

**TESTIMONY OF DR. ANDREW STEER**  
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***“The Paris Climate Promise: A Good Deal for America”***

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My name is Andrew Steer, and I am President and CEO of the World Resources Institute. The World Resources Institute is a non-profit, non-partisan research institution that goes beyond research to provide practical solutions to the world’s most urgent environment and development challenges. We work in partnership with scientists, businesses, governments, and non-governmental organizations in more than seventy countries to provide information, tools and analysis to address problems like food and energy security, water management, urbanization, and climate change. Our focus is on how to grow the economy, while protecting it for our grandchildren.

My testimony has three main themes:

1. **The Paris Agreement has transformed the climate change landscape in ways that reflect the leadership and longstanding objectives of the United States.** All countries – both developed and developing – are now taking climate action, with nationally-determined climate plans submitted by 187 nations as part of the Agreement. The Agreement also includes a set of universal, binding requirements for transparency and accountability.
2. **The private sector and subnational governments played a major role at Paris,** making new climate commitments and calling for strong market signals. Moreover, the Paris Agreement itself sends clear long-term signals that can set the course for investment in a prosperous low-carbon and climate resilient economy.
3. **The United States has much to gain from positioning itself as a climate leader.** Swift action on climate change will continue to enable the United States to benefit from economic opportunities, stimulate further global action on climate, and build resilience to climate impacts and their associated costs at home.

**The Paris Agreement is a Result of United States Leadership**

First, the events at the UNFCCC Conference of the Parties (COP) in Paris last year have transformed the climate change landscape in a way that represents a significant success for the United States. The Paris Agreement is built on national climate plans, known as Intended Nationally Determined Contributions (INDCs), submitted by 187 countries in the lead-up to the Paris COP. The provisions of the Agreement cement this universal approach to international climate policy in which all countries take action. As the United States has long sought, the Agreement marks a new type of international cooperation where both developed and developing countries are united in a common framework.

The Paris Agreement also establishes an enhanced robust architecture for transparency and accountability. In particular, the Agreement includes clear, binding mechanisms for monitoring progress and holding countries accountable, including common timeframes for reporting by all countries and a

requirement to put in place common rules for verifying countries' actions. It also includes provisions that ensure that all countries will revisit and regularly increase their ambition every five years.

Collectively, the INDCs will substantially bend the global emissions trajectory below our current path, but they still don't go far enough to limit warming to below 2 degrees C (3.6 degrees F) and avoid some of the worst climate impacts.<sup>1</sup> There is still more work to be done. With action by all countries that will increase over time, the Paris Agreement establishes a clear pathway forward and provides greater assurance than ever before that emissions will be reduced globally.

### **The Influence of American Businesses and Cities**

Second, the private sector and subnational governments played a significant role at Paris, making new climate commitments and calling for strong market signals, sending a powerful message to negotiators and policymakers. Initiatives and commitments on cities, forests, business and finance were among the many launched or strengthened during the Paris conference.

Thousands of business leaders and mayors attended the COP to make the case for a low-carbon economy and offer climate pledges. A wide range of companies pledged to cut their emissions in line with climate science and transition to 100% renewable energy. Subnational governments made new climate commitments through the Compact of Mayors and the Compact of States and Regions. These companies and governments didn't need to be coerced to act; they did so because they knew it was in their economic interest.

Forward-thinking businesses in the United States, such as Microsoft and Walmart, are taking the risks of climate change seriously, and are already seizing the opportunities afforded by a transition to a low-carbon economy. Members of the private sector, including Coca-Cola and General Mills, have long been ahead of national government in calling for climate action, and now with the Paris Agreement, they finally have the kind of policy clarity they desire.

The Paris Agreement itself also sends a powerful market signal to businesses and investors about the long-term direction of travel on climate change policy, providing a vital foundation for a healthier, stronger, and more prosperous United States economy. From now on, the smart money will shift away from fossil fuels and into cleaner energy, smarter cities, and more sustainable land use. And by spurring innovation, the Agreement has the potential to dramatically ramp up the speed and scale of the economic transition and ensure the United States can take advantage of the benefits this global transition will bring.

The financial sector can see which way the wind is blowing, and is already moving to minimize risk from high-carbon investment. The investment landscape is shifting rapidly. Clean energy investment broke numerous records in 2015,<sup>2</sup> while demand for high-polluting fuels such as coal is stalling globally.<sup>3</sup> The implementation of the nationally determined contributions, particularly in fast-growing economies like India and China, has the potential to shift global markets, as do rapid drops in the price of renewable energy.

### **A Good Deal for America**

Third, The United States has much to gain from positioning itself as a climate leader. Swift action on climate change will continue to enable the United States to benefit from economic opportunities,

stimulate global action on climate, and build resilience to climate impacts and their associated costs at home.

The historical record is clear: environmental protection is compatible with economic growth, and U.S. environmental policies have delivered huge benefits to Americans. The United States can achieve its commitments through the Paris Agreement in concert with economic growth. It is in our economic interest to act.<sup>4</sup>

Furthermore, no nation is immune to the impacts of climate change and no nation can meet the challenge alone. Every nation needs to work together, take ambitious action, and do its fair share. Now, as all nations take stronger action, all nations gain greater assurance that a concerted, global effort is underway, and gain greater reason to take stronger action themselves. The positive effect of American leadership in concert with other nations was apparent in the lead-up to Paris in such events as the joint announcement of climate commitments by the United States and China in November 2014, which helped drive stronger action internationally.

The United States has always provided leadership when the world faces big challenges, and climate change should be no exception. That leadership can ensure a livable planet for future generations and ourselves.

Delaying action on climate change will only result in climate-change-related events becoming more frequent and severe, leading to mounting costs and harm to businesses, consumers, and public health. The EPA report, *Climate Change in the United States: Benefits of Global Action*,<sup>5</sup> estimates that billions of dollars of damages could be avoided in the U.S. as a result of global efforts to reduce greenhouse gas emissions. These efforts range from reduced damage to agriculture, forestry, and fisheries, to reductions in coastal and inland flooding, to fewer heat-driven increases in electricity bills.

If nations fail to combat climate change, the U.S. will suffer billions of dollars of damages to agriculture, forestry, and fisheries, experience coastal and inland flooding and heat-driven increases in electricity bills, just to cite some of the impacts.

My testimony is organized as follows: Section I discusses the Paris Agreement, highlighting the key elements that contribute to its universality, durability and effectiveness. Section II covers the important role of business and non-state actors as well as the economic implications of the Paris Agreement. Section III explains how the Paris Agreement presents opportunities for the United States. Section IV provides some concluding remarks on climate policy and practical next steps for U.S. action.

## Section I: The Paris Agreement

### a. Universal Participation

The Paris Agreement is a truly universal agreement that is the result of efforts from all countries, both developed and developing. This is reflected not only in the adoption of the Paris Agreement by all 196 Parties to the UNFCCC at COP21 in Paris but the unprecedented climate contributions that were communicated last year. This demonstrates both the commitment that all countries have to the Paris Agreement as well as the success of United States leadership. The United States played an important

role in achieving broad universal participation. Through historic international partnerships such as the US-China Joint Announcement on Climate Change and Mission Innovation the United States has been central to moving worldwide action forward.

To date, 145 developing countries have submitted a national climate plan (INDC) to the UNFCCC,<sup>6</sup> a significant increase from the 46 developing nations that submitted pre-2020 plans following the Copenhagen climate talks.<sup>7</sup> Under the Paris Agreement, these INDCs will become Nationally Determined Contributions. This is an unprecedented effort, and indicates developing countries' increased seriousness in addressing climate change.

The language “nationally determined” underscores that these national climate plans are established by countries in accordance with their national circumstances.<sup>8</sup> This means that INDCs can be tailored to domestic priorities and capabilities. As a result, INDCs are diverse, particularly so for developing countries. However, all developing countries address GHG mitigation in some form in their INDC,<sup>9</sup> and many use their INDCs as a platform to communicate additional policies, goals, and actions that will enhance climate action—whether it be in the form of shifts to renewable energy, increases in energy efficiency, climate change adaptation, or the restoration of forests:

- 85 developing countries set quantitative renewable energy targets to be achieved between 2020 and 2030.<sup>10</sup> The achievement of these targets will limit GHG emissions, support economic growth, boost energy security, and provide energy access to the millions of people who lack it now.<sup>11</sup> China, for example, plans to increase the share of non-fossils in primary energy consumption to around 20 percent by 2030,<sup>12</sup> which could see renewable energy supply in the country jump by 76 percent between 2012 and 2030.<sup>13</sup> India, on the other hand, will increase its renewable electrical capacity to 40 percent of total installed electrical capacity by 2030.<sup>14</sup> This builds on Prime Minister Modi's earlier commitment to increase solar power to 100 gigawatts by 2022—30 times the current level and five times above the previous renewable energy target.<sup>15</sup> This renewable energy target will require aggressive domestic action, as it significantly exceeds current policy scenario projections<sup>16</sup> — notable, given India's per capita emissions are only one-third of the global average.<sup>17</sup> Brazil, too, is ramping up its renewable energy portfolio, and plans to increase the share of renewables (other than hydropower) in the power supply to at least 23% by 2030. This target will be achieved by raising the share of wind, biomass and solar. WRI analysis shows that target exceeds current policy scenario projections by more than 40 percent,<sup>18</sup> demonstrating the additional effort that will be required to achieve the country's commitment.
- 136 developing countries outline adaptation plans in their INDCs,<sup>19</sup> describing activities and goals in vulnerable sectors like water, agriculture and human health. Most countries clearly identify existing gaps, barriers, and needs associated with adapting to their local climate change impacts, which begins to outline a roadmap for global efforts to build capacity, develop and share technology, and scale up adaptation finance.<sup>20</sup>
- Several developing countries set land-use and forest restoration targets, which form part of the greatest collective commitment to reduce land-use emissions ever seen in international climate negotiations.<sup>21</sup> Moreover, China, Brazil, Bolivia and the Democratic Republic of the Congo have put forth targets that could alone contribute to the protection of more than 50 million hectares of forest over the next 15 years, an area the size of Spain. This could achieve a reduction of 17 gigatonnes of CO<sub>2</sub> over 15 years, or 2.5 percent of the current total annual emissions globally.<sup>22</sup>

While some developing countries have put forward unconditional INDCs, many require the support of developed nations to fully realize their goals—whether in the form of financial support, capacity building or technology transfer. Some countries have explicitly expressed these needs, such as South Africa, who presents cost estimates for individual mitigation activities.<sup>23</sup> Other countries, like Bangladesh, caveat their contributions in more general terms, along the lines of their commitments being “subject to appropriate international support in the form of finance, investment, technology development and transfer, and capacity building.”<sup>24</sup> Ultimately, the extent to which developing countries can achieve their INDCs will largely depend on the adequate provision of finance, technology and capacity-building support from developed nations.

The climate actions of major developing countries are particularly worth noting. The November 2014 U.S.-China Joint Announcement on Climate Change was an historic accord that included unprecedented actions by China. China committed to reach a peak in its carbon dioxide emissions around 2030 and make best efforts to peak earlier, and to increase the non-fossil fuel share of its energy use to around 20 percent by 2030.<sup>25</sup> China’s Paris climate action plan, submitted in June 2015, formalized these targets and also set additional targets to reduce the carbon intensity (carbon emitted per unit of GDP) of its economy by 60 to 65 percent, and increase its forest stock by around 4.5 billion cubic meters, from 2005 levels by 2030.<sup>26</sup> In addition to national targets, eleven cities and provinces from across China committed to reach a peak in their carbon emissions before the national goal to peak around 2030.<sup>27</sup> This group comprises a quarter of China’s urban carbon emissions, roughly equivalent to the total annual carbon emissions of Japan or Brazil.<sup>28</sup>

China has made significant progress in decoupling emissions from economic growth in recent years, and as of 2014 was on track to exceed the carbon intensity and energy intensity targets in its 12<sup>th</sup> Five Year Plan (2011-2015).<sup>29</sup> These are key steps to achieving China’s commitment to reduce its carbon intensity by 40 to 45 percent from 2005 levels by 2020.<sup>30</sup>

China’s 2030 targets are in line with even stronger efforts. A 2014 study by MIT and China’s Tsinghua University found that a scenario with emissions leveling off between 2025 and 2035 and slowly declining after that involves stronger measures well beyond current policies, including a rising price on carbon.<sup>31</sup> Stronger steps will also be needed to achieve the non-fossil target. China will need to install 800-1,000 gigawatts (GW) of non-fossil fuel electricity generation capacity to achieve its 2030 non-fossil energy target, greater than its current coal-fired capacity and almost the total current electricity generation capacity of the United States.<sup>32</sup>

Expert projections<sup>33</sup> of a peak in China’s carbon emissions and an increased share of non-fossil energy are supported by several major building blocks: scaling up non-fossil energy, limiting coal use,<sup>34</sup> improving energy efficiency, placing a price on carbon, and rebalancing the economy from heavy industry toward services.<sup>35</sup> China is already taking significant action in each of these areas.

China led the world with over a third of global investment in clean energy in 2015,<sup>36</sup> leads the world in installed wind power capacity,<sup>37</sup> is likely to have overtaken Germany for the lead in installed solar power capacity in 2015,<sup>38</sup> and has set targets to increase its wind capacity to 200 gigawatts and its solar capacity to 100 gigawatts by 2020.<sup>39</sup> China has banned new coal plants in three key industrial regions<sup>40</sup> and many provinces have targets to reduce coal use.<sup>41</sup> China has been strengthening and expanding policies to increase energy efficiency across its economy, including targets for the efficiency of coal plants,<sup>42</sup> energy-saving targets for industrial enterprises,<sup>43</sup> building energy codes,<sup>44</sup> and fuel economy standards.<sup>45</sup> President Xi Jinping announced in September that in 2017 China will launch a national

emissions trading system,<sup>46</sup> which has the potential to be a powerful instrument to reduce emissions over time.<sup>47</sup> Finally, China is seeking to shift away from its old growth model driven by investment in energy-intensive industry toward a new model driven by consumption, services, and advanced manufacturing,<sup>48</sup> which should have an emissions reduction benefit.<sup>49</sup>

China is working on including additional steps in its upcoming 13<sup>th</sup> Five Year Plan, to be released in March.<sup>50</sup> The decline in China's physical coal use over the past two years<sup>51</sup> and other trends has led some experts to predict that China's coal use may have already reached its structural peak (controlling for cyclical factors)<sup>52</sup> and that China's emissions will likely peak before 2030, consistent with the government's stated aim to make best efforts to peak early.<sup>53</sup>

We have all witnessed the evolution of China's negotiating position over the past six years from wary in Copenhagen to collaborative in Paris. Xie Zhenhua, the Chinese climate envoy, addressing the Plenary at COP21, said the pact may not be perfect, and some areas needed improvement. "But it does not prevent us from marching forward in historic steps. The agreement is fair, just, comprehensive, and balanced, with legally binding force." Now that Paris is over, what more shall we expect from China?

- **More accountability.** China committed to have data subject to international scrutiny just as will other countries.
- **Ramping up of national measurement and reporting systems.** In order to fulfill the strong provisions contained in the Paris Agreement to regularly report their emissions and progress made towards achieving their emission reduction targets (as reflected in their INDC), China will need to continue to strengthen its GHG monitoring and reporting system and strengthen its domestic rules for monitoring and reporting GHG emissions, including finalizing the mandatory GHG reporting system for all key industrial sectors.
- **Demonstration of progress through regular submissions of national reports on:**
  - Information required by the Agreement: China can be expected to incorporate the provisions of the agreement and steps to implement their INDC into the next national five year plan that sets the long-term social and economic policies for the 2016-2020 time period. This is to be adopted in March 2016. Every 2 years updates on progress on emissions and other information required by the agreement will be submitted to UNFCCC.
  - China's steps to showcase the benefits of tackling air pollution (which remains at high levels in 2015 despite some progress<sup>54</sup>), e.g. saving thousands of lives while continuing to limit and reduce coal consumption.
  - China's continuing leadership on non-fossil energy, scaling up work on green buildings as stated in China's INDC and joint statement with the U.S., and clean transportation.
  - As per Article 2 (on the objectives of the Paris Agreement), China's steps on its commitment made in September last year to further strengthen green and low carbon policies and regulations, with a view to controlling public investment into high carbon projects domestically and internationally.

## b. Key Elements of the Paris Agreement

The Paris Agreement is a global agreement comprised of national commitments which establish a clear pathway for reducing global emissions. Several recent studies have shown that the Intended Nationally-Determined Contributions (INDCs) to the Paris Agreement will make a significant difference in reducing global emissions in comparison to current policy trajectories. WRI analysis of the studies found that the INDCs collectively reduce global emissions relative to the current trajectory, though additional effort will

be needed to limit the global temperature increase to a rise of less than 2 degrees Celsius (3.6 degrees F) above pre-industrial temperatures, the globally agreed goal for limiting climate change.<sup>55</sup>

The International Energy Agency's Energy and Climate Change Report<sup>56</sup> concludes that full implementation of INDCs would contribute to 4-8 gigatons (GtCO<sub>2</sub>e) of greenhouse gas emissions reductions by 2030. The report estimates that the path set by the INDCs would be consistent with an average global temperature increase of around 2.7 degrees Celsius by 2100. That contrasts with the Agency's projections of an almost 4 degrees Celsius temperature increase by 2100 given business as usual (BAU) policies.<sup>57</sup>

The Synthesis Report of the INDCs conducted by the UNFCCC estimates that the implementation of INDCs would result in emissions in 2025 that are 2.8 gigatons (and up to 5.5 gigatons) of greenhouse gas emissions (GtCO<sub>2</sub>e) lower than current policy trajectories and emissions in 2030 that are 3.6 gigatons (and up to 7.5 gigatons) lower. The synthesis report does not present the effect of INDCs on global temperature.<sup>58</sup>

The Paris Agreement takes the world further than it has ever gone before on climate policy. Five elements in particular were secured in Paris and demonstrate that the Agreement is the start of a new era of international action on climate change.

1. It establishes a clear pathway for future emissions. The Paris Agreement sets landmark goals aiming to keep temperature rise to well below 2 degrees C (3.6 degrees F) and to pursue efforts to limit temperature increase to 1.5 degrees C (2.7 degrees F). To achieve this, countries will aim to peak global emissions as soon as possible and reduce emissions rapidly to reach net-zero greenhouse gas (GHG) emissions in the second half of the century.
2. For the first time in the history of global climate policy, the Paris Agreement establishes an ongoing, regular process to increase ambition by all countries over time. This mechanism is what makes the Paris Agreement a dynamic and long-lasting accord that can respond to the science of climate change, shifts in technology and economic opportunities, and to growing public support for action.  
Building on the momentum from countries' INDCs, countries have agreed to ramp up action on emissions every five years. By 2020, countries have agreed to come back and either submit new or updated national climate plans (known as nationally determined contributions). Every five years after that, countries will submit new contributions, increasing the ambition of their previous efforts.
3. The Agreement establishes a common system of transparency and reporting for all countries. Through an enhanced transparency framework all countries will be required to regularly report on their emissions and track progress on achieving their nationally determined contributions. The information provided by all parties will be subject to review and multilateral consideration of progress. The framework provides flexibility and support that takes account of different countries' capacities. Developed countries will report on the finance and support they provide, and developing countries will report on the finance and support needed and received.
4. The Agreement strongly recognizes the risks of climate impacts. Unlike previous international climate agreements, which focused solely on mitigation, the Paris Agreement provides equal attention to building resilience in all countries, especially the most vulnerable. It establishes a global goal of enhancing adaptive capacity, strengthening resilience and reducing vulnerability. The Agreement also creates a cycle of action for strengthening adaptation efforts regularly, similar to the mitigation cycle.

5. The Agreement shifts finance toward low-carbon, sustainable development. Finance will provide the needed power to turn the world toward a low-carbon, climate-resilient future, and the purpose of the Agreement states that all financial flows – both public and private – need to be shifted from high to low emissions activities and risky to resilient investments. The Agreement makes clear that developed countries will continue to provide and mobilize finance to support developing countries, and developed countries agreed to meet their 2020 commitment to mobilize \$100 billion a year until 2025. The Agreement opens the door for developing countries to provide support to their peers, recognizing that some developing countries are already doing so.

### c. Legal Form

The Paris Agreement is a universal agreement that contains both legally binding and non-binding components under international law. The Obama Administration was clear before COP21 last year that it was seeking a hybrid agreement with a mix of binding and non-binding elements, as is the case with many international agreements including the UN Framework Convention on Climate Change.<sup>59</sup>

The Paris Agreement does not contain legally binding emission reduction targets. The type and level of target pledged by each individual country is discretionary, based on each individual country's national circumstances. What is binding is the obligation for all countries to prepare, communicate, and maintain these nationally determined targets.

This approach to emissions reduction targets reflects long-standing objectives of the United States. During the Bush Administration Secretary of State Rice called for Parties to agree on a long-term goal for greenhouse gas reduction and to set individual mid-term national targets, stating that "Every country will make its own decisions, reflecting its own needs and interests."<sup>60</sup> The need for governments to work with private industry to develop energy technologies was also emphasized. Each of these core ingredients, advocated by the Bush Administration in 2007, have their analogue in the Paris Agreement which reflects further evolution.

To ensure that countries follow-through on the targets and other actions in their INDCs, the Paris Agreement includes a legally binding process of measuring, reporting and verification (MRV). All countries will be required to measure and report on their emissions in the same format every year two years and have those reports verified through an independent technical process. The Agreement also ensures that countries must come to a multilateral setting to discuss progress on implementation of their emissions reduction targets. This legally binding commitment from all countries provides the means to track progress on how countries implement their national targets.

Transparency and accountability mechanisms not only work at the international level, but also play an important role in helping to mobilize and facilitate domestic action.<sup>61</sup> Research has shown that this form of incentive is far more effective to fulfil international obligations.<sup>62</sup> To cite one example, the power of international scrutiny and regular international moments of review was seen in the case of 1975 Helsinki Declaration which has been one of the most successful human rights instruments, despite being non-legal in nature. This was due to its regular review conferences, which provided domestic advocates with a basis for mobilization.

The Agreement's combination of components, balancing nationally-based decisions on emission targets with strong provisions on process and transparency, makes the Paris Agreement fundamentally different



from the Kyoto Protocol. The Kyoto Protocol was a product of its time, with only a limited number of countries taking on binding emission reduction targets.<sup>63</sup> The Paris Agreement moves beyond that, achieving universal participation.

The Paris Agreement also reflects a sophisticated understanding of psychology and the process of political change. Advances in cognitive and social psychology suggest that major sustained changes in behavior are most likely to come from shifts in perception, the behavior and urging of others, and the exposure that transparent reporting and review brings.<sup>64</sup> Such “nudging” is often more effective than efforts to formally regulate even within national legal jurisdictions, but especially so when international cooperation is required.<sup>65</sup>

Whether an international agreement is effective is not dependent solely on its legal form but rather is a function of three factors: (1) ambition; (2) the level of participation by states; and (3) the likelihood of compliance.<sup>66</sup> Looking at the Paris Agreement in this way, there are a number of key reasons why countries will deliver on their contributions:

- **The “nationally determined contributions”** are the foundation of the Agreement. These are based on national policy, and countries have carefully considered the appropriate climate action for their national circumstances. In most countries, much of this climate action is already underway and supported by domestic legislative and policy frameworks. This strongly supports countries delivering on their commitments.
- **It is a universal agreement that includes the participation of all countries**, both developed and developing. Having all countries undertake climate action creates significant reasons for following through on contributions – climate action has become the norm, as opposed to the exception.
- **Enhanced transparency and accountability through a common framework for all countries will be a strong incentive** for countries to deliver on their contributions.

#### d. Raising Ambition

The Paris Agreement is not a static agreement. For the first time in the history of global climate policy, the Paris Agreement establishes an ongoing, regular process to increase action by all countries. Each year success will be highlighted, and every five years achievements will be reviewed and gaps assessed.

Low-carbon investments in energy, city development, agriculture, and forestry will be profiled, and the positive synergies between climate action, technological progress, economic growth, and the quality of life highlighted. Leaders of nations, cities and corporations will learn from each other and the pace will accelerate. This can already be seen in China and India, both countries accelerating their domestic energy transitions during 2015. China is expected to have set two new clean energy world records in 2015 – one for installing a record 30.5 gigawatts (GW) of wind in a single year, and the second for installing 16.5GW of solar.<sup>67</sup> India is continuing to rapidly decrease the cost of solar, with a further 7% reduction in tariffs this year. The total installed cost for solar in India dropped by more than 20% in 2015 alone.<sup>68</sup>

As part of this ambition mechanism, the Agreement establishes a strong process for countries to regularly assess implementation and take stock of climate action every five years, called the Global Stocktake. This will assess implementation of action on mitigation, finance, adaptation, and support, and will inform implementation of countries’ climate plans. Assessment will start in 2023, but countries have agreed to return in 2018 to review implementation of mitigation measures to inform their 2020 mitigation contributions.

This ambition mechanism, or ‘cycles of action’, is what makes the Paris Agreement a dynamic and long-lasting agreement that will be responsive to the science of climate change, shifts in technology, economic opportunities, and to growing public support for action. This process of review and revision every five years provides the means through which the Paris Agreement’s goal—to keep temperature rise to well below 2 degrees C (3.6 degrees F) and pursue efforts to limit temperature increase to 1.5 degrees C (2.7 degrees F)—can be achieved.<sup>69</sup> COP21 established a new form of international cooperation to accelerate the transition to a clean, resilient economy and achieve more than individual countries or small groups could on their own. The unity displayed between developed and developing countries was unprecedented in the history of the climate negotiations. In Copenhagen, the negotiations were sharply divided along the lines of developed and developing countries. This was not the case in Paris. The success of Paris was built on what was known as the “High Ambition Coalition” – a group led by the Marshall Islands and consisting of over 100 developing and developed countries, including the United States. Developing countries stepped up and showed leadership, joining with the US and others to call for a high ambition outcome. The debate in Paris was not about developed and developing – it was about the willing and the unwilling. Anyone unwilling would be left out of the majority and the benefits that the Paris Agreement brings.

#### e. Robust and Universal Transparency

As noted above, the Paris Agreement has set the world on course for transformative climate action to cut emissions, promote clean energy, build climate resilience, and catalyze climate action investments. The backbone of the Agreement includes provisions that ensure transparency and accountability of action. This transparency is vital for building international trust and confidence that action is taking place and assessing how to facilitate further action. The Paris Agreement contains the most robust, credible and balanced transparency requirements agreed to date in the international climate regime.

The Agreement’s provisions on Measurement, Reporting, and Verification (MRV) are central to this transparency system. The transparency framework will provide countries and wider stakeholders with the information and feedback they need on actual progress to improve efforts and promote efficient and cost-effective policies while also providing domestic and international accountability.

The Paris Agreement unquestionably delivers a strong, enhanced transparency and accountability framework that is:

- **Balanced:** covering mitigation and adaptation actions, as well as support provided and received.
- **Universal and harmonized:** with common guidelines to be agreed for reporting and verification accounting requirements.
- **Strong and pragmatic:**
  - The rules are legally binding holding all countries accountable.
  - Recognizing that it has taken about 15 years for developed countries to build their current monitoring systems and that many developing countries, based on their national circumstances and stages of development may need more help to meet these new and more demanding requirements, the agreement allows for enhancement overtime and puts particular emphasis on capacity building.
- **Supportive of effective implementation:**
  - The agreed-upon technical expert review process includes consideration of countries’ implementation and achievement of their INDCs, identification of areas for improvement, and review of whether the information provided is consistent with the rules agreed, hence trustworthy.

- The outcome of the MRV process will trigger the review by the committee established under the agreement to address implementation questions and promote compliance in a facilitative and transparent way.

The Paris Agreement's transparency framework places all countries on a level playing field in a cooperative spirit. While the full set of common related rules and procedures will be designed starting in 2016, the Agreement has already established the foundation for strong and ambitious actions and support needed to achieve a climate transformation.

#### f. Building Resilience to Climate Impacts

The Paris Agreement places unprecedented importance on actions needed to help people, especially the most vulnerable communities, to adapt—both nationally and globally. Recognizing that 80% of the 186 INDCs have a significant adaptation component, building resilience plays a large role in the Agreement and is provided political parity with mitigation.

The Agreement includes a long-term adaptation goal alongside the goal for mitigation. The Agreement's goal of "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal" explicitly links adaptation to the mitigation goal of limiting global temperature rise to well below 2 degrees C (3.6 degrees F). This connection makes it clear that if mitigation activities succeed in limiting the rise in global temperature, less adaptation will be needed.

Through "cycles of action" on adaptation that are parallel to the cycles for mitigation, the Agreement will also stimulate and accelerate increasingly effective adaptation action over time. Every five years, countries will review and increase the ambition of their climate plans. Countries will also submit and periodically update information about their adaptation priorities, implementation, and support needs to a public registry.

In Paris countries acknowledged that funding for adaptation has historically lagged behind support for mitigation. The set of decision and provisions in the final Agreement provide more support for adaptation, including efforts to:

- Balance overall climate finance between adaptation and mitigation. In particular, developed countries must increase the share of funding going to adaptation by 2020. This will be checked through the reporting and verification regime.
- Recognize that public grants-based resources are especially important for adaptation, because it is more difficult to attract private investment. Again, this resource will be monitored through the reporting and verification regime since all countries will be asked to provide regular information on the source and type of support provided for all actions.
- Help the most vulnerable nations better access climate finance, especially through funds that place an emphasis on adaptation. In particular, in Paris more countries pledged to fund the Least Developed Countries Fund and the Adaptation Fund, and the United States committed to double<sup>70</sup> its annual public grant funding for adaptation to \$800 million by 2020. The US also announced a \$30 million contribution to the G7 Climate Risk Insurance Initiative<sup>71</sup>, which aims to increase access to direct or indirect insurance coverage against the impacts of climate change for up to 400 million of the most vulnerable people in developing countries by 2020. The G7 recognizes that significant funding will be necessary and can leverage several billion USD of risk

from the private insurance and re-insurance industry and will require close partnership with emerging countries as well.

## Section II: The Role of Business and Non-State Actors

### a. Contributions from businesses and non-state actors

The contributions of the business community and non-state actors were a significant reason why the Paris conference was so successful. There was remarkable support for the agreement by the global business elite, including CEOs of world-leading companies, as well as by mayors and governors. These leaders realize that by reducing emissions, they can unlock significant savings in energy and resource costs and boost productivity and innovation.

Subnational governments made bold moves in Paris. It was announced at the conference that more than 400 cities have joined the Compact of Mayors, a coalition of city leaders dedicated to significantly reducing emissions.<sup>72</sup> Based on an analysis of 360 cities, WRI found that Compact of Mayors signatories can collectively reduce their emissions by nearly 17 percent below 2010 levels by 2030.<sup>73</sup> To put that in perspective, they can avoid emitting 740 million tons of greenhouse gas emissions annually in 2030, more than what Mexico emits every year.

A similar initiative called the Compact of States and Regions, comprising 44 states and regions, announced during the Paris COP their intentions to reduce their emissions by 12.4 Gt CO<sub>2</sub>e by 2030, greater than China's current annual output.<sup>74</sup> Additionally, the Pacific Coast Collaborative, a partnership between three US states and British Columbia that would be the world's fourth largest economy if combined, committed to deep emissions reductions and low-carbon economic integration.<sup>75</sup>

The private sector too, made strides to seize the opportunities of the low-carbon economy and avoid the negative impacts of climate change. During COP21, it was announced that 114 companies with more than \$923 billion in profits and 476 million tonnes of CO<sub>2</sub> emissions have committed to setting serious, ambitious emissions targets aligned with climate science.<sup>76</sup> These companies have said that they are not only going to do their fair share, but are going to do enough to get the job done and limit climate change to 2 degrees C. They include Coca-Cola, which has committed to reduce absolute GHG emissions from their core business operations 50% by 2020, using a 2007 base year; General Mills, which has committed to reduce absolute emissions 28% across their entire value chain by 2025, using a 2010 base year; and Sony, which has committed to reduce GHG emissions from its operations by 2020, using 2000 as a base year, and also plans to reduce its environmental footprint to zero by 2050.<sup>77</sup>

The CEO of General Mills put his reasoning for the commitment this way:

*“As a global food company, we recognize the significant impacts climate change can have on our business if left unaddressed. That’s why we are taking action across our value chain. However, we understand that no one company, industry or government will mitigate climate change. It is an urgent and shared global challenge. Real progress toward more sustainable emission levels will require unprecedented collaboration and collective innovation.”*

-Ken Powell, chairman and CEO of General Mills.<sup>78</sup>

As part of the RE100 initiative, during the Paris conference companies like Google<sup>79</sup> and Microsoft<sup>80</sup> committed to transition to 100% renewable power in the shortest practical timescale. The total number

of companies that have made such commitments is now at 63, including BMW, Goldman Sachs, Unilever, and Walmart.<sup>81</sup>

The business commitments go on and on. 119 companies are now committed to responsible corporate engagement in climate policy.<sup>82</sup> 181 companies are committed to reporting how climate change impacts their company as a fiduciary duty.<sup>83</sup> 51 companies have committed to remove commodity-driven deforestation from all their supply chains by 2020.<sup>84</sup> The Carbon Disclosure Project reported in Paris that more than 1,000 companies have in place or plan to implement an internal carbon price, often of \$40 or more.<sup>85</sup>

The private sector also played a big role in developments around clean energy innovation, which will be vital for an economic transition. In Paris a group of 27 billionaires, including Bill Gates (Microsoft), Jack Ma (Alibaba), and Mukesh Ambani (Reliance Industries), came together and launched the Breakthrough Energy Coalition.<sup>86</sup> This group of private investors is putting billions of dollars on the table to help new, clean energy technologies come to market. It will operate in support of Mission Innovation, an initiative launched by 19 countries, representing 80% of global clean energy R&D, that have committed to double their respective research and development investments over five years.<sup>87</sup>

The mayors, governors, and CEOs who converged on Paris had a big impact on the success of the conference. They made it clear that they were ready for a strong signal on climate action from the world's governments and would even go further than they were required.

America's businesses offered overwhelming support for the Paris Agreement. During the COP21 conference it was announced that 154 companies have signed the American Business Act on Climate Pledge. These companies have operations in all 50 states, employ nearly 11 million people, represent more than \$4.2 trillion in annual revenue, and have a combined market capitalization of over \$7 trillion.<sup>88</sup> By signing the pledge these companies voiced support for a strong Paris outcome and demonstrated an ongoing commitment to climate action. As part of this initiative, each company is announcing significant pledges to reduce their emissions, increase low-carbon investments, deploy more clean energy, and take other actions to build more sustainable businesses and tackle climate change.<sup>89</sup> They include companies from a range of sectors, including 21<sup>st</sup> Century Fox, Adobe, Dupont, Jetblue, Kohl's, News Corp., and Verizon.<sup>90</sup>

Six financial giants, Bank of America, Citi, Goldman Sachs, JPMorgan Chase, Morgan Stanley, and Wells Fargo, also issued a statement in favor of a global agreement on climate change.<sup>91</sup> They, like the rest of the private sector clamoring for change, believe climate action to be in their best interest.

It's not just the Paris Agreement that American companies support; they also back the actions the U.S. is taking to meet its commitments. For example, 365 companies, including General Mills, Adidas, Nestle, eBay, Gap, Levis, and Staples, sent a letter to U.S. governors last year in strong support of the EPA's carbon pollution standards for existing power plants.<sup>92</sup>

*"Our support is firmly grounded in economic reality. Clean energy solutions are cost effective and innovative ways to drive investment and reduce greenhouse gas emissions. Increasingly, businesses rely on renewable energy and energy efficiency solutions to cut costs and improve corporate performance."*

Letter to National Governors Association, July 31, 2015

## b. The Paris Agreement sends a powerful market signal

The Paris Agreement gives businesses and investors the policy signals they crave and provides a vital foundation for a healthier, stronger and more prosperous economy. It makes clear the future direction of travel of the world economy. From now on, the smart money will move away from fossil fuels and into cleaner energy, smarter cities, and more sustainable land use. And by spurring innovation, the agreement has the potential to dramatically ramp up the speed and scale of the economic transition.

The Agreement represents an unprecedented political acknowledgement of the risks of climate change.<sup>93</sup> There will now be greater economic opportunities for those businesses that help deliver the transition to a net zero-carbon emissions future, and greater risks for those that don't.

Because of the Agreement's long-term goal<sup>94</sup> and five-year cycles of increased ambition,<sup>95</sup> businesses can now be confident that climate regulation and action will progress, not backslide. This will enlarge the global market for low-carbon goods and services and create incentives for innovation.

In addition, the agreement's provisions for enhanced transparency and accountability<sup>96</sup> will help businesses know what's coming. The regular submission of nationally determined climate action plans will give companies the transparency they need to anticipate each country's climate and energy regulatory programmes and identify potential investment opportunities. The new common transparency and accountability regime will further enhance confidence that governments are serious about delivering.

The timing of the economic signal is perfect for a global economy stuck in a low-growth trap and desperately searching for certainty and new growth opportunities. The agreement should shift and align expectations that a low-carbon growth model is possible, and indeed inevitable. The fact that many countries are already demonstrating this and making good money out of it is also helping to shape expectations. Instead of claiming that others should be acting first, countries will race to compete in the low-carbon economy.

## c. The new climate for doing business

The business sector is certainly heeding the signal that the Paris Agreement sent, and considering the risks of climate change with absolute seriousness. Every year, the World Economic Forum (WEF) conducts a Global Risks Perception Survey, asking members of its global multi-stakeholder community what they believe to be the greatest threats to the economy and society. This year, the Global Risks Report 2016 found that "failure of climate-change mitigation and adaptation" was the number one risk in terms of impact and the number three risk in terms of likelihood.<sup>97</sup>

As leading businesses factor in the risks of climate change, they are also looking forward to seizing the opportunities afforded by a transition to a low-carbon economy. For example, at the WEF's annual meeting in Davos two weeks ago, at an event entitled "A New Climate for Doing Business," the CEO of Walmart, Doug McMillon, expressed how encouraged he was by what happened in Paris. He articulated how Walmart believed that "doing the right thing is good business" and that making Walmart's products and processes more low-carbon "increase[s] the value we're able to offer our customers."<sup>98</sup>

Walmart is not alone. Business leaders around the world hailed the Paris Agreement, including from Microsoft, NIKE, IKEA, Mars, Royal DSM,<sup>99</sup> HSBC,<sup>100</sup> Unilever,<sup>101</sup> Virgin,<sup>102</sup> General Mills,<sup>103</sup> and Siemens.<sup>104</sup>

The We Mean Business Coalition, which brings together more than 500 businesses and investors, called the Paris Agreement a “catalytic moment.”<sup>105</sup> The Confederation of British Industry, representing over 190,000 British businesses, welcomed the deal, with director-general Carolyn Fairbairn saying the deal “can provide the framework for business to invest with confidence.”<sup>106</sup>

It’s clear why businesses want to be a part of the low-carbon economy: it’s good for their bottom line. Companies taking the strongest climate action outperformed the Bloomberg world index of top companies by almost 10% from 2010-2014.<sup>107</sup> More than half of the Fortune 100 companies are already saving around \$1.1 billion per year from energy efficiency, renewable energy and other emission reduction initiatives.<sup>108</sup>

The WEF considers the Paris Agreement a turning point for business-as-usual and a signal of the future direction of investment and opportunity.

*“In the coming months and years, the impact of the Paris Agreement will be felt in board rooms, banks and stock exchanges across the world. The expectation is that, as a result, trillions of dollars needed for investments will be unlocked to put the world onto a climate-safe pathway. The time has come to pivot from business-as-usual...”*

*“For businesses, the Paris Agreement is a license not only to implement climate-friendly practices but also to innovate and develop the next generation of solutions. The race is on for forward-looking businesses and governments alike to capitalize on these new business opportunities for growth and resilience.”*

Global Risks Report 2016, 11<sup>th</sup> edition – World Economic Forum, 2016<sup>109</sup>

#### d. Investment is shifting

The financial sector can also see which way the wind is blowing. It has already been changing the way it approaches high-carbon vs. low-carbon investment, and the signals sent in Paris will accelerate the changes. Over 400 investors representing \$24 trillion in assets have signed the Global Investor Statement on Climate Change, pledging to seek out and scale up low-carbon and resilient investments.<sup>110</sup>

Part of the reason investors are so excited about the low-carbon market is because technological innovation is lowering the price of renewable energy much faster than anticipated. The cost of solar PV modules has fallen 80% since 2008, and solar and wind are cost-competitive with fossil fuels in many regions.<sup>111</sup> This has led to a drastic market shift: in 2013, new clean power capacity exceeded that of new fossil fuel capacity for the first time ever.<sup>112</sup> We can expect this trend to continue, especially since the Paris Agreement calls for cycles of increasing ambition on emissions targets.

Because of the advantages of the low-carbon economy, the opportunity cost of investing in carbon-intensive sectors is increasing. According to research from Corporate Knights, fourteen prominent funds holding over \$1 trillion in assets could have saved \$22 billion had they shifted investments from the highest carbon companies to those that receive at least 20% of their revenues from environmental markets or new energy.<sup>113</sup>

The financial community is already moving to minimize risk from high-carbon investment. Last month, the Portfolio Decarbonization Coalition, a joint effort by UNEP, its Financial Initiative, and major funds and asset managers, announced that over \$600 billion in assets had been committed to



decarbonization, six times its original target.<sup>114</sup> This is a clear indication that the smart money is already moving in the low carbon direction.

While awareness of the risks of high-carbon investment is growing, there is ongoing work to make it even clearer. At the request of the G20, the Financial Stability Board, which drafts global financial regulation recommendations, launched a task force at the Paris conference to develop consistent and voluntary disclosures on climate risk.<sup>115</sup> Launched by Mark Carney, the Governor of the Bank of England, and led by Michael Bloomberg, former Mayor of New York, the task force will help investors, insurers, and lenders in G20 countries better understand companies' climate risk. The financial community should expect increasing pressure on companies to disclose their exposure to climate risk and to improve transparency and awareness around the carbon intensity of investment.

Globally, the investment landscape is rapidly shifting. According to Bloomberg New Energy Finance, clean energy investment attracted a record \$329 billion in global investment in 2015, nearly six times its 2004 total.<sup>116</sup> Surges in China, Africa, the U.S., Latin America and India drove the world total to its highest ever figure, beating the 2011 record by 3%. This was driven by an expanded list of new markets that committed billions to clean energy, with record growth in Mexico (114%), Chile (157%), South Africa (329%), and Morocco (reaching \$2 billion from almost zero in 2014).<sup>117</sup> 2016 is expected to be another strong year for renewable investment.<sup>118</sup> Renewable energy was largely immune to the upheaval that has plagued the fossil fuel industry, which has experienced crashing prices and retreating investment over the past year.

The implementation of the renewable energy targets set as a part of the Paris Agreement by countries like India and China has the potential to drastically shift global markets. China invested twice as much in solar capacity in 2015 as the United States,<sup>119</sup> and is on track to become a superpower of the low-carbon economy. Indian Prime Minister Narendra Modi increased India's solar power capacity goal for 2030 from 20 GW to 175 GW.<sup>120</sup> For comparison, the U.S. has only about 25 gigawatts of solar capacity.<sup>121</sup> Prime Minister Modi didn't make this decision because he's a member of Greenpeace. He did it because it makes the most sense for India's economic development.

At the same time as investment in renewables is surging, demand for high-polluting fuels such as coal is stalling globally<sup>122</sup> and even declining in fast-growing economies like India, where imports dropped by 34% in 2015.<sup>123</sup> Around \$1.1 trillion of energy-sector assets are at risk of stranding if financial markets fail to anticipate the transition to low-carbon energy. Coal mining investments face the majority of lost value.<sup>124</sup> Spending money on a coal plant becomes a much more risky decision when 195 governments are planning for a world economy with net-zero carbon emissions by the second half of the century.

#### e. Debunking the false dilemma – climate action is in our economic interest

The reason why businesses, investors, countries, and cities are so eager to act on the Paris Agreement is because they believe it is in their economic interest to do so. This is true for the United States as well.

A growing body of evidence had found that economic growth and action on climate change can be mutually compatible. The Global Commission on the Economy is an independent initiative that consists of 28 leaders in government, business, and finance from 20 countries. In a landmark report in 2014, *Better Growth, Better Climate: The New Climate Economy Report*, it found that the perceived choice between growth and climate action is a false dilemma.<sup>125</sup> Around \$90 trillion globally will be invested in cities, land use and energy infrastructure between now and 2030. It would only cost a fraction more to



make these investment choices low-carbon, and the higher investment costs could be fully offset by reduced fuel expenditure and other savings.<sup>126</sup>

Many of the pessimistic economic models cited by opponents of climate action have serious shortcomings, as described in *Better Growth, Better Climate*.

*The view that there is a rigid trade-off between low-carbon policy and growth is partly due to a misconception in many model-based assessments that economies are static, unchanging, and perfectly efficient.... Indeed, once market inefficiencies and the multiple benefits of reducing greenhouse gases, including the potential health benefits of reduced air pollution, are taken into consideration, the perceived net economic costs are reduced or eliminated.*

Better Growth, Better Climate: The New Climate Economy Report – Global Commission on the Economy and Climate, 2014<sup>127</sup>

In 2015, the Global Commission issued a second report, *Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate*.<sup>128</sup> It found that essentially all of the emissions cuts we need to stop severe climate change can be met through actions that boost the economy. Smart climate policies promote economic efficiency, drive technological advances, provide policy predictability for investors, generate huge economic co-benefits, and reduce the negative impact on growth of climate change itself.

In the U.S., the historical record is clear: environmental protection is compatible with economic growth, and U.S. environmental policies have delivered huge benefits to Americans. In 2010, The Office of Management and Budget reviewed 20 years of major Federal regulations (1999-2009) for which agencies estimated and monetized both benefits and costs, and found aggregate annual benefits of \$128-\$616 billion, while annual costs were estimated at \$43-\$55 billion. Research also shows that the actual cost of environmental regulations frequently ends up being less than *ex ante* predictions by industry, and even the EPA.<sup>129</sup>

The movement toward a low-carbon economy is already being demonstrated throughout the United States. Already between 2005 and 2012, greenhouse gas emissions dropped by 8 percent while real GDP grew by 8 percent.<sup>130</sup> Projections from the U.S. Energy Information Administration (EIA) estimate that the intensity of energy use in the economy will continue to decline through 2040, even in the absence of new policies. With reduced energy intensity in manufacturing, more efficient appliances and buildings, and more fuel-efficient vehicles coming to market, the overall economy is becoming more energy efficient. The EIA projects that GDP will grow at an average 2.4 percent per year through 2040, while energy use will grow at only 0.4 percent per year.

This is happening not just at the federal level either. Efforts to reduce greenhouse gas emissions have already proven to be a win for local economies and jobs in the northeast United States. The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by nine New England and Mid-Atlantic states to cap and reduce emissions from the power sector. Economic growth in the nine RGGI states has been higher than in the rest of the states, at the same time as they have reduced their emissions by 18% compared to 4% in other states. The RGGI contributed a net benefit of \$1.3 billion to these member economies in 2012-2014 alone, generating 14,200 new job years. All nine participating U.S. states showed net job additions.<sup>131</sup>

The United States can achieve its commitments through the Paris Agreement in concert with economic growth. Over the next decade, the proposed Clean Power Plan will play a key role in meeting the target.

Damage to health from air pollution in the United States is estimated to amount to as much as 4% of GDP per year on average.<sup>132</sup> From a benefit-cost perspective, EPA estimates that just the air pollution co-benefits of the Clean Power Plan are worth \$25-\$62 billion, far more than the estimated \$7-9 billion in compliance costs.<sup>133</sup> Adding in global climate benefits increases total benefits to \$55-\$93 billion.

Research has shown us that environmental policies everywhere have become stricter over time, but that this increase in stringency does not harm productivity growth<sup>134</sup> and that the effect on trade and investment locations is negligible.<sup>135</sup> Moreover, well-designed environmental regulations can lead to increased innovation<sup>136</sup> and the benefits to society, particularly in terms of public health, outweigh the costs.<sup>137</sup>

Too many policies miss the full economic picture by failing to account for the costs of the impacts of climate change. Failure to reduce emissions will increase economic, social, and environmental risks for the United States and all nations.<sup>138</sup> With global GHG emissions still on the rise,<sup>139</sup> delaying action on climate change will only result in climate-change-related events becoming more frequent and severe, leading to mounting costs and harm to businesses, consumers, and public health. Inaction on climate change could reduce the United States' per capita GDP up to 36% by the end of the century, according to a new estimate from leading researchers in *Nature*.<sup>140</sup> According to *Risky Business*, if we continue on our current emissions path without significant adaptation, by the end of the century some states in the Southeast, lower Great Plains, and Midwest risk up to a 50% to 70% loss in average annual crop yields (corn, soy, cotton, and wheat), absent agricultural adaptation.<sup>141</sup>

Climate-smart policies reduce these negative impacts on growth.

The true costs of continuing with a high-carbon economic growth model in the United States are much higher than previously realized, and they are rising as concentrations of greenhouse gases in the atmosphere increase each year. The true job killer is inaction on climate change – not the solutions we need to stop it.

## Section III. A Good Deal for the United States

The United States has a massive leadership role to play and is uniquely positioned to impact the global course of action to address climate change. There are three key reasons the United States must act:

1. There are undeniable economic opportunities from taking action.
2. U.S. leadership is capable of stimulating broader action globally, and we are already well positioned to meet our international climate commitments.
3. The U.S. is not immune to the impacts of climate change and delaying action will only create higher costs and more drastic impacts in the long run.

### a. The clean energy economy of the future

There are major opportunities for better growth and a better climate in three key economic systems in the United States – cities, land use and energy. By improving efficiency, investing in infrastructure and stimulating innovation across these sectors, government and business can deliver strong growth with lower emissions.

The costs of uncoordinated, sprawled city planning in the United States are high. Urban sprawl is immensely expensive, costing the United States around \$1 trillion per year.<sup>142</sup> Sprawl raises the costs of infrastructure and service delivery up to 40%.<sup>143</sup> U.S. commuters lose 7 billion hours and 3 billion gallons of fuel in traffic each year.<sup>144</sup>

However, there is a smarter model of urban development. Compact, connected, and coordinated cities can generate stronger growth, create jobs, alleviate poverty, reduce investment costs, and improve quality of life through lower congestion and air pollution. Worldwide, investing in public transport, building efficiency, and better waste management could save cities around \$17 trillion globally by 2050 and reduce emissions by more than the current annual emissions of India.<sup>145</sup>

By encouraging smarter urban growth, the United States could save an estimated \$200 billion annually through savings in infrastructure investment and provision of services.<sup>146</sup> Spending \$1 billion on public transport could boost GDP by \$1.8 billion per year.<sup>147</sup> It could also support 36,000 jobs on average. This is 9% and 19% higher than the number of potential jobs created in road maintenance or new road projects respectively (using the same amount of resources).<sup>148</sup> Making urban settings more transit-oriented could reduce car use by 50%, and could reduce household expenditure by 20%.<sup>149</sup>

Land use can also benefit from more sustainable practices, which in turn can make a big difference for the climate and the economy. Forests provide vital ecosystem services for agricultural productivity, including pollination and regulation of water flows. Each hectare of forest provides the equivalent value of up to \$6,000 in ecosystem services annually.<sup>150</sup> Initiating restoration of at least 350 million hectares of forest by 2030 could generate \$170 billion per year worldwide in net benefits from watershed protection, improved crop yields, and forest products.<sup>151</sup>

Many of the gains to be made in land use are more applicable to other countries, especially those with tropical rainforests. With that said, food waste is a key area where the U.S. can make a big difference.

An estimated one third of all food produced in the world ends up in the trash, taking with it a substantial chunk of consumers' food budgets and causing substantial carbon emissions. As the global middle class expands, global consumer food waste will cost \$600 billion per year by 2030. A 20-50% reduction in global consumer food waste could save between \$120 and \$300 billion per year by 2030. This could reduce GHG emissions by as much as 1 billion tonnes CO<sub>2</sub>e per year, which is more than the annual emissions of Germany.<sup>152</sup>

The energy system presents a prime opportunity for the U.S. to improve the economy while reducing emissions. The renewable energy industry can simultaneously create jobs, improve public health, and reduce emissions. Already an important part of the U.S. economy, the renewable energy industry will only become more vital as time goes on.

The National Solar Jobs Census released in January 2016 found that the U.S. solar industry added workers at a rate nearly 12 times faster than the overall economy, and that it accounted for 1.2% of all jobs created in the U.S. over the past year.<sup>153</sup> The solar industry now employs nearly 209,000 workers, and wages paid to solar workers remain competitive with similar industries.<sup>154</sup> The solar industry expects employment to increase to around 240,000 over the next 12 months, which reflects an annual growth rate of 14.7%.<sup>155</sup> In total, 724,000 Americans worked in renewable energy as of 2014, according to a January 2016 report from the International Renewable Energy Agency.<sup>156</sup>

Through the transition to a clean energy economy, we can deliver hundreds of thousands of new jobs and huge economic co-benefits in the United States. A clean energy future in the U.S. could create on average 550,000 net jobs per year between now and 2050, according to a study from Synapse Energy.<sup>157</sup> Another new economic analysis from ICF International found that a clean energy economy will create more than 1 million additional jobs by 2030, increase U.S. GDP by \$145 billion, increase household disposable income by \$350-\$400, and save families \$5.3 billion on energy bills.<sup>158</sup>

Increasing energy efficiency is another powerful way to reduce emissions and unlock savings for U.S. citizens. By 2035, investment in energy efficiency could boost global cumulative economic output by \$18 trillion, according to the New Climate Economy.<sup>159</sup> The United States' Energy Star program has already lowered household utility bills by an estimated \$360 billion since 1992.<sup>160</sup> States with energy efficiency targets and programs in place are saving customers at least \$2 for every \$1 invested.<sup>161</sup>

### b. The United States' Intended Nationally Determined Contribution

As demonstrated in the previous sections, opportunities are emerging across the economy in multiple sectors to harness fuels, technologies, and processes as we move toward a low-carbon economy. The actions taken to date by the Obama Administration under the Climate Action Plan seize many of these opportunities. They also build an important foundation for meeting its target of reducing emissions 26–28 percent below 2005 levels by 2025, as outlined in its Intended Nationally Determined Contribution (INDC).

In May 2015, WRI published *Delivering on the U.S. Climate Commitment: A 10-Point Plan Toward A Low-Carbon Future*. The study demonstrates that the United States can meet, and even exceed, its INDC target with a broad policy portfolio using existing federal laws combined with actions by states. This would include expanding and strengthening some current and proposed policies and standards, as well as taking action on emission sources that are not yet addressed. Since we completed our analysis, the Administration has already started to move on some of the additional actions we identified as necessary for the US to meet its INDC target, including steps toward improving the efficiency of medium- and heavy-duty trucks, aircraft, and rooftop air conditioning units.

Figure 1 presents emissions projections for three low-carbon pathways that could reduce U.S. emissions by 26–30 percent below 2005 levels by 2025, and 34–38 percent by 2030. *Delivering on the U.S. Climate Commitment* outlines specific steps that federal agencies and state governments can take to achieve these reductions, recognizing that other pathways could also reach those targets by applying different policy portfolios. Notably, our pathways do not include steps to reduce emissions and increase sequestration from the agriculture and forestry sectors. However, in April 2015 the Administration announced an initiative titled *Building Blocks for Climate Smart Agriculture & Forestry*.<sup>162</sup> By 2025, USDA expects this comprehensive set of voluntary programs and initiatives to reduce net emissions and enhance carbon sequestration by over 120 million metric tons of CO<sub>2</sub> equivalent per year. The opportunities in agriculture and forestry reinforce the notion that there are multiple pathways to achieve the U.S. INDC target.

**Figure 1. Net U.S. Greenhouse Emissions: Reference Case and Low-Carbon Pathways Using Existing**

### Federal Authorities and Additional State Action

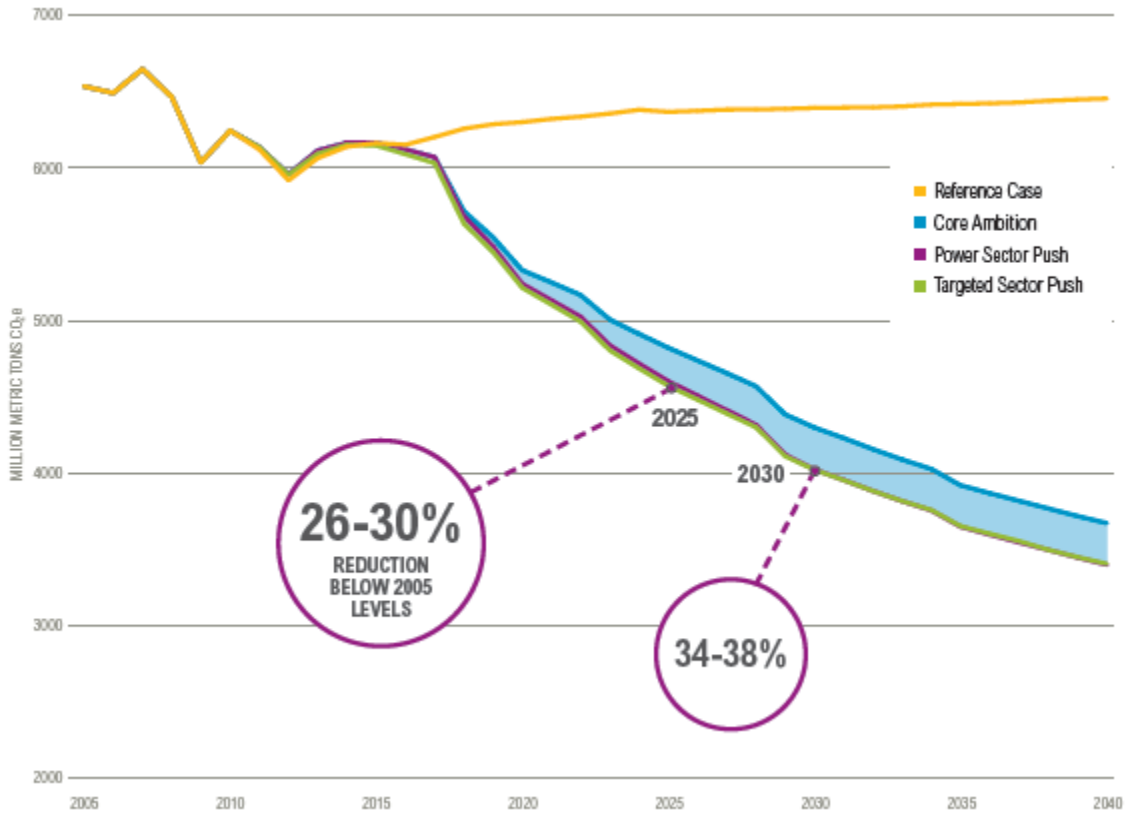


Figure 1 depicts net GHG emissions under three low-carbon pathways that WRI modeled in an analysis that could be pursued using existing federal laws and additional state action. The “Core Ambition” pathway reflects the EPA’s proposed Clean Power Plan (CPP), as well as emission abatement opportunities across other sectors of the economy. “Power Sector Push” builds on Core Ambition by assuming that states and utilities go beyond the CPP as proposed, or that EPA strengthens the proposal to take advantage of cost-effective energy efficiency resources and continued decreases in renewable energy costs. “Targeted Sector Push” assumes that the CPP is finalized as proposed, but pushes the envelope in a few key areas outside the power sector to achieve economy-wide reductions similar to “Power Sector Push”. Both of these pathways were designed to achieve very similar levels of emission reductions, illustrating alternative ways to go beyond a 26 percent reduction across the economy, either through increased action in the power sector or outside the power sector. The shaded area between the pathways indicates that reductions anywhere in this range are possible given mixtures of policies that blend these three pathways. The full report contains all the details and assumptions underlying these pathways and the Reference Case projection, and the modeling approaches used.

### c. Benefits of Climate Protection

The Paris Agreement sets landmark goals for taking action on climate change. It aims to keep temperature rise to well below 2 degrees C (3.6 degrees F) and to pursue efforts to limit temperature increase to 1.5 degrees C (2.7 degrees F). Failure to meet these goals will increase economic, social, and environmental risks for the United States and all nations.<sup>163</sup> With global GHG emissions still on the rise,<sup>164</sup> delaying action on climate change will only result in climate-change-related events becoming more frequent and severe, leading to mounting costs and harm to businesses, consumers, and public health. The new EPA report, *Climate Change in the United States: Benefits of Global Action*,<sup>165</sup> estimates billions of dollars of avoided damages in the U.S. would result from global efforts to reduce greenhouse gas emissions. Actions range from reduced damage to agriculture, forestry, and fisheries, to reductions in coastal and inland flooding, to fewer heat-driven increases in electricity bills.

We are already experiencing the impacts of climate change. 2015 replaced 2014 as the hottest year on record<sup>166</sup>. Fourteen of the fifteen hottest years on record have occurred since 2000.<sup>167</sup> In the United States, some regions are experiencing a higher frequency of flooding, heavier precipitation events, and more frequent heat waves and wildfires.<sup>168</sup>

Extreme weather events are expensive. Between 1980 and 2014, the United States experienced 178 extreme weather and climate events that cost at least \$1 billion each, with total damages of more than \$1 trillion.<sup>169</sup> The frequency and severity of these types of events have increased over the same period, as four of the six years with the most billion dollar disasters on record in the United States have occurred since 2010. A similar increase in these costly events is happening around the world.<sup>170</sup> Many factors contribute to the cost of these events, such as growing population density and increased development in vulnerable areas that are more prone to extreme events. Meanwhile, increasing global temperatures and climate variability are making certain types of these costly events more frequent and severe.

U.S. leadership is critical to the success of the global efforts necessary to avoid billions of dollars in damages to our country. That leadership has already begun to pay off, as the international community adopted a new Agreement at the climate negotiations in Paris last December.

## Section IV: Concluding Comments

The United States has the opportunity in the coming years to lay the foundation for a path to economic growth that delivers significant climate benefits. The key drivers of economic growth—including more efficient use of energy and natural resources, smart infrastructure investments, and technological innovation—can also lead to a low-carbon future. By bringing a spirit of competition, ingenuity, and innovation to the climate challenge, the United States can be a leader in delivering the improvements in energy efficiency, the cleaner fuels, and the new technologies and processes that can lower emissions and create net economic benefits. With more than 50 years' experience in addressing environmental problems, the United States has demonstrated that environmental protection is compatible with economic growth, and environmental policies have delivered huge benefits to Americans.

The U.S. emissions reduction target of reducing emissions by 26 to 28 percent below 2005 levels by 2025 is both ambitious and achievable. Use of existing federal laws combined with actions by the states

can help accelerate recent market and technology trends in renewable energy, energy efficiency, alternative vehicles, and many other areas in order to meet or beat that target.

This year, there are six steps the United States should take to help meet its greenhouse gas reduction targets and play a leadership role in climate action:

### **1. Implement the Clean Power Plan (CPP)**

EPA should continue working with states, electric utilities and other stakeholders to ensure that states are on track to submit their implementation plans. EPA projects that the CPP will reduce power sector GHG emissions by 32 percent below 2005 levels by 2030.

### **2. Propose Standards to Reduce Methane Emissions from Existing Natural Gas Infrastructure**

In August, EPA proposed its first-ever rules targeting methane emissions from new and modified oil and gas equipment and infrastructure. However, WRI research shows much more can be done<sup>171</sup> by also addressing methane leaks from existing sources.

### **3. Step up Action on Hydrofluorocarbons (HFCs)**

Building on EPA's actions on HFCs last year, the environmental agency should propose new rules to ban even more of the most potent HFC uses while also expanding the current list of climate-friendly alternatives. EPA should also finalize its proposed rule to extend requirements for the servicing and disposal of air conditioning and refrigeration equipment that apply to other ozone-depleting substances (like chlorofluorocarbons and hydrochlorofluorocarbon) to include HFCs. That would help capture, reclaim and recycle more HFCs from existing equipment to reduce the amount of new HFCs produced. The United States Government should also work with the international community to amend the Montreal Protocol to curb HFC production and use.

### **4. Lay the Groundwork for the Next Administration to Address Emissions from Industry**

In December 2010, EPA announced its intent to establish GHG performance standards for new and existing refineries, though it has not met its own deadlines for action. White House officials met with leaders from the industrial sector at the end of 2015 to discuss their efforts to reduce GHG emissions. The Obama administration should continue meeting with stakeholders to lay the groundwork for the next administration to address emissions from the largest industrial sources, like refineries and cement, pulp and paper, chemicals, and iron and steel manufacturers.

### **5. Follow Through on Actions Addressing the Transport Sector**

EPA and DOT should finalize the proposed second round of fuel efficiency standards for medium- and heavy-duty trucks.<sup>172</sup> EPA should also keep working on emissions standards for new aircraft while the Federal Aviation Administration expands programs to improve the operational efficiency of the existing aircraft fleet through its NextGen program.<sup>173</sup>

### **6. Increase Support to Local Communities to Boost Climate Resilience**

This includes releasing a progress report on the recommendations from the president's Local Task Force on Climate Preparedness and Resilience, enhancing coordination of efforts at all levels of government to

address climate impacts, creating better incentives for local and state governments to proactively invest in resilience strategies to avoid unnecessary costs and mandating that federal agencies better account for and track the costs of impacts from climate change.

These actions are consistent with WRI's 10-point action plan coming out of Delivering on the U.S. Climate Commitment,<sup>174</sup> which examined pathways the United States can take to achieve its 2025 emission reduction target of reducing emissions 26-28 percent below 2005 levels by 2025. To achieve its climate goals domestically, the United States must act in these areas. Future administrations can then build on this action to ensure deep U.S. cuts in GHG emissions by mid-century.

The United States has always provided leadership when the world faces big challenges and strong domestic action can continue to build U.S. international climate leadership. By showing the resolve to cut its own emissions, the United States can accelerate climate action around the world.

Thank you for the opportunity to testify before the Committee, and I look forward to answering any questions.



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