Testimony before the House Oversight and Reform Subcommittee on Environment

Climate Change, Part IV: Moving Towards a Sustainable Future

Robert C. Orr

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Chairman Rouda, Ranking Member Green, and members of the subcommittee, thank you for this opportunity to testify before you on this very timely and exceedingly important topic.

My name is Robert Orr, and I am the dean of the School of Public Policy at the University of Maryland. Prior to joining the University of Maryland I spent a decade at the United Nations as Assistant Secretary-General for Strategic Planning, where, among other portfolios, I led the United Nations system's efforts on climate governance. I still serve as special advisor to the Secretary-General on climate change; however I testify today in my capacity as a U.S. citizen and dean of a school focused on good governance.

In 1963, just at the far end of the National Mall, Dr. Martin Luther King, Jr. called on all Americans to recognize the "fierce urgency of now." Today, over five decades later, as our country faces a continuing racial reckoning, we also simultaneously face a climate reckoning, one that imperils our planet, our country, and disproportionately, those members of our society who are most vulnerable and who can least afford it. In the last month alone we have witnessed the American West burn, the South flood, and the Midwest ripped by severe storms -- all indications of the "new abnormal" that climate change visits upon us year over year. Indeed, the Fourth National Climate Assessment from 2018 paints a troubling picture of

a country, our country, that will see increasing impacts to lives and livelihoods across the width and breadth of the United States¹.

As Dr. King also said in his same remarks to the March on Washington, "...there is such a thing as being too late. This is no time for apathy or complacency. This is a time for vigorous and positive action." I welcome the opportunity to be with you today to outline some vigorous and positive actions the U.S. government can take to address the climate crisis, and in so doing, protect all Americans' jobs, freedom, and future. I will focus my remarks on two areas where we have great opportunities, but where recent Federal government backsliding and inaction is undermining U.S. interests — first, our economic transformation and competitiveness, and second, our resilience to inevitable climate shocks.

ECONOMIC TRANSFORMATION AND COMPETITIVENESS

Addressing climate change is at its core an issue of economic development. The countries that seize the opportunities and transition their economies most adroitly and profoundly, will benefit the most. Those that do not, will suffer the consequences of being uncompetitive in a highly competitive global marketplace. Around the world governments are shifting their thinking about how to address the issue, moving it from the sole domain of environment and resource ministries and instead placing it at the center of their long-term economic development strategies. Governments are looking to their policy and political levers to

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¹ USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018

strongly position their countries, their industries, and their citizens in this transition.

Unfortunately, the United States, at the federal level, is moving in the opposite direction.

Where other countries have targeted research and development investment in emerging clean energy technologies, the current Administration seeks significant cuts to investment in these areas. Where other countries are growing domestic markets for the electrification of transport, the U.S. seeks to remove support for producers and consumers to adopt this technology and the good, long-lasting quality jobs that come with it². The U.S. is failing to take advantage of the opportunities presented by this transition, and instead is letting others seize the commanding heights of the 21st century economy.

We are seeing this competition play out in many areas, three of which I will discuss today. Renewable energy is a clear example where there is significant market potential to attract investment and create jobs. An energy system that meets the goals of the Paris Agreement, the climate framework agreed by every nation on earth, will require a cumulative global investment of \$15 trillion between 2019 and 2040³. Looking at the \$2.6 trillion investment in renewable energy capacity over the past decade, China has captured 31% of this total, with the U.S. claiming only 14%⁴. This past year alone, China spent over \$87 billion in new solar generation capacity, over half the global total. This dominance in generation capacity is translating to economic dominance. While the U.S. gave birth to the oil and gas industry, and continues to lead the sector today in terms of technology, equipment, and services, the energy industries of tomorrow are not currently under U.S. leadership, and getting further away by

² Wayland, Michael. *Trump budget would cut loan program for vehicle production used by Tesla, Ford. CNBC* February 10, 2020

³ IEA (2019), *World Energy Outlook 2019*, IEA, Paris, Available at: https://www.iea.org/reports/world-energy-outlook-2019

⁴ Frankfurt School-UNEP Centre/BNEF. 2019. *Global Trends in Renewable Energy Investment 2019*, Available at: http://www.fs-unep-centre.org (Frankfurt am Main)

the day. Countries in Asia dominate the photovoltaic cell and module production market, representing 98% of shipments in 2018. China alone supplied 57% of all production⁵. China is also home to 73% of the global lithium cell manufacturing capacity that will power the electric vehicle transition⁶. There is only one U.S. based company in the top 10 global wind manufacturers. This is not just "happening". It is a consequence of deliberate policy and political efforts by governments to position themselves at the vanguard of the new economy. Meanwhile, the United States has been asleep at the switch.

However, the federal government has historically played a key role in the development of an economically significant renewable industry in the U.S., and it is imperative it reassumes this role. During this period when governments around the world face the need to stimulate the recovery of their economies, this public expenditure should be used to invest in ways that will stimulate the industries of the future. Yet we are seeing fossil fuels supported far in excess of renewables, including in the U.S. where more than \$72 billion of public money has been committed to fossil fuel support compared to \$27 billion for renewable energy. As we look towards investing in the recovery, the extension of tax incentives for the deployment of renewable generation and the expansion of support for research and development into next-generation technologies should be central in any federal response.

Second, policy and market forces are shifting the automotive industry towards electrification.

Numerous high-profile policy announcements of the phasing out of the internal combustion

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⁵ Feldman, D. & Margolis, R., *Q4 2018/Q1 2019 Solar Industry Update*, National Renewable Energy Laboratory, Available at: https://www.nrel.gov/docs/fy19osti/73992.pdf

⁶ Rapier, R., *Why China Is Dominating Lithium-Ion Battery Production*, Forbes, August 4, 2019 Available at: https://www.forbes.com/sites/rrapier/2019/08/04/why-china-is-dominating-lithium-ion-battery-production/#47e a69337867

⁷ Energy Policy Tracker, *United States*, Available at: https://www.energypolicytracker.org/country/united-states

engine -- most recently with the United Kingdom announcing a ban on all new petrol, diesel, and hybrid cars by 2035 -- are joining announcements by manufacturers increasing their all-electric models and, in the case of Volvo, transforming their entire collection to electric by 2025. Top automotive manufacturers plan to spend more than US\$300 billion globally over the next ten years to further the production of electric vehicles. Looking out to 2030, the implementation of current policies is expected to see electric vehicle uptake of 57% of all new sales in China, 26% in Europe, and 8% in the U.S. Based on current trends, the U.S. stands to largely lose out on the benefits of the global transition to electric vehicles. China commands a 50% global share of the electric vehicle production market, was producing 11 times the number of battery cells for electric vehicles than the U.S. in 2017, and will account for more than 50% of global battery production capacity by 2022, compared to 12% for the U.S. 10 Again, this is not just "happening" in China -- government policy has nurtured both production capacity and consumer markets for this technology. Again, the United States has been asleep at the switch.

Governments around the world are including support for the electrification of transport in their recovery stimulus. France, Germany, Spain, Austria, and Italy have all included billions in incentives in their recovery packages for the adoption of electric vehicles and the deployment of electric transport infrastructure. In addition, the €750 billion European Union recovery package has placed support of the clean energy transition at its core. This is a clear

⁸ Mosquet, X., Arora, A., Xie, A., & Renner, M., *Who Will Drive Electric Cars to the Tipping Point?* BCG, Available at: https://www.bcg.com/publications/2020/drive-electric-cars-to-the-tipping-point.aspx

⁹ IEA (2019), *Global EV Outlook 2019*, IEA, Paris Available at: https://www.iea.org/reports/global-ev-outlook-2019

¹⁰ Lutsey, N., Grant, M., Wappelhorst, S., & Zhou, H., *Power Play: How Governments are spurring the electric vehicle industry*, The International Council on Clean Transportation, Available at: https://theicct.org/sites/default/files/publications/EV Government WhitePaper 20180514.pdf

area for action that we are leaving on the table. On the regulatory side, the significant downward revision to the Corporate Average Fuel Standards as a result of the Safer Affordable Fuel-Efficient Vehicles Rule has the effect of taking our foot off the gas just as others are accelerating towards the electric transition. We need an ambitious and increasingly stringent mileage standard to push the markets further and faster. Our auto companies have proven up to the task and can compete if given the incentive to do so.

Third, and closely interdependent on the growth of renewable energy and the electrification of transport, is the rise of smart electrical grids as *the* critical infrastructure of the 21st Century. While the U.S. electricity grid has been described as the largest and most complex machine ever created, it is also an aging and vulnerable weak link in an increasingly electricity-dependent economy. To be able to ramp up renewable generation to the levels needed, to support an electrified transportation sector, and to efficiently align power supply with demand, we need not just to maintain current grid infrastructure but invest in the smart grids that will power tomorrow's economy. Over the last decade, China has invested more in its electric grid than the United States has in all but one of ten years. In this case, U.S. investment was driven in large part by the need to upgrade our aging infrastructure¹¹. U.S. investments in smart grid technologies specifically have been rising since 2014, and are expected to continue doing so through 2024 to represent \$13.8 billion in investment¹². Yet it is clear that a modernized grid is a strategic priority on the part of China, with ultra-high voltage transmission grids -- the backbone of an upgraded national grid -- identified as a

¹¹ IEA (2020), Smart Grids, IEA, Paris https://www.iea.org/reports/smart-grids

¹² U.S. Department of Energy, 2018, *Smart Grid System Report - 2018 Report to Congress*, Available at: https://www.energy.gov/sites/prod/files/2019/02/f59/Smart%20Grid%20System%20Report%20November%20 2018 1.pdf

priority investment area in the country's pandemic recovery plan. In 2020 alone, nearly \$27 billion is expected to be invested in such projects¹³. This isn't just a domestic priority. The State Grid Corporation of China has laid out its intentions to connect the power grids of Eurasia and beyond with \$27 trillion dollars of energy investments -- \$7 trillion in grid construction alone -- through 2030 as part of the Belt and Road Initiative¹⁴.

The scale of investment needed in this area demands a federal government response. A bi-partisan infrastructure package that privileges grid modernization in partnership with the utility industry is needed to not just close the investment gap, but provide a grid upon which to build a sustainable, competitive economy.

In these three areas and beyond, the United States' ability to compete in the global marketplace of tomorrow and secure the jobs of a clean economy fundamentally rests on two great enablers. First, private finance, and its flow towards productive uses, is at the heart of a successful economic and climate equation. With estimates that US\$6.9 trillion worth of global infrastructure investment is needed each year through 2030 to meet the goals of the Paris Agreement¹⁵, and current finance flows meeting less than one-tenth of this need¹⁶, there exists much unmet need. However, we are starting to see a significant shift in private capital

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¹³ Power Technology, 2020, *China Develops \$26bn Ultra High Voltage Electrical Grids to Stimulate Economic Recovery*, Available at: https://www.power-technology.com/comment/china-26bn-uhv-grids/

¹⁴ Cornell, Phillip, 2019, *Energy governance and China's bid for global grid integration*, Atlantic Council, Available at:

 $[\]underline{https://www.atlanticcouncil.org/blogs/energysource/energy-governance-and-china-s-bid-for-global-grid-integration/}$

OECD/The World Bank/UN Environment (2018), Financing Climate Futures: Rethinking Infrastructure, OECD Publishing, Paris, https://doi.org/10.1787/9789264308114-en

¹⁶ CPI, 2019. *Global Landscape of Climate Finance 2019* [Barbara Buchner, Alex Clark, Angela Falconer, Rob Macquarie, Chavi Meat- tle, Rowena Tolentino, Cooper Wetherbee]. Climate Policy Initiative, London. Available at: https://climatepolicyinitiative.org/publication/global-climate-finance-2019/

markets to align themselves with the Paris Agreement. This past year, 29 international institutional investors representing nearly US\$5 trillion in assets under management committed to align their portfolios to be consistent with a 1.5 degree Celsius pathway, and 130 banks from 49 countries -- representing more than US\$47 trillion in assets -- committed to align their business strategies to be consistent with the Paris Agreement In five major markets (European Union, United States, Japan, Canada, and Australia/New Zealand), assets under management using sustainable investment strategies reached US\$30.7 trillion In 2019, the green bond and green loan issuance market set a new global record of US\$257.7 billion, a 51% increase on 2018 In Private capital is mobilizing behind climate-aligned investments rapidly, but it needs places to go. If the U.S. doesn't provide the environment that produces the investment environment this capital is seeking, it will go elsewhere.

Around the world, regulators, analysts, and credit rating agencies have all moved to recognize that climate change represents a material business risk. From the Financial Stability Board to the Network for Greening the Financial System (NGFS), core actors including central bank governors and supervisory authorities have widely recognized that climate change even represents significant risks to financial stability itself²⁰. This is not about politics, but about our governmental and corporate leaders taking the right steps to protect businesses, employees, and the economy itself from real business risk. In this context the

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https://www.unepfi.org/banking/bankingprinciples/

¹⁷ United Nations Environment Programme Finance Initiative, Principles for Responsible Investment, *Net-Zero Asset Owner Alliance*, Available at: https://www.unepfi.org/net-zero-alliance/
United Nations Environment Programme Finance Initiative, *Principles for Responsible Banking*, Available at:

¹⁸ Global Sustainable Investment Alliance, *2018 Global Sustainable Investment Review*, Available at: http://www.gsi-alliance.org/wp-content/uploads/2019/06/GSIR Review2018F.pdf

¹⁹ Climate Bonds Initiative, *2019 Green Bond Market Summary*, Available at: https://www.climatebonds.net/resources/reports/2019-green-bond-market-summary

²⁰ Network for Greening the Financial System, *Overview of Environmental Risk Analysis by Financial Institutions*, September 10, 2020, Available at: https://www.ngfs.net

Task Force on Climate-related Financial Disclosures (TCFD) has come up with a set of recommendations for businesses to enhance transparency around their climate-related risks. This mechanism has successfully enhanced transparency and shown the way to make financial markets more efficient and economies more stable. At the same time, the limits of voluntary disclosure have been on display with incremental growth of businesses participating when economy-wide coverage is needed.

Last week New Zealand passed legislation mandating climate-related disclosure, becoming the first country to do so. Australia, Canada, the United Kingdom, France, Japan, and the European Union are all working on some form of enhanced requirements for climate risk reporting for businesses. In order to protect American businesses and the U.S. economy from climate risk, and to keep the United States sound and competitive as a financial center, the U.S. federal government should require our financial regulatory bodies (SEC, FDIC, etc.) to focus on developing enhanced risk reporting requirements for the United States.

Second, the technological advancements needed for climate solutions are immense, and it is here where the United States' position as a research and development powerhouse is of great importance to the transition. However, a shifting global landscape threatens our dominance in this space. While in absolute expenditure the U.S. remains the largest investor in research and development, others are catching up, and quickly. Countries in Asia, particularly China, have significantly contributed to the overall growth in research and development expenditures in the past two decades. Between 2000 and 2017, China accounted for 32% of the increase in expenditure compared to the United States' 20% contribution. This is

reflected in the rates of research and development spending growth over the same period, where the United States' 4.3% rate of spending growth comes up against China's 17.3%, South Korea's 9.8%, and India's 8%²¹. These figures represent macro-level spending, and not specifically investments into climate-related research and development, yet they tell a story of a global shift in the center of gravity for research and development away from the U.S. and European Union and towards the economies of East and South Asia. Actions taken by Congress have sustained federal funding of research and development in the face of proposed reductions by the current Administration, and this commitment is needed to strengthen public investment and maintain our leadership. Furthermore, targeting research and development spending in energy, agriculture, transportation, and industrial systems to enable reduction of greenhouse gas emissions will reap outsize economic as well as climate rewards.

RESILIENCE

While addressing climate change is an opportunity to set the competitive sights of the U.S. towards creating a more sustainable society, it is undeniable that we are experiencing the impacts of climate change today. It is also clear that these impacts fall inequitably upon our communities, and will continue to do so unless we specifically focus our attention on building the resiliency of those most vulnerable, whether they be older Americans' vulnerability to heat, communities of color living on land prone to flooding, or rural populations subject to the vicissitudes of fire, drought, and flooding. If addressing climate

²¹ National Science Board, National Science Foundation. 2020. *Science and Engineering Indicators 2020: The State of U.S. Science and Engineering*. NSB-2020-1. Alexandria, VA. Available at https://ncses.nsf.gov/pubs/nsb20201/.

change at its core is an opportunity for economic development, climate change itself is fundamentally an issue of risk, both to lives and livelihoods.

I will touch on two key issues that pose risks to lives and livelihoods in America, and where federal action can help to mitigate those risks. First, the fingerprints of climate change on health are becoming ever clearer, with the current COVID-19 pandemic laying bare the nexus between our health and climate outcomes. Research results are emerging that find links between air pollution and COVID-19 death rates²², adding to already known linkages between climate, pollution, and adverse health impacts. This joins an expansive body of knowledge about climate-driven health risks, led chiefly by heat-related illnesses that are expected to drive significant increases in emergency room visits and hospital admissions²³ and for which heat is already the largest weather-related cause of death in the U.S.²⁴.

The U.S. Federal government can help address the growing issues by funding valuable climate science research, particularly through the National Oceanic and Atmospheric Administration (NOAA). NOAA is a national treasure that gives us a clearer picture of the fast evolving threats the U.S. population faces from rapid growth and intensification of extreme weather, and its funding must not be politicized. In addition, funding for the Department of Health and Human Services and the National Institutes of Health should be

²² Wu, X., Nethery, R.C., Sabath, B.M., Braun, D. and Dominici, F., 2020. *Air pollution and COVID-19 mortality in the United States: strengths and limitations of an ecological regression analysis*. Science Advances (in press).

²³Ebi, K.L., J.M. Balbus, G. Luber, A. Bole, A. Crimmins, G. Glass, S. Saha, M.M. Shimamoto, J. Trtanj, and J.L. White-Newsome, 2018: Human Health. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 539–571. doi: 10.7930/NCA4.2018.CH14

²⁴ National Weather Service, Weather Fatalities 2019, Available at: https://www.weather.gov/hazstat/

expanded to address the very real health/climate nexus, and must likewise be depoliticized. Research is not enough, however, as American's lives and livelihoods depend on having insurance coverage that allows them to manage the increased risks to their health. Steps taken in recent years to limit health coverage available under the Affordable Care Act (ACA) are highly counterproductive. The Federal government role in guaranteeing health coverage to all Americans is paramount in a world where climate-related risks to Americans' health are growing rapidly.

Second, our insurance system's ability to address risk -- to property, to livelihoods, and to lives -- is itself at risk. Our insurance system's (public and private) declining ability to adequately protect Americans against risk is being driven by an inability to accurately price risk in the face of climate change. This data and analytical gap is well known, and was most recently highlighted as a critical constraint to managing climate-related financial risk by the Market Risk Advisory Committee of the U.S. Commodity Futures Trading Commission²⁵. Often, there exists an unwillingness to appropriately price the risk, as is typified by the continued insuring of properties that lie within flood zones. The result of both issues is an under-appreciation of the costs associated with climate change, and an over-extension of insurance coverage. We have seen in recent years how the sheer scale of climate impacts is fundamentally disrupting the insurance business model, as insurers decline to cover homeowners in wildfire risk areas in California²⁶. Further, the world's largest reinsurer has

²⁵ Climate-Related Market Risk Subcommittee (2020). *Managing Climate Risk in the U.S. Financial System*. Washington, D.C.: U.S. Commodity Futures Trading Commission, Market Risk Advisory Committee. ²⁶Sweet, K. & Skidmore-Sell, S., 2019, *Wildfires cause turmoil in California property insurance market*, Associated Press, Available at: https://www.pbs.org/newshour/economy/wildfires-cause-turmoil-in-california-property-insurance-market

warned that climate change threatens to make insurance premiums unaffordable for most people²⁷.

The Federal government programs for flood insurance (National Flood Insurance Program managed by FEMA), and crop insurance (Federal Crop Insurance Corporation), need to be reviewed in light of the changing risk equation posed by climate change. The NFIP remains on the Government Accountability Office's high-risk list with a recommendation for Congress to consider comprehensive reform, a situation driven in large part by the program's competing goals to provide affordable flood insurance while remaining fiscally solvent. The program's solvency issues that have resulted from a focus on affordability at the expense of accurate risk pricing will only be exacerbated by a changing climate²⁸. Increases in federal liabilities arising from the FCIC are also projected, with the USDA's Economic Research Service estimating program cost increases of 22% in 2080 under a high emissions scenario. In so much as both of these programs mask the true risk of climate change, they will continue to support -- at increasing cost to taxpayers -- activities and behaviors incompatible with our new climate realities.

US LEADERSHIP

Climate change is a global problem that requires global solutions. The United States has been central in organizing the world to respond to this challenge from the beginning, with strong

²⁷ Neslen, A., 2019, *Climate change could make insurance too expensive for most people – report*, The Guardian, Available at:

https://www.theguardian.com/environment/2019/mar/21/climate-change-could-make-insurance-too-expensive-for-ordinary-people-report

²⁸ U.S. Government Accountability Office, 2019, *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*. GAO-19-157SP. Washington, D.C.: March, 2019.

bi-partisan U.S. support for the Rio Convention and its component UN Framework

Convention on Climate Change negotiated under the leadership of President George H.W.

Bush. The achievement in 2015 of the world's first truly universal climate agreement was the direct result of U.S. leadership and engagement -- across the width and breadth of the U.S. government -- with the world's other major emitters of greenhouse gasses and with lead actors in the real economy at home and abroad.

Yet in the past four years, the United States has abdicated this leadership position. Not only has federal inaction both prevented and erased progress, the United States government has disappeared from global efforts to get everyone to do what is required. Luckily U.S. businesses, states and cities have helped to fill this leadership void²⁹. It is, however, not enough. Two days ago President Xi Jing Ping of China announced China's intent to peak emissions before 2030 and to reach net zero climate emissions before 2060. The European Union plans to do so by 2050 and is making the investments to that end. The United States is missing in action.

Today I have talked about some of the high value areas where the Federal government can and should refocus efforts to get the United States back on the path of "walking the walk." As it does so, the U.S. will only be truly successful if it leverages its many strengths to

²⁹ The America's Pledge Initiative on Climate Change (2019) *Accelerating America's Pledge: Going All-In to Build a Prosperous, Low-Carbon Economy for the United States.* By N. Hultman, C. Frisch, L. Clarke, K. Kennedy, P. Bodnar, P. Hansel, T. Cyrs, M. Manion, M. Edwards, J. Lund, C. Bowman, J. Jaeger, R. Cui, A. Clapper, A. Sen, D. Saha, M. Westphal, W. Jaglom, J.C. Altamirano, H. Hashimoto, M. Dennis, K. Hammoud, C. Henderson, G. Zwicker, M, Ryan, J. O'Neill, E. Goldfield. Published by Bloomberg Philanthropies with University of Maryland Center for Global Sustainability, Rocky Mountain Institute, and World Resources Institute. New York. Available at: americaspledge.com/reports

promote a "race to the top" with other countries -- a race that everyone can win by doing more.