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**Environmental Commission –
Enhancing renewable energy
incentives**

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[EMUN 2018] [Environmental Commission - Enhancing renewable energy incentives]

[**Forum:**] [Environmental Commission]

[**Issue:**] [Enhancing renewable energy incentives]

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[Introduction

“At UN Environment, we believe that sustainable energy presents an opportunity to transform lives and economies while safeguarding the planet. That’s why we’re working with governments to help them improve energy efficiency and increase the use of renewables in their countries and cities. We aim for sustainable energy to lay the foundation for resilient, low-emission economies and societies around the world.”¹

Since the Industrial Revolution, The world’s carbon dioxide and other greenhouse gas emissions have been one of the causes of a phenomenon called greenhouse effect which has caused the earth’s climate to change. These changes in climate are causing havoc all around the world and are greatly affecting both the environment and human society. Many species are going extinct as they can no longer live in their habitats due to a temperature change, a drought or an increase in rainfall. Every year the sea levels rise, heat and polar waves hit major cities, droughts and floods are becoming more common. In January 2017, a polar wave hit Europe, killing 60 people and causing massive snowfall. This year the Western Cape province of South Africa is expecting to run out of water reserves and will have to cut tap water.

One of the most accepted solutions to help minimize the effect of climate change is to reduce the amounts of greenhouse gas emissions. One of the easiest ways to reduce emissions is to change to renewable energy sources instead of using fossil fuels. However not every country

¹ <https://www.unenvironment.org/explore-topics/energy/why-does-energy-matter>

can invest in renewable energy as it is a very expensive source of energy. Furthermore, many developing countries haven't been industrialized yet and need the fossil fuels to boost their economy and be able to start bettering the life quality and conditions of their citizens before investing in renewable energy.

This is where financial aid to renewable resources comes into play. More developed countries are starting to invest in developing countries where there is a huge potential for the harvesting of renewable energy. As well as investing in developing new and cheaper ways to generate renewable energy. The Question at hand is in what ways we can enhance the incentives given to countries to maximize or improve the production and investment in renewable energy resources.

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Definition of key-terms

- **Renewable energy sources:** Energy sources that can be used more than once. These include solar, wind (Eolic), tidal, hydroelectric power and geothermal.
- **Financial Incentive:** Monetary benefit offered to consumers, employees and organizations to encourage behavior or actions which otherwise would not take place. A financial incentive motivates actions which otherwise might not occur without the monetary benefit.
- **Non-Renewable energy sources:** Any natural resource from the Earth that exists in limited supply and cannot be replaced if it is used up; also, any natural resource that cannot be replenished by natural means at the same rates that it is consumed.
- **Contamination:** Environmental contamination is the introduction into water, air and/or soil of microorganisms, chemicals, toxic substances, wastes or waste water in a concentration that makes the medium (water, air and/or soil) unfit for its next intended use (consumption, crop production, habitation).
- **Fossil Fuels:** any combustible organic material, as oil, coal, or natural gas, derived from the remains of former life.

General Overview

Non-Renewable Energy and Fossil Fuels:

An important aspect of enhancing renewable energy resources is the reduction of the consumption of fossil fuels such as natural gas and oil. This is because the combustion of fossil fuels produces high amounts of greenhouse gases which contaminate the atmosphere and contribute to climate change. Therefore enhancing the incentives of renewable energy sources would greatly reduce the atmospheric contamination currently done by both industrialized and industrializing countries.

Renewable Energy Sources

Solar Energy:

The amount of energy received by the earth in 30 minutes is equivalent to all the power used by humans in a year. However high costs mean it's hard for the industry to achieve its full potential. Each Watt generated from solar power cost 4 to 10 times more than that generated by fossil fuels. Solar Energy is starting to increase in development with an increase of 15-20% each year.

The main producers of solar energy are: China (78GW), Japan (42GW) and Germany (41GW).

The main investors in solar energy in 2016 where: China, USA and India

Wind Power (Eolic):

Wind power is good for small scale production. It needs an exposed site such as a hillside, flat land, costal or off-shore location. Most importantly it requires strong and reliable winds. Some disadvantages it has are the high costs of large scale development, the interruption on wildlife (migrating birds) and the fact that the best locations for wind farms are often far from the centers of demand.

Main Producers (2017): China (188MW), USA (89MW) and Germany (56MW)

Main Investors (2017): China, USA and Germany

Hydroelectric Power (HEP):

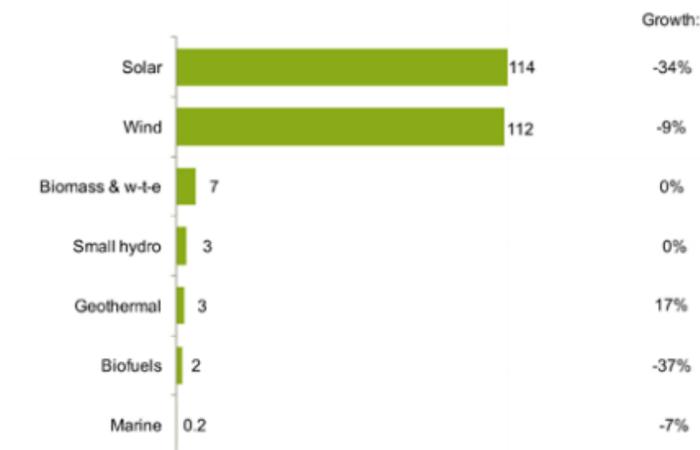
Hydroelectric Power Plants harness the energy from fast flowing water dropping from a sufficient height. However these plants tend to be very costly as well as only being suitable to be built in a small number of places. The biggest disadvantage is that the plant needs to run at full capacity to be economically viable, meaning a market capable to consume the energy must be available nearby.

Main Producers (2015): China (319GW), USA (102GW) and Brazil (92GW)

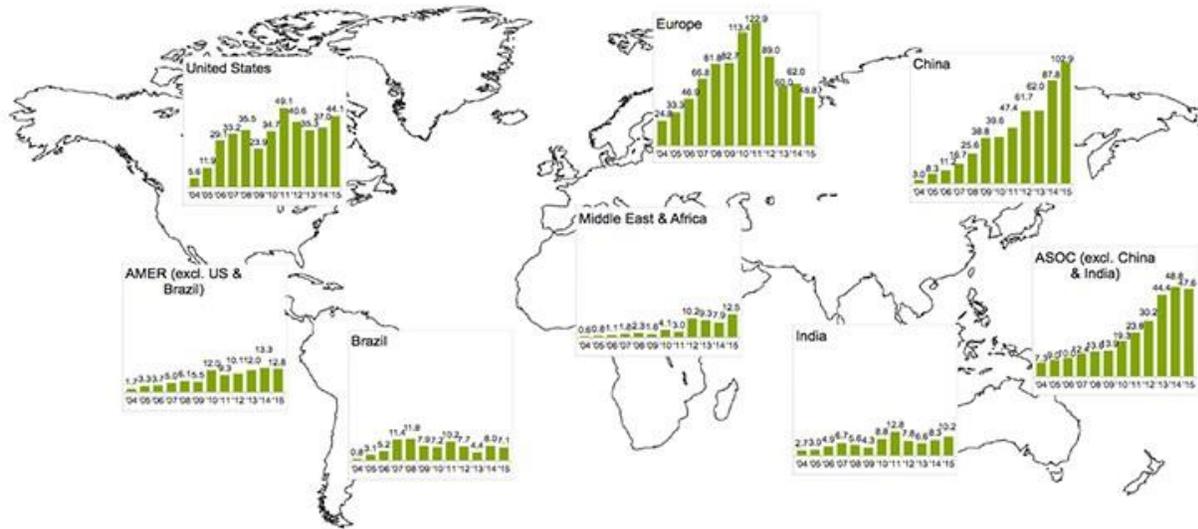
Main Investors: China, Brazil, India

Investment Growth:

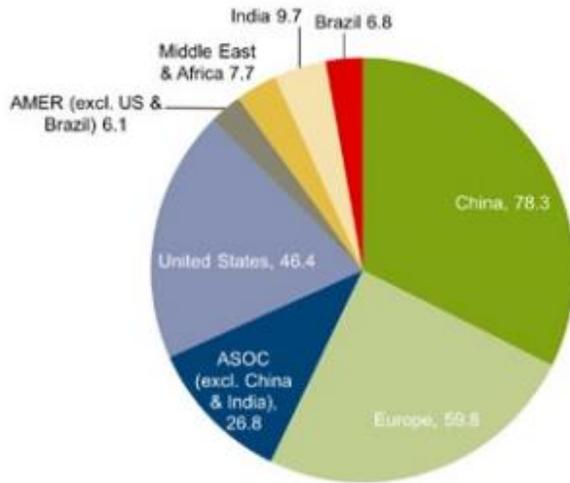
Global new investment in renewable energy by sector (2016 Billion U\$S):



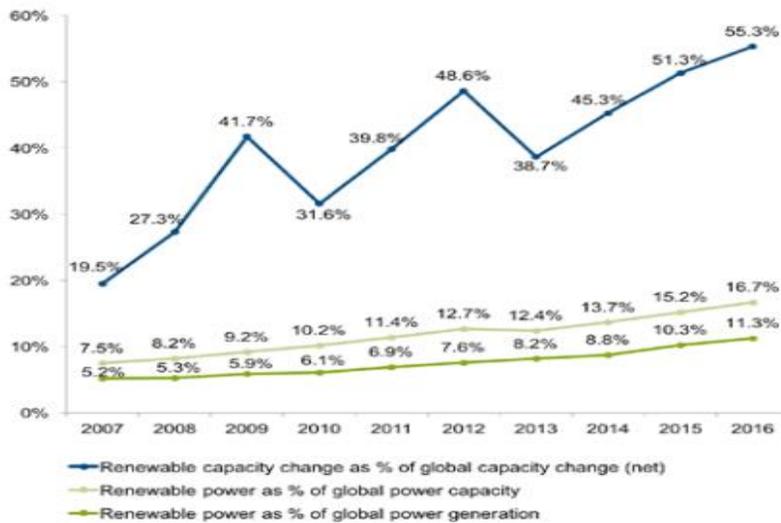
Global new investment in renewable energy by region 2004-2016 (Billion U\$S)



Global new investment by region 2016



Renewable power generation and capacity as a share of global power 2007-2016



Major parties involved and their views

China: China continued to be the world's dominant force in the building and financing of clean energy technology globally in 2017, according to a report published today by the Institute for Energy Economics and Financial Analysis (IEEFA). The report, which builds on IEEFA's summation of China's expanding new energy capacity in January 2017, analyzes China's further progress in clean energy sectors in 2017, including advancements led by the nation's large and influential state-owned utility, engineering, and finance companies. Growing Chinese dominance is led by the Belt and Road Initiative (BRI) that is driving outbound infrastructure investment along ancient trading routes; 2017 saw BRI gain momentum. Despite encountering some headwinds in 2017, it remains a central feature of China's foreign and economic policy.

India: India's electricity-generation market is changing fast, pushed by sustained deflation in renewable energy tariffs, technological advances in the wind and solar sectors, the availability of lower-cost financing, acceleration in wind- and solar-tender activity, and a national political desire to abide by the Paris climate agreement. Solar tender activity in India has been impressive as well, with auctions for a total of 14 gigawatts in the last quarter of 2017/18 and an ambitious 30-gigawatt annual target for the next two years. India has made recent progress, too, on greater integration of variable renewable energy capacity as a result of building out its interstate and international grid connectivity. This revenue-generating export opportunity has been prominently highlighted by Piyush Goyal, India's coal minister, and Energy Minister R.K. Singh. This is an important element in the India transition story, as detailed in an IEEFA report published in February, "Power-Industry Transition, Here and Now."

Brazil: The growth of wind power and nascent solar power, much of which is through small-scale distributed generation, has attracted new players such as Huawei, BYD, Yingli, and Goldwind to the Southern Cone. In August, Huawei signed its first contract to supply inverters (devices that convert the direct electrical current

produced by solar panels to the alternating current used in grids) for a planned solar plant in the state of Minas Gerais, southeast Brazil. In December, BYD will inaugurate its solar plant in the state of São Paulo, also in the southeast, where it already has an assembly line for its electric vehicles. Many of Brazil's big energy contractors have been implicated in the far-reaching investigation into corruption at state-run oil company Petrobras and their owners are selling-off assets to cover their debts. The country's economic problems have also exacerbated the need for foreign investment in energy.

USA: The U.S. coal industry continued to shrink in 2017, and its trend toward long-term structural decline is all but sure to persist, concludes a study published today by the Institute for Energy Economics and Financial Analysis. The report notes that coal consumption in 2017 stayed at record lows, that retirements of coal-fired plants preceded apace, that wind generation in particular contributed to record renewable-energy gains, and that low coal prices continued to hobble the industry. The market share of wind and solar has increased four-fold since 2009 and in four states—Iowa (37%), Kansas (36%), Oklahoma (32%), and South Dakota (30%)—wind's share of total electricity generation exceeded 30% in 2017. Trends in long-term utility-scale investment in renewables show that more wind and solar are coming.

UK: The U.K.'s capacity market is the weak link in the country's ongoing transition toward a resilient, low-carbon grid. The report finds that the U.K. grid is coping well with a coal phase-out, but requires greater investment in reliable generation to back up renewable power than the country is currently making. Four years ago, the government introduced electricity market reforms intended to drive some £100 billion (\$122 billion) in private sector investment in electricity infrastructure, specifically in the construction of a reliable, low-carbon grid. The government has also since targeted a phase-out of coal power generation by 2025. Further, the country has a large pipeline of planned new renewable generation, including some 17 gigawatts of offshore wind. A pipeline of about 12 GW of new sub-sea cables with European neighbors will provide additional, low-carbon electricity (from Norwegian hydropower, for instance), while providing a cost-effective buffer for variable domestic wind and solar power.

Germany: North-Rhine/Westphalia is the historic heart of Germany's industry; an industry that is largely powered by coal. NRW sits atop Europe's biggest lignite coal region, and despite Germany's rapid adoption of renewables, NRW still generates 75% of its electricity from coal, making it responsible for almost 1% of global annual greenhouse gas emissions. Internationally, Germany is well-known for its Energiewende energy policy, a transition away from nuclear and fossil fuels to renewables. But despite the aggressive push toward renewables, coal remains central to Germany's power supply. In recent years, electricity production from coal has hardly fallen, unlike in other developed countries such as the UK and US. In fact, lignite coal provided 23% of gross power production in 2016, and hard coal 17%. Some critics argue that coal still dominates Germany's power generation because the country has chosen to phase-out nuclear power, with the remaining plants to shut by 2022. In the aftermath of the Fukushima disaster in Japan, around a dozen new coal plants opened in Germany.

Japan: Several years of US\$20-30 billion annual domestic Japanese solar PV investment—over 2013 through 2015—made Japan the second largest installer of solar PV globally behind China. Japanese companies, working in their own backyard, have gained important expertise and a deep understanding of the full implications of rapidly-evolving renewable energy technology. It's also raised awareness of investment opportunities emerging elsewhere in the inevitable transition toward a lower-emission global energy market. Since January, a series of mid-scale Japanese solar projects have progressed. Many projects such as Thai Solar Energy acquired the rights to develop a solar project in Onikobe, Miyagi prefecture. LG Group of Korea has teamed up with Canadian Solar and Hanwhat Asset Management to develop a solar project at the Shin Mine site in Japan's Yamaguchi prefecture. And the Solar Farm Minami Satuma also reached financial close, supported by a power purchase agreement from Kyushu Electric. Even with all this activity, Japanese solar investment is actually being wound back to more sustainable levels. But an interesting companion trend is emerging: Leading Japanese companies are starting to look overseas for further opportunities in the renewable energy sector. SoftBank, an early mover in the Japanese solar market, is now leveraging its expertise in other

markets. SBG Cleantech, a partnership between SoftBank, Bharti Enterprises of India and Foxconn of Taiwan, is seeking to develop solar projects in India. Most recently, SBG Cleantech unsuccessfully bid for the entire Rewa solar project in Madhya Pradesh. SBG Cleantech won its first solar tender in December 2015: a solar project at Ghani solar park in Andhra Pradesh. This builds on SoftBank's Mongolian wind farm investments supported by Japanese International Cooperation Agency (JICA) financing |

Timeline of important events/Documents

2000 BC – Chinese first use Coal as an energy source

200 BC – Europeans harness water energy to power mills

1st Century – Chinese first to refine petroleum to use as energy source

10th Century – Windmills built in Persia to grind grains and pump water

1600's – Industrial Revolution in England

1712 – Development of first steam engine

1800 – Discovery of electrolysis

1860 – First solar power system developed in France

1882 – First Electric Plant built in New York

1882 – First Hydroelectric Commercial plant starts operating

1888 – First Windmill to generate electricity

1892 – First Geothermal district heating system

1905 – Description of the photoelectric effect by Einstein

1921 – First Geothermal plant built

1927 – First Commercial wind turbine sold

1953 – First Silicon solar cell developed

1978 – First solar power village

1980 – First Wind farm built

1997 – Kyoto Protocol

2016 – Paris Agreement

UN involvement

UN Conventions and Initiatives

- Sustainable Development Goals (2015)
- All UN Climate Change Conferences (1995-2017)
- Sustainable energy for all initiative (2015)

Attempted Solutions and current approaches by UN:

- **Lima-Paris Action Agenda:** objective of limiting global warming to well below 2°C.
- **SDG 7:** Ensure access to affordable, reliable, sustainable and modern energy for all
 - **Target 7.1:** By 2030, ensure universal access to affordable, reliable and modern energy services
 - **Target 7.2:** By 2030, increase substantially the share of renewable energy in the global energy mix
 - **Target 7.3:** By 2030, double the global rate of improvement in energy efficiency
 - **Target 7.a:** By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology
 - **Target 7.b:** By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support
- **SDG 13:** Take urgent action to combat climate change and its impacts

Possible Solutions

A possible solution for the problem of enhancing renewable energy incentives would be the introduction of worldwide incentives to the scientific community and LEDC countries to start developing and investing in both reducing the amount of CO₂ and other greenhouse gases emission as well as the investment in the improvement of technology and efficiency of renewable energy sources such as more efficient and less expensive solar panels and wind turbines.

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