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# Energy as a global challenge

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Appropriate matching of energy supply with energy demand is one of the most formidable challenges facing humankind today and in the near future.

On the supply side, although fossil fuels do have the potential for satisfying energy demand for at least a few decades –especially in light of the recent massive introduction of shale gas in the international market, heavily relying upon such resources does not appear to be a sustainable solution even in the medium term, as questions and doubts arise from both the economic and environmental standpoint. Renewable resources are gaining importance as alternative energy supply: they have an enormous potential and many renewable-based technologies are competitive on the market today. However, renewables face and pose major challenges (but also offer great opportunities) while entering the current very structured energy system, as a broad rethinking is needed of energy policies, market dynamics, and infrastructures.

On the demand side, there are two opposite trends at the global level. In the OECD countries there is a strong push towards the reduction of energy demand by acting along the entire energy value chain, both by considering efficient energy conversion technologies, and by promoting awareness and technology-based energy-saving solutions for the end user. Conversely, BRICS and developing countries strongly rely on energy for sustaining their economic growth, resulting in a marked increase in energy demand.

In this contribution, I will provide a critical overview on the global status and trends of energy demand and supply, outlining current strategies to improve the appropriateness and sustainability of energy supply, and to mitigate energy demand. Then, I will describe and exemplify some important indicators enabling the evaluation of the energy quality according to such strategies. Finally, I will show the high degree of complexity of the energy issue caused by the interplay with a number of other interconnected global challenges, such as a growing world population, access to food and water, human health, environmental issues, and security.

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Figure 1: V. LUGHI

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