



**SRMUN CHARLOTTE 2020**  
***Redefining the Role of International Organizations in the New Global Era***  
**March 26-28, 2020**  
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Esteemed Delegates,

Welcome to SRMUN Charlotte 2019 and the United Nations Environment Programme – Committee on Permanent Representatives (UNEP-CPR). My name is Allie Fowler, and I have the pleasure of serving as your Director for the UNEP-CPR. This will be my fourth time as a SRMUN staff member. Previously, I served as the Assistant Under Secretary-General (AUSG) for SRMUN Charlotte 2019, Assistant Director for the North Atlantic Treaty Organization (NATO) at SRMUN Atlanta 2017, and as Assistant Director for the United Nations Environment Assembly (UNEA) at SRMUN Atlanta 2016. In December 2016, I graduated from Berry College with a Bachelor's in History with a minor in Political Science. I currently work in the Education Department of the Booth Western Art Museum. Our committee's Assistant Director will be Haley Bufka. She is studying at Kennesaw State University with the intention of obtaining a B.A. in International Affairs with a French Language concentration and a minor in African Diaspora studies. After completing her studies, Haley hopes to serve in the Peace Corps before going to work with international non-profit organizations in sustainable development. This is her first time on staff, but she has participated in several Model United Nations conferences in the last three years and is well versed in SRMUN procedures.

The UNEP is one of two environment-focused committees within the United Nations (UN). The UNEP-CPR focuses on establishing environmentally-sound programs and policies to combat a variety of environmental issues such as, but not limited to, desertification, ecosystems, environmental governance, and the development of international environmental conventions.

With a focus on the mission of the UNEP-CPR and the SRMUN Charlotte 2020 theme of "*Forging Connections: Building a Community Among Nations Through Diplomacy*," we have developed the following topics for delegates to discuss at the conference:

- I. Cultivating Technological Innovations to Meet Climate Change Challenges
- II. Reducing the Impact of Pollution on Habitat Loss

The background guide provides a strong introduction to the committee and the topics and should be utilized as a foundation for the delegate's independent research. While we have attempted to provide a holistic analysis of the issues, the background guide should not be used as the single mode of research for the topics. Delegates are expected to go beyond the background guide and engage in intellectual inquiry of their own. The position papers for the committee should reflect the complexity of these issues and their externalities. Delegations are expected to submit a position paper and be prepared for a vigorous discussion at the conference. Position papers should be no longer than two pages in length (single spaced) and demonstrate your Member State's position, policies and recommendations on each of the two topics. Delegates should visit [srmun.org](http://srmun.org) for more detailed information about guidelines, formatting, and the position papers. **All position papers MUST be submitted no later than Friday, March 6, 2020, by 11:59 pm EST via the SRMUN website.**

Haley and I are very excited to be serving as your dais for the UNEP-CPR. We wish you all the best of luck in your conference preparation and look forward to working with you in the near future. Please feel free to contact Director-General Vanessa DuBoulay, Haley, or myself if you have any questions while preparing for the conference.

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## History of the United Nations Environment Programme – Committee on Permanent Representatives

From June 5th-16th in 1972, representatives from 113 Member States and more than 400 non-governmental organizations (NGOs) convened for the United Nations Conference on the Human Environment (UNHCE) in Stockholm, Sweden.<sup>1</sup> The UNHCE, also known as the Stockholm Conference, was the first major conference of its kind. It was there that the Declaration of the Conference on the Human Environment was drafted, along with an action plan of 109 specific recommendations for improving the condition of the environment. The conference also saw the creation of the United Nations Environment Programme (UNEP). The purpose of the UNEP is to centralize the knowledge and environmental efforts of the United Nations (UN).<sup>2</sup> In this capacity, the UNEP “sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the UN system, and serves as an authoritative advocate for the global environment.”<sup>3</sup> The official mission of the UNEP is “to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.”<sup>4</sup>

The UNEP is headquartered in Nairobi, Kenya, and is overseen by the Acting Executive Director of the Senior Management Team.<sup>5</sup> In February 2019, UN Secretary-General António Guterres appointed Inger Andersen as the current Acting Executive Director of UNEP.<sup>6</sup> Andersen works with the Governance Affairs Office and the Secretariat of the Environment Management Group to maintain a presence through seven different divisions and six regional offices.<sup>7</sup> The Governance Affairs Office also oversees the relationships with the secretariats and host the research bodies of several multilateral environmental agreements including: The Convention on Biological Diversity, The Convention on International Trade in Endangered Species of Wild Fauna and Flora, The Carpathian Convention, The Bamako Convention, and the Tehran Convention.<sup>8</sup> In this fashion, UNEP promotes communication and advancement, making the organization the foremost authority in addressing the complex environmental circumstances of the current era.

UNEP encompasses two major governing bodies. The first is the policy-drafting governing body of UNEP, formerly known as the UNEP Governing Council and later morphed into the United Nations Environment Assembly (UNEA).<sup>9</sup> The Governing Council was composed of 58 members who serve in term lengths of four years.<sup>10</sup> Since its induction, the UNEP has guided Member States through various environmental protections,

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<sup>1</sup> “United Nations Conference On The Human Environment (1972),” Encyclopedia.com, <https://www.encyclopedia.com/environment/energy-government-and-defense-magazines/united-nations-conference-human-environment-1972> (accessed June 9, 2019).

<sup>2</sup> “United Nations Conference,” Encyclopedia.com.

<sup>3</sup> “Why does UN Environment matter?” United Nations Environment Programme, <https://www.unenvironment.org/about-un-environment/why-does-un-environment-matter> (accessed June 9, 2019).

<sup>4</sup> “Why does?” United Nations Environment Programme.

<sup>5</sup> “Organizational structure,” United Nations Environment, <https://www.unenvironment.org/about-un-environment/why-does-un-environment-matter/organizational-structure> (accessed June 10, 2019).

<sup>6</sup> “Inger Anderson,” United Nations Environment Program, <https://www.unenvironment.org/people/inger-andersen> (accessed June 29, 2019).

<sup>7</sup> “UN Environment Programme Secretariat,” United Nations Environment, <https://wedocs.unep.org/bitstream/handle/20.500.11822/26006/UNEnvironmentOrganigramme.pdf?sequence=1&isAllowed=y> (accessed June 10, 2019).

<sup>8</sup> “Secretariats and Conventions,” United Nations Environment Programme, <https://www.unenvironment.org/about-un-environment/why-does-un-environment-matter/secretariats-and-conventions> (accessed June 28, 2019).

<sup>9</sup> “UN Environment Assembly and Governing Council,” UN Environment Assembly, <http://web.unep.org/environmentassembly/un-environment-assembly-and-governing-council> (accessed July 6, 2019).

<sup>10</sup> “UN Environment Assembly and Governing Council,” UN Environment Assembly, <http://web.unep.org/environmentassembly/un-environment-assembly-and-governing-council> (accessed July 6, 2019).

including but not limited to the Brundtland Report, the Millennium Development Goals, and the United Nations Conference on Environment and Development (UNCED).<sup>11</sup>

By 2012, the environment became a pressing enough issue that it began to be treated with a similar standard as topics like peace, poverty, health, and security. At the United Nations Conference on Sustainable Development in 2012, world leaders demanded that the UNEP be strengthened in its status due to the emerging need for climate change correction.<sup>12</sup> This desire resulted in the creation of the United Nations Environment Assembly (UNEA).<sup>13</sup> The UNEA offers a universal membership and as such it is comprised of 193 Member States. The UNEA is led by a Bureau formed by a president along with nine other Ministers of the Environment, who are tasked with conducting the general business of the assembly and acts as the Governing Council of the UNEP.<sup>14</sup> The Ministers elected to the bureau serve two-year terms, and elections follow a geographical rotation.<sup>15</sup>

UNEP's second governing body is the intergovernmental Committee of Permanent Representatives (CPR). The CPR was officially created as a subsidiary organ of the Governing Council in May 1985 with the passage of Governing Council Decision 13/2.<sup>16</sup> Under Governing Council Decision 27/2 in February 2013, the CPR was extended to be open-ended in order to function as the main inter-sessional organ of the UNEA.<sup>17</sup> The UNEP-CPR provides policy advice, agenda preparation, and decisions for adoption for the UNEA. The UNEP-CPR ensures and oversees the UNEA's implementation of these directives.<sup>18</sup> The CPR follows the same Rules of Procedure as the UNEA.<sup>19</sup> The CPR is made up of the accredited Permanent Representatives to the UN Environment and, per the most recent report, is comprised of 122 members.<sup>20</sup> The bureau that leads the CPR is comprised of five members that each represent one of the UN regional groups of Member States: African, Asia-Pacific, Eastern European, Latin American and Caribbean, and Western European/Others. Each member of the bureau serves a two-year term, and the CPR meets a minimum of four times every year.<sup>21</sup>

UNEP works under the purview of the 2030 Agenda for Sustainable Development and aims to uphold the principles of environmental, social, and economic sustainability goals in all of its endeavors.<sup>22</sup> The work of UNEP includes "assessing global, regional and national environmental conditions and trends; developing international and national environmental instruments; and strengthening institutions for the wise management of the environment."<sup>23</sup> Modernly, this work is categorized into seven broad thematic areas or sub-programmes: climate change, disasters and conflicts, ecosystem management, environmental governance, chemicals and waste, resource efficiency, and environment under review.<sup>24</sup> Work is executed through the seven divisions overseen by the Acting Executive Director, as well as through regional, liaison, and out-posted offices.<sup>25</sup>

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<sup>11</sup> Johnson, S. *UNEP The First 40 Years: A Narrative*. United Nations Environment Programme (UNEP), 2012.

<sup>12</sup> "UN Environment Assembly," UN Environment, <http://web.unep.org/environmentassembly/about-un-environment-assembly> (accessed June 10, 2019).

<sup>13</sup> "UN Environment Assembly," UN Environment.

<sup>14</sup> "UN Environment Assembly," UN Environment.

<sup>15</sup> "UN Environment Assembly," UN Environment.

<sup>16</sup> "DIRECTORY Committee of Permanent Representatives to the UN Environment," United Nations Environment Programme, <https://wedocs.unep.org/bitstream/handle/20.500.11822/28185/CPR%20directorynew.pdf?sequence=1&isAllowed=y> (accessed June 10, 2019).

<sup>17</sup> "DIRECTORY," United Nations Environment Programme.

<sup>18</sup> "The Committee of Permanent Representatives," UN Environment, <https://www.unenvironment.org/cpr/committee-permanent-representatives> (accessed June 10, 2019).

<sup>19</sup> "The Committee of Permanent Representatives," UN Environment.

<sup>20</sup> "DIRECTORY," United Nations Environment Programme.

<sup>21</sup> "The Committee of Permanent Representatives," UN Environment.

<sup>22</sup> "Environmental, Social and Economic Sustainability Framework," United Nations Environment Programme, <https://www.unenvironment.org/about-un-environment/why-does-un-environment-matter/environmental-social-and-economic> (accessed June 10, 2019).

<sup>23</sup> "What we do," United Nations Environment, <https://www.unenvironment.org/about-un-environment/what-we-do> (accessed June 10, 2019).

<sup>24</sup> "What we do," United Nations Environment.

<sup>25</sup> "What we do," United Nations Environment.

Since its inception, the UNEP has relied almost entirely on voluntarily contributed funds and partnerships. These voluntary contributions encompass both flexible funds and earmarked funds.<sup>26</sup> The largest amount of UNEP's flexible funding comes from the Environment Fund, which consists of the commitment of voluntary contributions from Member States of the UNEP.<sup>27</sup> In 2002, the Voluntary Indicative Scale of Contributions (VISIC) was created to establish a fair standard by which Member States might be encouraged to contribute to the fund, considering the economic and social circumstances of each Member State.<sup>28</sup> In 2018, the Environment Fund provided USD 67.9 Million, roughly 16 percent of the total income for the UNEP.<sup>29</sup> Yet while UNEP is comprised of all 193 Member States of the UN, only 83 Member States contribute their calculated share to the Environment Fund.<sup>30</sup> Since this is where the majority of the funding for the seven thematic sub-programmes comes from, UNEP recommends and requests that all Member States make their fair-share contribution.<sup>31</sup> Approximately 79 percent of UNEP's funding came from earmarked contributions in 2018.<sup>32</sup> This can present a large challenge to the UNEP, which must find a way to use funds in a balanced and efficient manner to meet its agenda while satisfying the demands of the donors. For this reason, expansion of soft earmarking to the sub-programme level by Member States is necessary for UNEP to be able to objectively implement its programs across the board.<sup>33</sup> In the years to come, UNEP will look forward to increasing the amount of successfully applied soft earmarked funds, as well as increasing the number of multi-year contribution agreements held by UNEP with other international actors.<sup>34</sup>

Throughout the years, the spirit of UNEP has not changed. Rather, the participation within UNEP has increased over time as more Member States and non-state actors are convinced of the detriment human activity is wreaking on the planet and commit toward halting the damage, and protecting and rebuilding the environment for future generations.<sup>35</sup> The UNEP continues to focus on the issues brought forth in the 2012 Conference, validating that poverty eradication, moving from unsustainable to sustainable patterns of producing and consuming, and properly managing the natural resources that serve as a base of economic and social development are imperative to sustainable development.<sup>36</sup> The UNEP also emphasizes the need to reach the 2030 Sustainable Development Goals (SDG), specifically those regarding the impacts on the environment - SDGs Six, Seven, and 11 through 15.<sup>37</sup> It is the hope of the UNEP to lead a holistic and inclusive approach towards development that is anchored in human rights and interlinked with the 2030 Agenda for Sustainable Development.<sup>38</sup> It is only through international collaboration and global reorganization that the environment can be fully protected and kept safe from un-sustainable development.

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<sup>26</sup> "Funding and Partnerships," UN Environment, <https://www.unenvironment.org/about-un-environment/funding-and-partnerships> (accessed June 10, 2019).

<sup>27</sup> "Funding and Partnerships," UN Environment.

<sup>28</sup> "Environment Fund," UN Environment, <https://www.unenvironment.org/about-un-environment/funding/funding-facts/environment-fund> (accessed June 10, 2019).

<sup>29</sup> "Environment Fund," UN Environment.

<sup>30</sup> "Environment Fund," UN Environment.

<sup>31</sup> "Environment Fund," UN Environment.

<sup>32</sup> "Earmarked Contributions," UN Environment, <https://www.unenvironment.org/about-un-environment/funding/funding-facts/earmarked-contributions> (accessed June 10, 2019).

<sup>33</sup> "Earmarked Contributions," UN Environment.

<sup>34</sup> "Earmarked Contributions," UN Environment.

<sup>35</sup> "United Nations Environmental Programme Upgraded to Universal Membership Following Rio+20 Summit," UN Environment, <https://www.unenvironment.org/news-and-stories/press-release/united-nations-environment-programme-upgraded-universal-membership> (accessed June 28, 2019).

<sup>36</sup> "Future We Want - Outcome Document," Sustainable Development Goals: Knowledge Platform <https://sustainabledevelopment.un.org/rio20/futurewewant> (accessed July 6, 2019).

<sup>37</sup> "Sustainable Development Goals," Sustainable Development Goals: Knowledge Platform, <https://sustainabledevelopment.un.org/?menu=1300> (accessed June 12, 2019).

<sup>38</sup> "About the Sustainable Development Goals," UN Environment, <https://www.unenvironment.org/explore-topics/sustainable-development-goals/about-sustainable-development-goals> (accessed June 10, 2019).

# I. Cultivating Technological Innovations to Meet Climate Change Challenges

## *Introduction*

While the ancient civilizations may have had some impact on their local environment, it was the Industrial Revolution of the late-18<sup>th</sup> century that had the most lasting impact on the global climate.<sup>39</sup> Unsustainable development, improper waste dumping, and land manipulations have caused the detrimental effect of global warming.<sup>40</sup> With the 2030 Sustainable Development Goals (SDGs), the ability to sustainably develop is at the forefront of lowering the average global temperature and greenhouse gas emissions.<sup>41</sup> Cultivating new technological innovations to either remove human-caused impacts or not further damage the environment will be the key to meeting the goal of reducing the average global temperature and carbon emissions to pre-Industrial levels.

Industry, human activity, and human-caused geological changes, such as mining, have led the global climate into the warmer and weather-influencing state it is today.<sup>42</sup> The Industrial Revolution was not the first time humans changed the environment to their benefit, but it was the first time it had been done on an international scale.<sup>43</sup> The revolution began in the mid-eighteenth century Great Britain, when machines began to replace human labor.<sup>44</sup> This sparked an international revolution that benefited humans across the board. Specialized jobs, indoor plumbing, and modern medicine are all fields that stemmed from this revolution due to the new found freedom to choose one's career.<sup>45</sup> Due to this increase in technology, lifespans have become longer, infant mortality continues to drop to unprecedented levels, and the people of the world can communicate on a massive network known as the internet.<sup>46</sup> Humans, however, did not take steps towards lessening their impact on the environment and are currently having to deal with these adverse effects. Industrial waste in the air, water, and on land has significantly affected the health of both humans and wildlife across the globe.<sup>47</sup> According to the Safe Drinking Water Foundation, the two chemicals of most concern found in industrial waste are dry cleaning fluids and embalming fluids.<sup>48</sup> Dry cleaning fluids contain perchloroethylene, or PCE, a potential carcinogen that contaminates local groundwater.<sup>49</sup> Embalming fluids are leached into the groundwater around cemeteries, often in contact with decaying organic matter, and flow into local water sources.<sup>50</sup> With the rapid increase of the human population over the next few decades, these contaminant issues will only increase alongside.<sup>51</sup> Other effects of the Industrial Age can be found in the ocean - where plastic and other non-biodegradable objects are consistently found. Plastics have been found in 60 percent of ocean bird species' stomachs and 100 percent of sea turtle species' stomachs that were studied as both of these types of animals confuse the waste for food.<sup>52</sup> Ocean Conservancy has estimated that eight million metric tons of plastic are dumped into the ocean every year, adding to the 150 million metric tons already present.<sup>53</sup> The pollutants found in this waste are ingested by

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<sup>39</sup> Eric McLamb, "The Ecological Impact of the Industrial Revolution," Ecology Communications Group, <https://www.ecology.com/2011/09/18/ecological-impact-industrial-revolution/> (accessed July 28, 2019).

<sup>40</sup> McLamb, "The Ecological Impact of the Industrial Revolution."

<sup>41</sup> "Sustainable Development Goals" *Sustainable Development Knowledge Platform*. United Nations, [sustainabledevelopment.un.org/?menu=1300](https://sustainabledevelopment.un.org/?menu=1300) (accessed July 29, 2019).

<sup>42</sup> Editors, "Climate Change History."

<sup>43</sup> McLamb, "The Ecological Impact of the Industrial Revolution."

<sup>44</sup> McLamb, "The Ecological Impact of the Industrial Revolution."

<sup>45</sup> McLamb, "The Ecological Impact of the Industrial Revolution."

<sup>46</sup> McLamb, "The Ecological Impact of the Industrial Revolution."

<sup>47</sup> McLamb, "The Ecological Impact of the Industrial Revolution."

<sup>48</sup> Nicole Hancock, "Industrial Waste," Safe Drinking Water Foundation, December 23, 2016, <https://www.safewater.org/fact-sheets-1/2017/1/23/industrial-waste> (accessed July 29, 2019).

<sup>49</sup> Hancock, "Industrial Waste."

<sup>50</sup> Hancock, "Industrial Waste."

<sup>51</sup> Hancock, "Industrial Waste."

<sup>52</sup> "Plastics in the Ocean," Ocean Conservancy, <https://oceanconservancy.org/trash-free-seas/plastics-in-the-ocean/> (accessed July 29, 2019).

<sup>53</sup> "Plastics in the Ocean," Ocean Conservancy.

wildlife or have chemicals that saturate the water which affects the water cycle, and in turn, the health of humans and animals.<sup>54</sup>

The SDGs have been brought forth as a way to minimize the global greenhouse emissions and other climate change challenges.<sup>55</sup> SDG7 urges universal access to clean and renewable energy that is also reliable and efficient.<sup>56</sup> SDG9 encourages Member States to sustainably develop industries and technologies, while upgrading their infrastructure to support these efforts.<sup>57</sup> SDG11 demands sustainable cities and communities that will reduce the environmental impacts by better managing waste and water filtration.<sup>58</sup> SDG 12 hopes to increase sustainable production and consumption in regards to energy, food production, waste management, and recycling efforts.<sup>59</sup> SDG13 would have education and policy change be the focus for climate change actions.<sup>60</sup> Then finally, SDG17 calls for international funding and collaboration to meet all of these goals and is especially crucial for climate change initiatives.<sup>61</sup>

In conjunction with the SDGs, is the United Nations Framework Convention on Climate Change (UNFCCC). Founded in 1992, the UNFCCC has created an international network in order to promote awareness and raise funds for climate change actions, while also noting the current impacts and measures needed to be taken.<sup>62</sup> A few years later, the Kyoto Protocol increased the urgent responses from developed Member States to specifically reduce greenhouse gas emissions.<sup>63</sup> This laid the groundwork for the Millennium Development Goals (MDGs) in which ensuring environmental sustainability was one of the eight main goals.<sup>64</sup> MDG7, which called for environmental sustainability, was achieved by the global society by the 2015 deadline: 2.6 billion people gained access to clean water and 2.1 billion people had improvement in sanitation.<sup>65</sup> To further these efforts, the UN moved on to the creation of the SDGs, which the global community is currently striving to accomplish.<sup>66</sup>

Besides the creation of the SDGs, the most recent climate action initiative is the 2015 Paris Agreement.<sup>67</sup> The Paris Agreement builds on all of the previous actions and pushes for greater reductions in greenhouse gas emissions in order to keep the global average temperature two degrees Celsius above pre-industrial levels.<sup>68</sup> Through these agreements, the UNFCCC was able to determine that technology is a key element in reducing greenhouse gas emissions and, in turn, reducing human impacts on the environment.<sup>69</sup> This is seen in the

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<sup>54</sup> "Plastics in the Ocean," Ocean Conservancy.

<sup>55</sup> "Sustainable Development Goals," *Sustainable Development Knowledge Platform*, United Nations, [sustainabledevelopment.un.org/?menu=1300](https://sustainabledevelopment.un.org/?menu=1300). (accessed July 29, 2019).

<sup>56</sup> "Goal 7 - Sustainable Development Knowledge Platform," United Nations, <https://sustainabledevelopment.un.org/sdg7> (accessed July 29, 2019).

<sup>57</sup> "Goal 9 - Sustainable Development Knowledge Platform," United Nations, <https://sustainabledevelopment.un.org/sdg9> (accessed July 29, 2019).

<sup>58</sup> "Goal 11 - Sustainable Development Knowledge Platform," United Nations, <https://sustainabledevelopment.un.org/sdg11> (accessed July 29, 2019).

<sup>59</sup> "Goal 12 - Sustainable Development Knowledge Platform," United Nations, <https://sustainabledevelopment.un.org/sdg12> (accessed July 29, 2019).

<sup>60</sup> "Goal 13 - Sustainable Development Knowledge Platform," United Nations, <https://sustainabledevelopment.un.org/sdg13> (accessed July 29, 2019).

<sup>61</sup> "Goal 17 - Sustainable Development Knowledge Platform," United Nations, <https://sustainabledevelopment.un.org/sdg17> (accessed July 29, 2019).

<sup>62</sup> "History of the Convention," UNFCCC, <https://unfccc.int/process/the-convention/history-of-the-convention#eq-1> (accessed July 30, 2019).

<sup>63</sup> "History of the Convention," UNFCCC.

<sup>64</sup> "United Nations Millennium Development Goals," United Nations, <https://www.un.org/millenniumgoals/bkgd.shtml> (accessed July 30, 2019).

<sup>65</sup> "Were the Millennium Development Goals a Success? Yes! Sort Of: World Vision International," World Vision, <https://www.wvi.org/united-nations-and-global-engagement/article/were-mdgs-success> (accessed September 20, 2019).

<sup>66</sup> "Were the Millennium Development Goals a Success?" World Vision.

<sup>67</sup> United Nations Framework Convention on Climate Change, *Paris Climate Agreement*, November 4, 2016.

<sup>68</sup> "The Paris Agreement," UNFCCC, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> (accessed July 30, 2019)

<sup>69</sup> "The Paris Agreement," UNFCCC.

creation of the Technology Transfer Framework and the Expert Group on Technology Transfer (EGTT).<sup>70</sup> These two groups work together to ensure that sustainably developed and environmentally friendly technologies are easily transferred amongst Member States with both the financing and the engineering required to build such technologies included.<sup>71</sup> In 2007, four themes were initiated by the groups to focus their purpose: efficient financing, international cooperation, internal technology development, and synergistic research and development.<sup>72</sup> These two groups were replaced in 2010, in order to enhance productivity, by the Technology Mechanism which consists of the Technology Executive Committee (TEC) and Climate Technology Centre and Network (CTCN).<sup>73</sup>

The TEC is the policy-making body of the Technology Mechanism; it investigates various climate change issues and reviews the draft resolutions that are put forth in front of the committee.<sup>74</sup> The TEC provides annual recommendations to the UNFCCC's Conference of the Parties that addresses key innovative ways in which developed and developing Member States can enhance their climate change technology as well as holding various green technology themed conferences throughout the year.<sup>75</sup> The CTCN provides resources to developed and developing Member States such as education on new technologies, technical assistance as needed, and facilitates collaboration amongst Member States.<sup>76</sup> It is hosted by the UNEP in conjunction with the United Nations Industrial Organization and 11 other institutions.<sup>77</sup> This branch offers free solutions to climate change issues by working with Member States through nationally designated entities (NDEs).<sup>78</sup> These solutions are specifically tailored to that Member State or region's needs and financial capabilities.<sup>79</sup> Both of these entities urge Member States to engineer and facilitate the creation of new, sustainably developed technologies to meet climate change challenges.<sup>80</sup>

### ***Current Situation***

Combating the destruction climate change is causing is one of the most significant issues that modern day humans will have to overcome.<sup>81</sup> The rise in the global average temperature occurs because the atmosphere acts as a semiconductor in regards to gas meaning some gases stay trapped within the atmosphere while the rest escape out into space, including heat from the sun.<sup>82</sup> These trapped gasses act like a greenhouse, taking in the warmth from the sun and not releasing much heat into space.<sup>83</sup> A massive volume of these greenhouse gasses has now led to the Earth warming up to unhealthy and unsustainable levels.<sup>84</sup> The four main greenhouse gases of concern are carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons (CFCs).<sup>85</sup> Although carbon dioxide, methane, and nitrous oxide are all naturally occurring; it is the vast amounts produced as by-products of industry and agriculture that cause the greenhouse effect.<sup>86</sup> CFCs, most notably found in aerosols, are

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<sup>70</sup> "Technology Transfer Framework," TT:CLEAR, <https://unfccc.int/ttclear/tec/tech-transfer-framework.html> (accessed July 30, 2019).

<sup>71</sup> "Technology Transfer Framework," TT:CLEAR.

<sup>72</sup> "Technology Transfer Framework," TT:CLEAR.

<sup>73</sup> "Climate Technology Negotiations," TT:CLEAR, <https://unfccc.int/ttclear/negotiations> (accessed July 30, 2019).

<sup>74</sup> "Technology Mechanism," TT:CLEAR, <https://unfccc.int/ttclear/support/technology-mechanism.html> (accessed July 30, 2019).

<sup>75</sup> "Technology Mechanism: Enhancing Climate Technology Development and Transfer," United Nations Framework Convention on Climate Change, 2015, [https://unfccc.int/ttclear/misc/\\_StaticFiles/gnwoerk\\_static/TEM/0e7cc25f3f9843ccb98399df4d47e219/174ad939936746b6bfad76e30a324e78.pdf](https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/TEM/0e7cc25f3f9843ccb98399df4d47e219/174ad939936746b6bfad76e30a324e78.pdf) (accessed November 14, 2019).

<sup>76</sup> "Technology Mechanism," TT:CLEAR.

<sup>77</sup> "Technology Mechanism: Enhancing" UNFCCC.

<sup>78</sup> "Technology Mechanism: Enhancing" UNFCCC.

<sup>79</sup> "Technology Mechanism: Enhancing" UNFCCC.

<sup>80</sup> "Technology Mechanism," TT:CLEAR.

<sup>81</sup> "The Causes of Climate Change," NASA, <https://climate.nasa.gov/causes/> (accessed July 30, 2019).

<sup>82</sup> "The Causes of Climate Change," NASA.

<sup>83</sup> "The Causes of Climate Change," NASA.

<sup>84</sup> "The Causes of Climate Change," NASA.

<sup>85</sup> "The Causes of Climate Change," NASA.

<sup>86</sup> "The Causes of Climate Change," NASA.

synthetically manufactured and the most threatening to the ozone layer.<sup>87</sup> This warming phenomenon is causing the polar ice caps to melt, water levels to rise, weather patterns to shift, and overall high temperatures amongst other travesties.<sup>88</sup>

According to a 2013 Intergovernmental Panel on Climate Change (IPCC) study, it may be likely that global warming cannot be reversed due to the longevity of the greenhouse gases before they breakdown enough to be negligible.<sup>89</sup> One study predicts that the goals laid out in the Paris Agreement will have the global average temperature rise by three degrees Celsius by 2100.<sup>90</sup> However, this Agreement did not take into account long-term effects of the carbon-cycle, therefore the actual rise in temperature may be five degrees Celsius by 2100 and reaching the three degrees Celsius threshold by 2050.<sup>91</sup> This level of heating will cause devastation amongst the world's ecosystems.<sup>92</sup> Scientists have estimated that a rise of four degrees Celsius would melt the ice caps causing water levels to rise and warm the oceans which could cause mass die-offs of coral reefs and other habitats, as well as change the weather patterns and daily heat averages.<sup>93</sup>

### ***Current Technological Issues***

Technology, in its various forms, has shaped the world into what it is today, especially in developed Member States. Even some “eco-friendly” labeled technologies, like hybrid cars, cause drastic environmental impacts.<sup>94</sup> In the case of hybrid cars, the car battery's materials have to be mined which creates unhealthy emissions that leak into the air or water.<sup>95</sup> Current farming technologies, like pesticides and herbicides, can leach into the groundwater, polluting local water sources and harming local wildlife.<sup>96</sup> Another example of non-sustainable resources is oil or petroleum. Oil surged in productive use as the fuel source for automobiles in the early 20th century and as a lubricant in machines throughout the 19th and 20th centuries.<sup>97</sup> Oil cannot sustain the modern world for much longer, due to its nonrenewable nature, and therefore, is a top priority amongst many engineers and scientists to find more sustainable resources for power.<sup>98</sup> The world has seen time and time again the detriment of oil spills on the environment. While most oil spills are caused by human error, natural disasters, or technological failure, the largest oil spill was an act of warfare.<sup>99</sup> During the Persian Gulf War in 1991, Iraqi forces entered Kuwait.<sup>100</sup> UN forces in combination with forces from other Member States attempted to intervene.<sup>101</sup> In order to prevent this, the Iraqi military began to purposefully dump millions of gallons of oil into the ocean.<sup>102</sup> This act of “environmental terrorism” saw 11 million gallons of oil purged into the Persian Gulf.<sup>103</sup> It is estimated that at least 706 kilometers of coastline were affected by the spill with clean-up efforts being

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<sup>87</sup> “The Causes of Climate Change,” NASA.

<sup>88</sup> “The Causes of Climate Change,” NASA.

<sup>89</sup> Matthew Collins and Reto Knutti, “Long-term Climate Change: Projections, Commitments and Irreversibility,” In *Climate Change 2013: The Physical Science Basis: Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2014), 1029-1136.

<sup>90</sup> David Spratt and Ian Dunlop, *Existential Climate-related Security Risk: A Scenario Approach* (Melbourne, AU: Breakthrough-National Centre for Climate Restoration, 2019), [https://docs.wixstatic.com/ugd/148cb0\\_b2c0c79dc4344b279bcf2365336ff23b.pdf](https://docs.wixstatic.com/ugd/148cb0_b2c0c79dc4344b279bcf2365336ff23b.pdf) (accessed August 5, 2019).

<sup>91</sup> Spratt and Dunlop, *Existential Risk*.

<sup>92</sup> Spratt and Dunlop, *Existential Risk*.

<sup>93</sup> Spratt and Dunlop, *Existential Risk*.

<sup>94</sup> Andrew Gellert, “Technological Advancement and the Effect on the Ecosystem,” *Sciencing*, March 02, 2019. <https://sciencing.com/technological-advancement-effect-ecosystem-23107.html> (accessed August 5, 2019).

<sup>95</sup> Gellert, “Technological Advancement.”

<sup>96</sup> Gellert, “Technological Advancement.”

<sup>97</sup> John P. Rafferty, “9 of the Biggest Oil Spills in History,” *Encyclopædia Britannica*, <https://www.britannica.com/list/9-of-the-biggest-oil-spills-in-history> (accessed August 5, 2019).

<sup>98</sup> Rafferty, “9 Biggest.”

<sup>99</sup> Rafferty, “9 Biggest.”

<sup>100</sup> Nick Barber, “1991 Gulf War Oil Spill,” *Stanford.edu*, November 23, 2018, <http://large.stanford.edu/courses/2018/ph240/barber1/> (accessed August 5, 2019).

<sup>101</sup> Barber, “1991.”

<sup>102</sup> Barber, “1991.”

<sup>103</sup> Barber, “1991.”



limited by the war.<sup>104</sup> The World Wildlife Fund's United Arab Emirates (UAE) office estimated over 30,000 water birds died because of the oil spill.<sup>105</sup> Fish health and reproduction was also negatively affected, in turn affecting the birds and other wildlife that consumes them.<sup>106</sup> However, by 1994, most populations had made a miraculous recovery.<sup>107</sup> The hot climate and bacteria helped to evaporate/breakdown the oil which allowed wildlife to flourish again.<sup>108</sup> Despite these recoveries, many deep sea environments, like coral reefs, remain damaged to this day.<sup>109</sup> It is crucial that governments and companies have action plans in place to limit the damage done to the environment by oil spills.<sup>110</sup>

### ***Green Technology***

According to UNEP Executive Director Inger Anderson, investments in renewable energy is also an investment in a "profitable future." Based on global trends, Anderson added, "Investments in renewable energy in 2018 were three times higher than the amount invested in new coal and gas-fired generators. While this is encouraging, we need to significantly step up the pace, if we are to meet international climate and development goals."<sup>111</sup> Although advances in technology caused great harm to the environment since the beginning of the Industrial Revolution, green technology will be the key to halting the deterioration of the environment.<sup>112</sup> Green technology is technology that has been sustainably produced and will either help the environment or not cause any harm to it, such as ocean vacuums and harvesting electricity from renewable resources like water and wind.<sup>113</sup> These tools can and will drastically improve and better local and global ecological biomes.<sup>114</sup> Because of the rise in climate change awareness, many technology companies have begun developing more sustainable and eco-friendly technologies.<sup>115</sup> These technologies encompass many areas of daily life from eco-friendly irrigation systems and non-toxic pesticides to waste collection devices in both the ocean and internal waterways.<sup>116</sup> Others include water filters, air purifiers, removing carbon dioxide from the air, wind and water energy sources, energy-efficient appliances, etc.<sup>117</sup>

In the modern world, society and technology are significantly linked: society deems what technology is needed and new technology influences how much of society is developed.<sup>118</sup> However, many existing institutions do not prioritize the sustainable development of these technologies, leading to an ever increasing devotion to non-renewable resources like coal, natural gas, and oil.<sup>119</sup> Therefore, it is imperative that Member States, and society as a whole, incentivize these institutions and companies to develop sustainable technologies in order to halt the

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<sup>104</sup> Barber, "1991."

<sup>105</sup> Mark Tutton, "Lessons Learned from the Largest Oil Spill in History," CNN, June 04, 2010, <http://www.cnn.com/2010/WORLD/meast/06/04/kuwait.oil.spill/index.html> (accessed August 5, 2019).

<sup>106</sup> Tutton, "Lessons Learned."

<sup>107</sup> Tutton, "Lessons Learned."

<sup>108</sup> Tutton, "Lessons Learned."

<sup>109</sup> Tutton, "Lessons Learned."

<sup>110</sup> Tutton, "Lessons Learned."

<sup>111</sup> "Renewable Energy Investment in 2018 Hit USD 288.9 billion, Far Exceeding Fossil Fuel Investment," United Nations Environment Programme, June 18, 2019, <https://www.unenvironment.org/news-and-stories/press-release/renewable-energy-investment-2018-hit-usd-2889-billion-far-exceeding> (accessed November 22, 2019).

<sup>112</sup> "What Is Green Technology and Its Benefits?" U.S. Green Technology, July 26, 2016, <https://usgreentechnology.com/green-technology/>, (accessed August 5, 2019).

<sup>113</sup> "What Is Green Technology" U.S. Green Technology

<sup>114</sup> "What Is Green Technology" U.S. Green Technology.

<sup>115</sup> "Technology Innovation for Sustainable Development," Harvard Kennedy School, <https://www.hks.harvard.edu/centers/mrcbg/programs/sustsci/activities/program-initiatives/innovation> (accessed September 20, 2019).

<sup>116</sup> "Technology Innovations," Harvard Kennedy School.

<sup>117</sup> Uclia Wang, "Top Five Sustainable Technology Trends of 2015," The Guardian, December 31, 2015, <https://www.theguardian.com/sustainable-business/2015/dec/31/top-5-sustainable-technology-trends-of-2015> (accessed September 20, 2019).

<sup>118</sup> Laura Diaz Anadon, et al., "Making Technological Innovation Work for Sustainable Development," *SSRN Electronic Journal*, August 12, 2016 <https://www.pnas.org/content/113/35/9682>.

<sup>119</sup> Anadon, "Making Technological Innovation."

progress of climate change and prevent the rise of global temperatures.<sup>120</sup> These incentives would need to arise from the local governments of developed Member States or developing Member States could receive resources from Non-Governmental Organizations (NGOs) who cater to eco-friendly and green technologies.

According to the UNEP Global Trends in Renewable Energy Investment 2019 report, investments in renewable energy reached USD 272.9 Billion worldwide in 2018.<sup>121</sup> This number is lower than previous amounts of investments, however, the cost of solar energy products significantly decreased in recent years.<sup>122</sup> The largest contributor to the investment of renewable energy is China, as USD 88.5 Billion came just from China.<sup>123</sup> Following behind China are Europe with USD 59.9 Billion, the United States of America with USD 42.8 Billion, and Asia/Oceania (excluding China and India) at 15 percent.<sup>124</sup> Costs of renewable energy sources has dramatically decreased over the past decade- solar photovoltaic panels without tracking dropped 81 percent in cost from USD 304 per megawatt hour (MWh) in 2009 to USD 57 per MWh in 2019.<sup>125</sup> Onshore and offshore wind power have also seen significant reductions in cost, dropping from USD 93 MWh to USD 50 MWh and USD 160 MWh to USD 89 MWh respectively.<sup>126</sup> This continued drop in price is crucial to the growth of green technology and the inevitable switch to renewable energy sources as it is increasingly cost effective.<sup>127</sup> It is enormously beneficial for Member States to continue investing in renewable energy and green technologies.

## *Case Studies*

### *Hainan Island*

One small island in China has created an eco-friendly hub in the South China Sea.<sup>128</sup> Hainan Island, the southernmost point in China, is home to several eco-friendly and green technology companies who are striving to save the planet.<sup>129</sup> Hainan became a Chinese province in 1988 and at the same time was declared a Special Economic Zone (SEZ).<sup>130</sup> Later in 2018, it was declared a Free Trade Zone (FTZ) giving it free-trade capabilities with local and foreign businesses.<sup>131</sup> Hainan, being a tropical island, took this freedom and began its path towards a green technology- driven economy.<sup>132</sup>

Several foreign green technology companies have taken up residence on this lush island.<sup>133</sup> One small Dutch company located on the island is gearing up to release Onzense, a small mountable garden that will help major cities incorporate greenery.<sup>134</sup> These so called “green walls” have the ability to cut indoor temperature regulation costs by 50 percent and can even dissipate air-borne toxins.<sup>135</sup> In another part of the island, the Longshui Modern Agricultural Demonstration Base incorporates efficient eco-friendly farming techniques from across the

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<sup>120</sup> Anadon, “Making Technological Innovation.”

<sup>121</sup> “Global Trends in Renewable Energy Investment 2019,” United Nations Environment Programme and BloombergNEF, September 2019, <https://wedocs.unep.org/bitstream/handle/20.500.11822/29752/GTR2019.pdf?sequence=1&isAllowed=y> (accessed November 22, 2019).

<sup>122</sup> “Global Trends,” UNEP and BloombergNEF.

<sup>123</sup> “Global Trends,” UNEP and BloombergNEF.

<sup>124</sup> “Global Trends,” UNEP and BloombergNEF.

<sup>125</sup> “Global Trends,” UNEP and BloombergNEF.

<sup>126</sup> “Global Trends,” UNEP and BloombergNEF.

<sup>127</sup> “Global Trends,” UNEP and BloombergNEF.

<sup>128</sup> Crystal Reid, “This Tiny Island Is Trying to Save the World. But Why?” Popular Mechanics, June 12, 2019, <https://www.popularmechanics.com/science/green-tech/a27920022/chinese-island-hainan-green-tech/> (accessed August 5, 2019).

<sup>129</sup> Reid, “This Tiny Island.”

<sup>130</sup> Reid, “This Tiny Island.”

<sup>131</sup> Reid, “This Tiny Island.”

<sup>132</sup> Reid, “This Tiny Island.”

<sup>133</sup> Reid, “This Tiny Island.”

<sup>134</sup> Reid, “This Tiny Island.”

<sup>135</sup> Reid, “This Tiny Island.”

globe to produce various fruits and vegetables.<sup>136</sup> The Hainan Runda Modern Agricultural Group that runs the base uses vertical stacking of plants that can be rotated towards the sun throughout the day.<sup>137</sup> This group has eradicated most waste by using a smart irrigation system from Israel which administers the correct amount of nutrition each plant needs.<sup>138</sup>

An irrigation system, originally created by the Netherlands, is employed and keeps various bugs away using high-pressure water jets, minimizing the need for pesticides.<sup>139</sup> Before the high production levels, however, there was great cost in installing the proper machinery for green production.<sup>140</sup> In order to offset costs, the group has partnered with local farmers who will have access to the advanced technology and concepts.<sup>141</sup> They also offer an all-inclusive set up for other companies in which they will build the farming infrastructure, set up all the equipment, provide the labor, and help with marketing for the low price of USD 4.3 Million (RMB 30 million).<sup>142</sup> Hainan has inspired the rest of China, especially in Beijing, where the city has declined to take in anymore plastic waste and is promoting recycling within its borders.<sup>143</sup> The South African company, A Cup of Earth, based in Hainan, has used this policy to promote beach cleanups, alternatives to plastic wrap, and even urging local recycling centers in large city neighborhoods and apartment complexes which dispense free items or coupons to incentivize recycling.<sup>144</sup>

The island's government has created regulations to remove all plastic bags and utensils by 2020 and all non-degradable and non-recyclable plastics by 2025.<sup>145</sup> They have also begun the early stages of fixing other environmental issues by banning the use of high-emissions vehicles, cleaning up all bodies of water in and around the island, and improving waste disposal systems.<sup>146</sup> While some of Hainan's reasoning for their green efforts are to promote tourism, the island also understands that by creating and implementing these policies they can serve as an example to other businesses, cities, and even Member States that wish to adopt similar ideologies.<sup>147</sup>

### *The "Living Building Challenge"*

The "Living Building Challenge", a completely eco-friendly building or office, is another way to negate human-produced effects on the environment.<sup>148</sup> Seattle-based architect John F. McLennan began this challenge in 2006 as a way to have various communities and buildings produce more clean water and energy than they consume and throw out less waste than recycled materials used in the structure.<sup>149</sup> These buildings are also banned from using any one of 800 chemicals deemed harmful to the environment such as formaldehyde, asbestos, and pesticides.<sup>150</sup> A development must meet the seven standards of the "Living Building Challenge" in order to qualify and must maintain these for a minimum of a year.<sup>151</sup> These so called "petals" each strive to ensure the eco-friendly nature of the project while also allowing for design and social qualities.<sup>152</sup> First is the "Site Petal" which dictates where the project can be built and how to minimize environmental impacts.<sup>153</sup> Next is the "Water

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<sup>136</sup> Reid, "This Tiny Island."

<sup>137</sup> Reid, "This Tiny Island."

<sup>138</sup> Reid, "This Tiny Island."

<sup>139</sup> Reid, "This Tiny Island."

<sup>140</sup> Reid, "This Tiny Island."

<sup>141</sup> Reid, "This Tiny Island."

<sup>142</sup> Reid, "This Tiny Island."

<sup>143</sup> Reid, "This Tiny Island."

<sup>144</sup> Reid, "This Tiny Island."

<sup>145</sup> Reid, "This Tiny Island."

<sup>146</sup> Reid, "This Tiny Island."

<sup>147</sup> Reid, "This Tiny Island."

<sup>148</sup> "What Is the Living Building Challenge?" Living Building Chronicle, <https://livingbuilding.kendedafund.org/living-building-challenge/> (accessed August 5, 2019).

<sup>149</sup> "What Is?" Living Building Chronicle.

<sup>150</sup> "What Is?" Living Building Chronicle.

<sup>151</sup> "What Is?" Living Building Chronicle.

<sup>152</sup> Hourigan Team, "Understanding the Living Building Challenge and Its "Petals,"" Hourigan, January 16, 2018, <https://www.hourigan.group/blog/understanding-living-building-challenge-petals/> (accessed August 5, 2019).

<sup>153</sup> Hourigan, "Understanding."

Petal” which mandates that the building is net-zero in water usage and will use all rain water for various needs.<sup>154</sup> The “Energy Petal” ensures that the building uses completely renewable energy sources and is pollution-free.<sup>155</sup> The “Health Petal” focuses on the human health needs of daylight and fresh air and therefore requires windows in any space where people will remain for long periods of time.<sup>156</sup> The “Materials Petal” is the most demanding, requiring a detailed list of every material used in the building and none of the material can contain the aforementioned banned chemicals.<sup>157</sup> The “Equity Petal” deems that the building should be accessible to all people regardless of disabilities, net-worth, or other distinction.<sup>158</sup> Lastly the “Beauty Petal” wishes Living Buildings to be aesthetically pleasing and creatively designed.<sup>159</sup> The “Living Building Challenge” is a major step towards sustainable communities across the world and could soon be implemented at a lower cost with the advancement of technology as well as donations.<sup>160</sup>

### ***Moving Forward***

The UN has understood the urgent need for action across the globe. The MDGs, SDGs, Kyoto Protocol, and Paris Agreement amongst other initiatives have set the path for climate change control.<sup>161</sup> The UN met again most recently in September 2019 at the UN Climate Action Summit.<sup>162</sup> This summit brought together Member States, local authorities, private citizens, and other international groups in order to discuss various actions needing to occur to halt or even reverse climate change.<sup>163</sup> Numerous other meetings occurred during 2019 to lead up to the Summit, so that all Member States had definitive plans for their contributions to tackling this issue.<sup>164</sup> Louis Alfonso de Alba, the UN Secretary-General’s Special Envoy to the Summit, said that climate change is, “a problem that is not just affecting the environment. It touches on all the spheres of development and if we want to achieve sustainable development, fight poverty and eradicate diseases, etc., climate action is a fundamental thing, and will have far reaching impact on the future of our communities.”<sup>165</sup>

### ***Conclusion***

It is imperative that the UN and the world understand the reality of Climate Change. If humans do nothing, the flora and fauna will not be the only organisms to suffer. Humans, especially in developing countries or even low-income neighborhoods of developed countries will feel the most harm that Climate Change can cause.<sup>166</sup> Powerful actions are needed to stop this crisis so that future generations may have a better world to live in. It is the duty of the UNEP to insist on strong initiatives to stop or slow the effects of Climate Change both within the UN and within individual Member States.

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<sup>154</sup> Hourigan, “Understanding.”

<sup>155</sup> Hourigan, “Understanding.”

<sup>156</sup> Hourigan, “Understanding.”

<sup>157</sup> Hourigan, “Understanding.”

<sup>158</sup> Hourigan, “Understanding.”

<sup>159</sup> Hourigan, “Understanding.”

<sup>160</sup> “What Is?” Living Building Chronicle.

<sup>161</sup> “Climate Change,” United Nations, <https://www.un.org/en/sections/issues-depth/climate-change/> (accessed September 19, 2019).

<sup>162</sup> “UNITED NATIONS Climate Change - Summit 2019,” United Nations, <https://www.un.org/en/climatechange/un-climate-summit-2019.shtml> (accessed August 1, 2019).

<sup>163</sup> “UNITED NATIONS Climate Change - Summit 2019,” United Nations.

<sup>164</sup> “UNITED NATIONS Climate Change - Summit 2019,” United Nations.

<sup>165</sup> “UNITED NATIONS Climate Change - Summit 2019,” United Nations.

<sup>166</sup> Emma Schwartz, “Quick Facts: How Climate Change Affects People Living in Poverty,” Mercy Corps, September 17, 2019, <https://www.mercycorps.org/articles/climate-change-affects-poverty> (accessed September 19, 2019).

### ***Committee Directive***

Creating eco-friendly technology is a major key to combating Climate Change challenges. Delegates should research how their Member State has reduced emissions, sustainably developed, or is developing green technology. Delegates should also research the costs of switching to green technology and how they could offset the costs. Delegates may also consider what actions have Member States taken to reduce or correct these effects through technology? How will Member States enforce any climate change initiatives or policies? Have Member States been involved with handling climate change issues on an international level? Has the Member State worked with the Technology Mechanism, either through the TEC or CTCN to resolve any climate change issues and/or produce more efficient green technology? What specific green-technology initiatives or policies has your Member State implemented? How has your Member State invested in renewable energy and green technology? Has a building or project been built to the standards of the “Living Building Challenge” or other similarly eco-friendly ways domestically?

## II. Reducing the Impact of Pollution on Habitat Loss

### *Introduction*

Securing flourishing and biodiverse ecosystems is an essential part of protecting the planet because ecosystems are the very foundation of humanity's ability to survive.<sup>167</sup> Human beings depend on ecosystems for the production of oxygen, food, medicine, climate regulation, and many other raw materials used in societies.<sup>168</sup> Ecosystems are more resilient and able to adapt to changes when there is a lot of variation of flora and fauna, and when a large amount of biological diversity exists within the food chain.<sup>169</sup> Biodiversity is defined in three parts: genetic diversity - where DNA within a species is diverse; species diversity - the various wildlife within an area; and ecosystem diversity - the assortment of habitats within a defined section.<sup>170</sup> In the past, natural disasters, mass extinction events, disease, and drought were several causes of habitat and biodiversity loss.<sup>171</sup> In modern times, human pollution has become one of the leading causes of habitat loss, tarnishing many of the world's biomes with plastics, oil, and other waste products.<sup>172</sup> Human-caused habitat losses might not have such immediate effects as a natural disaster or other natural causes would, but the effects of this are much more long lasting.<sup>173</sup> Community building, wood production, pesticide use, high volume hunting operations, and many other human activities involve varying types of major pollution that have continued to devastate ecosystems, forcing the rapid extinction of many species.<sup>174</sup> Human development also increases habitat fragmentation, which significantly lowers biological diversity and has exponentially harmful effects on habitats over time.<sup>175</sup> With the ever-increasing number of species going extinct or being threatened with extinction, it is critical for humans to act with haste to eliminate these extinction-causing behaviors.<sup>176</sup> Protecting biodiversity is a key factor in fighting habitat loss because a biodiverse environment can adapt and compensate for a decline in a species, ensuring that all interdependent functions are still carried out and maintaining a sustainable balance conducive to habitat preservation.<sup>177</sup> The United Nations Environment Programme (UNEP) is leading the initiative to ensure that wildlife and habitats are either preserved or reverted back to pre-industrial conditions. Restoration and preservation are needed in order to restore land connectivity, curb extinction rates, and halt habitat loss.<sup>178</sup>

Scientists have determined that throughout the course of history the Earth has experienced five periods of time where biodiversity of life on Earth massively declined due to various natural phenomena.<sup>179</sup> These periods in time are referred to as mass extinction waves.<sup>180</sup> The Earth is currently in the sixth mass wave of extinction in the past half-billion years, and these extinction rates are driven by human activity rather than natural phenomena.<sup>181</sup> Human activities have put so much stress on the environment that dozens of species are going extinct every year.<sup>182</sup> Species such as the Woodland Bison, Merriam Elk, Rocky Mountain Grasshopper,

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<sup>167</sup> Anup Shah, "Why is Biodiversity Important?" Global Issues, January 19, 2014, <http://www.globalissues.org/article/170/why-is-biodiversity-important-who-cares> (accessed September 18, 2019).

<sup>168</sup> "Biodiversity," Capital Regional District, November 25, 2013, <https://www.crd.bc.ca/education/our-environment/concerns/biodiversity> (accessed August 7, 2019).

<sup>169</sup> "Biodiversity," Capital Regional District.

<sup>170</sup> "Biodiversity," Capital Regional District.

<sup>171</sup> "Biodiversity," Capital Regional District.

<sup>172</sup> "Biodiversity," Capital Regional District.

<sup>173</sup> "Biodiversity," Capital Regional District.

<sup>174</sup> "Biodiversity," Capital Regional District.

<sup>175</sup> Nick M. Haddad et al, "Habitat Fragmentation and its Lasting Impact on Earth's Ecosystems," Science Advances, <https://advances.sciencemag.org/content/1/2/e1500052> (accessed August 10, 2019).

<sup>176</sup> "The Extinction Crisis," Center for Biological Diversity, [https://www.biologicaldiversity.org/programs/biodiversity/elements\\_of\\_biodiversity/extinction\\_crisis/](https://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/) (accessed August 7, 2019).

<sup>177</sup> "The Extinction Crisis," Center for Biological Diversity.

<sup>178</sup> Haddad, "Habitat Fragmentation," Science Advances.

<sup>179</sup> "Timeline of Mass Extinction events on Earth," World Atlas, <https://www.worldatlas.com/articles/the-timeline-of-the-mass-extinction-events-on-earth.html> (accessed September 18, 2019).

<sup>180</sup> "Timeline of Mass Extinction events on Earth," World Atlas.

<sup>181</sup> "The Extinction Crisis," Center for Biological Diversity.

<sup>182</sup> "The Extinction Crisis," Center for Biological Diversity.

Passenger Pigeon, Culebra Parrot, and Rabbs' tree frog are now extinct due to habitat loss.<sup>183</sup> However, exact numbers for extinct and endangered species are not able to be ascertained for many complex reasons. Scientists are hesitant to declare species extinct prematurely for fear of removing their protections and condemning them to actual extinction, even if viable population samples have not been observed in the wild for decades.<sup>184</sup> Additionally, humanity does not have complete knowledge of all the existing species on Earth.<sup>185</sup> Scientists cannot track the populations of species they do not know exist, so it is impossible to quantify how many species have actually been lost as well as how many are critically endangered.<sup>186</sup> But the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has stated that natural ecosystems have declined by 47 percent on average from their earliest recorded states, and that the global biomass of wild mammals has fallen by 82 percent.<sup>187</sup>

The most harmful human activities contributing to high extinction rates are those that drive habitat loss such as construction and development, introduction of exotic species into habitats, and climate change.<sup>188</sup> Extinction is a natural phenomenon, but human stressors leading to global warming and habitat loss have accelerated extinction rates to as much as a thousand times more than the natural background rate of extinction.<sup>189</sup> For example, construction produces air, water, noise, and soil pollution in alarming quantities.<sup>190</sup> Construction is responsible for about four percent of all particulate emissions due to land clearing, operation of diesel engines, demolition, burning, and the use of toxic materials at work sites.<sup>191</sup> Construction sites also introduce diesel, oil, paint, solvents, cleaners and chemicals, debris, and dirt as water pollutants.<sup>192</sup> Land clearing exposes soil and leads to silt run offs and sediment pollution that restricts sunlight filtration in water and destroys aquatic life.<sup>193</sup> Surface water run-off also carries the various construction contaminants deep into the ground, causing soil and groundwater pollution.<sup>194</sup> Construction sites also produce a lot of noise because of the industrial equipment used on site.<sup>195</sup> Noise has been researched as a pollutant in recent studies, and has been shown to disturb the natural cycles and reduce the usable habitat of animals.<sup>196</sup> These sites impose permanent fragmentation of habitats and create areas that are not able to sustain many species. Yet, as the human population grows, construction and development are necessary to sustain human activities, and this inevitably causes habitat destruction.<sup>197</sup> One of the largest modern challenges is learning to develop in a regulated fashion that ensures the protection of natural habitats.

As economies and industrialization continue to expand, it will be extremely important to curb and regulate the amount of air pollution that we produce. Aside from the numerous and alarming health effects of air pollution on human beings, air pollution is inextricably linked with climate change since both problems stem from and are

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<sup>183</sup> "The Extinction Crisis," Center for Biological Diversity.

<sup>184</sup> John Platt, "Why Don't We Hear About More Species Going Extinct?" *Scientific American*, <https://blogs.scientificamerican.com/extinction-countdown/why-dont-we-hear-about-more-species-going-extinct/> (accessed September 18, 2019).

<sup>185</sup> Platt, "Why Don't We Hear About More Species Going Extinct?"

<sup>186</sup> Platt, "Why Don't We Hear About More Species Going Extinct?"

<sup>187</sup> Sandra Diaz, et. al., "Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services," IPBES, [https://www.ipbes.net/sites/default/files/downloads/spm\\_unedited\\_advance\\_for\\_posting\\_htn.pdf](https://www.ipbes.net/sites/default/files/downloads/spm_unedited_advance_for_posting_htn.pdf) (accessed September 18, 2019).

<sup>188</sup> "The Extinction Crisis," Center for Biological Diversity.

<sup>189</sup> "The Extinction Crisis," Center for Biological Diversity.

<sup>190</sup> Jennifer Gray, "Pollution From Construction," *Sustainable Build*, May 30, 2019, <http://www.sustainablebuild.co.uk/pollutionfromconstruction.html> (accessed August 10, 2019).

<sup>191</sup> Gray, "Pollution From Construction."

<sup>192</sup> Gray, "Pollution From Construction."

<sup>193</sup> Gray, "Pollution From Construction."

<sup>194</sup> Gray, "Pollution From Construction."

<sup>195</sup> Gray, "Pollution From Construction."

<sup>196</sup> Gray, "Pollution From Construction."

<sup>197</sup> Paul R. Ehrlich, "The Loss of Diversity: Causes and consequences," *The National Academic Press*, <https://www.nap.edu/read/989/chapter/3#21> (accessed November 13, 2019).

exacerbated by the current energy model of fuel burning.<sup>198</sup> Climate change has become a huge problem we must face and is a major aggressor of habitat loss and species extinction. All species are adapted to survive in their own niche, so temperature, meteorological, and water changes caused by human activities have complex negative implications for many of them.<sup>199</sup> Studies have indicated that a temperature rise of only 1.8 to 2 degrees Celsius would put a million different species at risk of extinction.<sup>200</sup> Coral reefs, polar bears, and many plant species are particularly at risk of going extinct because of habitat loss caused by climate change.<sup>201</sup> Estimates state that one fifth of coral reefs have already been lost or severely damaged, and that another 35 percent could be lost in the next 10-40 years.<sup>202</sup> Coral reefs are disappearing at twice the rate rainforests are.<sup>203</sup> Since they are extremely delicate ecosystems that are sensitive to temperature change, climate change puts them at risk of total collapse.<sup>204</sup> Polar bears rely on the ice of the Arctic Sea as habitat and hunting grounds for the seals they eat.<sup>205</sup> The ice in the Arctic Sea has been declining at a rate of about 13 percent a decade due to climate change.<sup>206</sup> If this trend continues about two-thirds of the world's polar bears will be lost to habitat loss.<sup>207</sup> Plants are vulnerable to climate change simply because they cannot migrate quickly.<sup>208</sup> If temperatures change, it may mean that many species can no longer survive in the conditions of the areas where they have already been established.<sup>209</sup>

## History

Humans have impacted the environment for millennia. The Industrial Revolution of the mid-eighteenth century caused these impacts to grow exponentially.<sup>210</sup> When the Industrial Revolution began in the 1700s, textile and iron making processes in Great Britain began to utilize fossil fuels instead of renewable energy sources like wind, water, and wood because coal was and has remained a cheap and effective source of energy for countries with fast growing energy demands.<sup>211</sup> By the 19th century, industrialization of the world brought machinery to all facets of life significantly affecting food production, medicine, housing, clothing, and more.<sup>212</sup> Society had gained the ability to effectively produce higher quality goods more efficiently. Thanks to this revolution, impacts on medicine and improved living standards allowed for a huge population increase that has continued to this day.<sup>213</sup> At the dawn of the revolution in the 1700s, the world population was a mere 600 million.<sup>214</sup> By 1800, the population was 990 million, and in 1900 it had reached 1.65 billion.<sup>215</sup> Subsequently, at the dawn of the 21st century, the world population had grown to six billion, and in 2019 with the world population was

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<sup>198</sup> "The Link between Climate Change and Air Pollution," Sustainability For All, <https://www.activesustainability.com/climate-change/link-between-climate-change-air-pollution/> (accessed August 10, 2019).

<sup>199</sup> "Climate Change Causes Habitat Loss and Species Extinction," GreenPeace, <http://www.greenpeace.org/eastasia/campaigns/climate-energy/problems/impacts/habitat-loss-and-species-extinction/> (accessed August 10, 2019).

<sup>200</sup> "Climate Change Causes," GreenPeace.

<sup>201</sup> "Climate Change Causes," GreenPeace.

<sup>202</sup> "Coral Reef Destruction Facts," The World Counts, [https://www.theworldcounts.com/counters/ocean\\_ecosystem\\_facts/coral\\_reef\\_destruction\\_facts#top-facts](https://www.theworldcounts.com/counters/ocean_ecosystem_facts/coral_reef_destruction_facts#top-facts) (accessed November 13, 2019).

<sup>203</sup> "Coral Reef Destruction Facts," The World Counts.

<sup>204</sup> "Coral Reef Destruction Facts," The World Counts.

<sup>205</sup> Jane Palmer, "Will Polar Bears Become Extinct?" BBC Earth, <http://www.bbc.com/earth/story/20141107-will-polar-bears-become-extinct> (accessed November 13, 2019).

<sup>206</sup> Jane Palmer, "Will Polar Bears Become Extinct?"

<sup>207</sup> Jane Palmer, "Will Polar Bears Become Extinct?"

<sup>208</sup> "Climate Change Causes," GreenPeace.

<sup>209</sup> "Climate Change Causes," GreenPeace.

<sup>210</sup> Eric McLamb, "The Ecological Impact of the Industrial Revolution," Ecology Communications Group, <https://www.ecology.com/2011/09/18/ecological-impact-industrial-revolution/> (accessed August 9, 2019).

<sup>211</sup> McLamb, "The Ecological Impact."

<sup>212</sup> McLamb, "The Ecological Impact."

<sup>213</sup> McLamb, "The Ecological Impact."

<sup>214</sup> "World Population Growth," Our World in Data, <https://ourworldindata.org/world-population-growth> (accessed August 10, 2019).

<sup>215</sup> "World Population Growth," Our World in Data.



established at 7.7 billion inhabitants.<sup>216</sup> Consequently, with the increase of the population pollution has become a much larger problem.<sup>217</sup> Satisfying the needs of 7.7 billion people requires more resources, and the current production models utilize fossil fuels more than any other energy source. This fossil fuel model is problematic because of the alarming amounts of greenhouse gas emissions produced, making it a major contributing factor of climate change and habitat loss.

While using fossil fuels allowed for production potential previously unimaginable, fossil fuels accrue external costs at every step of the production and consumption chain.<sup>218</sup> The rapid expansion of the fossil fuel industry drastically altered the human relationship with the environment.<sup>219</sup> The advancements offered to society by the industrial revolution were vast, but they were gained at the expense of the extreme taxation of the environment.<sup>220</sup> Production for society strips desired resources from the environment without regard to the ecological impacts that extraction and production wreak on ecosystems after-the-fact.<sup>221</sup> Fossil fuels are extracted through various drilling or mining techniques, which all have a multitude of profound and adverse effects on the environment.<sup>222</sup> Active and abandoned underground mines produce detrimental drainage that introduce heavy metals into water and turn water acidic.<sup>223</sup> Surface mining requires the complete destruction of the habitats that lay on top of the desired deposits.<sup>224</sup> All surface vegetation must be cleared, and then explosives are used to blast hundreds of feet down resulting in extremely altered habitats.<sup>225</sup>

Furthermore, oil and gas drilling also lead to large amounts of water contamination consisting of dissolved solids, heavy metals, hydrocarbons, and radioactive materials that are brought to the surface in the process.<sup>226</sup> Once fossil fuels are obtained, they are shipped all over the globe. Transportation of these fuels produces its own pollution, and increases the chances of accidents where the fuels could cause catastrophe and be introduced into the environment.<sup>227</sup> In June 2016, a Union Pacific train derailed in Oregon's Columbia River Gorge, spilling over 42,000 gallons of crude oil that ignited and started a fire.<sup>228</sup> Crude oil was introduced into the soil, wastewater system, and the Columbia River.<sup>229</sup> Emergency response measures minimized the amount of oil introduced to the Columbia River, and no major wildlife impacts were observed.<sup>230</sup> However, nearly 3,000 tons of contaminated soil had to be excavated and removed to a landfill site.<sup>231</sup> Finally, the burning of these fossil fuels is responsible for acute amounts of air pollution.<sup>232</sup> While this technological revolution greatly benefitted the human population in terms of productivity, it was and continues to be devastating for wildlife.<sup>233</sup> The complex impacts of pollution cannot be addressed without assessing issues with the current global energy production and consumption models.

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<sup>216</sup> "World Population Growth," Our World in Data.

<sup>217</sup> "Population and Environment: A Global Challenge," Australian Academy of Science, <https://www.science.org.au/curious/earth-environment/population-environment> (accessed November 13, 2019).

<sup>218</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists, <https://www.ucsusa.org/clean-energy/coal-and-other-fossil-fuels/hidden-cost-of-fossils> (accessed August 10, 2019).

<sup>219</sup> McLamb, "The Ecological Impact."

<sup>220</sup> McLamb, "The Ecological Impact."

<sup>221</sup> McLamb, "The Ecological Impact."

<sup>222</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists.

<sup>223</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists.

<sup>224</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists.

<sup>225</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists.

<sup>226</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists.

<sup>227</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists.

<sup>228</sup> "Crude Oil Transportation: A Timeline of Failure," River Keeper, <https://www.riverkeeper.org/campaigns/river-ecology/crude-oil-transport/crude-oil-transportation-a-timeline-of-failure/> (accessed September 18, 2019).

<sup>229</sup> "Crude Oil Transportation: A Timeline of Failure," River Keeper.

<sup>230</sup> Richard Franklin, "Mosier Oil Train Derailment Response," United States Environmental Protection Agency, <https://www.nrt.org/sites/58/files/Mosier%20Oil%20Train%20Derailment%20-%20R.%20Franklin.pdf> (accessed November 13, 2019).

<sup>231</sup> Franklin, "Mosier Oil Train Derailment Response."

<sup>232</sup> "The Hidden Costs of Fossil Fuels," Union of Concerned Scientists.

<sup>233</sup> McLamb, "The Ecological Impact."

## *Current Situation*

There are three major areas where the effects of human pollution can be seen: in the air, ocean, and on land. Air pollution is the most problematic as it is the main contributor to climate change.<sup>234</sup> Other issues with air pollution are acid rain, smog, and respiratory system diseases.<sup>235</sup> Furthermore, air pollution cannot be contained to a defined area, leaving billions of living creatures to breathe in the toxic air.<sup>236</sup> Efforts have been brought forth to reduce air pollution, most notably in the Paris Climate Agreement. This agreement aimed to strengthen and coordinate the global effort to reduce climate change by spurring drastic action to reduce emissions and adapt to climate change while also providing support to developing Member States to strengthen their ability to deal with climate change.<sup>237</sup> While such agreements have provided a good starting point for coordination, goals, and implementation Member States would need to significantly reduce emissions even more so to minimize air pollution damages.<sup>238</sup>

Oceans and other waterways have been consistently polluted for centuries. Plastics in the ocean are a huge threat to the marine life that live within it as the trash can be consumed mistakenly, leach toxins into the water, or even block sunlight when piled up like in the Great Pacific Garbage Patch.<sup>239</sup> This massive island of waste is comprised of an estimated 1.8 million pieces of plastic weighing up to 80,000 tons.<sup>240</sup> Another problem with plastic in the ocean is that it breaks down into microplastics that are nearly impossible to remove and easily consumed by marine life.<sup>241</sup> Inland waterways have also been affected. The South-Western region of the United States has seen over 90 percent of their wetland loss in recent years due to urban development, pollution, and climate change.<sup>242</sup> Inland waters also are prone to pollution through groundwater contamination, water runoff, and acid rain.<sup>243</sup>

Land pollution is mostly found in three major forms: municipal solid waste (MSW), construction and demolition (C&D), and hazardous waste.<sup>244</sup> MSW consists of what most people consider trash- plastics, food, and other residential or non-hazardous waste products.<sup>245</sup> C&D waste, often referred to as debris, would be commercial waste products such as wood, concrete, asphalt, and metal.<sup>246</sup> Lastly, hazardous wastes are named for their toxicity with this type of waste being composed of gases, oil, toxic fluids, etc.<sup>247</sup> Each of these types of pollution are devastating to the wildlife that surround the polluted areas. Many types of animals and especially plants are not able to adapt or relocate to avoid the defilement of their habitat. Therefore, humans need to correct this situation in order to ensure local habitats survive.

Industry in general has caused major problems with pollution and habitat loss. While industry rapidly expanded and developed during the industrial revolution, proper waste management and disposal did not develop to match

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<sup>234</sup> "Health and Environmental Impacts of Air Pollution," Department of Environmental Protection-Commonwealth of Massachusetts, <https://www.mass.gov/files/documents/2016/08/vl/health-and-env-effects-air-pollutions.pdf> (accessed August 7, 2019).

<sup>235</sup> "Health and Environmental" Department of Environmental Protection.

<sup>236</sup> "How Air Pollution Is Destroying Our Health," World Health Organization, <https://www.who.int/air-pollution/news-and-events/how-air-pollution-is-destroying-our-health> (accessed August 7, 2019).

<sup>237</sup> "The Paris Agreement," UNFCCC, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> (accessed September 18, 2019).

<sup>238</sup> "How Air Pollution," World Health.

<sup>239</sup> "The Great Pacific Garbage Patch," The Ocean Cleanup, <https://theoceancleanup.com/great-pacific-garbage-patch/> (accessed August 7, 2019).

<sup>240</sup> "The Great Pacific," The Ocean Cleanup.

<sup>241</sup> "The Great Pacific," The Ocean Cleanup.

<sup>242</sup> Roberta Yuhas, "Loss of Wetlands in the Southwestern United States," US Geological Survey, December 9, 2016, <https://geochange.er.usgs.gov/sw/impacts/hydrology/wetlands/> (accessed September 18, 2019).

<sup>243</sup> Alina Bradford, "Pollution Facts & Types of Pollution," LiveScience, February 28, 2018, <https://www.livescience.com/22728-pollution-facts.html> (accessed August 10, 2019).

<sup>244</sup> Jerry A. Nathanson, "Land Pollution," Encyclopædia Britannica, <https://www.britannica.com/science/land-pollution> (accessed August 7, 2019).

<sup>245</sup> Nathanson, "Land Pollution."

<sup>246</sup> Nathanson, "Land Pollution."

<sup>247</sup> Nathanson, "Land Pollution."

increased production outputs.<sup>248</sup> There are six main causes of industrial pollution- rapid industrial growth, inefficient policies, amount of industries, antediluvian technology, using non-renewable resources, and imprudent waste management.<sup>249</sup> With proper regulation, each of these issues can be remedied or significantly improved, allowing for decreases in pollution.<sup>250</sup> Some solutions that have been proposed by environmental conservationists include proper education, researching the impact of the industry prior to building it, proper disposal of all wastes and recycling what can be recycled, as well as replanting anything that was disturbed by the industry.<sup>251</sup>

### *Actions Taken by the United Nations*

Currently, the UNEP, alongside most of the Member States of the UN, are striving to meet the goals set by the Paris Climate Agreement.<sup>252</sup> The goal of this agreement is to ensure that the global average temperature remains within two degrees Celsius above pre-industrial levels.<sup>253</sup> Furthermore, the agreement would see Member States have overall reduction of greenhouse gas emissions to ensure this goal is met and there will not be future need for such drastic mobilization of conservation efforts.<sup>254</sup>

The Convention on Biological Diversity (CBD) has also begun to increase conservation efforts amongst Member States through the Strategic Plan for Biodiversity 2011-2020.<sup>255</sup> Through this plan, the CBD has established twenty goals for biodiversity referred to as the Aichi Biodiversity Targets.<sup>256</sup> Each of the goals fit into five overarching categories: understanding and educating on the current causes of biodiversity loss, diminish current impacts on biodiversity loss, increase protection efforts towards all kinds of ecosystems, promote the benefits of biodiversity, and ensures Member States have access to action plans and aids to better their local ecosystems through the National Biodiversity Strategies and Action Plans (NBSAPs).<sup>257</sup>

The UN's 2030 Sustainable Development Goals (SDGs) also recognize tackling climate change along with protection of our forests and oceans to be necessary components for a prosperous and peaceful future.<sup>258</sup> Many Member States will make progress towards reducing the impact of pollution on habitat loss as they work towards achieving the SDGs. SDGs on clean water and sanitation, sustainable cities and communities, responsible consumption and production, climate action, life below water, and life on land will aid in the work towards increasing the ability to reduce pollution and habitat loss.<sup>259</sup> These goals are essential steps in the global effort to limit the impact of climate change.<sup>260</sup>

The UNEP participates in the Economics of Land Degradation (ELD) Initiative, which is a global initiative to assess and raise awareness on the economic benefits of land and land based systems.<sup>261</sup> The ELD approach considers economic, social, and environmental factors as well as costs and benefits of sustainable land

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<sup>248</sup> Josy O'Donnel, "Industrial Pollution: Causes and Effects And Biggest Culprits Of Global Warming," Conservation Institute, November 01, 2018, <https://www.conservationinstitute.org/industrial-pollution/> (accessed August 9, 2019).

<sup>249</sup> O'Donnel, "Industrial Pollution."

<sup>250</sup> Diaz, et. al., "Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services."

<sup>251</sup> O'Donnel, "Industrial Pollution."

<sup>252</sup> United Nations Framework on Climate Change, *Paris Climate Agreement*, November 4, 2016.

<sup>253</sup> "What Is the Paris Agreement?" UNFCCC, <https://unfccc.int/process-and-meetings/the-paris-agreement/what-is-the-paris-agreement> (accessed August 10, 2019).

<sup>254</sup> "What is?" UNFCCC.

<sup>255</sup> "Strategic Plan for Biodiversity 2011-2020," Convention on Biological Diversity, <https://www.cbd.int/undb/media/factsheets/undb-factsheet-sp-en.pdf> (accessed August 10, 2019).

<sup>256</sup> "Strategic Plan," Convention on Biological Diversity."

<sup>257</sup> "Strategic Plan," Convention on Biological Diversity."

<sup>258</sup> "Sustainable Development Goals," Sustainable Development Goals Knowledge Platform, <https://sustainabledevelopment.un.org/?menu=1300> (accessed August 10, 2019).

<sup>259</sup> "Sustainable Development Goals," Sustainable Development Goals Knowledge Platform.

<sup>260</sup> "Sustainable Development Goals," Sustainable Development Goals Knowledge Platform.

<sup>261</sup> "Accounting for Ecosystems," UN Environment Programme, <https://www.unenvironment.org/explore-topics/ecosystems/what-we-do/accounting-ecosystems> (accessed November 20, 2019).

management.<sup>262</sup> The ELD Initiative conducts research, capacity development, and active knowledge exchange to ensure that policy strategies and decision making for land-use, land-use change, and land-use management regularly consider and utilize the economic valuation of ecosystems.<sup>263</sup> The network was established in 2012 by the European Commission, The United Nations Convention to Combat Desertification (UNCCD), and the German Federal Ministry for Economic Cooperation and Development.<sup>264</sup> Through their work the ELD Initiative supports Member States in achieving UN Development Goal 15: Life on Land. Specifically their work addresses the sub-targets 15.3 and 15.9, which deal with combating desertification, land restoration, and the integration of ecosystems and biodiversity values into local and national level planning.<sup>265</sup>

The majority of marine pollution originates on land, and the UNEP contributes to tackling this pollution problem by hosting the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA).<sup>266</sup> Currently, the GPA focuses its resources on addressing marine litter, nutrient management, and wastewater through global voluntary multi-stakeholder partnerships of governments, intergovernmental agencies, academia, the private sector, and civil society.<sup>267</sup> The partnerships are the Global Partnership on Marine Litter (GPML), Global Partnership on Nutrient Management (GPNM), and Global Wastewater Initiative (GW2I).<sup>268</sup> In January 2019, the GPA along with the Science and Law Divisions of the UNEP launched a five-year project titled “Protecting the Marine Environment from Land-Based Pollution through Strengthened Coordination of Global Action.”<sup>269</sup>

## *Case Studies*

### *Kenya and Green Energy*

Kenya, located on the east coast of Africa, has set a goal to use completely Green Energy by 2020.<sup>270</sup> Green energy, energy that comes from renewable and environmentally friendly sources, is one of the keys to sustainable development.<sup>271</sup> The world’s largest wind farm, Lake Turkana Wind Power (LTWP), will grow Kenya’s electricity production by thirteen percent, furthering the country’s efforts to provide renewable electricity to over 60 percent of the population.<sup>272</sup> The wind farm, powered by the Turkana corridor wind that flows in from the Indian Ocean, has the ability to generate 310 megawatts.<sup>273</sup> Engineers and mechanics from across the world came together to install the project, alongside the African Development Bank (AfDB), an effort that cost over USD 700 Million.<sup>274</sup> Besides wind power, hydro-electricity accounts for 65 percent of what the state-owned power company, KenGen, produces annually.<sup>275</sup> Kenya is also home to the Green Belt Movement (GBM) that strives to promote protection and rehabilitation of ecosystems in Kenya.<sup>276</sup> GBM has planted over 51 million trees across Kenya in order to keep waterways from drying up and ecosystems from dying.<sup>277</sup> This

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<sup>262</sup> “ELD Initiative,” The Economics of Land Degradation, <https://www.eld-initiative.org/> (accessed November 20, 2019).

<sup>263</sup> “ELD Initiative,” The Economics of Land Degradation.

<sup>264</sup> “About ELD,” ELD Initiative, <https://www.eld-initiative.org/en/who-we-are/about-eld/> (accessed November 20, 2019).

<sup>265</sup> “ELD Initiative,” The Economics of Land Degradation.

<sup>266</sup> “Addressing Land-Based Pollution,” United Nations Environment Programme, <https://www.unenvironment.org/explore-topics/oceans-seas/what-we-do/addressing-land-based-pollution> (accessed November 20, 2019).

<sup>267</sup> “Addressing Land-Based Pollution,” United Nations Environment Programme.

<sup>268</sup> “Addressing Land-Based Pollution,” United Nations Environment Programme.

<sup>269</sup> “Addressing Land-Based Pollution,” United Nations Environment Programme.

<sup>270</sup> Johnny Wood, “Kenya Is Aiming to Be Powered Entirely by Green Energy by 2020,” World Economic Forum, <https://www.weforum.org/agenda/2018/12/kenya-wants-to-run-entirely-on-green-energy-by-2020/> (accessed August 10, 2020).

<sup>271</sup> Wood, “Kenya.”

<sup>272</sup> “Kenya Launches Largest Wind Power Plant in Africa,” CNN, July 20, 2019, <https://www.cnn.com/2019/07/20/africa/africas-largest-wind-farm-intl/index.html> (accessed August 10, 2019).

<sup>273</sup> “Kenya Launches,” CNN.

<sup>274</sup> “Kenya Launches,” CNN.

<sup>275</sup> “Kenya Launches,” CNN.

<sup>276</sup> “Who We Are,” The Green Belt Movement, <http://www.greenbeltmovement.org/who-we-are> (accessed August 10, 2019).

<sup>277</sup> “Tree Planting and Water Harvesting,” The Green Belt Movement, <http://www.greenbeltmovement.org/what-we-do/tree-planting-for-watersheds> (accessed August 10, 2019).

effort of using green energy from renewable resources will allow ecosystems within Kenya to thrive without threat of pollution.<sup>278</sup>

### *The Great Barrier Reef*

One ecosystem that is highly dependent on the reduction of climate change is the Great Barrier Reef located off the northeast coast of Australia.<sup>279</sup> The Great Barrier Reef is one of the seven natural wonders of the world and is classified as a World Heritage site because, altogether, it is the largest living organism on the planet.<sup>280</sup> The Reef is home to thousands of species of coral, sea plants, and marine life.<sup>281</sup> The effects of climate change are devastating to this otherwise pristine habitat.<sup>282</sup> Climate change is heating the oceans which, in turn, can cause bleaching of coral who are sensitive to temperature.<sup>283</sup> Pollution from local farms and industries has caused dangerous chemicals such as Nitrogen to leak into water sources that make their way to the Great Barrier Reef, poisoning the reef once it arrives.<sup>284</sup> The introduction of Nitrogen combined with increased CO2 and warmer temperatures allows for algal blooms to occur, cutting off sunlight and smothering coral and seagrass beds.<sup>285</sup> Besides these typical forms of water pollution, the Great Barrier Reef also faces threats from expansion of industry. New ports are scheduled to be added to the northeastern coastline of Australia, which would result in increased shipping traffic and dredging on the seafloor amongst more instances of pollution to the delicate area.<sup>286</sup> The fishing industry has also caused large amounts of damage. Overfishing has caused many important species populations to decline, threatening the vast biodiversity of this ecosystem and limiting its ability to adapt and overcome the threats facing the habitat.<sup>287</sup> While conservation and protection measures have been put in place for the Great Barrier Reef, all of these problems in combination have outgrown the capacity of the institutions put in place to protect it, further slowing efforts made to heal the reef.<sup>288</sup>

### *Invasive Species*

Invasive species are any kind of organism that is not native to a habitat and is causing harm.<sup>289</sup> Most invasive species travel through human activities such as transportation and shipping.<sup>290</sup> For example, Zebra and Quagga mussels were introduced to the Great Lakes from Eastern Europe through the ballast water of ocean-going ships in the 1980s, and have been introduced to 29 states by boats traveling through artificial channels.<sup>291</sup> These mussels reproduce at astonishing rates and disrupt the food-chain by consuming the plankton, competing with the native wildlife species.<sup>292</sup> The increased water clarity due to the lack of plankton create ideal conditions for algae to grow, which has led to an increased amount of deadly algae blooms.<sup>293</sup> Zebra and Quagga mussels also cause billions of dollars a year in damages to the Great Lakes economy as they attach to boats and structures, and litter beaches.<sup>294</sup> It is estimated that 10 trillion of these mussels are currently present in the Great Lakes, and scientists have not figured out a way of eliminating the mussels without harming other endemic life.<sup>295</sup> Asian

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<sup>278</sup> Wood, "Kenya."

<sup>279</sup> "Great Barrier Reef," World Wildlife Fund, <https://www.wwf.org.au/what-we-do/oceans/great-barrier-reef#gs.viu31w> (accessed August 10, 2019).

<sup>280</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>281</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>282</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>283</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>284</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>285</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>286</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>287</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>288</sup> "Great Barrier Reef," World Wildlife Fund.

<sup>289</sup> "Invasive Species," The National Wildlife Federation, <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Threats-to-Wildlife/Invasive-Species> (Accessed November 20, 2019).

<sup>290</sup> "Invasive Species," The National Wildlife Federation.

<sup>291</sup> "Invasive Species," The National Wildlife Federation.

<sup>292</sup> "Invasive Species," The National Wildlife Federation.

<sup>293</sup> "Invasive Species," The National Wildlife Federation.

<sup>294</sup> "Invasive Species," The National Wildlife Federation.

<sup>295</sup> "Invasive Species," The National Wildlife Federation.

Carp also feed on Plankton, and were introduced to the United States in farm settings in the 1970s.<sup>296</sup> Flooding allowed the Asian Carps' introduction into the surrounding habitats, and they have become aggressive competitors to the native wildlife for food and territory.<sup>297</sup> Invasive species can also stem from human interests such as exotic pets and ornamental plants. Examples of this are the growing Burmese python population in the everglades and the Water Hyacinth in US habitats.<sup>298</sup> It is expected that climate change will lead to a further spread of invasive species by increasing their range of livable climate conditions.<sup>299</sup> Once an invasive species is introduced to a habitat it can become very difficult and costly to remove it, so an important counter-measure for fighting invasive species is to create effective mechanisms for preventing an initial introduction.<sup>300</sup> Additionally, monitoring systems should be developed for early detection of invasive species, and rapid response must be utilized to address new invaders.

### ***Conclusion***

There are many ways that human activities have polluted the Earth. Mankind has made astonishing developments in the past few centuries, yet cultivated a culture of using the Earth in an unhealthy fashion. As the human population continues to grow, it will be pertinent to make changes in the way people continue to develop civilizations and societies. Moving away from fossil fuels and limiting greenhouse gas emissions will be an absolutely necessary step in reducing air pollution to combat climate change. Stopping the use of fossil fuels will also stop the harmful pollution that results from their various extraction processes. Centuries of pollution practices won't be easy to fix, indicating that a social movement may be necessary to enact the proper change. The current consumption pattern is ingrained in societies that pollution will be very hard to curb, but people need to be dedicated to changing the status quo. Moving forward, it will be pertinent to protect the remaining habitats of the planet and to restore ecosystems when possible.

### ***Committee Directive***

Combating pollution is absolutely pertinent in stopping habitat loss. Delegates should research how their Member States have fought pollution both intrinsically and internationally. What are the most successful examples of reducing pollution within Member States? How have industries within Member States tried to combat harmful pollution practices? Do any Member States afford any protection to habitats and ecosystems? Are there any Member State considering adding any protections? What areas within Member States' borders are being threatened with pollution and habitat loss, and how might these areas be protected? Should Member States work with international partners to combat a pollution problem or to protect a habitat? Do Member States have any legislation on pollution, and how is it enforced? How can Member States plan to interact with neighboring Member States in regards to multi-national ecosystems or otherwise shared ecosystems, i.e. waterways? How have different Member States contributed to conservation efforts regionally and internationally?

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<sup>296</sup> "Invasive Species," The National Wildlife Federation.

<sup>297</sup> "Invasive Species," The National Wildlife Federation.

<sup>298</sup> "Invasive Species," The National Wildlife Federation.

<sup>299</sup> "Invasive Species," The National Wildlife Federation.

<sup>300</sup> "Combating Invasive Species," The National Wildlife Federation, <https://www.nwf.org/Our-Work/Environmental-Threats/Invasive-Species> (Accessed November 20, 2019).

## Annotated Bibliography

### **I. Cultivating Technological Innovations to Meet Climate Change Challenges**

“About the Sustainable Development Goals,” United Nations, Accessed July 15, 2019.

<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

This is the UN information page for the Sustainable Development Goals of 2030. It briefly describes what the goals are, the blueprint for a better and sustainable future for all people. The goals address the issues we face in an interconnected way, so that nobody will be left behind if all 17 goals are achieved. Each of the goals is listed here as a hyperlink to a page that gives more information on each one respectively.

Bullis, Kevin, “How Much Will it Cost to Solve Climate Change?” MIT Technology Review, Accessed July 15, 2019. <https://www.technologyreview.com/s/527196/how-much-will-it-cost-to-solve-climate-change/>

This article discusses some of the different speculations about the costs of stabilizing greenhouse gas emissions. While some sources claim that it would be possible at a relatively low cost, these reports fail to consider some of the complications of implementation in a real-world scenario. Considering the reality of delays in technology development and proliferation as well as delays in policy changes, the cost estimates of switching to low carbon economies could be astronomically higher. But analyses also indicate that delaying the switch will only ever increase the cost of it. The report also states that the costs will increase if countries aren’t working together to switch their economies. It points out that any technology failures could significantly increase the cost as well.

Gellert, Andrew, “Technological Advancement and the Effect on the Ecosystem,” Scienceing, Accessed July 15, 2019. <https://sciencing.com/technological-advancement-effect-ecosystem-23107.html>

This article acknowledges the benefits technology brings to our lives but emphasizes the negative effects of new technologies on our environment. It discusses resource intensive technologies like electronics, which require materials that are difficult to come by which upon extraction, cause damage to the environment and human health. The advancements in farming have allowed higher crop yield, but introduce pesticides, herbicides, and chemical fertilizers into the environment. Many of our technological advancements like cars that make life easier produce hazardous by-products like greenhouse gasses and other toxic emissions. Advancements in technology mean old technology must be disposed, and this is rarely done properly. Improper disposal of technology introduces harmful substances into the environment as they end up in landfills or otherwise out in the environment.

Goddard, Gertie, “Exciting New Green Technology of the Future,” Science Focus, Accessed July 15, 2019.

<https://www.sciencefocus.com/future-technology/exciting-new-green-technology-of-the-future/>

This article opens with a paragraph about how human activity on earth has been disruptive and damaging, and asserts that we need to move away from burning fossil fuels and into using green technology. The article then highlights some of the newest green technologies. There are solar tiles that look like normal roof tiles and cost less, a smartflower that follows the sun to capture energy throughout the day, living buildings with plants for walls and roofs, vertical farming that uses no soil and 95 percent less water than standard agriculture practices, different types of innovative wind turbines, biodegradable coffins to make forests instead of cemeteries, plastic packaging alternatives that are edible for marine life, fabric that generates electricity from movement, and floorboards that generate electricity from footsteps.

“What is the Living Building Challenge?” The Kendeda Fund, Accessed July 15, 2019.

<https://livingbuilding.kendedafund.org/living-building-challenge/>

This article gives a debrief of the Living Building Challenge (LBC). The LBC is an organization that offers green building certifications. The standards are rigorous, and they fully embrace sustainable development. These buildings must produce low waste and produce more clean water and energy than they use. There is an extensive list of harmful chemicals that cannot be used in these buildings. LBC strongly encourages local sourcing as well. It is a project intended to make buildings regenerative for the environment instead of harmful towards it. This is indicative of a larger trend amongst building professionals. The page gives information on a variety of LBC projects and certifications, including LBC Full Certification, Zero Energy, Living Product Challenge, and Living Community Challenge.

## II. Reducing the Impact of Pollution on Habitat Loss

“How Air Pollution is Destroying Our Health,” World Health Organization, Accessed July 8, 2019. <https://www.who.int/air-pollution/news-and-events/how-air-pollution-is-destroying-our-health>

One third of deaths from stroke, lung cancer, and heart disease are due to air pollution. This article emphasizes the need for greater global collaboration to address the issues of air pollution, since pollution is not something that can be isolated. It also underlines the threat of climate change due to air pollution. It highlights the Global Conference on Air Pollution and Health as well as the Global Platform on Air Quality and Health. Under this platform, many critical issues are being discussed. The article concludes by affirming that air pollution must be addressed if we wish to preserve the health of humanity and prevent a climate crisis.

McLamb, Eric, “The Ecological Impact of the Industrial Revolution,” Ecology Communications Group, Accessed July 8, 2019. <https://www.ecology.com/2011/09/18/ecological-impact-industrial-revolution/>

This article relates the beginnings of our severe environmental problems to the industrial revolution. The beginning paragraphs discuss how the industrial revolution changed humanity’s relationship with the environment. It then points out the links between the industrial revolution and population growth. It uses statistics to show how the human population has increased at exponential rates since the dawn of the industrial revolution. Then there is a discussion of how people have realized coal burning for industry is bad, but there is such a large dependency on unsustainable practices that it has become difficult to transition to cleaner technologies. It uses a diagram at the end that illustrates the connections between our environment, social, and economic systems.

“Pollution Facts and Types of Pollution,” Live Science, Accessed July 8, 2019 <https://www.livescience.com/22728-pollution-facts.html>

This article starts by defining pollution and stating that toxic pollution affects more than 200 million people globally, by causing a variety of health complications. It then goes on to discuss the following types of pollution with more specificity: land, water, air, noise, and light. It also provides a short list of additional facts and resources.

“The Extinction Crisis,” Center for Biological Diversity, Accessed July 8, 2019 [https://www.biologicaldiversity.org/programs/biodiversity/elements\\_of\\_biodiversity/extinction\\_crisis/](https://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/)

The Center for Biological Diversity published this article to discuss the current and ongoing alarming trends of extinction across the globe. It clearly distinguishes the difference between naturally occurring “background” rates of extinction and the massive rates that are currently being experienced as causation of human activities. It discusses the importance of biodiversity to ecosystem resilience, and notes that any extinction can have a domino extinction effect on other species. Especially in more fragile ecosystems that are less often advocated for, such as grasslands, tundras, and polar seas. In ecosystems with such extreme conditions and so few species, any loss can be devastating. When the article was published the International Union for Conservation of Nature (IUCN) had already identified 16,928 species worldwide as being threatened with extinction, and they had only assessed about 3 percent of described species. Then amphibians, birds, fish, invertebrates, mammals, plants, and reptiles are each briefly discussed.

“The Paris Agreement,” United Nations Climate Change, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> (accessed July 8, 2019).

This is the page for the Paris Agreement on the United Nations Climate Change website. At the top of the page is a link to progress documentation. Here, the full document can be downloaded in any of the UN working languages. The page discusses the essential elements of the agreement, as well as nationally determined contributions and the status of ratification. The Paris Agreement aims to strengthen the global response to the threats to climate change in the context of sustainable development.