

# Renewable and Sustainable Energy Development to Improve people's Welfare towards the Availability of energy: A Review

Hari Subagyo<sup>1</sup>, Raja Oloan Saut Gurning<sup>2</sup>

Faculty of Marine Technology, Institut Teknologi Sepuluh Nopember Surabaya 60111 Keputih, Surabaya, Indonesia  
Engineering Centre, Institut Teknologi Sepuluh Nopember Surabaya 60111 Keputih, Surabaya, Indonesia

**Abstract.** This paper illustrates that all countries still use conventional fuels in generating electricity, while all countries also agree that this can disrupt the greenhouse effect which causes the air temperature on the earth's surface to rise and also affect the world's climate. The availability of energy in nature in a cursory form always disturbs humans throughout the year. Technology with the appropriate level is needed to transform natural energy into other forms of energy that can be used for human welfare. Many countries have developed renewable energy in accordance with their natural conditions to increase the electricity needs of the community. The steps that have been taken in the development of renewable energy are carried out by developing and developed countries. The most supports the implementation of this program is state policy in the fields of energy, economic capacity, stakeholder support, scientists. In developing countries prefer solar energy as Renewable Energy Sustainable to be used as a substitute for conventional energy that is less friendly to the environment. Whereas developed countries are more established to develop wave and tidal energy that are still immature, the success of developing this wave and tidal energy will further strengthen its technological level.

*Key words: Renewable Energy, Sustainable, Development, Availability*

## 1. Introduction

The Paris Agreement has recently emphasized the substantial implementation of carbonization given that it will be experienced by all nations in the future. Reduce exhaust emissions through technological changes. Janvier Munyaneza et al. (2016) stated that energy consumption is evaluated as an indicator of socio-economic development throughout the world. Yiyi Bai et al. (2018) reported that US crude oil reserves were economically abundant in 1955 to 2002, but physically decreased. Marianne Zeyringer et al. (2018) states that low carbon energy systems can be represented through marine technology which in this case when viewed globally, the UK is leading in the development of hydroelectric power projects. Although at this time the level of marine technology is still in the early stages of development. The seriousness of UK readiness is evidenced by the ownership of several world-class marine testing facilities, and also the continuous monitoring of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and HFC emissions. R. Rodprasert1 et al. (2014) explained that the importance of energy consumption for the world community, increased power consumption resulted in the energy crisis beginning with the increase in the price of fossil fuels that could affect the world economy. Marianne Zeyringer et al.

(2018) explains that marine energy will have a significant contribution to the British decarbonisation pathway. On the other hand, the results of oil exploration began to decline.

## 2. The Problems of Using Conventional Energy Sources on Nature And Environment

Energy has a very important role in the economic development of a country, which is also an important factor for human life. Adel Daoud (2018) argues that the threat of scarcity can force competing parties to find common solutions to problems of scarcity and thus encourage them to work together, substitution of resources is another important condition for relative scarcity. That is, if resources can be replaced or allocated differently. Hsing Chen Lee et al. (2018) high consumption of fossil fuels causes serious environmental problems, such as an increase in greenhouse gas emissions that have caused global warming and climate change. Many countries are aware of the enormous and specific threat of climate change for carbon reduction and green economy development. Therefore, the transition from fossil sources

to clean energy is an important problem for many countries. Taiwan has almost no energy source alone, with nearly 98% of its energy consumption dependent on imports, and almost all fossil fuels come from the Middle East. Mehmet Melikoglu (2018) provides input that the use of fossil fuels in global power plants is very large. Based on data from the Energy Information Administration of the United States, International Energy's 2016 outlook that nearly 67.2% of global electricity generation is supplied from fossil fuels (coal, petroleum and natural gas), while renewable energy sources are only 21.9%. Rhythm Singh et al. (xxxx) reports that India has very large coal resources. Coal extraction and extraction activities are not environmentally friendly. Emissions in the form of CO<sub>2</sub>, SO<sub>x</sub>, NO<sub>x</sub> and particulate matter, water pollution in the form of acid waste from coal, coal waste, soil pollution due to ash, heavy metals, health hazards from ecology, radioecology. Overall coal is a dirty energy source, in the future it is not an energy choice. Mustafa Ozcan et al. (xxxx) explains that coal use is still the main energy source worldwide, which is also Turkey's domestic fossil energy. Most of Turkey's coal reserves are lignite which has a harmful impact on the environment, and recommends that coal be replaced by Renewable Energy Sustainability (RES) as a more efficient energy in terms of reducing the impact of greenhouse gas emissions from Turkey. Simon Jenniches. (2018), said that greenhouse gas emissions change the world climate which has a negative impact on ecosystems, as the highest proportion (25%) of greenhouse gases emitted by heat and electricity generation,

### 3. Sustainable Renewable Energy Development

Alexander Zerrahn et al. (2018), Conveying the use of renewable energy sources is the main strategy to reduce climate change. But excessive electricity storage requirements limit further expansion of variable wind and solar energy. The use of renewable energy sources is the main strategy to decarbonize the global environment. Because hydro potential, biomass or geothermal energy is limited in many countries, wind power and photovoltaic solar (PV) play an increasing role. Simon Jenniches. (2018), said that increasing the development of renewable energy sources (RES) is an important strategy for reducing greenhouse gas emissions and thus combating climate change by facilitating and accelerating the development of renewable energy technologies to generate heat and electricity is a key point in the global debate about energy transition because it requires structural changes in the energy system.

#### 3.1. Solar power

Rhythm Singh et al. (xxxx) said that the National Solar mission launched by the Indian government envisaged a total installed capacity of 100,000 MWp by 2022. Electrical installations realized from solar energy in India began around 2009–10. Solar energy development in India is supported by government policies and initiatives for the promotion of solar power technology - CSP and CPV. They concluded that the development of large amounts of solar energy in India could help resolve most of the striking energy problems such as energy deficits, energy inequality and energy security. Photovoltaic sun roofing potential is available in the twenty most populous cities in India. As per the report published by the National Institute of Solar Energy, India's total solar power potential has been estimated as 749 GWp. Guilherme de Oliveira Silva, et al (2017) The Belgian country encourages the use of local and renewable energy sources to reduce dependence on fossil fuels for energy supply. Indicates that up to about 30% of electricity self-sufficiency can be obtained only by using PV and nearing grid parity. Over 40% of self-sufficiency, energy storage must be used, greatly increasing the installation costs. Alexandre G. Viana et al. (2018) reports that Brazil has a strong tradition of developing renewable energy, has designed a framework with the aim of introducing solar photovoltaic (PV) into a mix of power that includes contracts to reduce risk for investors, and solar photovoltaics (PV) takes longer than which is estimated but is considered a real option for electricity generation.

#### 3.2. Wind power

Rhythm Singh et al. (xxxx) Wind power installations began in India in the early 1990s. That's the cumulative installed wind power installed capacity of the year. The estimated total generation of wind power potential in India is around 102,772 MW. This is the accepted value of wind power potential in India, at present. Currently installed wind power capacity in India (as of 31/03/2015) is around 23,439 MW. Wind power, on average, has a better capacity factor than solar power technology. Theoretical capacity factor wind power ranges from 20% to 30%, depending on the site and wind profile, as well as pole height. Simon Jenniches (2018), the German wind power industry has found that the area takes advantage of potential because there is more progressive spread of wind power in North Germany (which has a better wind regime), than in the South. Asad Ashfaq et al.(2018) The wind power generation of Pakistan much higher potential than solar power generation and very good potential for the concentrated solar power. Furthermore, the suggestion of optimum power mix wind/solar that 5% of solar (PV) power generation and 95% of wind power generation leads

to the least amount of power-shortfall. It is envisioned that the integration of renewable energy with cooling sector can be instrumental in overcoming Pakistan's electrical power-crisis. The current power-shortfall of 38.36 TW h can be resolved by installing rated wind and solar (PV) power generation capacity of 10.4GW and 882 MW, respectively.

### 3.3. Small hydro power

Rhythm Singh et al. (xxxx) Small hydro power is one of the oldest renewable power generation technologies in India, which existed since around the beginning of the 20th century. Most hydro installations in India until 1947 were small hydro. Later, after India's independence in 1947, the focus shifted to large-scale multipurpose hydro projects, and there was almost no small hydro growth for decades. The potential of a small hydro power in India, specifically from the point of view of its potential CO<sub>2</sub> emissions reduction and development which may be under the construction of a clean mechanism. Estimates of the small hydro potential of power in India are around 19,749 MW, per [55]. Currently installed a small hydro power capacity in India, as of 31/03/2014, there are around 3800 MW

### 3.4. Biomass power

Rhythm Singh et al. (xxxx) the use of biomass to generate electricity is a relatively new concept, starting around the late 1990s. Compare policies for, and potential, biomass energy in India and Indonesia. Their analysis shows that while India's biomass energy potential of 23 GW is less than half of the 50 GW potential in Indonesia, India has significantly more mature policies and a strong institutional framework for tapping into bioenergy potential.

decentralized biomass gasification in India

### 3.5 Ocean Waves

R. Rodprasert1 et al. (2014) Conveying that another energy source is a wave energy system that uses the shape of the waves in the ocean to create energy. Marine energy has the potential to contribute to the UK energy system, but there is a big risk that strategic investment in the main national market will not produce results in the long run. Johnn Andersson et al (2017), marine energy technology can contribute to meeting sustainability challenges, but they are still immature and dependent on public support. Sweden is one of the few countries that has promoted the development of marine energy through different policies. Marine energy technology has great physical resource

potential, estimated at around 90 000 TWh per year, that only a small portion of physical potential can be exploited realistically because of technical, economic, social, and ecological constraints. Marine energy is estimated to be able to meet 20% of Britain's current electricity demand. Potential in Sweden is limited relative to other European countries. Estimates available for wave power ranges from 8 to 30 TWh each year.

The EU has affirmed its commitment to marine energy in Blue Energy communications recently, and is providing extensive funding for RD & D through various funding mechanisms. This has led to several strategic initiatives and collaborative RD & D projects with actors from several European countries including Sweden. Swedish energy policy experts do not see marine energy as a political priority, which is confirmed by a lack of politically supported goals, strategies and planning frameworks. There were no marine energy specific laws and regulations in 2014, but all marine installations for testing and commercial purposes had to undergo an approval process based on the Swedish Environment

## 4. Literature Review

Literature collection is those that have papers on renewable energy that have a relationship with sustainability. Regarding the location may be in a different country to be used as a reference paper or as a comparison in terms of all the conditions of the economy, technology, natural conditions owned, so that it can be determined as a sub-chapter where the material can be combined to achieve integrated. After scanning the appropriate publication literature references to identify further literature.

## 5. Result And Discussion

The use of conventional energy will gradually decrease along with the impact on the environment which is dangerous, besides that also because conventional energy is not renewable so the limited time to use it needs attention. PV energy is more of an option to be used as a renewable energy sustainable by developing countries, geographically their country is very easy to obtain sunlight as the main source of energy even though in reality the energy that has been obtained and stored in the battery before its use in the system is still experiencing losses storage. PV energy has a level of ease of technology that is easier to use, but if it is not attempted to improve technological capabilities until the manufacture of cell panels, we will forever import these materials.

The need to be oriented towards the Taiwanese country that already has the ability to produce cell panels. All

countries, especially those on the equator, should apply free energy from this world if there are no problems with space because panel cell installation requires a large area and does not need to be forced to use productive areas for agriculture. Developed countries that have strong economies have researched and developed and made their energy policies lead to renewable sustainable energy from ocean waves and utilize tidal energy. The costs needed for research up to very high applications because to build a world-class marine laboratory, this is the step taken by Britain so that it is worth mentioning as a leader in exploring sustainable renewable energy.

## 6. Conclusion And Recommendations

The seriousness of a society and the state in looking at the worst possibilities that will occur in the field of energy, will inspire them to take preventive steps, namely the need to explore and develop renewable energy sustainable in accordance with their circumstances and abilities. The acceleration of technological change has an important role in enabling the occurrence of low carbon energy transitions. Although marine technology is still in its early stages of development and lags behind other, more established renewable energy.

Marianne Zeyringer et al. (2018) said that the Government can play an important role in spurring technological innovation through the intervention of the implementation of technological promotion measures. Such additional support for sustainable technology is justified by the simultaneous occurrence of two market failures e environmental externalities as well as knowledge and other externalities in the innovation system. The need for rapid transition to low-carbon energy systems is becoming increasingly urgent, technology must immediately reach commercial availability. A statement of the UK Carbon Plan, defining a long-term national decarbonisation strategy, by the 2020s we will run a technology competition, with the largest market share of the cheapest technology in order to help various technologies reduce their costs so they are ready to compete.

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