International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 866-870 www.ijaem.net ISSN: 2395-5252

India catching fifty percent non fossil energy and combating COP26 obligations

Rohal Nikhil and Bagri Namita, Dr Kesari JP
Delhi Technological University
Department of Mechanical, Production & Industrial Engineering

Submitted: 10-07-2022 Revised: 17-07-2022 Accepted: 21-07-2022

ABSTRACT
The climate crisis and the global economic has impacted the whole world with slowing growth as well asit has widened the equalities around the world. We should need a change for a new environment friendly which is sustainable and has inclusive approach to our growth for future. The humans have to invest in clean innovation for shaping this accompanied with assets of sustainable infrastructure to achieve net zero greenhouse gas emissions but will also improve productivity, living standards and the prosperity of the Earth. In this research paper we will draw the evidence on the opportunities and the polices for our innovation-led sustainable growth. We will be highlighting the long-term solutions so that we can enable a clean innovation and to draw the inspiration for the good vision for green renewables by reorienting the growth.

INTRODUCTION

The climate crisis, global warming, and environmental pollution have impacted the ecosystem of our Earth. A new environmentally inclusive approach to growth is required for sustainable and innovative sustainable infrastructure which will not only help to achieve net-zero carbon and greenhouse gas emissions but will also convert the prosperity and standards around the world. As the earth temperature is rising, we need urgent action at a bigger scale so that there is no any substantial delay to manage and prevent the temperature rising till 2°C. A technological change must be enabled by green renewables, and hybrid solutions to sustain and prevent the global warming change effect to stabilize the ecosystem of this planet.

This research paper will enable and focus on the need to enable green renewables and hybrid solutions and why they must be invested as a very important asset on a larger scale from India to the whole world. Also spreading light on the climate change conference and its agenda to tackle this problem. COP26: Together for our planet, The UN climate change conference in Glasgow has brought together 120 world leaders with so many delegates and participants riveted on all facets of climate change- the science, the solutions, the political will to act, and clear indications of actions.

India catching fifty percent non fossil energy and combating COP26 obligations

Chapter 1: COP26 Obligations with World and Indian sceneries

The 26th session of the Conference of the Parties (COP 26) to the UNFCCC was scheduled to take place from 9-19 November 2020, in Glasgow UK.

On 28 May 2020, the COP officials decided that it would take place from 1-12 November 2021, in Glasgow, UK. At COP26, UNEP worked towards three goals:

- To raise ambition at the national level, but more importantly to spur immediate action and get started on reducing emissions.
- To deliver on the 100 billion USD promise and stimulate the large-scale private finance needed to reach the Paris Agreement.
- To encourage solutions that can reduce GHG emissions while also adapting to climate impacts like extreme weather events.

The agreement - although not legally binding but will set the global agenda on climate change for the next decade:**Emissions -** It was agreed countries will meet next year to pledge further cuts to emissions of carbon dioxide (CO2) - a greenhouse gas which causes climate change. This is to keep temperature rise within 1.5C - which scientists say is must to prevent a "climate catastrophe". Current effort if met, will only limit global warming to about 2.4C.

Coal - For the first time at a COP conference, there was an explicit plan to reduce use of coal - which is responsible for 40% of annual CO2 emissions. However, countries only agreed a weaker

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 866-870 www.ijaem.net ISSN: 2395-5252

commitment to "phase down" rather than "phase out" coal after a late intervention by China and India.**Trees** - Leaders from more than 100 countries - with about 85% of the world's forests - promised to stop deforestation by 2030. This is seen as vital, as tress absorb vast amounts of CO2. Similar initiatives haven't stopped deforestation, but this one's better funded. However, it's unclear how the pledge will be policed.**What was COP26 and why was it necessary?**COP26 was the moment countries revisited climate pledges made under the 2015 Paris Agreement. Six years ago, countries were asked to make changes to keep global warming "well below" 2C - and to try to aim for 1.5C. COP stands for "Conference of the Parties", and the one in Glasgow was the 26th annual summit. Ahead of it, 200 countries were asked for their plans to cut emissions by 2030. The goal is to keep cutting emissions until they reach net zero by mid-century. Next year's COP27 summit is in Egypt. India has announced that it would be net zero by 2070. 'Net zero' refers to the year by which GHG emissions produced will be balanced by those that are absorbed. By 2030, India – the world's fourth-largest greenhouse gas (GHG) emitter after China, the US and the EU – will generate 500 GW from non-fossil fuel sources (up from the previous pledge of 450 GW), Prime Minister Narendra Modi pledged. This will be 50% of the country's installed energy capacity.India would reduce emissions by 1 billion tons by 2030 and would reduce emissions intensity by over 45%. On 13 November 2021, the participating 197 countries agreed a new deal, known as the Glasgow Climate Pact, aimed at staving off dangerous climate change. The pact "Reaffirms the Paris Agreement temperature goal of holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels" and "Recognizes that limiting global warming to 1.5 °C requires rapid, deep and sustained reductions in global greenhouse gas emissions, including reducing global carbon dioxide emissions by 45 per cent by 2030 relative to the 2010 level and to net zero around midcentury, as well as deep reductions in other greenhouse gases".However, achieving the target is not ensured, as with existing pledges the emissions in the year 2030 will be 14% higher than in 2010.

Chapter 2: Reviewing the work done around the world

Some are focusing on curbing deforestation and boosting renewable energy sources. Several nations are experimenting with cap-and-trade plans: Regulators set mandatory limits on industrial emissions, but companies that exceed those "caps" can buy permits to emit from companies that have allowances to spare.**Australia** has set a national goal of reducing greenhouse gas emissions by 5 percent below 2000 levels by 2020.**Brazil** is aiming to reduce its emissions to 1994 levels and cut deforestation by 80 percent from historic highs by 2020.**Canada**is committed to reducing its greenhouse gas emissions by 6 percent below 1990 levels. It later proposed a new, less ambitious goal to reduce emissions by 17 percent from 2005 levels by 2020, a pledge that matches the U.S.**China** hasn't made any pledges to reduce its carbon emissions. As its economy grows, emissions will increase. But China has promised to become at least 40 percent more energy efficient by 2015.The **EU** and its 27 member states have pledged to reduce emissions by 20 percent below 1990 levels by 2020. The EU has said it would bump this commitment up to 30 percent if other developed countries sign up for similar commitments.

Japan has pledged to reduce its emissions by 25 percent below 1990 levels by 2020.**Russia** has pledged to reduce its emissions by at least 15 percent from 1990 levels — a year when the Soviet Union was still in existence, and emissions from heavy industry, mostly related to the military, were sky high and now The **U.S**. pledged to reduce emissions by 17 percent by 2020, but that promise was contingent on Congress passing an aggressive cap-and-trade bill. Instead, the bill ended up in the trash, and the U.S. hasn't made it clear how it will meet its emission goals. We can also find out that the 2015 Paris Agreement committed each of its 195 state signatories to pledge what they will individually do to reduce or limit their greenhouse gas emissions by 2025 or 2030; their so-called Nationally Determined Contributions (NDCs). Taken together, however, the current NDCs of all nations are not enough to put the world on track to limit global warming to 'well below 2°C.

In India the renewable energy sources have a combined installed capacity of 150+ GW. As of 31 December 2021, the total installed capacity for renewable energy in India is 151.4 GW. The following is the breakup of total installed capacity for Renewables, as of 31 December 2021: Wind power: 40.08 GW, Solar Power: 49.34 GW, Biopower: 10.61 GW, Small Hydro Power: 4.83 GW, Large Hydro: 46.51 GW.

Renewable energy is the fastest-growing energy source in the United States, increasing 42 percent from 2010 to 2020 (up 90 percent from 2000 to

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 866-870 www.ijaem.net ISSN: 2395-5252

2020). Renewables made up nearly 20 percent of utility-scale U.S. electricity generation in 2020, with the bulk coming from hydropower (7.3 percent) and wind power (8.4 percent). Solar generation (including distributed), which made up 3.3 percent of total U.S. generation in 2020, is the fastest-growing electricity source. Globally, renewables made up 29 percent of electricity generation in 2020, much of it from hydropower (16.8 percent). A record amount of over 256 GW of renewable power capacity was added globally during 2020. Renewable ethanol and biodiesel transportation fuels made up more than 17 percent of total U.S. renewable energy consumption in 2020, a decrease from recent years, likely due to the COVID-19 pandemic. The International Energy Agency notes that the development and deployment of renewable electricity technologies are projected to continue to be deployed at record levels, but government policies and financial support are needed to incentivize even greater deployments of clean electricity (and supporting infrastructure) to give the world a chance to achieve its net zero climate goals.

Chapter 3: Solar PV, Thermal, Hydrogen and Fuel cell as an alternator

After 5.23 years generating electricity, the Solar PV will make up for the energy used to produce the system itself. Moreover, solar panels have their financial payback within 19.3 to 34.4 years, depending on the rate of renewable energy feed-in-tariff applied, according to an Irish paper. In addition, studies back up that electricity production by photovoltaic solar panels is more sustainable than electricity powered by fossil fuels. Still, these calculations depend on the region of production since, for instance, the carbon footprint of a panel produced in China can be up to twice as big compared to panels produced in Europe. Hence, solar PV technologies are small and can be used anywhere in the world with relatively low operation and maintenance costs. Regarding the problems around the solar panels end of life, as the industry grows recycling sites will grow too and industry players will likely feel encouraged to find new solutions to improve the efficiency of their operations. And the good news is that some minerals, like aluminum, lead, and copper require less energy to be recycled when compared to primary extraction. This is the peak period for solar PV development. Governments offered heavy subsidies on tariff, lands were offered at concessional rate to spread the solar panels, ambassadors emerged from reputed institutes to promote solar, solar has become a catchword in many countries. Countries thought solar PV cells convert solar energy to electricity without releasing carbon dioxide.Electricity can be used to split water into hydrogen and oxygen. This technology is well developed and available commercially, and systems that can efficiently use renewable power—for example, wind, geothermal, or solar—are being developed. **Hydrogen** is an energy carrier and can be produced from a wide variety of sources. Its market is well established, with global demand currently standing at around 8–10 exajoules (EJ), most of which is consumed in the chemical sector. At present, roughly 95% of worldwide hydrogen production comes from fossil fuels. the potential of hydrogen from renewable power to decarbonize the global energy system and its relevance in different national energy contexts. It also envisioned its roles in developing a global hydrogen supply chain including Austria, Germany, India, Italy, Japan, Morocco, Saudi Arabia, the United Arab Emirates and the USA, as well as the European Commission, the International Partnership for Hydrogen and Fuel Cells in the Economy, the International Energy Agency and the Global Maritime Forum. Hydrogen from renewable power has the potential to be a key driver of the energy transition by tackling various critical energy challenges. We can also apply the use of Fuel cell including DMFC and SOFC that can generate electricity from chemical and can be sustain to earth. Fuel cells have several benefits over conventional combustion-based technologies currently used in many power plants and vehicles. Fuel cells can operate at higher efficiencies than combustion engines and can convert the chemical energy in the fuel directly to electrical energy with efficiencies capable of exceeding 60%. Fuel cells have lower or zero emissions compared to combustion engines.

Chapter 4: Biomass, waste to energy and brigading

Biomass is an abundant renewable resource that can be produced domestically, and it can be converted to hydrogen and other byproducts through a number of methods. Because growing biomass removes carbon dioxide from the atmosphere, the net carbon emissions of these methods can be low. Biomass is an abundant domestic resource. In the United States, there is more biomass available than is required for food and animal feed needs. A recent report projects that with anticipated improvements in agricultural practices and plant breeding, up to 1 billion dry tons of biomass could be available for energy use annually. For more information, see U.S. Billion-Ton Update: Biomass Supply for a Bioenergy and Bioproducts Industry. **Biomass "recycles" carbon**

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 7 July 2022, pp: 866-870 www.ijaem.net ISSN: 2395-5252

dioxide. Plants consume carbon dioxide from the atmosphere as part of their natural growth process as they make biomass, off-setting the carbon dioxide released from producing hydrogen through biomass gasification and resulting in low net greenhouse gas emissions.We can also think about using fermentation as Biomass is an abundant domestic resource, and many microbes have evolved to efficiently break down biomass to produce hydrogen and other products. Fermentation has already been used as an industrial technology to generate biofuels and other products, and many of the challenges to scaling up systems have been addressed for different products, allowing hydrogen researchers to focus on the challenges unique to hydrogen production. MEC-based systems have the potential to produce hydrogen from resources that otherwise can't be used for fuel production, and could reduce the large amount of energy normally needed for wastewater treatment while producing a valuable fuel in the form of hydrogen. These two pathways can be combined to maximize the hydrogen yield from the starting biomass feedstock.Biomass, as a renewable energy source, has started to look much more favorable again in recent years. There are many reasons for this trend, ranging from increased socio-political discussion on our future energy supply to technological progress. The latter, in particular, has helped change the image of biomass: while fewer regard it as old fashioned, expensive or even dirty, today biomass raise its profile as a renewable and profitable energy carrier. New processing methods have even improved the fuel and handling characteristics of biogenic fuels. Those that have made the biggest difference are briquetting and palletization, from the solid fuel industry. Both of these techniques are based on compacting the original loose material to yield one basic advantage: a higher energy densification.Almost all forms of energy, fossil fuels, wind or biomass, were or are driven by solar energy. When managed sustainable, i.e., harvest does not exceed growth, biomass is a renewable energy. Through the mechanism of photosynthesis solar energy is bound into chemical energy in the plants. Thereby it gets usable for humans in form of eating or burning.

Chapter 5: Economics, COP26 and global

Though renewables' market is inclining, and most probably will do so for the coming decades, most of the recent reports suggest that it would still not be enough to meet the global goals by 2030. Therefore, the following section presents some strategies that can push and encourage investment in the sector.

Expansion of Renewable Energy Use: The basic economics of renewable energy need to be artificially altered, either by increasing the cost of fossil fuel-based energy (e.g., through taxes, removing subsidies or equivalent mechanisms), or by reducing the costs of renewable energy (e.g., subsidies), or by boosting the returns to renewable energies (e.g., through paying a premium for this form of energy). Removal or gradually reducing governmental fossil fuels subsidies is being carried out in some cases. Developing countries should not necessarily be required to meet these costs. This is particularly so where the development of renewable energy capacity may place countries at a competitive disadvantage and/or these countries bear no responsibility for climate change. The costs should be met by countries that do bear these responsibilities.

Declining renewables' costs, which is also already taking place.

Implementing new renewables' financial policies.

Encouraging domestic manufacturing of renewables' equipment: the example of the Chinese case would be the best to illustrate this point, since the Chinese low-cost equipment have achieved a lot for the promotion of affordable renewable projects around Asia.

Reducing institutional barriers: experience has shown that institutional dysfunction always leads to delays, consequently having a major impact on the economic value of the projects in hands.

Grounding renewables in the economic analysis and applying market principles.

Enhancing transmission grids and supporting transmission integration.

On the other hand, with the current market changes in the energy sector, and the remarkable technological achievements, especially for solar PV and wind technologies, the estimates of future renewables equipment cost were found to be more predictable, less risky with a significantly higher certainty than fossil fuels, as about 3/4 of the survey participants agreed that renewables' costs will continue to fall and in more accelerated fashion than that of fossil fuels. Furthermore, the majority of the survey participants believed that the investments in renewables will continue rising along the coming decades, at least until 2050.

Dealing of all this we can also shift our focus to COP26 and its global affairs that to get committed to cut emissions to keep within reach the global warming limit of 1.5 degrees. Second, to reach the target of 100 billion dollars per year of climate finance to developing and vulnerable

countries. And third, to get agreement on the Paris rulebook. This gives us confidence that we can provide a safe and prosperous space for humanity on this planet. But there will be no time to relax: there is still hard work ahead". 195 countries set a target to keep average global temperature change below 2°C and as close as possible to 1.5°C. Before COP26, the planet was on course for a dangerous 2.7°C of global warming. Based on new announcements made during the Conference, experts estimate that we are now on a path to between 1.8°C and 2.4°C of warming. In today's conclusions, Parties have now agreed to revisit their commitments, as necessary, by the end of 2022 to put us on track for 1.5°C of warming, maintaining the upper end of ambition under the Paris Agreement. In order to deliver on these promises, COP26 also agreed for the first time to accelerate efforts towards the phase-down of unabated coal power and inefficient fossil fuel subsidies, and recognized the need for support towards a just transition.

Developed countries have committed to mobilize a total of $100 billion per year of international climate finance from 2020 until 2025 to help the most vulnerable countries and small island states in particular in their mitigation and adaptation efforts.

REFERENCES

[1]. https://www.npr.org/2011/12/07/143302823/what-countries-are-doing-to-tackle-climate-change#:~:text=Some%20are%20focusing%20on%20curbing,that%20have%20allowances%20to%20spare.
[2]. https://www.sciencedirect.com/science/article/pii/S0048733321000949
[3]. https://www.unep.org/unep-climate-cop26
[4]. https://www.sciencedirect.com/science/article/pii/S0268401221001493
[5]. https://www.sciencedirect.com/science/article/pii/S2772671121000206
[6]. https://www.un.org/en/climatechange/cop26-dialogues
[7]. https://www.investindia.gov.in/sector/renewable-energy#:~:text=Renewable%20energy%20sources%20have%20a,Wind%20power%3A%2040.08%20GW
[8]. https://www.c2es.org/content/renewable-energy/#:~:text=Globally%2C%20renewables%20made%20up%2029,was%20added%20globally%20during%202020.
[9]. https://timesofindia.indiatimes.com/blogs/dornadula-c/is-solar-pv-green-energy/
[10]. https://www.energy.gov/eere/fuelcells/hydrogen-resources#:~:text=Currently%2C%20most%20hydrogen%20is%20produced,more%20directly%20to%20generate%20hydrogen.
[11]. https://energypedia.info/wiki/The_Economics_of_Renewable_Energy#:~:text=The%20basic%20economics%20of%20renewable,returns%20to%20renewable%20energies%20(e.g.