

The need for widespread new developments in energy engineering

Energy is the cornerstone of the current economic model and living standards of society. The energy demand has been exponentially increasing since the industrial revolution, consuming large quantities of fossil fuels (petroleum, natural gas, and coal) that support over 80% of the world's energy demand [1]. On the one hand, this energy model is driving the accelerated depletion of the fossil fuel reserves that, at the current pace of consumption, are forecasted to be depleted before the end of this century. Additionally, the use of fossil fuels has severe environmental consequences including, but not limited to, global warming, and climate change. Fossil fuels related emissions are the main driver of global warming and climate change. The environmental consequences of energy consumption patterns are more evident now than ever before [2]. As a result, there are several campaigns worldwide promoting higher energy efficiency standards and higher developments of alternatives energy sources to replace fossil fuels. Alternatives like nuclear energy, considered a cleaner source of energy than fossil fuels, were implemented in the past. However, incidents like the accidents in Chernobyl and Fukushima show that nuclear energy has implicit risks that must be carefully considered. Other alternatives based on renewable energies are in different levels of technological development, in most cases facing economic, technological, and other barriers. In particular, the use of renewable sources is assessed by checking the share of renewable in the energy mix. However, in poor and developing countries the use of cooking wood, which is an unsustainable use of renewable sources causing deforestation, soil erosion, and other impacts, is significant. This and other unsustainable energy-related practices must be highlighted, discussed, and addressed.

To address the increasing demand for energy and its environmental consequences on a global scale, the United Nations targets one of the sustainable development goals to 'Ensure access to affordable, reliable, sustainable and modern energy' [3]. To reach this goal, it is required to at least [3]:

- To increase the improvement rate of energy efficiency that currently falls short in face of the global challenges.
- Provide access to clean, safe, and affordable cooking fuels and technologies for some 3 billion people worldwide
- Expand renewables beyond electricity generation.
- Expand the electric service for the nearly 800 million people lacking electricity worldwide
- Increase the share of renewables in the energy mix

Currently, renewable sources are the mainstream to replace fossil fuels, with increased development of bioenergy conversion systems based on solar, Eolic, biomass, hydraulic, marine, and geothermal sources. However, renewable sources have different characteristics and technological requirements for energy conversion. Moreover, although many environmental benefits have been advertised for renewables, different studies proved that in many cases these benefits are questionable [4] and most published carbon footprints or LCAs, presume that biomass heating fuels are carbon neutral. However, it is recognised increasingly that this is incorrect: biomass fuels are not always carbon neutral. Indeed, they can in some cases be far more carbon positive than fossil fuels. This flaw in carbon footprinting guidance and practice can be remedied. In carbon footprints (not just of biomass or heating fuels, but all carbon footprints).

Overall, there is a global need to study and address issues to further expand energy efficiency strategies and technologies, to upgrade and develop alternatives and technologies to increase bioenergy conversion systems and further expand renewables in the energy mix, and approaches to expand the energy infrastructure to meet the sustainable development goals. In general, poor and developing countries, particularly in Latin America does not escape this reality and have several challenges to address affordable, reliable, and sustainable energy exploitation.

The journal Latin American Development in Energy Engineering aims at becoming a platform for researchers and academics to widespread the new developments in energy-related research fields, including its policy and economic implications relevant to address issues and barriers in Latin America and other poor and developing countries worldwide.

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