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Renewable Energy Law: International and National perspectives

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ABSTRACT

The world has become dependent on non-renewable resources for its energy needs and has been depleting the non-renewable resources steadily, especially since the Industrial Revolution[2]. This led to global warming due to emissions of greenhouse gases, resulting in climate change - an international threat at present. Due to the threat of depletion of resources, environmental laws and sustainable development principles are also connected to it. The first attempt at energy security began with the Stockholm Declaration[3], Rio Declaration[4] and United Nations Framework Convention on Climate Change[5] which provided for sustainable development and inter-generational equity principles, among others. There are other international instruments, but they are soft laws with no binding implications. But it shows the will of the international community. There have been actions implemented at the national level by many nations for shifting the energy source to renewable sources but there lacks a binding international convention. A vast population also doesn't have access to electricity either despite the heavy use of fossil fuels. The paper tries to co-relate aspects of energy law environmental law, including climate change laws and sustainable development principle of inter-generational equity. It also tries to present an analysis of activities taken by a few nations to shift from non-renewable energy sources towards renewable energy sources for energy production.

Keywords: *non-renewables, climate change, sustainable development, shift, renewables.*

I. INTERNATIONAL LAW AND RENEWABLE ENERGY PRODUCTION

Energy law is something not much discussed in academics or legal literature by the international community[6] in the past, but energy has been produced and consumed in vast

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[2] William Cullen, A Comparative Analysis to Understand the Subnational Motivations for Renewable Energy Development in India 2175 (2019) (unpublished CMC Senior Theses, Claremont Colleges) (on file with the Claremont Colleges Library).

[3] U.N. GAOR, 27TH Sess., 2112 plen. mtg., U.N. Doc. A/RES/2994, United Nations Conference on the Human Environment, (Dec. 15, 1972).

[4] 31 ILM 874 (1992).

[5] United Nations Framework Convention on Climate Change, May 9, 1992, S. Treaty Doc No. 102-38, 1771 U.N.T.S. 107.

[6] Raphael J. Heffron, Anita Rønn, Joseph P. Tomain, Adrian Bradbrook, Kim Talus, *A treatise for energy law,* 11 JOURNAL OF WORLD ENERGY LAW AND BUSINESS 34 (2018).

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amounts throughout the world, and there have been national laws in each state to regulate the same. With the passage of time, the advancement of science and technology and the boost of the industrial revolution, energy production have been more rapid than ever, and conventional sources or non-renewable sources (words used interchangeably) of energy are getting depleted fast. The depletion of the non-renewables such as coal, oil, natural gas, etc. and the environmental consequences of the conventional means of energy production brought the international community's attention towards the non-renewable energy sources. Thus, the less discussed energy law became closely related to climate change laws and sustainable development laws by the international community. Since the era of the industrial revolution and growing international trade, the emission of greenhouse gases [7](hereinafter referred to as "GHG") have increased tremendously (about 41%[8]), thereby causing global warming and adverse climate change due to the conventional energy production and consumption processes like coal, oil and petroleum, natural gas etc. It has also been leading to the depletion of these non-renewable resources globally.

Under the auspices of the United Nations, the first discussion and implication of depletion of non-renewable energy sources for sustainable development were made in the 1972 Stockholm Declaration on Human Environment[9]. Subsequently, it was further emphasised by Commission on Environment and Development Report, 1987 and the Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy[10]. The United Nations Environment Programme established an intergovernmental Panel on Climate Change in 1988 for climate change concerns, and in 1992, the United Nations Framework Convention on Climate Change[11] (hereinafter referred to as "UNFCC") was adopted along with the Rio Declaration on Environment and Development[12]. While both the international instruments did not have any express provision for renewable energy, UNFCC, along with the Kyoto Protocol 1997[13], provided for Clean Development Mechanism scheme to reduce GHG emissions, and Rio Declaration provided for sustainable development principles along with inter-generational

[7] William Cullen, A Comparative Analysis to Understand the Subnational Motivations for Renewable Energy Development in India 2175 (2019) (unpublished CMC Senior Theses, Claremont Colleges) (on file with the Claremont Colleges Library).
[8] Id.
[9] U.N. GAOR, 27TH Sess., 2112 plen. mtg., U.N. Doc. A/RES/2994, United Nations Conference on the Human Environment, (Dec. 15, 1972).
[10] Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).
[11] United Nations Framework Convention on Climate Change, May 9, 1992, S. Treaty Doc No. 102-38, 1771 U.N.T.S. 107.
[12] 31 ILM 874 (1992).
[13] 2303 UNTS 148.

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and intra-generational equity principles. The GHG emissions can be curbed by shifting the energy production sources from non-renewable/conventional sources to renewable sources, thereby promoting renewable energy production. The same applies to sustainable development principles since the depletion of non-renewable sources goes entirely against the principle. United Nations General Assembly released Sustainable Development Goals, and in 2015, one such goal was adopted[14] with 17 global goals and 169 targets with the objective of transforming the planet into a sustainable one by 2030.[15] The Paris Accord under the UNFCC in 2015 is an essential international instrument when it comes to climate change and, thereby, renewable energy law. It blends the tension between the developing nations and developed nations by incorporating the 'common but differentiated responsibilities and respective capabilities' (hereinafter referred to as "CBDR-RC") and ensuring accountability and precision even though all of its provisions are not binding.[16] At present, 195 countries have signed it, and 189 countries have ratified the agreement[17], which is more than 90% of the nations in the world.

There are other soft laws or non-binding instruments relating to renewable energy production like Johannesburg Plan of Implementation 2002, Beijing Declaration on Renewable Energy for Sustainable Development 2005, Barbados Declaration on Achieving Sustainable Energy for All in Small Island Developing States 2012, Astana Ministerial Statement on Access to Affordable, Reliable, Sustainable, and Modern Energy 2017 etc. but being soft law instruments, all of them are non-binding in nature.[18] Non-binding instruments are often failed instruments because of the lack of enforceability, and some even say that the Paris Agreement is a failed instrument in this aspect, like the Kyoto Protocol 1997[19].

One instance of a successful international but regional instrument is the Energy Charter Treaty 1994[20], which was initially a non-binding expression of the principles towards international energy cooperation, based on a shared interest to secure energy supply and sustainable economic development[21] called 'European Energy Charter' adopted in 1991. It received the

[14] U.N. GAOR., 70TH Sess., U.N. Doc. A/RES/70/1 (Oct. 21, 2015).
[15] Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).
[16] Id.
[17] *The Paris Agreement*, United Nations, (May 27, 2021, 10:04 PM), https://www.un.org/en/climatechange/paris-agreement.
[18] Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).
[19] 2303 UNTS 148.
[20] 2080 UNTS 100.
[21] Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).

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political will of 70 signatories by 1994, subsequently becoming a legally binding Energy Charter Treaty. But it mainly functions around the European states. There have been similar regional initiatives, actions and plans, but none are binding in nature.

Three noteworthy international institutions have also been established for the promotion of renewable energy – International Energy Agency (hereinafter referred to as "IEA") in 1974, International Renewable Energy Agency (hereinafter referred to as "IRENA") in 2011 and Renewable Energy Policy Network for 21st Century (hereinafter referred to as "REN21") in 2004. The IEA was established the by Organisation for Economic Co-operation and Development (OECD) Council decision through the Agreement on International Energy Program, while the IRENA was established through the IRENA Statute, which entered into force on 08th July 2010. REN21, on the other hand, is an alliance between International Geothermal Association, International Hydropower Association, International Solar Energy Society, World Bioenergy Association, and World Wind Energy Association formed at the Bonn International Renewable Energy Conferences held in 2004[22]. Both IRENA and REN21 was a product of the Bon Conference 2004.

As we can see, there exists no internationally binding and widely ratified instrument dedicated to renewable energy or its production even though climate change has been identified as a significant concern for the international community along with several international discussions and establishments for the purpose of renewable energy production. Due to the lack of a binding instrument as such, the renewable energy production and promotion by nations have been driven by their own political will itself, and that has also caused a good amount of global shift from non-renewables to renewables for energy production till now.

(A) National Laws and Renewable Energy Production

1. China

China's stance towards renewable energy law has been complicated but quite effective for it. It comprises various laws, which are broad categories into three[23] –

1) Renewable Energy Law which comprises five-year national plans for renewable energy productions
2) Specialised rules of renewable energy comprising of central and provincial rules and regulations of renewable energy

[22] Id.

[23] Junxia Liu, *China's renewable energy law and policy: A critical review* 99 RENEWABLE AND SUSTAINABLE ENERGY REVIEWS 212 (2019).

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3) Unspecialised rules are containing regulations of renewable energy law which comprises other laws such as environmental and climate change laws relating to renewable energy law.

Despite the complaints of fragmented laws and policy along with market monopoly by conventional energy producers, China's renewable electricity consumption in 2016 was 25.3% of the total electricity consumption with a yearly growth of 0.9%[24]. In 2018, China was the largest coal producer and consumer globally, and by the end of 2018, it was home to 13.2% of global coal reserves, ranking 4th in the world[25]. Coal comprised 70% of total electricity generation in 1990, while it comprised 68% of entire electricity generation in 2017[26]. Earlier hydropower comprised most of China's renewable sources; other renewable sources such as nuclear, biofuel, wind and solar have grown from 0% in 1990 to 11% in 2017[27].

2. Germany

Germany is considered the most advanced when it comes to renewable energy production[28]. Its regulation and enforcement have been well done over the years, starting from its Electric Power Transmission in 1991 to Renewable Energy Sources Act (hereinafter referred to as "EEG") in 2000[29]. The EEG has been amended from time to time, regulating the incentives and subsidies in a positive manner. It has reduced its coal share from about 60% in 1990 to below 40% in 2018, using various renewable energy sources like wind, solar biofuel and waste. Its renewable sources share from 1990 increased from 32% to 49% in 2018[30]. The share of the nuclear source had gone down from 28% in 1990 to 12% in 2018, while its share of wind and solar sources, which was practically non-existent in 2000, grew to 17% and 7%, respectively, in 2018[31].

3. Australia

Australia was the first country to legislate renewable energy development goals as law in the form of Renewable Energy Target[32]. Through Renewable Energy (Electricity) Act 2000,

[24] Id.
[25] Margareth Sembiring, *Domestic Coal: A Hindrance to Renewable Energy Development?*, NTS INSIGHT, No. IN 20-01 (Singapore: RSIS Centre for Non-Traditional Security Studies (NTS Centre), Nanyang Technological University Singapore 2020).
[26] Id.
[27] Id.
[28] Junxia Liu, *China's renewable energy law and policy: A critical review* 99 RENEWABLE AND SUSTAINABLE ENERGY REVIEWS 212 (2019).
[29] I Junxia Liu, *China's renewable energy law and policy: A critical review* 99 RENEWABLE AND SUSTAINABLE ENERGY REVIEWS 212 (2019).
[30] Margareth Sembiring, *Domestic Coal: A Hindrance to Renewable Energy Development?*, NTS INSIGHT, No. IN 20-01 (Singapore: RSIS Centre for Non-Traditional Security Studies (NTS Centre), Nanyang Technological University Singapore 2020).
[31] Id.
[32] Junxia Liu, *China's renewable energy law and policy: A critical review* 99 RENEWABLE AND SUSTAINABLE ENERGY REVIEWS 212 (2019).

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Renewable Energy (Electricity) Regulations 2001 and Renewable Energy (Electricity) Amendment Act 2015, it reduced its coal share in electricity generation from 80% in the 1990s to 60% in 2018 while increasing renewables shared from 10% in 1990s to about 17% in 2018[33]. Among the types of renewables preference, the share of hydropower decreased from 10% in 1990 to 6% in 2018, while the solar and wind share rose from 0% in 1990 to 2% and 3% in 2018, respectively[34].

4. Russia

Russia's renewable share in electricity generation is quite insignificant to date, where coal, natural gas and hydropower make up about 15-16%, 50% and 15%, respectively between1990-2018[35]. It approved Russia's Energy Strategy to 2030 in 2009 with the aim of increasing the renewable energy share, excluding hydropower, to 4.5% in electricity production[36].

5. Indonesia and the Philippines

Indonesia and the Philippines have shown a keen interest in renewable energy production over the years. Indonesia is a coal-producing country with 3.5% of global coal reserves and ranking 6th in 2018, but it utilised geothermally and hydropower even before the 1992 UNFCC was signed[37]. In 2015, they made up about 17% and 56% share respectively in electricity production. Indonesia set its target in 2015 to reduce its share of geothermal and hydropower and increase the percentage of wind and solar sources from 0% to 17% and 27%, respectively, by 2050, but it has seen no significant progress till date but an increase in the share of coal from 41% in 2008 to 56% in 2018[38].

In contrast to this, the Philippines, which also had geothermal and hydropower as a dominant source in electricity production from 1990-2016, also planned to increase its share of wind and solar sources from nothing in 2010 to 15.5% and 1.9% by 2030 while reducing the share of geothermal and hydropower from 36.2% and 62.5% in 2010 respectively to 22.6% and 15.5% in 2030 respectively[39]. While the Philippines's coal share had also increased from 37% in 2010 to 50% in 2017, its renewables share had increased shares of biofuels, solar and wind in the renewable mix, unlike Indonesia[40].

6. India

[33] Margareth Sembiring, *Domestic Coal: A Hindrance to Renewable Energy Development?*, NTS INSIGHT, No. IN 20-01 (Singapore: RSIS Centre for Non-Traditional Security Studies (NTS Centre), Nanyang Technological University Singapore 2020).
[34] Id.
[35] Id.
[36] Id.
[37] Id.
[38] Id.
[39] Id.
[40] Id.

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India is a unique case with a mix of criticisms and development. Till 2006, India was the only country in the world with an exclusive ministry to deal with new and renewable energy sources[41]. It starts with the establishment of the Commission for Additional Sources of Energy (CASE) in 1981 for promoting, developing and implementing new and renewable energy programmes, which were then incorporated into the Department of Non-Conventional Energy Sources in 1982, which then became the Ministry of Non-Conventional Energy Sources in 1992 and was subsequently renamed as Ministry of New and Renewable Energy (hereinafter referred to as "MNRE") in 2006[42]. India holds 9.6% of the global coal reserve, ranking 5th in the world, is the 4th largest coal producer in the world and is second to only China in global coal consumption[43]. By 1974, Coal comprised 40% as a source for electricity generation while hydropower constituted more than 50% share. By 2018, the non-renewables share had increased to 75%[44]. At the same time, the share of hydropower had dropped to less than 10% in 2018, but excluding hydropower, its renewable consumption has grown annually at the rate of 17.5% in 2007-2017, and its other renewables share grew from nothing to about 8% in 2018[45]. India has been undergoing critical transformation since the ratification of the Paris Agreement in 2016 to meet the Intended Nationally Determined Contributions (hereinafter referred to as "INDCs") of renewables to comprise 40% of the total power generation[46]. The renewables share consisted of 23.39% of total electricity production in 2020[47], and coal consisted of 70%. But India has often been criticised for its air quality in critical terms such as 'dreaded pollution season in India, requiring citizens to wear masks to walk and cancellation of flights', 'air quality was severe enough to be considered a natural disaster'[48] etc. due to its frequent deteriorating air quality in some cities like Delhi, Mumbai etc. Its primary legislation in energy aspects is Electricity Act 2003, Electricity (Amendment) Act 2014, and India Renewable Energy Act 2015.

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[41] Huang Liming, *Financing rural renewable energy: A comparison between China and India"* 13 RENEWABLE AND SUSTAINABLE ENERGY REVIEWS 1096 (2009).
[42] Id.
[43] Margareth Sembiring, *Domestic Coal: A Hindrance to Renewable Energy Development?,* NTS INSIGHT, No. IN 20-01 (Singapore: RSIS Centre for Non-Traditional Security Studies (NTS Centre), Nanyang Technological University Singapore 2020).
[44] Id.
[45] Id.
[46] Apurba Mitra, Thomas Damassa, Taryn Fransen, Fred Stolle, Kathleen Mogelgaard, *5 Key Takeaways from India's New Climate Plan (INDC)*, WORLD RESOURCE'S INSTITUTE, (Oct. 2, 2015, 10:04 PM), https://www.wri.org/insights/5-key-takeaways-indias-new-climate-plan-indc.
[47] *Initiatives and Achievements,* MINISTRY OF NEW AND RENEWABLE ENERGY (Feb. 29, 2020, 10:05 PM), https://mnre.gov.in/.
[48] William Cullen, A Comparative Analysis to Understand the Subnational Motivations for Renewable Energy Development in India 2175 (2019) (unpublished CMC Senior Theses, Claremont Colleges) (on file with the Claremont Colleges Library).

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II. ANALYSIS AND SUGGESTIONS

From the brief introduction to the renewable laws and renewable energy production of the above nations, it can be observed that the growth of renewable energy production differs significantly from country to nation and isn't uniform, despite having the political will to indulge in renewable energy mix production. There is a trend that can also be observed – some nations have decreased share of conventional sources while the increased share of renewable sources in electricity production (Like Australia, Germany China), some have increased share of traditional sources and no significant change in share/growth of renewable sources in electricity production (like Russia), and some have increased share in both conventional as well as renewable sources (like India and Philippines). The unique case of Indonesia and the Philippines also implies the challenges that nations face despite having similar circumstances and political will. A survey on UN Sustainable Development Goals progress suggests that most of the renewable energy activities focus on electricity and not on heating, transport and other sectors[49]. This is also observed in the national renewable energy laws of the nations mentioned in the previous chapter. But energy is used in sectors other than electricity purposes too, and as long as they aren't provided with renewable sources of energy, they will contribute significantly to the GHG emissions.

While renewable energy production seems to be increasing at a fast rate from the above instances, renewables are said to comprise only 23.7% of global electricity generation in 2016 and around 1.2 billion people (about 16% of the world population), mostly from sub-Saharan Africa and developing Asia, still don't have access to the electricity itself[50]. The international community and few authors[51] show relief and confidence because of the percentage increases of renewable sources for energy production, but it should be kept in mind that with the growing population, growing economies, scientific advancements and developing nations, the total consumption of energy also increases multi-fold over years. Along with this, we are already experiencing melting glaciers, excessive droughts and ocean acidification[52], along with yearly rising temperatures and heatwaves. Hence, it is obvious that the shift in energy production from conventional/non-renewable sources to non-conventional/renewable sources isn't catching up

[49] Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).
[50] Id.
[51] Id.
[52] William Cullen, A Comparative Analysis to Understand the Subnational Motivations for Renewable Energy Development in India 2175 (2019) (unpublished CMC Senior Theses, Claremont Colleges) (on file with the Claremont Colleges Library).

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fast enough to reduce global warming and deal with the issue of climate change. Conventional energy production and consumption are responsible for more than 60% or almost 2/3rd of the world's GHG emissions, leading to global warming and adverse climate change[53]. Scientifically, it is suggested that 2/3rd of all fossil fuels/conventional sources, i.e. 35% of oil, 52% of natural gas and 88% of coal reserves worldwide, must be kept in-ground till 2050 to maintain the temperature below 2 degrees Celsius as per the Paris Accord[54]. The fluctuating prices of fossil fuels in the last few years indicate the opposite and mankind's dependency on fossil fuels. The rapid exploitation of fossil fuels is contributing to both climate change as well as the issue of sustainable development, which the international community has been emphasising on since more than half a century. Conventional energy use is what is contributing to climate change, yet there is no binding international law for the promotion of renewable energy law. On the other hand, we have soft laws for climate change and sustainable development, which mostly requires nations to cut down on GHG emissions and use of fossils, with only a few provisions for the promotion of renewable energy. Climate Change is the concern of all of mankind. This can also be legally established by following the principle of 'transboundary environmental harm', where the activities of one nation should not harm the environment of another nation. This was established in the famous **Trail Smelter Arbitration Case[55]** (USA v Canada). There is no boundary separating the atmosphere of each nation, and hence all nations share a common atmosphere. Therefore, the GHG emissions are collectively being released by all nations, especially the developed states, causing global warming and harming the environment of all other nations, especially the under-developed nations. Therefore, climate change should be a significant concern legally for all of mankind, and the same can be mitigated by aggressive promotion of renewable energy production and decline of conventional energy production.

Following are the suggestions (being made by the author) to effectively deal with the issues of renewable energy laws, climate change and sustainable development-

(A) International Law

1. A binding international treaty dedicated to renewable energy production with an international body to help with the same, incorporating the CBDR principle – There is political will in most nations for renewable energy shift, but it is neither efficient nor sufficient. This political will needs to be given substance in the form of a binding

[53] Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).
[54] Id.
[55] United States v. Canada 3 UNRIAA 1905 (1938 and 1941).

international treaty providing for renewable energy production and expressly declaring adverse climate change and depletion of fossil fuels beyond a certain percentage as the 'common concern of all of mankind' and also setting up an international body under that treaty to effectively and efficiently deal with the related issues. It will require careful planning, organising and expertise. The established body should help all interested nations with the expertise while consideration the relevant topography and circumstances of the interested nation. REN21 has already paved the way for it. It will also require a huge amount of manpower, thereby creating jobs globally with the required expertise. The budget and the responsibilities should be undertaken on the CBDR-RC principle since the developed world has contributed more to the depletion and use of fossil fuels. They are better equipped with the expertise for the same[56] while the developing and under-developed world doesn't, and they have to focus on their GDP growth along with the shift to renewable energy production. For example, India's (developing country) share of fossil fuel share in electricity production probably increased to 75% in 2018 because of its heavy dependence on fossil fuels for the security of supply which can be affected due to the import dependence of fossil fuels. On the other hand, Germany (a developed country) is considered a global champion in shifting to renewable energy production. Non-binding and roundabout international instruments are not going to solve the imminent issue of climate change or sustainable development but targeted and co-ordinated shifts to renewable energy sources for energy consumption will. This treaty should also provide for the right of sovereignty over the land and territorial waters and their resources to prevent misappropriation and related controversies.

2. Joint implementation programme and sharing of technology – Nations should jointly implement renewable energy programmes, which they have the expertise on, with other nations for a swifter transition to renewable energy technology and production. This would cut down their costs too and help another country in need of the expertise of the same by sharing of the technology and ideas.
3. Trade opportunities in the Carbon Emission Trading scheme – Carbon Emission Trading Scheme was established under the Kyoto Protocol[57], where one nation could buy another nation's carbon emission units. The same can be applied with an

[56] Per Josephson, Common But Differentiated Responsibilities in the Climate Change Regime – Historical Evaluation and Future Outlooks (2017) (unpublished International Environmental Law thesis, Stockholm University) (on file with the Stockholm University library).
[57] Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 2303 U.N.T.S. 162.

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internationally binding instrument for renewable energy production. A country may trade for another nation's carbon emission units in return for the expertise or significant help with renewable energy production.

4. Care for the ecological balance – While promoting the renewable energy production and shift aggressively, the established international body also needs to pay special attention and care to the ecological balance while engaging in the infrastructure building for renewable energy production or renewable energy production process since it can seriously affect the biodiversity as well ecosystem. For example, hydropower affects marine life significantly; infrastructure building leads to deforestation etc.
5. Revision in WTO law – WTO provides for the Most-Favoured Nation principle and national treatment where a member state is not allowed to legislate policies that discriminate between local products/services and imported products/services. Member states are obliged to give similar treatment to all. In the context of renewable energy production, this can become an obstacle if the shift is a mere domestic affair since a nation will not be able to provide subsidies on renewables to private players of its nation since it would be discriminatory under WTO Law[58].
6. Outer-Space Mining – Helium-3 is available on the surface of the moon, and it is a clean and very efficient source of nuclear energy.[59] Mankind will not stop exploring space, and hence outer-space mining, which is a growing idea among the international community, will also not die out. The legality of it is not the scope of this paper, so it won't get into it, but helium-3 will help with sustainable development goals as well as climate change goals.[60] Further, asteroid mining will also help with the same for all of mankind since asteroids are rich sources of minerals, metals, fossils etc., and they are available in plenty in outer space.[61]

(B) National Laws

1. Mitigate and curb, not just enable- A nation, while increasing its renewable share in energy production, also needs to curb its non-renewable share for a significant shift to happen. Some nations (like India, China, Russia etc.) may have increased their renewable share in energy production, but their non-renewable share doesn't reduce much or rather increase. It has to be kept in mind that global energy production and

[58] M Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).
[59] Akash Agarwal, *Outer space mining-An analysis of its legal aspects,* 7 International Journal of Law 85 (2021).
[60] Id.
[61] Id.

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consumption increases every year with industrial growth, economic growth, population growth etc. and hence merely increasing some percentage of renewable energy production in a nation's total global energy production is just enabling renewable energy production and not mitigating non-renewable energy consumption.

2. Legal & financial incentives and additional duties & taxes– Legal and financial incentives are a must for renewable energy production to achieve grid parity in the energy production industry. The opportunity of engaging in renewable energy production should seem more lucrative and profitable than of engaging in conventional energy production to a private player. This can be further implemented by progressively raising taxes and duties in conventional energy production processes.
3. Joint Ventures – A nation may enable joint ventures for renewable energy production for cost-effectiveness as well as for the sharing of technology in that respect.
4. International funding – Since investment treaties are very common in recent times, international investment or funding can be sought and increased, particularly for the renewable energy production sector, while curbing for conventional energy sectors. This would provide for the needed capital for aggressively targeting renewable energy production.
5. Not just electricity – Most nations, while increasing their renewable energy production, focus only on electricity production and ignore other sectors such as transportation, equipment and gadgets, agriculture etc.[62]

III. CONCLUSION

There is a need for an internationally binding instrument for an efficient shift towards renewable sources of energy for energy production with minimal wastage of time. It will help guide the developing and under-developed nations in the shift and have good grid parity and help the people who are still deprived of electricity because of infrastructure or because they cannot afford it. Renewable energy production can be relatively cheaper than conventional energy production. It will help solve the crisis of climate change and the inter-generational equity principle of sustainable development by preventing the emissions of GHG and causing a massive reduction in the use of fossil fuels, thereby stopping depletion. The international community individually and regionally have already paved the path, REN21 and Energy Charter Treaty being significant instances of them. The choice of not wanting to shift to

[62] Md Ershadul Karim, Abu Bakar Munir, Mohammad Ataul Karim, Firdaus Muhammad-Sukki, Siti Hawa Abu-Bakar, Nazmi Sellami, Nurul Aini Bani, and Mohamad Zaki Hassan, *Energy Revolution for Our Common Future: An Evaluation of the Emerging International Renewable Energy Law*, 11 ENERGIES 1769 (2018).

efficient renewable energy production means is unreasonable because the renewable energy source will never deplete and is also a clean source of energy. It will also create a lot of employment opportunities, both international and national. It's the accountability and investment which is deterring nations from taking active steps towards it, but climate change is a common concern of mankind, and no one can deny it. The international community needs to approach it in a socialistic view rather than a capitalistic view or lead to 'tragedy of commons'.

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