

Remarks at the White House Summit on “Climate and the Road through Paris: Business and Science Coming Together”

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“Science and Technology on the Road through Paris”

Introduction and Welcome

- Hello, everyone, and welcome. I’m John Holdren, President Obama’s Science Advisor and the Director of the White House Office of Science and Technology Policy, OSTP.
- Let me start by thanking you, on behalf of the President, for your participation in this White House Summit on Climate and the Road through Paris: Business and Science Coming Together.
- We’ve got a great group for this event, including members of Congress, representatives from some of our Nation’s most successful businesses, and leaders from the public, academic, and civil-society sectors.
- This is the third time that a multi-sector summit on climate has been sponsored by the White House. The first one, the White House Conference on Climate Change, was held on October 19, 1993, and the second on October 6, 1997.
- I will start my remarks on climate science, business, and the road through Paris with a summary of what current climate science is telling us about how and why the Earth’s climate is changing, and what the impacts are and are likely to be on the United States and the rest of the world, including impacts on businesses and economies. And then I’ll offer just a few thoughts about the path forward as we head into the Paris Conference and beyond.

On Climate Science

- Let me begin with what climate is: It is the pattern exhibited by weather over a period of decades—specifically averages and extremes, and timing and spatial distribution, not only of hot and cold but also of
 - cloudy & clear;
 - humid & dry;
 - drizzles & downpours;

- snowfall, snowpack, & snowmelt; and
 - breezes, blizzards, tornadoes, & typhoons.
- Climate change, then, doesn't just mean a change in average temperature; it means disruption of the patterns—the averages and extremes of all of these weather variables, and their timing and spatial distribution.
- Moreover, climate governs, so changing the climate necessarily affects...
 - the availability of water;
 - the productivity of farms, forests, & fisheries;
 - the prevalence of oppressive heat & humidity;
 - the formation & dispersion of air pollutants
 - the geography of disease
 - the damages from storms, floods, droughts, and wildfires;
 - property losses from sea-level rise;
 - expenditures on engineered environments; and
 - the distribution & abundance of species (those we need, those we love, and those we hate).
- That the climate is changing and that humans are the dominant cause is now clear, from the science, beyond any reasonable doubt.
 - The pace and pattern of the observed changes in climate cannot be explained by known natural influences on the Earth's climate and in fact run counter to those natural influences. Under natural influences alone, the Earth would still be in the grip of a long-term cooling trend that started about 7,000 years ago.
 - That cooling trend came to an abrupt halt as the industrial revolution took hold at the end of the 1700s, and a huge uptick in anthropogenic emissions of heat-trapping gases from fossil-fuel burning and deforestation began. The pace and pattern of the changes of climate that have occurred since match, with great fidelity, what climate science tells us (and told us) would result from the build-up of heat-trapping gases in the atmosphere that has taken place.
- Also clear beyond reasonable doubt is that the ongoing, human-caused changes in climate are already causing harm to life, health, property, economies, and ecosystems, including...
 - more extremely hot days, and longer and stronger heat waves, often accompanied by worse smog;
 - longer allergy seasons;
 - a larger fraction of precipitation coming in extreme downpours, resulting in floods and mudslides;
 - an increase in the power of the strongest tropical storms;
 - shoreline erosion and aggravation of coastal flooding by sea-level rise;
 - longer and more intense droughts in regions prone to drought;
 - longer wildfire seasons and larger areas burned in regions prone to that; and
 - major impacts on ecosystem dynamics, including factors governing pest outbreaks and the geographic ranges of tropical diseases.
- As if all that were not enough, the human-caused build-up of atmospheric carbon dioxide that is the dominant driver of climate change is also leading to acidification of the global ocean,

as some of the excess CO₂ dissolves in seawater to form carbonic acid. This puts at risk all the marine organisms that make their shells from calcium carbonate, including shrimp, oysters, clams, lobsters, crabs, many of the zooplankton near the base of ocean food webs.

- We know, too, that climate change will continue for many decades to come, and the harm it does will continue to grow, because of the momentum in the climate system and the inertia in society's energy system.
 - Concerning the momentum in the climate system, it takes decades for the ocean to come to equilibrium with changes in the Earth's heat balance caused by the greenhouse gases already added to the atmosphere. That means that even if we could freeze the composition of the atmosphere at its current state (which we cannot), the near-surface air temperature would continue to rise for decades. In addition to the multi-decade timescale for ocean-atmosphere equilibration, moreover, the timescale for the ocean-atmosphere system to come to equilibrium with the great ice sheets on Greenland and Antarctica is centuries to millennia. (More about that in a moment.)
 - Concerning the inertia in society's energy system, the current system, about 80 percent of which is based on fossil fuels, is worth about 25 trillion dollars. That's the approximate replacement cost of the all of the power plants, transmission lines, oil refineries, pipelines, drilling rigs, solar collectors, windmills, and biofuels operations in the world. In the normal course of things, that 25 trillion dollar investment turns over on a timescale of 30 or 40 years. No matter how badly we might want to change our energy system to one much less dependent on fossil-fuel technologies that release the carbon stored in coal, oil, and natural gas to the atmosphere as CO₂, that is a transition that will take decades.
- This, and the fact that climate change is already doing serious harm, is why our strategy must include major efforts on climate-change preparedness, resilience, and adaptation alongside major efforts to reduce emissions and thus the pace and magnitude of the changes in climate that materialize. As the subtitle of a 2007 report to the UN Secretary General put it, our motto must be "Avoiding the unmanageable and managing the unavoidable."
- We know, from the science, that the chances of avoiding an unmanageable degree of climate change are far better if the world takes prompt, strong evasive action than if it doesn't. Two examples:
 - On an emissions trajectory consistent with the keeping the global-average temperature increase from pre-industrial times at or below 2°C (the ambitious but still attainable goal on which virtually all of the world's governments have agreed), the increase in annual-average temperature in the 48 contiguous United States between the beginning of this century and the end is projected to be in the range of 1.5 to 2°C (call it 2.5 to 3.5 degrees Fahrenheit). Under continuation of business as usual, the increase over the same period is projected to be in the range of 5 to 6°C (call it 9 to 11 degrees Fahrenheit). The disruption associated with that temperature increase would be unmanageable.
 - With respect to sea-level rise over the course of this century, the best-estimate projection of the IPCC for the 2°C emissions trajectory is 18 inches. The best-estimate projection for business-as-usual emissions is 30 inches.
 - And, crucially, because of the long equilibration time of the ice sheets, mentioned earlier, sea-level rise will not be finished in 2100. The best estimate for the ultimate increase in sea level after equilibrium is finally reached—maybe in centuries, maybe not for

millennia—is 2.3 meters for every 1°C increase above the pre-industrial value. That’s 7.5 feet per degree. So even a 2°C increase in the temperature means 15 feet of eventual sea-level rise, and a 4°C increase, which we’ll get in the absence of concerted, prolonged, and effective mitigation, will bring 30 feet of eventual sea-level rise.

Impacts of Climate Change on Businesses and the Economy

- So what does all this mean for businesses and the economy? The nature of much of the economic impact can be surmised from the laundry list of the existing and prospective climate-change impacts I’ve already described.
- In dollar terms, the 2014 National Climate Assessment – the most comprehensive report ever on climate-change impacts in the United States – concluded that climate change is already costing the national economy many billions of dollars, and is projected to cost many billions more in the future. I want to highlight four key ways in which these costs manifest themselves:
 - First, climate change affects supply of and demand for critical resources, like water, energy, and food. Changing precipitation and runoff patterns are stressing the quantity and quality of available surface and groundwater supplies. Global warming is increasing the demand for electricity—for example for air conditioning—even as extreme-weather events present ever-greater risks to our energy production and distribution systems. And though climate change may have some positive effects on agricultural production in the short term, analyses show that, by mid-century, the effects of climate change on the agricultural sector – which, in the United States, currently produces nearly \$330 billion per year in commodities – will be increasingly negative.
 - Second, climate change threatens critical infrastructure, particularly coastal infrastructure. In 2011 (the most recent year for which data are available), coastal counties, which comprise just 10 percent of the Nation’s landmass, contributed over \$6.5 trillion to the U.S. economy. But these disproportionately valuable regions are also disproportionately vulnerable to sea-level rise, powerful storms and storm surge, coastal erosion, and other consequences of climate change.
 - Third, climate change can disrupt transportation and supply chains, meaning that regional impacts have national and global impacts. I’m sure many, if not all, of you have experienced this firsthand at airports. I bet at least some of you were among the tens of thousands of people affected when a chain of storms forced airlines to cancel or delay over 80,000 flights during a two-week stretch in February and March of this year. Unabated climate change will make disruptions like these more and more common.
 - Finally, climate change causes market uncertainty. As the climate becomes less stable, infrastructure, suppliers, and markets themselves will become less reliable, discouraging long-term investment. Commodity prices will become more volatile. Indeed, a recent study suggests that the volatility of U.S. corn prices is already more a result of weather than of any other factor. Businesses will need to rethink their current models and become more agile, as climate change compromises their ability to plan and act for the future.

- But the good news is that there is an enormous difference between the amount of additional harm projected to occur if we don't take strong action to address climate change and the amount of additional harm projected to occur if we do.
- There is also an enormous difference between the costs of acting now and the costs of acting later. The President's Council of Economic Advisors has found that net mitigation costs increase, on average, by approximately 40 percent for each decade of delay.¹

Looking Toward the Future

- So there are compelling reasons to act on climate, and to do it now. And that's why President Obama has made climate change one of the signature issues of his Administration.
- As you know, in June 2013, the President released his Climate Action Plan, committing the Federal government to work to cut carbon pollution in America, prepare the United States for the impacts of climate change, and lead international efforts to address climate change.
- As Brian Deese has already related, we have made real progress in advancing those goals, and we are proud of that. But we are also acutely aware that more needs to be done, and that climate change is a challenge that the government cannot meet alone.
- To effectively address climate change on the time scale that we need, we must work together across the public, private, and non-profit sectors to facilitate emissions reductions and adaptation actions, and to promote innovation in energy and environmental technologies.
- It's this philosophy of collective action that led the Administration to launch the American Business Act on Climate – or ABAC – Pledge this past July. At that launch, 13 of the largest companies from across the American economy – representing more than \$1.3 trillion in revenue in 2014 and a combined market capitalization of at least \$2.5 trillion – made commitments to step up and do their part in taking on climate change.
- And today, we're announcing that an additional 68 companies are joining the ABAC Pledge.
- I want to extend my sincere congratulations and appreciation to all 81 companies that are now part of this initiative. If you are a representative of one of these companies, could you please stand to be recognized?
- Thank you. I cannot overemphasize how critical the contributions of the private sector are to helping us move the needle on climate change.
- Thanks largely to private-sector investment in energy and environmental innovations, low-carbon technologies are becoming cost-competitive and gaining market share while contributing to economic growth.

¹ https://www.whitehouse.gov/sites/default/files/docs/the_cost_of_delaying_action_to_stem_climate_change.pdf

- The average cost of solar electric systems has dropped by 50 percent since the beginning of 2010, for instance, and last year the solar industry added jobs 10 times faster than the rest of the economy.
 - In 2014, the United States produced three times as much electricity from the wind, and more than twenty times as much from the sun, as in 2008.
 - And under this Administration's fuel-efficiency standards, by 2025 the average car will go nearly twice as far on a gallon of gas it does today.
- And just as importantly, the demonstrated commitment of the private sector, the academic sector, and the civil-society sector to addressing climate change shows that just as we as a Nation have come together to solve thorny issues in the past, we can and must come together on climate change today.
 - This spirit of cooperation and collective responsibility sets the tone for what we're working to achieve at the climate negotiations in Paris this December.
 - As Todd Stern will discuss, the United States has been leading consistent engagement with other countries to give us our best chance at achieving our goals in Paris.
 - But not even the most successful possible outcome in Paris will be a silver bullet. Whatever agreement is achieved will require considerable effort and follow-up to ensure meaningful implementation. And increased ambition by everybody over time will certainly be needed if the world is to hold the temperature increase to 2°C above the preindustrial level .
 - That's why we see concerted action on all aspects of climate change as important steps on the road through – not just to – Paris. And we look forward to continuing to work with all of you on this sustained effort.

A Closing Observation

- In July, the Administration released one of the first full “blue marble” photos of Earth taken by the joint NASA / NOAA / Air Force DSCOVR satellite mission.
- At the time, President Obama tweeted that the image was, quote, “a beautiful reminder that we need to protect the only planet we have.”
- Today, NASA is launching a website on which you'll be able to view and download new blue-marble photos from DSCOVR every day. The rotating-Earth image you all saw before the program began was composed of pictures you can now find on this site.
- As the President observed, these images are not just beautiful in their own right. They also remind us just how fragile Earth is, and how important it is that we take action to protect it. On our road through Paris and beyond, we need to remember what we're working for—a sustainable, livable future for us, our children, and future generations.
- Thank you!

