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Climate Change: A Call to Action

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Climate Change: A Call to Action

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Climate Change: A Call to Action

Introduction

On Dec 15, 2018, in the town of Katowice, Poland, diplomats from 200 countries adopted a detailed set of rules to uphold and implement the Paris Agreement, the international treaty drafted by United Nations Framework Convention on Climate Change (UNFCCC) to reduce greenhouse gas emissions. This deal will require every country to track its emissions and climate policies by following a uniform set of standards. Furthermore, countries are to cut their emissions ahead of the next round of talks in 2020. Climate change is a complicated problem, one that will not be solved by national governments alone. A lot of real action is going to come from the entrepreneurs, the business sector, at the city and state level (Plumer, 2018b).

In this editorial, we discuss the latest Intergovernmental Panel on Climate Change (IPCC) report, the follow up National Climate Assessment (NCA) report and the effects detailed in these reports. Then, we discuss what might some of the remediation steps be. Where do we go from here? What are actionable steps that can be taken at the policy level, at the corporate level and at the individual level.

IPCC Reports and Predictions

IPCC: On October 8th, 2018, the latest report from the United Nations scientific panel was published in Incheon, South Korea. This IPCC report portends a far gloomier picture of climate change consequences than previously held and states that avoiding this damage requires transforming the world economy at a speed and scale that has “no documented historic precedent.” According to this latest IPCC report released, if the greenhouse gas emissions continue at the present level, the atmosphere will warm by 2.7 degrees Fahrenheit or 1.5 degrees

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3 Celsius above pre-industrial levels by 2040. This updated threshold is lower than the previously
4 held threshold of 3.6 degrees Fahrenheit or 2 degrees Celsius (Davenport, 2018).
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8 The Intergovernmental Panel on Climate Change (IPCC), founded in 1988, is a body
9 governed by the United Nations and its primary charge is to evaluate climate change science.
10 The IPCC is comprised of hundreds of scientists and volunteers who assess the research on
11 climate change and synthesize it into major assessment reports every 5-7 years. The IPCC
12 review process assesses peer-reviewed scientific literature, which is the majority, almost 90%,
13 but it also considers some “grey literature,” non peer-reviewed material. The working groups of
14 the IPCC draft three assessments or volumes. Working Group 1 (WG1) analyzes the scientific
15 evidence for climate change and the extent to which human activity is the cause for this change.
16 Working Group 2 (WG2) concentrates on the impacts of climate change and how animals,
17 humans, and plants can adapt. Working Group 3 (WG3) focuses on climate mitigation, on how
18 the climate impact can be reduced. The academic experts are recommended by governments and
19 NGOs and the final list of experts is selected by the coordinating body of the organization. Other
20 than travel expenses, these scientists are not compensated (Clark, 2011). So, one can assume that
21 the scientific reports are un-biased and not influenced by any agency with a particular agenda.
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40 **Results of the IPCC Report:**

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42 The most dramatic finding of the IPCC report is that we have only 12 years to be kept to
43 a maximum of 1.5 degrees Celsius and avoid catastrophic environmental breakdown. The other
44 finding is that the impact and costs of the temperature rise will be much greater than expected.
45 The report calls for urgent and unprecedented changes to be implemented to reach this target,
46 which is on the ambitious side of the Paris agreement pledge to keep temperatures between 1.5
47 Celsius and 2 Celsius (Taylor, et. al., 2018).
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3 As per the Paris Agreement, most nations agreed to keep global temperatures well below
4 3.6 degrees Fahrenheit (2 degrees Celsius). However, the current pledges to cut carbon emissions
5 would push global warming to at least 5.4 degrees Fahrenheit (3 degrees Celsius) by 2100. This
6 temperature rise would risk natural tipping points, such as the permafrost melting that would
7 subsequently release tons of methane into the atmosphere, which, in turn, would further drive
8 global temperatures higher. In the past decade, the world has witnessed a slew of record
9 breaking storms, droughts, forest fires, coral bleaching, heat waves and floods with just 1.8
10 degrees Fahrenheit (1 degree Celsius) change. However, all of these climate related events will
11 get much worse with 3.6 degrees Fahrenheit (2 degrees Celsius) (Leahy, 2018).
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24 The IPCC report notes that global warming needs to be limited from 2 degrees Celsius to
25 1.5 degrees Celsius. This is important because a reduction would reduce the challenging impacts
26 such as heat waves, rising seas, erratic weather, stronger storms, and subsequent secondary
27 impacts on infrastructure and migration patterns (Leahy, 2018). With the lower limit, the
28 likelihood of Artic Ocean free of ice in summer would be once a century versus once a decade
29 with higher temperature rise. With the lower limit, coral reefs would decline by 70-90 percent
30 versus most coral reefs would be destroyed with higher temperature rise. Sea levels rise would
31 also be 10 cm lower with the lower temperature rise. In addition, adapting to 1.5 degrees Celsius
32 warming would be easier and less expensive. However, the reality is that even limiting warming
33 to 1.5 degrees Celsius would require unprecedented changes that are two-fold: the world needs to
34 start cutting emissions and these cuts need to happen very soon (Rathi, 2018).
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49 In order to avoid the ramifications of climate change, it would require a transformation of
50 the world economy. The damage of climate change is estimated at \$54 trillion by the IPCC
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3 report. Even though it is possible to technically achieve the rapid changes needed to avoid the
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5 2.7 degrees of warming, such solutions are likely to be politically infeasible (Davenport, 2018).
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8 **NCA Report**

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10 A month after the IPCC report, another report was released. Issued by 13 federal
11 agencies, this report warns of the consequences of climate change for the United States and
12 outlines the crippling effects of a changing climate that include the wildfires in California, the
13 crop failures in Midwest and the crumbling infrastructure in the South. The report estimates that
14 climate change could slash up-to a tenth of gross domestic product by 2010, which is more than
15 double the losses of the Great Recession. The price tags put forth by the report include: \$141
16 billion from heat-related deaths, \$118 billion from sea level rise and \$32 billion from
17 infrastructure damage (Davenport and Pierre-Louis, 2018).
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28 A hotter climate will lead to more heat waves and related deaths and more outbreaks of
29 diseases. The two areas of impact that will be of particular interest are: agriculture and trade.
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32 *Agricultural Risks:* The hardest hit region will be the farm belt where by 2050, changes in
33 rainfall and hotter temperatures will reduce the agricultural productivity of the Midwest to 1980s
34 levels. According to the report, rising temperatures, extreme drought, wildfires on rangelands
35 and heavy downpours will disrupt agricultural productivity. These risks also depend on the
36 adaptability of the farmers. For examples, farmers who practice conservation practices fared
37 better in the 2012 Midwestern drought. However, the federal programs that were designed to
38 help farmers with climate change have stalled with the expiration of the farm bill this Fall
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49 (Davenport and Pierre-Louis, 2018).
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3 *Trade:* Extreme weather will also impact US trade and economy since weather related disasters
4 will temporarily shut factories in the US and abroad, that, in turn, would cause price spikes. A
5 large portion of the American companies supply chains are global and, hence, there is no
6 industry that would be immune from effects of climate change. As an example, during the
7 extreme flooding in Thailand in 2011, Western Digital, an American company which majority
8 operations in Thailand sustained \$199 million in losses and had to cut its hard drive shipments by
9 half. This shortage led to a doubling of price of hard drives that affected companies such as
10 Apple, HP and Dell (Davenport and Pierre-Louis, 2018).
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22 What will the US need to do in order to get prepared to address global warming
23 concerns? Besides the mitigation strategy of cutting emissions drastically, there are other
24 adaptation strategies. In the case of agriculture, extremely hot temperature and droughts reduce
25 crop yields and water supplies for irrigation. As a solution, more precise irrigation techniques
26 would be required to conserve water in areas of drought. New crop varieties ought to be
27 developed that can tolerate drought, heat and pests. Detailed weather forecasts can help farmers
28 determine what crops to plan and when. Engineers need to adjust infrastructure planning to
29 incorporate the new realities of climate change. Examples include adjusting sewer systems to
30 accommodate heavier rainfalls, relocating neighborhoods in low lying, flood prone areas
31 (Plumer, 2018a).
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45 Since the projections for sea level rise range from 1 to 4 feet this century, large cities with
46 coastlines like New York City and Miami will probably invest in sea walls and tide gates.
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48 Smaller coastal communities have fewer options and millions of residents might need to relocate
49 inland. Flood insurance policies might have to be adjusted to discourage residents from building
50 in disaster prone areas. Natural environment can also be managed to defend against climate
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3 change. Examples include planting more trees to absorb excess carbon dioxide and reduce urban
4 temperatures, restoring wetlands and marshes to protect cities and coasts from flooding,
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6 controlled fires in forests to protect against wildfires, and protecting pollinator species to
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8 improve the resiliency of agricultural systems (Plumer, 2018a).
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12 In essence, the NCA report cautions that government officials need to include climate
13 change in their decision making and ought to conduct and update contingency plans. It also
14 emphasizes that the outcomes depend on how quickly the US and other countries take action to
15 mitigate global warming (Plumer, 2018a).
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21 **What can we do? How can we respond? Tools and Strategies**

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23 Given all this information on the implications of global climate change and warming,
24 what can be done? What is the call of action here to address one of the biggest global challenges
25 of the modern world. The solutions range from policy decisions by government and regulators to
26 actions at the business level to individual and consumer choices.
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32 **Role of Governments and Policy Prescriptions**

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34 As the world demand for sustainable products, services and systems rises, there is a
35 crucial role for governments in facilitating the transition to an economy that is much more
36 efficient, much more fair and much less damaging than the present one. Governments that lead
37 will be in a stronger position to set the agenda and establish advanced positions for their
38 industries and their citizens. Countries that lag behind will inevitably face increasing competitive
39 disadvantage and lost opportunity (Peck and Gibson, 2000).
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49 In the US and Canada, as in most other developed countries, the government is the largest
50 landowner; the largest fleet owner; the largest single employer; and the largest landlord or
51 operator of buildings. Therefore, it is also the largest consumer of energy, the largest producer of
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3 most environmental impacts; the greatest single source of support for social capital; and so on. A
4 strong case can be made that governments should “walk the talk” by putting their internal
5 operations on a firm sustainability foundation (Bell, 2002). In developing countries, the role of
6 the government assumes even greater significance. In relation to sustainability issues, the
7 government’s role is to encourage private enterprise to address the needs of the world’s entire
8 population (i.e. not just those fortunate enough to live in rich market economies) and to do so
9 through a sustainability lens (Prahalad and Hart, 2002).
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19 What are the various policy prescriptions that can be utilized by governments or
20 regulatory agencies trying to curb emissions? The three main solutions put forth by the NCA
21 report are: put a price on greenhouse gas emissions, either in form of taxes or fees, establish
22 government regulations on pollution levels, and invest public money on clean energy research
23 (Davenport and Pierre-Louis, 2018).
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30 **Pricing Carbon or Carbon Taxes**

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33 What is a carbon tax? The basic economic theory has to do with externalities that occur
34 as a side effect of industrial or commercial activity which causes an impact on third parties.
35 From this perspective, the emissions in the atmosphere are a negative externality, on which
36 economists propose putting a price so as to internalize the externality. The IPCC climate report
37 states that *a price on carbon is central to prompt mitigation*. In order for it to be effective, such a
38 price would have to range from \$135 to \$5,500 per ton of carbon dioxide pollution in 2030, and
39 from \$690 to \$27,000 per ton by 2100 (Davenport, 2018). As a comparison, under the Obama
40 administration, the price of carbon was estimated at \$50 per ton and this figure was lowered to
41 about \$7 per ton under the Trump administration.
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3 Though a carbon tax sounds good theoretically, it would be very difficult to implement it
4 in reality. As shown by the recent Yellow Vest protests in France, the carbon tax was met with a
5 stiff resistance from the public. The high price estimate put forth by the reports would make it
6 all the more difficult to implement. A carbon tax might work if it is designed more holistically.
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8 As an option, the revenues of the tax might be diverted to relieve the burden on the working class
9 or towards the development of renewable energy. However, designing and implementing the
10 carbon tax would require the support of the public and the political will of the leaders.
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19 **Government Regulations**

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21 Regulations are needed to establish a standard or threshold for natural resources, like air
22 and water, or for industry, such as efficiency regulations imposed on vehicles (Gillis, 2018).
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26 Another policy proposal gaining traction is to set up a national clean energy standard which
27 would require that a certain share of electricity generation be derived from low-carbon sources.
28 This policy would require the share of electricity from low emitting sources to increase steadily
29 over time. The standard would give states the flexibility in how they meet the national goal by
30 choosing which energy sources to adopt. Such a policy would also encourage the growth of
31 renewable energy and encourage investment in other options to clean the power grid (Gillis and
32 McBride, 2018).
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42 **Investment in Public Projects / Clean Energy Projects**

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44 If governments want to discourage consumers from driving, it needs to provide
45 alternatives to get to work. Most of American public does not have access to public transit and
46 the ones that do exist in cities like New York City and Chicago need upgrades (Gillis, 2018).
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49 The United States needs to invest in public infrastructure and clean energy projects. From the
50 literature in resource economics, the Hartwick Rule calls to rent non-renewables and re-invest
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3 the revenue towards the development of clean, renewable energy (Hartwick, 1977). As an
4 example, the revenues from petroleum could potentially be re-invested in solar or wind energy
5 technology.
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10 **Corporate Responses**

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12 Of the world's 100 largest economic entities, 63 are corporations, not countries. This
13 immense power calls for greater responsibility as society wants to hold global businesses
14 accountable to meet the challenges facing our planet. The world is witnessing increasing limits
15 on growth and lesser credit. For this reason, companies need to develop and execute a strategy
16 for emissions reductions and sustainability. In a large picture, a sustainable business means a
17 business that can thrive in the long term. Sustainability is much more than a public relations push
18 or efforts at greenwashing, focusing more on communicating green efforts than on the efforts
19 themselves. Sustainability is even bigger than an occasional agreement to ongoing efforts to
20 save the planet. If sustainability is to be realized fully and well implemented, it can drive a
21 bottom-line strategy to save costs, a top-line strategy to reach a new consumer base, and a talent
22 strategy to get, keep, and develop creative employees. This kind of true sustainability has four
23 equal components:
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40 • *social, to address conditions that affect us all, including poverty, violence, injustice, education,*
41 *public health, and labor and human rights*

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44 • *economic, to help people and businesses meet their economic needs; for people: securing food,*
45 *water, shelter, and creature comforts; for businesses: turning a profit*

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49 • *environmental, to protect and restore the earth--for example, by controlling climate change,*
50 *preserving natural resources, and preventing waste*
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3 • *cultural, to protect and value the diversity through which communities manifest their identity*
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5 *and cultivate traditions across generations* (McKinsey Quarterly, 2009).
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8 In the absence of national legislation in the United States, most of the corporate responses
9
10 in come in the form of Corporate Social Responsibility, a voluntary effort for corporations to
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12 behave responsibly and pursue sustainable development goals. Hence, in very general terms,
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14 CSR stands for the social role or responsibility that a corporation has towards the society that it
15
16 operates within.
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19 CSR is located at the intersection of business and society. Its role changes as demands
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21 and the expectations of society change. The CSR movement has had four main phases over the
22
23 last 15 years. It started with a reactive phase, wherein CSR was viewed as a public relations
24
25 function intended for damage control when companies made mistakes with the community and
26
27 the environment. In the second phase, some of these companies started to incorporate process
28
29 efficiencies in manufacturing and services and started to establish relationships with stakeholders
30
31 including NGOs. In the third phase of integration, companies created key performance
32
33 indicators that were then used to publicly report on various functional business units. The
34
35 knowledge garnered from this stage fed into the fourth stage of value creation where brand
36
37 enhancement, product development, and R&D looked for solutions to social issues that impacted
38
39 the bottom line as well (Smalheiser, 2006). The main advantage of a well-executed CSR is that
40
41 it builds business value in many ways: by enhancing brand image, establishing a co-operative
42
43 relationship with government or regulatory agencies, and attracting investors who are interested
44
45 in sustainability. In addition, a company can attract and retain motivated employees, enter new
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47 markets, position the company as good partner for peers, governments, and NGOs, and improve
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49 risk recognition and avoidance (Smalheiser, 2006).
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3 Reporting, once considered voluntary, is now becoming a de facto requirement for most
4 companies that are concerned about their public image. Fortunately, there are numerous
5 standards that exist for companies to choose from – ranging from international standards such as
6 Global Reporting Initiative (GRI), International Organization on Standardization (ISO 14001),
7 Carbon Disclosure Project (CDP), to smaller, local standards such Dow Jones Sustainability
8 Index (DJSI) and Ceres. In order to illustrate gains in environmental performance, a company
9 needs to be able to report and verify its accomplishments. In this age of media scrutiny and
10 consumer backlash, to not do so would invite criticisms of greenwash, that in turn would
11 undermine any efforts made by the organization.
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26 **Role of Individuals / Consumers**

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28 The average U.S. citizen consumes eighteen tons of natural resources per person per year
29 and generates an even higher volume of wastes. The affluent consumers in developed economies
30 are inundated by consumer options, most of which are produced with considerable carbon
31 footprints. The poorer people, who are responsible for emitting the lowest levels of greenhouse
32 gases, are disproportionately vulnerable to the loss of biodiversity and ecosystem services.
33 Furthermore, they will also suffer most from the impacts of climate change, such as flooding,
34 reduced access to clean freshwater, health and social problems (SCORE!, 2009).
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45 According to the One Planet Business Report, food and drink have the highest levels of
46 ecological impact per dollar spent, followed by household equipment and housing. Each US\$ 1
47 million spent by consumers on food has an ecological footprint of approximately 1,500 hectares.
48 In terms of absolute consumption impacts, food, transport and housing are seen as the most
49 significant (WWF UK, 2006).
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3 How can consumers make more informed and more sustainable choices in these primary
4 areas of impact? The main takeaway is that consumers need to change their lifestyles and
5 consumption patterns to more sustainable alternatives. This is especially true in the areas where
6 the consumers have control, such as dietary preferences, modes of transportation, and the
7 buildings they reside in (MacIntosh, 2018).
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14 Food and Diet: The best option is to eat lower on the food chain and buy food from local
15 Community Supported Agriculture (CSA) farm shares. A simple choice of eating less meat
16 would in turn led to an overhaul of agricultural and land-use practices, including protection of
17 forests and not converting forests into farms for livestock. The livestock sector alone accounts
18 for 14.5% of the greenhouse gas emissions, that is more than the transport sector (MacIntosh,
19 2018). Another option is to eat organic food since it is grown without the use of synthetic
20 pesticides, fertilizers, antibiotics or added hormones.
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31 Water: There has been much discussion on the environmental damage from bottled water.
32 First of all, the water inside is not regulated as much as tap water and there is no guarantee where
33 this water was collected. In addition, bottled water contains a host of issues. The flexible plastic
34 water bottles leach phthalates, chemicals that mimic female hormone estrogen and are linked to
35 health problems. The most damaging environmental concern comes from the manufacture of 1.5
36 million plastic bottles (from petrochemicals) every year and most of these bottles end up in
37 landfills (Horn, 2006). A sustainable solution is filtered water and there are numerous water
38 filters in the market ranging from simple carbon filters and faucet mounted filters to expensive
39 systems like reverse-osmosis systems and ultraviolet light filters.
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51 Buildings: Residents can increase the home's efficiency by sealing cracks around doors
52 and windows, turning down the thermostat by two degrees, replacing the lightbulbs with
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3 compact fluorescent lightbulbs, using smart thermostats that switch on when residents are in the
4 home and upgrading to more energy efficient appliances. Suburban homes with a yard are heavy
5 on water and pesticide consumption and one adaptation strategy is to employ xeriscape
6 landscaping, that is designed for areas that are susceptible to drought. Other simple strategies to
7 reduce energy consumption include installing a fan to cool the house, washing clothes in cold
8 water cycles, drying clothes on drying rack or clothesline, using power strips that are turned off
9 when not in use (Garlough, et. al., 2008).

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19 Transport: Consumers need to travel less and shift towards more sustainable modes of
20 transport. If available, consumers can choose to take public transportation such as buses and
21 trains instead of driving to work and dealing with congested pathways. In case public
22 transportation is not a viable option, consumers would need to more sustainable alternatives such
23 as ride sharing or moving towards electric and hybrid cars (MacIntosh, 2018).

30 **Going forward**

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33 At the UN Climate meeting in Poland, about 200 leaders met to agree on rules on how to
34 meet their national promises to reduce greenhouse gas emissions under the Paris Climate
35 Agreement of 2015. Though the Trump administration has stated its intention to back out of the
36 Paris agreement, a coalition comprised of governors, mayors and local officials from the US
37 stated their commitment to reducing greenhouse gases and met with governments from France,
38 Germany and others (Hersher, 2018).

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47 The US Climate Alliance is a coalition of states that have promised to abide by the Paris
48 Agreement on Climate Change and is made up of 14 Democratic senators and 3 Republican
49 senators from traditional blue states. This coalition was created after President Trump's
50 announcement that US will withdraw from the Paris agreement. Included in this coalition was
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3 the Mayor of Pittsburg, Bill Peduto, who has pledged to transition the city governments energy
4 use to entirely renewable sources by 2030. It is the largest coalition to emerge since Trump took
5 office: the 16 states represent 40% of US population and half of its GDP. However, the 16 states
6 only represent a quarter of US emissions (Meyer, 2018a).
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12 Some of the other leaders of American cities are increasingly involved in climate policy.
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14 Los Angeles is publicly tracking its greenhouse emissions and is spending more than \$100
15 billion to expand its train system. Houston's mayor is working on a plan to make the city carbon
16 neutral by 2050 (Hersher, 2018). Indeed, the mayor of CA, Jerry Brown, warns that governments
17 are not being ambitious enough about moving to a renewable energy economy.
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24 **Green New Deal**

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26 One of policies being proposed by recently elected Democrats is the Green New Deal, the
27 goal of which is to come up with a 'detailed national, industrial, economic mobilization plan' to
28 rapidly transition the country away from fossil fuels and toward clean energy, such as solar,
29 wind, and electric cars (Friedman, 2008). In essence, this Green New Deal aims to cut US
30 emissions fast enough to reach the climate goal put forth by the Paris Agreement: preventing
31 warming to no more than 2.7 degrees by 2100.
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40 The Green New Deal is comprehensive and ambitious. It was pushed forth by The
41 Sunrise Movement, a youth led activism group that has listed seven demands that any Green
42 New Deal must address. These demands range from requiring the US to get all of its energy
43 from renewables to decarbonizing, repairing and improving transportation and infrastructure to
44 investment in technologies to capture and remove carbon dioxide from the atmosphere. The most
45 controversial aspect of this Green New Deal is the proposed job guarantee, in that every
46 American can have a job within this new economy. For now, the Green New Deal is being
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3 promoted by Ocasio-Cortez, the youngest woman elected to Congress who grew up with
4 stagnating climate policies in the US (Meyer, 2018b). In order for the Green New Deal to gain
5 political traction, it needs larger acceptance by Liberals and Conservatives alike. One idea
6 suggested is to invest a portion of each dollar raised by a carbon tax in two new community
7 colleges and high-speed broadband in rural areas of every state. In other words, for the Green
8 New Deal to work, every American needs to feel a chance to gain from it (Friedman, 2018).
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19 **Conclusion**

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21 We are witnessing climate change on a widespread, global scale. From the bleaching of
22 corals in Australia to ferocious forest fires in California, no nation state is immune to climate
23 change. Indeed, the two scientific reports that were published in the end of 2018 laid out the
24 ramifications of continued warming and the devastating effects these would have all across the
25 world.
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33 The response to climate change needs to be multi-pronged. Governments and regulatory
34 agencies need to align public policy and investments that favor clean, renewable energy and
35 weans away from heavy polluting industries. Corporations and businesses ought to invest in
36 natural capital, to preserve natural resources and align their reporting to reflect their social and
37 environmental impacts. Individuals and consumers should reflect upon their personal
38 consumption choices and the impact of these choices on the natural resources and the climate.
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47 The issue of climate change is enormous, non-linear and dynamic. Indeed, climate
48 change is perceived to be a complicated and unsolvable problem. The Earth is resilient and it
49 might survive our species. However, the future of humanity, in another 50 or 100 years, depends
50 directly on the choices we make and implement today.
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