Energy management under the perspective of applied physics

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PERSPECTIVE

The progress in physics has led to the evolution of applied physics in the development of innovative technologies in various fields. The topic of energy is one of the most important elements of innovation and technology development since the past through the present and future. This academic article features a conceptual framework pertinent to the development of hybrid energy sources set up in the various regions of the world. It also presents the ideas for hybrid energy management on the concept of environmentally friendly non-renewable energy, alternative energy, and renewable energy under the framework of "Sufficiency Economy Philosophy". This is one of the ways of sustainable community energy planning in each region of the world.

The lavish energy consumption of the world population is direct affect natural resources and the environment, causing severe changes to the Earth's atmosphere and affects the world from the ground to the core. Various pollutants are covering the entire world with dust and radioactive substances. It has affected all life in the world. When life on earth has released too much carbon dioxide, the earth's atmosphere is transformed into a greenhouse effect, causing the higher temperature surface of the earth. It affects the polar ice melt to increase and methane increases. That is why the world needs to adjust to a new balance faster.

In the 21st century, it was an important transition period in which the world faced a severe natural crisis in many forms. Scientists have tried to find a solution. The study of physics has created a new concept of environmentally friendly energy and green energies. The world is moving towards full intelligent technology. It is the era of smart technologies. And the world is moving towards the era of artificial intelligence technologies. Clean technology and green technology have been invented and developed from the surrounding environment by applying to renewable energy and alternative energy. But the important existing obstacles are the potential of each country including consciousness and awareness of leaders.

The solutions must have an understanding of the principles of energy management. The local communities must participate and understand the current situation of the world and join for energy management too. The energy of heat transfer caused a crisis under the greenhouse effect. The accumulation of heat on the surface and the earth's atmosphere will act as a catalyst to transfer for energy from inside the earth to surface. It is, therefore, an adaptation into the new balance of the world.

The problems in energy management of community are the following: lack of financial support, poor budget planning for workshops and seminars to raise awareness and disseminate knowledge and understanding among constituents. Such seminars on energy management will enable the communities to explore new energy resources, as well as would get them involved and participate actively in managing wise use of energy through the whole community. In conclusion, the implementation of appropriate energy management in each region in the world is an alternative with which community leaders in each region in the world should be able to use and apply for the legislation of policies on environmentally friendly energy management under the framework of the sufficiency economy philosophy.

All life forms on earth under the laws of nature are driven by energy in various forms. Energy is, therefore, an important basic necessity of living for the survival of all living creatures in this world. The evolution of energy has begun since the birth of the world. Early life that originated on earth, known as energy from the sun until the new stone age humans began to gather and settle. There is a change of lifestyle from hunting to raising animals and planting. Therefore is the starting point for the development of various forms of energy come out continuously at present, there are a variety of energy technology developments until the creation of new energy management innovations up a lot.

The energy that is used in daily life is divided into three forms

1. Wasteful energy (Conventional energy) is the energy generated from the deposition of organic matter for a period of millions of years, which is the energy that has been used and cannot be replaced in time, such as oil, natural gas, coal, oil shale, oil sands, etc.

2. Renewable energy is the energy obtained from various sources in nature, including heat from the sun, wind, currents, heat under the sea, sea waves, waste energy, etc.

3. Alternative energy is an energy that is used to replace wasteful energy by applying renewable energy to renewable energy such as water from the dam, wind turbine power, solar energy, biomass, nuclear energy, hydrogen energy, etc.

All three forms of energy have evolved in the development of energy in each era has been divided into time periods according to the era of technology development into the future and according to the age of the needs of the world community by showing the energy source to the needs of the population in each period.

Energy development in the 1.0 era began from 8,000-5,000 years before the arrival of the 17th century. It was an era of energy discovery that humans have begun to know the use of energy for agricultural (Labor period) focusing on natural energy and applying for the benefit of agricultural production by applying natural energy to be processed directly.

In the 2.0 era during the 18th- 19th century, it was an era of scientific discovery humans have changed the way of production from the original that used direct natural energy and simple tools to be machinery in industrial systems by starting to use energy in the light industry (Machine period) with the conversion of fuel, wasteful energy to use with the mechanical equipment. In order to increase the efficiency of the production process in the era of the 1st industrial revolution, classified as the era of steam engines.

In the 3.0 era during the 19th–20th century, human beings have developed transportation systems and communication systems with computer and internet systems. There is a development of energy for use in heavy industries (Electronics period). There are improved and develop in wasteful energy, renewable energy, and hybrid energy development. It can be considered an era of the 2nd industrial revolution, with the development of electronic systems to control the operation of the machine, making the world more connected; therefore, it is the starting point for the development of various energy innovations into the next era.

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During the 20th-21st century, it is the current era that has developed clean energy and green energy. This era has full digital technology development (Digital Period), therefore, developing energy in the 4.0 era, which is the integration of information technology and electrical machinery together, is a fully automatic electrical system that makes the world more connected and faster. It is, therefore, the era of full electric power. In this era, there is a development of alternative energy sources in various forms. Come out to support the increased energy consumption. It can be considered an era of the 3rd industrial revolution, which is the starting point for the development of environmentally friendly energy innovations by focusing on clean technology and developing energy sources in the community.

Since the middle of the 21st century onwards, will be a major evolution in development to the 5.0 era. It is creating a full energy eco-friendly innovation by developing intelligent artificial intelligence technology (Artificial intelligence period). That is to be integrated together with information technology systems and mechanical systems, enabling the machine to operate automatically. It can be considered an era of the 4th industrial revolution, with the development of intelligent technology (Smart technology) in all systems that are related to human life including an era of full hybrid energy use between renewable energy and alternative energy under smart grid network systems to be controlled in systematic energy management to every community, resulting in a better quality of life for the community.

Economic and social development of various countries around the world in the present time, causing the energy crisis of the existing mineral fuel or fossil fuel from being excavated and used in many ways since 1750 onwards, it has resulted in both direct and indirect environmental impacts on the daily lives of people and communities around the world.

Due to differences in the natural environment and man-made environments in each region of the world, consumption, and management of energy varies from one place to another. This concept is a combination of mixed technology between rural technology and current technology according to different geographical and climatic characteristics of each region of the world by following consideration of the geography character of each terrain under the geophysics process.

The development of hybrid energy from heat energy sources, natural water sources, gorges, and peaks. And for the sea area, it is appropriate to develop marine energy sources in the form of integrated energy source development on the sea platform. Under continuous management and management processes will be the sustainable development of community energy. Therefore, the appropriate model in each region to develop an integrated energy source is to improve the quality of life in each community to increase the potential of self-reliance appropriately.

Physics is a rational philosophy subject of origin for application, including management. When creating new energy innovations, there must be a good and appropriate management process. Therefore, energy physics is an applied physics to develop energy sources in the universe including energy management for the next generation under clean technology and green technology.