Global Energies

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Introduction

Understanding the dynamic present and possible future of the global energy system is central to academic and public policy concerns. Energy is essential for economic and social development and improved quality of life. Having a sustainable and consistent energy source leads to improved resources for agriculture, transportation, waste collection and human communication, leading to a more efficient and expanding economy. Energy has become a key source of economic growth and is argued to be one of the most important inputs for economic development. As a result, the securing of sustainable energy sources is a central issue for all countries in the world today.

Findings

Since the industrial revolution in the western world over the eighteenth and nineteenth centuries, fossil fuels have dominated energy supply and strategy. Fossil fuels continue to underpin contemporary capitalist society, affecting the way economies operate, accumulation is maintained, and livelihoods sustained. Yet fossil fuels have a number of related problems. They produce a range of polluting materials through their extraction and use, including carbon dioxide, which together contribute to local and global environmental problems. Fossil fuels are also non-renewable in nature, which means there is a finite stock which is being quickly depleted. Fossil fuels reserves can only be found in some regions of the world, so their supply is often a key cause in geopolitical tension and even warfare.

Conflicts

The competition for energy has become a key factor in many conflicts around the world. Countries argue and battle over who gets to control fossil fuel reserves, whilst elites within countries may often try to gain political power through taking control of energy supply. Over recent decades, multiple conflicts in the Middle East stem directly from western countries wanting access to the rich oil fields which exist there. In African countries, such as South Sudan and Nigeria (as well as in other nations such as Russia), it has been widely alleged that state officials have gained personally from deals which give control of energy to different countries and corporations.

Climate change

Another significant factor in the global energy crisis is the environmental effects caused by high carbon emissions. In 2018, 89% of carbon dioxide emissions came from fossil fuels and energy-related industries. Research has found that these emissions are the dominant cause of global warming. The effects of climate change threaten sea level rise, extreme weather, biodiversity loss and species extinction as well as worsening health and poverty for millions worldwide.

Addressing the issues

The need to tackle these problems is being tackled by governments, intergovernmental organisations, and local policymakers. Countries continue to try and acquire energy security, (i.e. having affordable, reliable access to energy), whilst also transitioning to a low carbon society, reducing environmental costs, amelioriating conflict, and eradicating corruption. To ensure this transition is achieved, various treaties and agreements have been signed to facilitate change.

One example of this is the Paris Agreement in 2015 which was signed by 196 countries and aims to limit global warming to pre-industrial levels. The hope is to incentivise countries to come up with renewable, sustainable, and environmentally-benign ways to produce and supply energy; in other words, it seeks to create a post-carbon world.

Future of global energies

Germany

Germany has become a world leader in renewable energy and its energy plan sets a precedent for other countries to follow. By 2018, Germany produced enough renewable energy to power every home in the country for a whole year. This plan began in 2000, when the German government passed eight new pieces of legislation to push this transition forward, a move which included the closure of all nuclear power stations. Since then, they have set various ambitious targets, and aim for 100% of energy to come from renewable sources by 2035. Now the use of solar, biomass, hydropower and particularly wind power has become a key part of Germany's energy. The boom of Germany's renewables came from the introduction of feed-in tariffs (FiT's) in 2000, which set a guaranteed price for ordinary communities and citizens to invest in renewable energy generations. The feed-in tariffs have also led to an increase in employment in the renewable energy industry and an estimated 371,000 jobs were created direct and indirectly within the renewable energy sector as a consequence.

China

The Three Gorges Dam transformed the hydrological regime in the Yichang district of China. Since its opening in 2012, it generates hydroelectric energy which is renewable, emission-free, and reliable, and supplies more than 20,000 megawatts to East and South China. The Three Gorges Dam puts China as a world leader in the development of hydropower, with roughly 28% of global hydropower capacity and contributes to 8% of China's energy mix.

However, the Three Gorges Dam has caused controversy among many groups. This is because the construction of the dam itself led to the displacement of 1.3 million people due to the flooding of the central Hubei province, including 2 cities, 140 towns and over 1,300 villages. Major environmental concerns have also emerged following the construction of the dam destroying the habitat for 6,400 plant species, 34,000 insect species, 300 fish species and more than 500 terrestrial vertebrate species. The creation and maintenance of the dam is also an issue; it cost US$31.765 billion to build, with many citing the money could have been better invested.

Sweden

Sweden is a country that exemplifies how to use existing architecture to reduce energy consumption and improve efficiency. Sweden places a huge emphasis on using waste for energy production and its capital city, Stockholm, collects 70% of food waste for biogas production (in this process methadone is blended with natural gas to create energy). By 2030, Sweden aims for every vehicle to be powered by biogas, eliminating the use of fossil fuels.

Conclusions

- Fossil fuels have dominated industrialised nation's energy supply but are problematic in many ways.
- Various treaties, such as the Paris agreement in 2015, have been signed to commit countries to begin the transition to a world that is less reliant on fossil fuels
- Countries have come up with a range of new energy plans to create a post-carbon world

Questions.

- What are the benefits and costs associated with different energy 'paths' (e.g. renewables versus non-renewables)?
- What can we do as citizens to influence our energy use and related environmental emissions?
- Energy expert Amory Lovins said that, in relation to energy, 'there is no free lunch'. What do you think he meant by this?

References.

Bridge, G., Bouzarovski, S., Bradshaw, M. and Eyre, N. (2013) 'Geographies of energy transition: Space, place and the low-carbon economy', *Energy Policy 53* (0): 331-340.*

Miller, C. A., Iles, A. and Jones, C. F. (2013) 'The Social Dimensions of Energy Transitions' In: Science as Culture 22(2) pp. 135 – 148. Introduction to a special issue on Energy Transitions.

Sovacool, B.K, Sidortsov, R.V. and B.R. Jones (2014) *Energy Security, Equality and Justice*. London: Routledge.