



Analysis of the Competitive Advantages and the Impact of the Green Energy Resources Utilization at the Mmicro and Macro-Economic Level Financial Analysis and Evaluation

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Abstract

Current energy approaches address natural issues including ecologically benevolent innovations to build vitality supplies and empower cleaner, progressively proficient vitality use, and address air contamination, nursery impact, a worldwide temperature alteration, and environmental change. The requirement for energy and related administrations to meet human social and financial improvement, prosperity and wellbeing is developing. The arrival to sustainable power sources to help relieve environmental change is a fantastic methodology that must be reasonable to meet the vitality requests of who and what is to come. Sustainable power source can possibly assume an essential job in furnishing vitality with manageability to the immense populaces in creating nations who so far have no entrance to clean vitality. We are taking a gander at the open doors related with sustainable power sources, including: vitality security, access to vitality, social and financial improvement, moderation of environmental change and lessening the effect on nature and wellbeing. Despite these opportunities, there are difficulties that hamper the maintainability of sustainable power sources to moderate environmental change.

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These challengers incorporate market failures, absence of data, access to crude materials for the future utilization of sustainable assets, and our everyday carbon footprint.

As the worldwide picture of things to come developments in industry, transportation and families' utilization of vitality will drive more than 12 billion tons for each year, it is intriguing to break down the curiosities that utilization's changes will map under the world's increasing population.

Keywords: renewable energy sources; climate change mitigation; sustainability issues; clean energy; carbon footprint; environmental sustainability engineering.

1. Introduction

Globalization has involved huge benefits for humankind, from health improvements to culture diffusion and economic growth [1].

In the latter aspect, globalization is to a large extent responsible for the economic growth of entire countries, e.g. Singapore or China [2].

However, where local companies could not compete with foreign companies on a level playing field, globalization has caused loss of jobs and a certain impoverishment locally [3].

The most important economic effect of globalization, other than reducing the prices for goods and taking people out of poverty, is probably the increase in trade. For example, between 1970 and 2002 imports as a ratio to world gross domestic product (GDP) increased from around 12% to above 24% [4].

Other economic effects include foreign direct investment (FDI), e.g. where foreign companies either acquire local companies or set up local branches or production facilities, and the financing of local investment with foreign funds as seen e.g. in offshore wind farms in the North Sea [5].

On the other side, a number of negative effects have affected how people see globalization, from changes in land use resulting in the destruction of forests to make room for cash crops [6] to the delocalisation of manufacturing to countries with lower labour costs and less-strict environmental regulations [7].

One interesting aspect of globalization, one that directly affects the object of this research, is the interdependence between innovation and trade. Innovation is a competitive instrument, with

producers trying to fight off rivals with the aid of improved products and processes [8].

Innovation, referred to improvements in processes and products, is also a driver behind better quality and lower cost, the two key competitive elements in any established industry.

2. Literature review

Previous research has explored globalization connected to different industrial sectors. Gourevitch and his colleagues explored the effects on the hard disk drive (HDD) industry [9].

This industry had, at the time, worldwide revenues of \$30 billion, which is of similar order of magnitude as the turbine manufacture industry at around \$53 billion.

Although firms from the US dominated the industry in its beginnings, locally manufacturing around 80% of the world's HDD, and thus proved to be the most innovative firms, production moved to Asia by 1995. That year, while “over 80% of the world's hard disks were made by US firms, less than 5% of drives were actually assembled in the US”. In terms of employment in 1995 “only 20% of the world's employees in the HDD industry worked in the United States, yet over 60% of the wage bill paid by US firms were earned in the United States” [10]. The globalization of the pultrusion technology industry suggest that already some time ago low labor costs stopped being the most significant element behind delocalization of production to

emerging economies. In this case, vicinity to significant markets as the case of China e was a major reason [11].

Incidentally, the pultrusion industry is indirectly linked to wind energy in that they both use fiberglass, the main material in rotor blades [12].

The globalization of the mechanical industry in Italian industrial clusters shed some additional light on the relationships client company

local suppliers that can help understanding how to promote a local supply chain [13], something that will be reviewed later in this paper.

The analysis of globalization of the energy field can be focused on trade of energy resources and fuels or on means of exploring, transforming and exploiting energy e the latter perhaps linked more to industrial policy that to energy policy. The globalization of conventional energy resources (coal, natural gas, nuclear fuel, and oil and oil products) was explored by Overland, who found that it is growing and accelerating [14].

Renewable energy resources are globally available per nature: solar, wind, water and biomass is present everywhere although to a different extent. Energy products from renewable energy sources (e.g. pellets from biomass) are traded [15] and thus subject to globalization.

The energy industrial sector is significantly globalized with multinational corporations operating worldwide. Further, there is evidence of the positive impact of policies in the development of the wind industry [16].

3. Potential of renewable energy technologies

With conventional fossil-fuel-based energy systems still dominating energy investment, the introduction of new and emerging energy technologies needs to be assessed over a longer time scale. Such time scales are consistent

with IPCC emission scenarios, which common sense tells us will not occur overnight.

Renewable energy technologies hold great potential to satisfy basic needs and to support poverty alleviation and sustainable development. There is a range of commercially available, field-proven renewable energy technologies, including solar, wind, geothermal, biomass and hydropower, but they are not yet widely enough used in tackling the shortfall in access to energy services [19].

In its Global Energy Outlook, the International Energy Agency (IEA) states that production of primary energy from renewable sources is expected to grow rapidly, but that the impact of renewables on the global energy mix will remain relatively small in the next two decades.

From 2020 onwards this situation is expected to change significantly, driven especially by environmental concerns, but this shift will require governments and industry to act together and to invest heavily in technology and infrastructure [17].

The modularity and decentralized nature of renewable energy technologies make them particularly well suited for rural energy development and an environmentally sound alternative to grid extension.

To speed the introduction and adoption of renewable energy systems, the key issues are expanding access to the technologies and reducing their costs.

This can be done through supportive policy measures, market incentives and promotion activities.

As the G8 - Renewable Energy Task Force has recognized, expanding markets in industrial countries will be essential for bringing costs down. Costs cannot be reduced through activities in developing countries alone. Moreover, developing and industrial countries together will need to work to expand the manufacturing, assembly and service capabilities in developing countries to begin to make inroads in meeting the challenge of increasing access to energy services. Worth special note are modernized biomass technologies that provide fuels and electricity to meet rural energy needs; these are particularly promising and an area ripe for transfer to developing countries. This will require unique approaches to address technology, financing and capacity development efforts that support biomass generation where the natural resource base is sufficient. Enhanced regional and international co-operation will be important in identifying the appropriate entry points for supporting the expansion of renewable energy. UNEP's contribution in this regard is described.

4. Fossil fuel technologies

For at least the next several decades, fossil fuels will continue to be the primary energy supply option worldwide when considered as a proportion of the global supply mix. The challenge is how to use them more efficiently and how to reduce their negative environmental effects.

Fossil fuel resources are still abundant on a global scale. Even taking into account short-term price fluctuations, the trend towards relative price stability is expected to continue for the next 20–30 years.

There are significant regional differences, however, and the uneven geopolitical distribution of resources and demand means that any projections are subject to a high degree of political uncertainty.

Security of energy supply has become an increasing concern, first in the USA and now in the European Union.

The transition to cleaner and more advanced fossil fuel technologies is recognized as essential to support sustainable development. This is particularly important in developing countries, where the rising demand for energy services and growing populations will drive the largest demand for new installed capacity for electricity and increased supply of clean fuels.

Efforts should be focused on efficiency improvements in power plants, wider access to existing technologies, and research and development for advanced energy systems and fuels.

In order for developing countries to move to cleaner, more advanced fossil fuel energy systems, collaboration and cooperation at the international and regional levels are necessary. Given that the most rapid advances in these technologies have occurred in industrial countries, technology and information exchange is important for speeding up the transition to improved energy systems in developing countries.

This will need to be done so that developing countries can maintain, service and potentially manufacture and assemble the equipment, enhancing their own energy self-sufficiency and security.

Regulatory and financing mechanisms will serve as the foundation to encourage the adoption of clean fossil technologies. Government will need to establish guidelines and norms for regulations that will make this happen in a clean and sustainable manner.

A potential major incentive for stimulating technology transfer is the Kyoto Protocol mechanisms, including the Clean Development Mechanism. Through this, developing countries can use *technology leapfrogging* to actively advance their sustainable development objectives while reducing greenhouse gas emissions [20].

5. Challenges affecting renewable energy sources

Renewable energy sources could become the major energy option for low-carbon energy savings. Other changes to all energy systems are needed to make renewable sources of energy available on a large scale. Organizing the transition of energy from non-sustainable energy to renewable energy is often described as the major challenge of the first half of the 21st century.

The following are policy recommendations from the study that can help mitigate climate change and its impact:

- All sectors and regions have the potential to contribute by investing in renewable energy technologies and policies to reduce them.
- Reducing our carbon footprint through lifestyle changes and behavioural patterns can greatly contribute to mitigating climate change.

- Research on innovations and technologies that can reduce land use and can also reduce accidents from renewable energy sources and the risk of resource competition, for example in the field of bioenergy where food for consumption competes with energy production.
- Increase international cooperation and support developing countries to expand infrastructure and modernize technology for modern supply and sustainable energy services as a means of mitigating climate change and its impact.

6. Conclusions

Energy is a compulsory asset in our everyday life as a way to improve human development that leads to growth and productivity.

Returning to renewable sources will help mitigate climate change but must be sustainable to ensure a sustainable future for generations to meet their energy needs. Knowledge of the relationship between sustainable development and, in particular, renewable energy is still limited.

The full life cycle of renewable energy sources does not have net emissions to help limit the future global greenhouse gas emissions. However, cost, price, political environment and market conditions have become the barriers that prevent developing countries, the least developed and the developed ones from making full use of their potential.

In this way, creating a global opportunity through international cooperation to support LDCs and developing countries in terms of accessibility of renewable energies, energy efficiency, clean green technologies and research and investment in energy infrastructure will reduce the cost of renewable energy, remove barriers to energy efficiency (high upgrading rate) and promote new potential for mitigating climate change.

The study highlighted opportunities for renewable energy sources; energy security, access to energy, social and economic development and mitigation and reduction of climate change impacts on the environment and on health. There are challenges that tend to hamper the sustainability of renewable energy sources and its ability to mitigate climate change.

These challenges are: market failures, lack of information, access to raw materials for the future use of renewable resources, and, most importantly, our way of using energy inefficiently.

7. Recommendations

Based on the findings, the following suggestions can be made that can help improve renewable energy concerns as being sustainable and also reduce the ozone depletion rate due to greenhouse gas emissions, especially carbon dioxide (CO₂):

- To formulate policies and discussions in all sectors to improve technologies in the renewable energy sector to support them.

- Change in the use of our energy in a more efficient way as individuals, countries and the world as a whole. Efforts to increase the share of renewable energy and clean fossil fuel technologies in the global energy portfolio will help reduce climate change and its impact. Energy efficiency programs should be introduced globally, providing tax exemptions to firms that are proving to offer energy efficiency initiatives (energy efficient houses), product design (energy efficiency equipment) and services (heat and energy combined industry). Introducing the concept of use, adaptability and accessibility in the design of energy-dependent products is a way to promote energy-efficient behaviours.
- Increasing research in these areas, so that the fear of renewable sources poses risks in the future is limited.
- Improving education, awareness raising and human institutional capacity in climate change mitigation, adaptation, impact mitigation and early warning. Developed countries should include decarbonisation policies and strategies in industry, energy, agriculture, forests, health, transport, water resources, buildings and other sectors with potential for greenhouse gas emissions. Efforts in developing countries aim at improving institutional capacity building, strengthening institutions and improving research capacity in the field of climate change awareness, promoting adaptability and sustainable development. Least developed countries should develop and test tools and methods with global support leading to direct policy-making in climate change mitigation, adaptation and early warning.

If these suggestions are implemented, the sustainability of renewable energy sources would be as well as the seventh and thirteenth sustainable development objectives to ensure access to affordable, reliable, sustainable and modern energy for all, and to combat climate change and the impact of it.

Bibliography

- [1]. D.G. Johnson, Globalization: what it is and who benefits, *J. Asian Econ.* 13 (2002) 427e439, [https://doi.org/10.1016/S1049-0078\(02\)00162-8](https://doi.org/10.1016/S1049-0078(02)00162-8).
- [2]. K.M. Vu, Embracing globalization to promote industrialization: insights from the development of Singapore's petrochemicals industry, *China, Econ. Rev.* (2015), <https://doi.org/10.1016/j.chieco.2017.01.003>.
- [3]. N. Pangarkar, J. Wu, Industry globalization and the performance of emergingmarket firms: evidence from China, *Int. Bus. Rev.* 21 (2012) 196e209, <https://doi.org/10.1016/j.ibusrev.2011.01.009>.
- [4]. A. Dodson, Evergreen Solar Closing Massachusetts Plant Because of Competition from “heavily Subsidized Solar Manufacturers in China”, *Michigan Live*, 2011. http://www.mlive.com/midland/index.ssf/2011/01/evergreen_solar_closing_massachusetts_plant_because_of_competition_from_heavily_subsidized_solar_man.html.
- [5]. M. Dean, M. Barriel, Why Has World Trade Grown Faster than World Output?, 2005, p. 11. http://www.columbia.edu/~md3405/Other_Paper_1.pdf. (Accessed 10 Feb 2018).
- [6]. S. Robinson, Dudgeon Wind Farm Secures GBP1.3 Billion Project Financing - News - Allen &Overy, Allen &Overy, 2016, p. 1. <http://www.allenoverly.com/news/en-gb/articles/Pages/Dudgeon-wind-farm-secures-GBP1-3-billion-project-financing.aspx>. (Accessed 25 September 2017).
- [7]. E.F. Lambin, P. Meyfroidt, Global land use change, economic globalization, and the looming land

- scarcity, *Proc. Natl. Acad. Sci. U. S. A.* 108 (2011) 3465e3472, <https://doi.org/10.1073/pnas.1100480108>.
- [8]. J.-M. Grether, J. de Melo, *Globalization and Dirty Industries: Do Pollution Havens Matter*, 2003, <https://doi.org/10.3386/w9776>.
- [9]. R.E. Gomory, W.J. Baumol, *Globalization: prospects, promise, and problems*, *Pol. Model.* 26 (2004) 425e438, <https://doi.org/10.1016/j.jpolmod.2004.04.002>.
- [10]. P. Gourevitch, R. Bohn, D. McKendrick, *Globalization of production: insights from the hard disk drive industry*, *World Dev.* 28 (2000) 301e317, [https://doi.org/10.1016/S0305-750X\(99\)00122-9](https://doi.org/10.1016/S0305-750X(99)00122-9).
- [11]. A. Jacob, *Globalisation of the pultrusion industry*, *ReinforcPlast* 50 (2006) 38e41, [https://doi.org/10.1016/S0034-3617\(06\)71012-8](https://doi.org/10.1016/S0034-3617(06)71012-8).
- [12]. R. Lacal-Arantequi, T. Corsatea, K. Suomalainen, *2012 JRC wind status report*, Petten, 2013. <https://dx.doi.org/10.2790/72493>.
- [13]. A. Tunisini, R. Bocconcelli, A. Pagano, *Is local sourcing out of fashion in the globalization era? Evidence from Italian mechanical industry*, *Ind. Market. Manag.* 40 (2011) 1012e1023, <https://doi.org/10.1016/j.indmarman.2011.06.011>.
- [14]. I. Overland, *Energy: the missing link in globalization*, *Energy Res. Soc. Sci.* 14 (2016) 122e130, <https://doi.org/10.1016/j.erss.2016.01.009>.
- [15]. J. Heinimo, M. Junginger, *Production and trading of biomass for energy – an overview of the global status*, *Biomass Bioenergy* 33 (2009) 1310e1320, <https://doi.org/10.1016/j.biombioe.2009.05.017>.
- [16]. O. Kuik, F. Branger, P. Quirion, *Competitive advantage in the renewable energy industry: evidence from a gravity model*, *Renew. Energy* 131 (2018) 472e481, <https://doi.org/10.1016/j.renene.2018.07.046>.
- [17]. K. Kaygusuz, „Energy for sustainable development: A case of developing countries. *Renewable and Sustainable Energy Reviews*, 16.,” 2012. Available: <http://dx.doi.org/10.1016/j.rser.2011.11.013>.
- [18]. S. A. T. Abassi, *Renewable energy sources: Their impact on global warming and pollution*, Delhi: PHI Learning, 2010.
- [19]. C. Hoyer-Klick, „Systems Analysis and Technology Assessment,” 2018. Available: http://www.dlr.de/tt/en/desktopdefault.aspx/tabid-2885/4422_read-6548/. [Accessed 10 0 2019].
- [20]. *World Energy Outlook - the gold standard of energy analysis*,” 2018. Available: <https://www.iea.org/weo/>.