

ENERGY SECURITY TRENDS OF DIVERSE ECONOMIES IN THE 21ST CENTURY

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Overview

Energy security is one of the key strategic spheres of all economies. The paper presents review of energy security trends of twelve diverse economies of the world, considering energy consumption, scale of economy, geographical location (six continents covered), energy supplies and growth in renewables. Study is based on analysis of Energy Security Index (ESI) of the selected economies from year 2000 to 2015. ESI has been estimated as measure of indigenous proportion of energy supplies in the Final Energy Consumption (FEC). ESI has also been separately analyzed for all the four sectors of FEC. The paper examines impact of increasing energy consumption trends in emerging economies, in conjunction with the measures & initiatives taken for energy security improvement, on overall energy security. Paper also reviews the advantage of stagnant energy consumption of developed economies, changes in energy production & imports and the contribution of renewables on energy security.

Energy security trends of Australia, Brazil, China, Egypt, France, Germany, India, Japan, Norway, Pakistan, United Kingdom and the United States of America have been discussed. Each of these economies has been selected for its unique energy security characteristics like swift economic growth & increase in energy demand, substantial increase in local energy supplies, large economy with sluggish economic growth, increase in energy import or export or exorbitant developments in renewables.

Methods

Econometrical studies: (time-series, cross-sections).

ESI time-series has been analysed where ESI has been estimated as portion of Final Energy Consumption (FEC) originating from local energy supplies. Trends encompass fifteen years of developments in the 21st century. Separate analysis of Industry, Transport, Others and Non-energy sectors has been presented.

Results

Key findings are listed below (figures are not reported intentionally):

- Energy security depends upon various factors so the measures taken, even of similar nature & scale, have resulted in different level of improvement in energy security in diverse economies. It highlights that same extent of investment may not bring same level of relief in energy security.
- Developing economies are facing significant challenges even to retain prevailing energy security as it requires equivalent growth in local energy production (whether hydrocarbons or clean energy) on increase in energy demand with economic growth.
- Renewable energy growth has contributed in energy security, however, relatively on a lower scale. Contribution is significant in power generation for few economies.
- Increase in energy production by few countries and corresponding increase in export has indirectly improved energy security of importing countries by providing additional alternative for energy imports.
- Internal increase in specific energy consumption, whether coupled with economic growth or not, irrespective of net energy importing or exporting country, reduces degree of freedom to sway energy security.

Conclusions

Energy security is counted as a vital indemnity for economic growth. Energy security is a dynamic attribute and changes on any change in energy and economic portrait. Review of energy security trends of twelve diverse economies has revealed that measures and initiatives for energy security improvement imprints different impact on energy security of different economies, as per their respective energy and economic circumstances. Analysis has also indicated that developing economies are at disadvantage, compared to developed economies with stagnant growth, in sustaining or improving energy security. Study has showed that local increase in energy production increases while domestic increase in specific energy consumption decreases influence on energy security. Study has also indicated

that except for few economies, in general renewable or clean energy growth has relatively small impact on energy security as of now, though increasing.

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