

# New Total Approach to Energy Statistics and Forecasting

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A more complete energy statistics and forecasting matrix is presented. It allows integrated resource planning in the context of the transition to environmentally compatible sustainable economics. Included are all new renewable options, such as the increasingly important direct and indirect solar energy, co-generation, hybrid systems, small decentralized units, bio energy, ambient temperature utilization by heat pumps, clean fuels like hydrogen and substitutions of muscle powered systems or vice versa, besides the conventional finite and renewable energy sources.

The world energy supply is undergoing fundamental change due to the depletion of mineral resources and environmental constraints. For the enhancement of social and economic development more clean, sustainable energy sources must be harnessed at an accelerating pace, besides more efficient energy uses, if humankind wants to maintain the comforts of modern technology and mobility. The mineral resource depletion midpoint peak will be reached early in the 21<sup>st</sup> Century.

Hydropower and geothermal energy were often the only specifically mentioned renewable energy resources in statistics, sometimes complemented by the growing wind power and biomass with the remark that not much statistical evidence existed about non-commercial energy sources like fuel wood or private water pumps.

Millions of muscle-powered vehicles and work animals were missing in the statistics and thus were not part of any energy models in spite of their huge TWh order of magnitude. A new energy statistics data base methodology and forecasting matrix is presented, which includes all known energy sources in order to make complete energy planning and forecasting possible, based on all viable energy supplies, taking also into account all transport options, since traffic represents one of the main energy demand sectors and hitherto worst polluters.

It is proposed to integrate this comprehensive energy terminology into the ISO13600 standards series to facilitate the analysis of energy systems based on common terms and as a tool for better energy planning and forecasting.