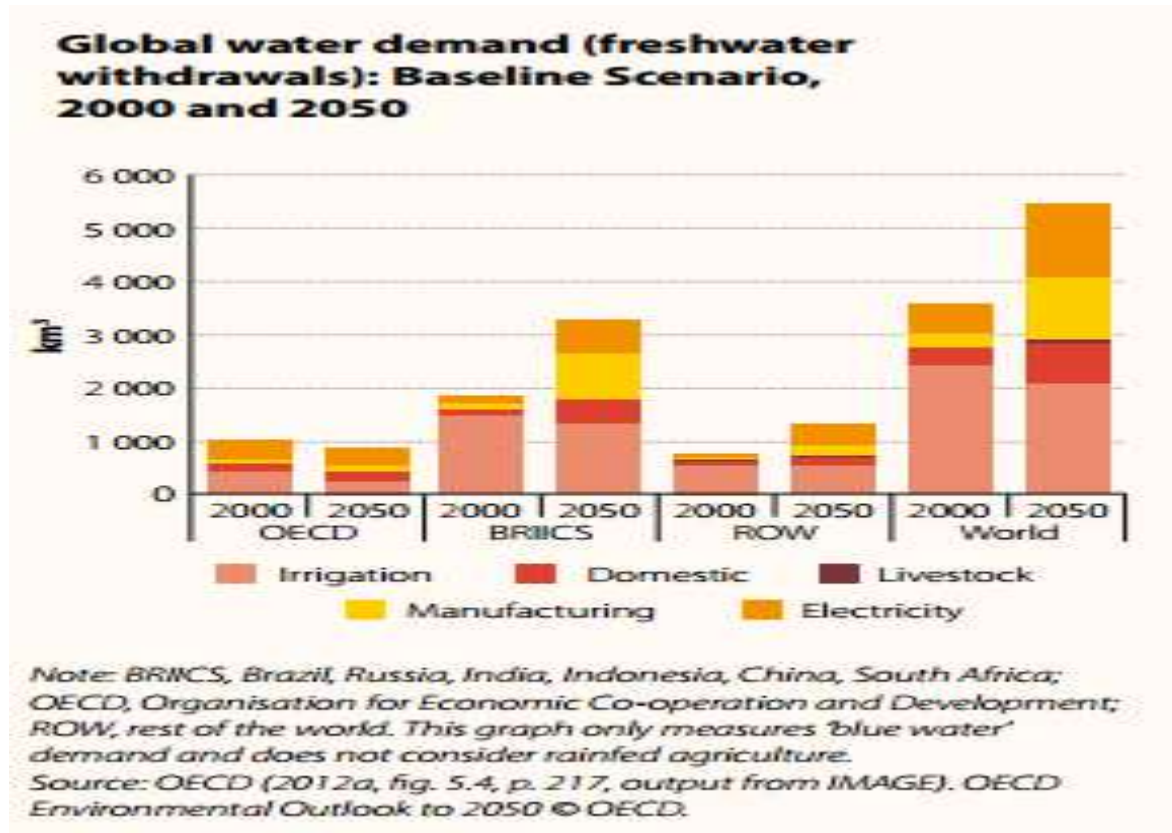
Population Growth in More- and Less-Developed Countries, 2002.



Source: United Nations, World Population Prospects.

World Population Estimate for 2050
9,000 million people

Projection of Water Consumption



According to the UN, global demand for water will grow by 55% by 2050 mainly by the sectors of production and thermal power generation.

Projection of Energy Consumption

Figure ES-1. World energy consumption by country grouping, 2012–40 (quadrillion Btu)

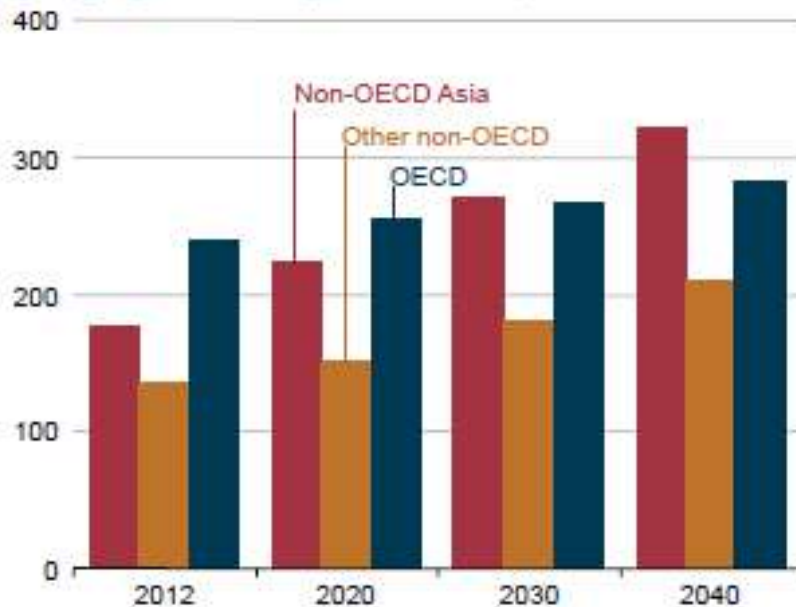
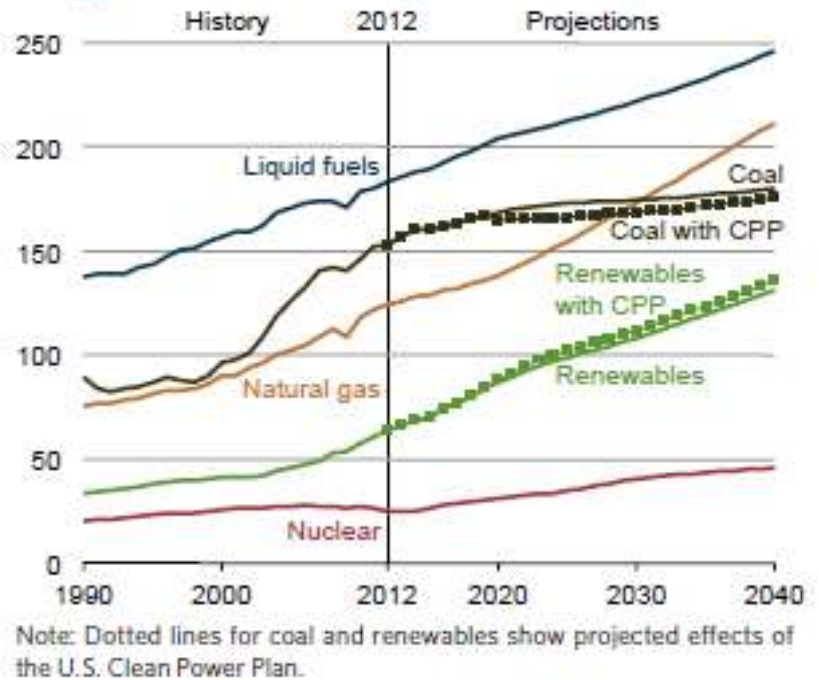


Figure ES-2. Total world energy consumption by energy source, 1990–2040 (quadrillion Btu)



³For consistency, OECD includes all members of the organization as of January 1, 2016, throughout all the time series included in this report. OECD member countries as of January 1, 2016, were Austria, Australia, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. For statistical reporting purposes, Israel is included in OECD Europe. See Appendix M for the complete list of regional definitions used in the IEO2016

Relationship Water with Energy.

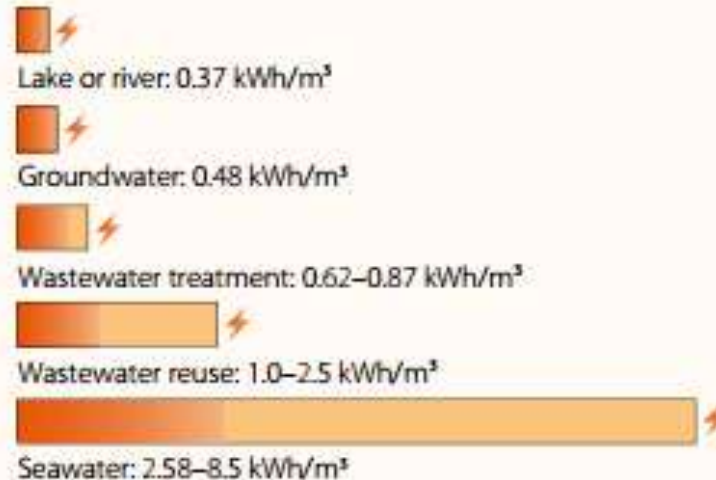
- Use in extraction of Oil, Natural Gas or Bituminous Sands.
- Hydroelectric Power Plants.
- Geothermal: Use of underground steam.
- Thermal Generation : - Water for cooling systems.
- Water for steam generation.
- Seawater energy: Tidal Wave / OTEC / SWAC.
- Biofuels and Biomass: Irrigation of plantations.

Relationship Energy with Water (1).

- Need for water extraction from wells.
- In the pumping for water transmission.
- In the treatment and purification of water.
- In pumping of water for distribution in cities.
- Need for pumping water in Agriculture and Livestock .
- Wastewater treatment.
- Desalination of sea water.

Relationship Energy with Water (2).

Amount of energy required to provide 1 m³ water safe for human consumption from various water sources



Note: This diagram does not incorporate critical elements such as the distance the water is transported or the level of efficiency, which vary greatly from site to site.

Source: WBSCD (2009, fig. 5, p. 14, based on source cited therein).

Integration in Rural Projects.

- Projects of mini hydroelectric power stations.
- Use of water for Electricity Generation, Human Consumption and Agriculture.
- Rural communities development / growth.

Challenges to overcome.(1):

- Increased global consumption of water and energy due to growth of Population.
- Changes in rain patterns.
- Reduction of per capita water consumption.
 - Programs for saving water consumption.
- Reduction of per capita energy consumption.
 - Programs of Energy Efficiency and Rational Use of Energy.

Challenges to overcome.(2):

- Reductions of losses in the distribution of water and energy.
- Changes in agricultural crop patterns.
- Improvement in efficiency in agricultural production.
- Integration of Renewable Energies (Solar, Wind, Tidal Wave, etc.).

IANAS' WATER QUALITY BOOK (1)

- IANAS' Water program.
- Meeting in Medellin, Colombia (21 -22 Nov., 2016).
- Support from Energy Program to make a Chapter about the use of RE for Water Quality improvement
- Julian Despradel was selected as liaison between the Water and Energy programs.
- Confirmed at the Energy Program meeting in Mexico (Dec. 2016). Energy Book presentation.

IANAS' WATER QUALITY BOOK (2)

➤ Proposal for Chapter Content:

➤ State of the Word Technologies.

➤ Technologies used in IANAS members countries.

➤ Future Challenges.

Thank You

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