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Transition to renewable energy and sustainable energy development in Azerbaijan

Nurtaj Vidadili^{a,*}, Elchin Suleymanov^{b,d}, Cihan Bulut^c, Ceyhun Mahmudlu^b^a Baku Engineering University, Baku, Azerbaijan^b Baku Engineering University, Azerbaijan^c Vistula University, Poland^d The Institute of Economics, Azerbaijan National Academy of Sciences, Azerbaijan

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ABSTRACT

Preponderance of industrial states is completely dependent on energy to fuel their economies. Besides, globalization has made the world to be so interconnected and interdependent that the energy industry is the biggest contributor of the climate change which doesn't affect a single country but have far wider implications. The growing awareness of the security of energy supply and climate change challenges associated with fossil fuels has triggered countries around the globe to find alternative energy resources. As a post-soviet country, the economy of the Azerbaijan Republic significantly based on oil production which is the biggest threat to sustainable energy development. Above all, Azerbaijan's dependency on the fossil fuel is the biggest obstacle for the long term economic growth due to decrease in oil prices and the depletion of oil resources. The combination of these newly emerged challenges give impetus for Azerbaijan to diversify its economy via a green economy that will pave a way for the long term economic stability while addressing environmental and social concerns in the country [15]. In this regard, the principal purpose of this research is to explore the sustainable energy development in Azerbaijan through the transition to renewable energy and propose appropriate measures for policy framework.

1. Introduction

Renewable energy is emphasized globally for the new model due to its potential to contribute to economic and sustainable development [16]. In particular, inexhaustible resources will promote energy security. The new model should also be supplemented with more efficient use of energy, using available and emerging technologies [33]. All countries around the globe should consider sustaining its welfare and resources to future generations through respecting sustainable development goals that comprise social progress, poverty reduction, equity, enhanced resilience, economic growth, and environmental sustainability. On the basis of the evidence currently available, it seems fair to suggest that all countries of the world community are interdependent that is to say they are committed to the “tragedy of the commons” unwillingly. To make it much more clear, tragedy of the commons means a situation within a shared-resource system where individual states acting independently and rationally according to their own self-interest behave contrary to the common environment and planet of all states by depleting that resource [32].

Energy politics affects all the aspects of daily life through the vast

use of energy from household to industries, hence, the issue of energy security remains a very crucial yet compelling one. Before there was a challenge of Energy Security in front of the states to tackle, starting from 1990s the intrusion of climate change into energy issues stir up states to adopt costly policies on climate change and energy security that would reduce growing emissions that is the result of the dependence from the non-renewable energy sources such as oil, gas and coal which promise the unsustainable future.

World energy consumption is based on 80% upon fossil fuels which are the polluting sources that accelerate global warming. Besides, climate change revealed that current energy and environment equilibrium is unsustainable [13]. Energy policies should now integrate climate change policies in order to save the environment that the people live in. This challenge is very crucial one in front of the not only a single country, but also all countries in the world. Thus, unsustainable patterns of energy production and consumption in any country threaten not only human health and quality of life but also affect ecosystems and contribute to climate change. There arises a question that who is going to save or sustain our planet for the future generations? Who is going to pay for the proper maintenance of the

* Corresponding author.

E-mail addresses: nuvidadili@beu.edu.az, nurtacvidadili@gmail.com (N. Vidadili).

planet? Can sustainable energy developments be an engine for (un) sustainable future?

The world has seen a sharp increase in renewable energy (RE) capacity over the past decades. This is thanks to a rise in RE promotion schemes; actions to make energy more secure in response to climate change; and a sharp fall in RE technology costs. This is an encouraging trend, as renewable energy solutions can yield important social, economic and environmental benefits, such as removing pressure on important ecosystems and allowing countries' electrical grids to be stable and reliable engines of economic growth.

Renewable energy and Energy efficiency are central to a transition to a sustainable future [11]. Efficiency slows down energy demand growth so that rising clean energy supplies can make deep cuts in fossil fuel use. Moreover, Renewable energy presents major economic opportunities such in elimination of energy poverty. If non-renewable energy prevails renewable energy, the future becomes unsustainable that will affect all states around the world. Most of the studies concerning climate change and its consequences show that developing countries may be the first victims of climate change [9].

Recently, countries with huge carbon-hydrogen resources also have focused on the increase of their renewable energy potential. The tendency isn't only caused with the environmental requirements but also with economic demands. For instance, Nigeria the country with oil rich resources has planned significantly to increase the amount of renewable energy resources in electricity production [31]. Other research has shown that in Qatar, one of the natural gas rich countries, the cost of electricity generation from the wind compares favorably to that from fossil fuel resources [1]. Recently, in Russia the government of this state has implemented various structural and market changes in order to facilitate investment in renewable energy market [5]. This tendency is observed almost in all energy rich countries, including Azerbaijan.

Azerbaijan is located in a Southeast part of Transcaucasian region, in the West of Asia. The size of its territory is 86.6 thousand sq km. It is bordered in the North with Russia, in the South with Iran, in the North West with Georgia, in the West with Armenia, in the South West with Turkey and in the East with Caspian Sea. Almost half percent of its territory is occupied by mountains and the country is also rich with its water resources, including numbers of rivers with short and long size which fall into Caspian Sea and more that 250 small and large lakes. Its population reaches almost 10 million of which 53.6% of them live in urban and the rest in rural areas.

Azerbaijan economy has completed its post-Soviet transition and entered into state based oil economy. During the middle of 2000s in the period of oil bum its economy demonstrated 41.7% of growth which was the highest in the world. Oil is the main contributor of its economy and that's why the recent drop of oil prices negatively affected to this country as well. According to the statistics of World Bank, Azerbaijan is in the 69th place according to the size of its economy in the world. In 2016, first time during the last two decades its economy showed stagnation. Such situation makes Azerbaijan search diverse energy strategy for its sustainable development which requires using the potential of renewable resources [24].

Transition to a renewable energy under conditions of a dominant oil industry is a challenging proposition to the Azerbaijan Republic that based on its economy on fossil fuels. Considering the fact that this transition is costly and promises higher growth in the long term, it pose a challenge to Azerbaijan whether to sustain its fossil-fuel based economy in order to keep economic growth or to pass to sustainable energy development that requires long-term implementation rather than economic growth? It is a big challenge to face with because Baku's lifeblood stems from its hydrocarbon reserves, with over 90% of its exports coming in the form of petroleum. A key to success is to transit to renewable energy that promises sustainable energy development in Azerbaijan.

This paper investigates renewable energy potential of Azerbaijan,

discusses it from the perspective of sustainable energy development and tries to find out whether recent challenges on world oil market regarding to drop of oil prices can motivate Azerbaijan to increase the use of its renewable energy resources.

2. Conceptualization of sustainable energy development

The scope of the sustainable development takes into consideration not only the industrial development aspects but also concerns the environmental, social and economic sides. All countries around the globe should consider sustaining its welfare and resources to future generations through respecting sustainable development goals that comprise social progress, poverty reduction, equity, enhanced resilience, economic growth, and environmental sustainability. Davidson [20] stated the definition of sustainable energy as follows;

“Sustainable energy is defined as energy providing affordable, accessible and reliable energy services that meet the economic, social and environmental needs within the overall developmental context of the society for which the services are intended, while recognizing equitable distribution in meeting those needs.”

Definition of the sustainable energy should be given as the production, conservation and use of energy sources in ways that promote or at least are suitable with long-term human well-being and ecological balance. As seen in Fig. 1, the sustainable development is a triangle consists of energy, environment and economy which are not superior to each other. Although renewable energy is very crucial indicator for sustainability, it does not provide the desired sustainable development without protecting the environment and taking the economic indicators into concern [21].

Five important targets for the sustainable energy view point should be given as;

1. Low or zero emissions of carbon dioxide;
2. No necessary ecological harmful impacts;
3. Enhancing the security of the energy transit;
4. Reducing the cost of the energy production;
5. Improving the utilization of the green technologies.

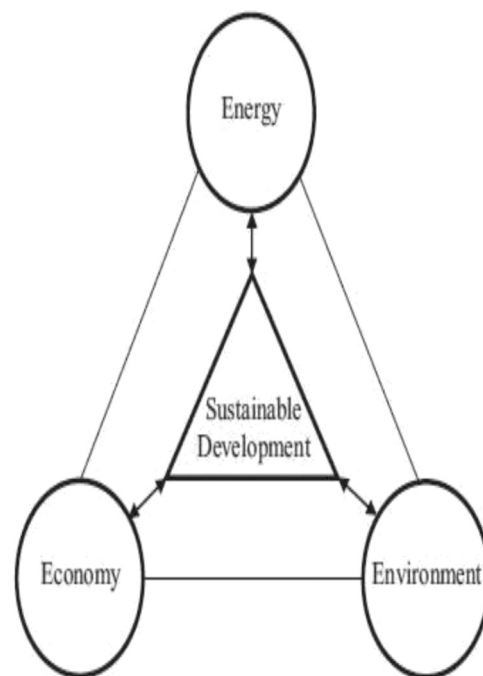


Fig. 1. The interdisciplinary triangle of sustainable development.

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