

BACKGROUND

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The Kigali Amendment Offers Little Benefit to the Climate, Great Cost to the U.S. Economy

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Abstract

The 1987 Montreal Protocol was an international agreement to phase out production and consumption of chlorofluorocarbons (CFCs) and halons shown to be harmful to the ozone layer. In October 2016, the U.S. and 196 parties supported an amendment (the Kigali Amendment) requiring an 85 percent phase-down of the production and consumption of hydrofluorocarbons (HFCs) by 2036 for developed nations, and by 2046 for developing nations (including China). The HFCs phase-out likely is motivated not by its ozone-depleting potential, but by the potential to contribute to climate change. The Kigali Amendment inappropriately expands the scope and focus of the Montreal Protocol. An HFC phase-out would impose substantial costs on American families through increased prices for air conditioners and refrigerators. Millions of businesses that have commercial air conditioning and/or refrigeration units would also face price increases and less choice in refrigerants. Moreover, even with full compliance, the amendment's benefits to the climate would be negligible. Congress and the Trump Administration should affirm that the Kigali Amendment requires Senate advice and consent. If the costs to the U.S. economy outweigh the benefits, the Senate should reject ratification.

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, ratified by the United States in 1988, was an agreement to phase out production and consumption of chlorofluorocarbons (CFCs) and halons believed harmful to the atmosphere's protective ozone layer. Parties to the Montreal Protocol have since adjusted and amended the treaty to accelerate phase-out of controlled chemicals, add new chemicals to the controlled list, and establish an assistance mechanism to help developing countries comply.

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KEY POINTS

- In October 2016, the United States and 196 parties supported an amendment (the Kigali Amendment) to require an 85 percent phase-down of the production and consumption of hydrofluorocarbons (HFCs) by 2036 for developed nations, and a decade longer for China and other developing nations.
- The HFC phase-out is motivated, not by its ozone-depleting potential, but by its potential to contribute to climate change.
- The Kigali Amendment would restrict consumer choice and force a costlier substitute on millions of American households and business owners. An HFC phase-out would have negligible impact on both ozone depletion and averting climate change.
- Congress and the Trump Administration should affirm that the Kigali Amendment requires Senate advice and consent under Article II, Section 2, of the Constitution. If the costs to families, businesses, and the U.S. economy outweigh the benefits, the Senate should reject ratification.

In March 2018, France became the 31st nation to ratify the latest amendment to the Montreal Protocol: the Kigali Amendment. Supported in October 2016 by the U.S. and 196 other Montreal Protocol parties, the Kigali Amendment requires an 85 percent phase-down of the production and consumption of hydrofluorocarbons (HFCs) by 2036 for developed nations, and by 2046 for developing nations (including China).¹ The phase-out of HFCs is clearly motivated by their potential to contribute to climate change rather than their potential to deplete the ozone. In this regard, the Kigali Amendment would inappropriately expand the scope and focus of the Montreal Protocol.

Phasing out HFCs would likely impose substantial costs with negligible benefit to the environment. American families and businesses would face higher prices and increasingly expensive repairs for air conditioners and refrigerators. The HFC phase-out would reward those companies seeking to profit from regulatory restrictions by creating a market for pricier substitutes. Congress and the Trump Administration should affirm that the Kigali Amendment requires Senate advice and consent under Article II, Section 2 of the Constitution. The Senate should reject ratification if the costs of the amendment to the U.S. economy outweigh its impact on ozone depletion.

The Scope and Purpose of the Montreal Protocol

Previous adjustments and amendments to the Montreal Protocol have been directly related to the

narrow issue of phasing out ozone-depleting substances. The Montreal Protocol has been adjusted six times to “accelerate the reductions required on chemicals already covered by the Protocol,” and amended four times by the parties to add new chemicals to the controlled substances list and create a “financial mechanism to enable developing countries to comply.”² The motivation for these adjustments and amendments was to hasten phase-out and control substances directly depleting the ozone layer. HFCs have been a primary substitute for substances controlled under the Montreal Protocol and their use has been instrumental in replacing CFCs and other compounds banned for damaging the ozone layer.

Studies conducted in the 1990s found that HFCs had a negligible (perhaps zero) effect on ozone depletion.³ More recent studies confirm these findings.⁴ In a 2015 NASA study, the authors found that “HFC emissions cause increased warming of the stratosphere, speeding up the chemical reactions that destroy ozone molecules, and they also decrease ozone levels in the tropics by accelerating the upward movement of ozone-poor air. According to the model, their impact is such that HFCs will cause a 0.035 percent decrease in ozone by 2050.”⁵ In the news release accompanying the study, the lead author, Margaret Hurwitz, noted: “We’re not suggesting HFCs are an existential threat to the ozone layer or to ozone hole recovery, but the impact isn’t zero as has been claimed. HFCs are, in fact, weak ozone-depleting substances.”⁶

1. United Nations, “Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer,” November 18, 2016, http://conf.montreal-protocol.org/meeting/mop/mop-28/final-report/English/Kigali_Amendment-English.pdf (accessed April 9, 2018).
2. United Nations Environment Programme, Ozone Secretariat, “The Montreal Protocol on Substances that Deplete the Ozone Layer,” <http://ozone.unep.org/en/treaties-and-decisions/montreal-protocol-substances-deplete-ozone-layer> (accessed April 9, 2018).
3. U.S. Department of Commerce and National Oceanic & Atmospheric Administration, *Scientific Assessment of Ozone Depletion: 1994*, chapter 13, “Ozone Depletion Potentials, Global Warming Potentials, and Future Chlorine/Bromine Loading,” <https://www.esrl.noaa.gov/csd/assessments/ozone/1994/chapters/chapter13.pdf> (accessed April 20, 2018), and A. R. Ravishankara, A. A. Turnipseed, N. R. Jensen, S. Barone, M. Mills, C. J. Howard, and S. Solomon, “Do Hydrofluorocarbons Destroy Stratospheric Ozone?” *Science*, Vol. 263, No. 5143 (January 1994), pp. 71–75, https://www.researchgate.net/profile/Michael_Mills8/publication/6092774_Do_Hydrofluorocarbons_Destroy_Stratospheric_Ozone/links/0c96053176fbce04000000/Do-Hydrofluorocarbons-Destroy-Stratospheric-Ozone.pdf?origin=publication_detail (accessed April 20, 2018).
4. Ki-Hyun Kim, Zang-Ho Shon, Hang Thi Nguyen, and Eui-Chan Jeon, “A Review of Major Chlorofluorocarbons and Their Halocarbon Alternatives in the Air,” *Atmospheric Environment*, Vol. 45, No. 7 (March 2011), pp. 1369–1382, <https://www.sciencedirect.com/science/article/pii/S1352231010010654?via%3Dihub> (accessed April 20, 2018).
5. Margaret M. Hurwitz, Eric L. Fleming, Paul A. Newman, Feng Li, Eli Mlawer, Karen Cady-Pereira, and Roshelle Bailey, “Ozone Depletion by Hydrofluorocarbons,” American Geophysical Union, *Geophysical Research Letters*, October 22, 2015, <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1002/2015GL065856> (accessed April 9, 2018).
6. News release, “NASA Study Shows That Common Coolants Contribute to Ozone Depletion,” National Aeronautics and Space Administration, October 22, 2015, <https://www.nasa.gov/press-release/goddard/nasa-study-shows-that-common-coolants-contribute-to-ozone-depletion> (accessed April 18, 2018).

Despite HFCs' minimal impact on the ozone layer, international negotiators forged ahead to eliminate them through the Kigali Amendment. The U.N. made no secret about the fact that the focus of the Kigali Amendment was combatting climate change rather than ozone depletion. Statements following the 28th Meeting of the Parties to the Protocol in Rwanda focused overwhelmingly on the benefit of the Kigali Amendment to address climate change and support other multilateral efforts like the Paris Agreement on climate change.⁷ In a December 2016 story, the U.N.'s Environmental Programme wrote: "The talks in Kigali may not have attracted as much attention as the Paris event last year, but the outcome from the meeting is expected to have even greater impact on Parties' efforts to slow down climate change."⁸

Indeed, statements on the Kigali Amendment from the Obama Administration ignored its benefits to the ozone layer, instead emphasizing that it would "avoid up to 0.5°C of warming by the end of the century—making a significant contribution towards achieving the goals we set in Paris."⁹ However, these claimed climate change benefits are exaggerated. The study used to advance the climate benefits of the Kigali Amendment projects that 0.5 degrees Celsius is the highest end of the range and far outside the temperature projections of the U.N.'s Intergovernmental Panel on Climate Change.¹⁰ Thus, although HFCs are extremely potent greenhouse gases on a per molecule basis, phasing them out would likely have a smaller impact on the climate.

Obama Administration Attempt to Implement Phase-Out Through Regulation

The Paris Agreement and the Joint Comprehensive Plan of Action (JCPOA) on Iran's nuclear program illustrated the Obama Administration's preference for eschewing the Senate advice and consent process before adopting international agreements. Precedent regarding amendments to the Montreal Protocol, however, should make such practice impossible for the Kigali Amendment. The four prior amendments to the Protocol were each submitted to the Senate for its advice and consent before being ratified by the U.S.¹¹

However, this precedent did not prevent attempts to impose the Kigali Amendment phase-out through domestic regulation. In October 2016, the Obama Administration issued a press release detailing the U.S.'s domestic regulatory action:

Today's amendment [the Kigali Amendment] builds on strong action on HFCs that the United States has already taken domestically. Notably, the U.S. Environmental Protection Agency (EPA) has finalized two rules under its Significant New Alternatives Policy program to prohibit the use of certain HFCs where safer and more climate-friendly alternatives are available. In parallel, EPA has also listed as acceptable additional climate-friendly alternatives to expand the options for businesses to use, and has finalized a rule that strengthens existing refrigerant management

7. News release, "Historic Amendment to the Montreal Protocol Adopted in Kigali, Giving Renewed Hope in Fight Against Climate Change," Rwanda's Green Fund (FONERWA), October 15, 2016, <http://www.fonerwa.org/blog/historic-amendment-montreal-protocol-adopted-kigali-giving-renewed-hope-fight-against-climate> (accessed April 9, 2018); United Nations Secretary-General, "Statement Attributable to the Spokesman for the Secretary-General on an Amendment to the Montreal Protocol to Limit Near-term Warming of the Planet," October 15, 2016, <https://www.un.org/sg/en/content/sg/statement/2016-10-15/statement-attributable-spokesman-secretary-general-amendment-0> (accessed April 9, 2018); and Environmental Investigation Agency, "Kigali Amendment to the Montreal Protocol: A Crucial Step in the Fight Against Catastrophic Climate Change," Briefing to the 22nd Conference of the Parties to the United Nations Framework Convention on Climate Change, November 7-18, 2016, <https://eia-international.org/wp-content/uploads/EIA-Kigali-Amendment-to-the-Montreal-Protocol-FINAL.pdf> (accessed April 9, 2018).
8. United Nations Environmental Programme, "The Kigali Amendment to the Montreal Protocol: Another Global Commitment to Stop Climate Change," October 2016, <https://www.unenvironment.org/news-and-stories/story/kigali-amendment-montreal-protocol-another-global-commitment-stop-climate> (accessed April 9, 2018).
9. The White House, Office of the Press Secretary, "Statement by the President on the Montreal Protocol," October 15, 2016, <https://obamawhitehouse.archives.gov/the-press-office/2016/10/15/statement-president-montreal-protocol> (accessed April 9, 2018).
10. Drew Jones, "The Kigali Deal on HFCs Is Important but Won't Save Us Another Half a Degree," Climate Interactive, October 17, 2016, <https://www.climateinteractive.org/insights/the-kigali-deal-on-hfcs-is-important-but-wont-save-us-another-half-a-degree/> (accessed April 20, 2018).
11. U.S. Senate Executive Report 107-10, "Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer," 107th Cong., 2nd Sess., October 2, 2002, <https://www.gpo.gov/fdsys/pkg/CRPT-107erpt10/html/CRPT-107erpt10.htm> (accessed April 9, 2018).

rules for ozone-depleting refrigerants and applies those same requirements to HFCs. In addition, the White House has held two summits at which private-sector commitments to reduce the use and emissions of HFCs were announced. Taken together, the private-sector commitments and executive actions announced to date will slash U.S. reliance on HFCs and reduce cumulative global consumption of these greenhouse gases by the equivalent of more than 1 billion metric tons of carbon dioxide equivalent through 2025.¹²

Those EPA regulations phasing out HFCs were subsequently vacated by a federal court because the agency had no authority to restrict these compounds based on their global warming potential.¹³

Nonetheless, the air conditioning and refrigeration industry has broadly supported ratification of the Kigali Amendment.¹⁴ Companies, including Honeywell and Chemours, have invested and taken actions in anticipation of the phase-out.¹⁵ The amendment offers a clear opportunity for profit, as households and businesses are forced to purchase new air conditioning and refrigeration systems that use new alternative coolants to replace HFC units to be phased out.¹⁶ Honeywell, one of the major companies that secured patents for several HFC alternative hydrofluoroolefins (HFOs), boasted that its HFO-based products would generate \$1 billion in annual revenue by 2020.¹⁷ The same regulatory scheming occurred for the phasing out of CFCs.¹⁸ Furthermore, wide-scale deployment of HFO or other HFC alternatives may have unforeseen impacts on the envi-

ronment or public health and safety. Proponents of the CFC phase-out hailed HFCs as the panacea for the ozone layer and now those same compounds are targeted. The same fate could hold true for HFOs.

Phase-out Costs to U.S. Economy and Impacts on Developing Countries

The Kigali Amendment would likely impose significant costs on American families. New air conditioning units for home- and car-owners will be considerably more expensive. In addition, maintenance and repairs of the hundreds of millions of existing HFC-using units would likely increase as the supply of HFCs dwindles and prices rise. An Amazon.com search for HFC refrigerants versus HFO refrigerants shows a significant per pound price disparity, with HFO refrigerants being anywhere from 10 to 15 times more expensive. Dr. Patrick Michaels from the Cato Institute illustrated the costs HFO alternatives would have on a typical American family by comparing a cheap HFC unit to an expensive HFO (Solstice) unit. Michaels writes:

HFC-134a, out of patent and made in China, goes for a bit under \$7 per pound. Solstice costs \$71. A 3500-square-foot house's heat pump will require approximately 15 pounds, or \$105 worth of HFC-134a, but a whopping \$1,056 worth of Solstice, and that's without installer markup. A similar ratio applies to the three pounds that a car air conditioner uses.¹⁹

Commercial air conditioning units would also be subject to the phase-out, which would adversely affect

12. The White House, "Fact Sheet: Nearly 200 Countries Reach a Global Deal to Phase Down Potent Greenhouse Gases and Avoid Up to 0.5°C of Warming," October 15, 2016, <https://obamawhitehouse.archives.gov/the-press-office/2016/10/15/fact-sheet-nearly-200-countries-reach-global-deal-phase-down-potent> (accessed April 9, 2018).
13. *Mexichem v. Environmental Protection Agency*, No. 15-1328 (D.C. Cir., 2017), [https://www.cadc.uscourts.gov/internet/opinions.nsf/3EDC3D4817D618CF8525817600508EF4/\\$file/15-1328-1687707.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/3EDC3D4817D618CF8525817600508EF4/$file/15-1328-1687707.pdf) (accessed April 9, 2018).
14. United Nations Environmental Programme, "Global Refrigeration and Air Conditioning Industry Determined to Support Kigali Amendment," April 13, 2017, <http://web.unep.org/ozonaction/news/global-refrigeration-and-air-conditioning-industry-determined-support-kigali-amendment> (accessed April 20, 2018).
15. Hiroko Tabuchi and Danny Hakim, "How the Chemical Industry Joined the Fight Against Climate Change," *The New York Times*, October 16, 2016, <https://www.nytimes.com/2016/10/17/business/how-the-chemical-industry-joined-the-fight-against-climate-change.html> (accessed April 9, 2018).
16. *Ibid.*
17. 30293482, "Honeywell: Advancing the Global Effort to Phase Down HFCs," Harvard Business School Technology and Operations Management, November 3, 2016, <https://rctom.hbs.org/submission/honeywell-advancing-the-global-effort-to-phase-down-hfcs/> (accessed April 9, 2018).
18. James Maxwell and Forrest Briscoe, "There's Money in the Air: The CFC Ban and DuPont's Regulatory Strategy," *Business Strategy and the Environment*, Vol. 6 (1997), <https://eng.ucmerced.edu/people/awesterling/SPR2014.ESS141/Assignments/DuPont> (accessed April 9, 2018).
19. Patrick J. Michaels, "Treaty Will Make AC Units Costly with No Benefit to Environment," *The Hill*, February 22, 2018, <http://thehill.com/opinion/energy-environment/375099-treaty-will-make-ac-units-costly-with-no-benefit-to-environment> (accessed April 26, 2018).

every business that has such a unit. For example, Laura Mandala, CEO of Mandala Research, pointed out the impact of the phase-out on the hotel industry and how those costs would be passed onto consumers: “Alternatives will be more expensive and may require equipment replacement and modification. It is not unreasonable to expect that the costs associated with this will ultimately get reflected in hotels’ average daily rate.”²⁰ The hotel industry is just one of many that will increase its prices to pay for what is now more expensive air conditioning. Millions of small businesses that rely on air conditioning and/or refrigeration, such as restaurants and convenience stores, will be similarly impacted—as will their customers.

A study in the journal *Environmental Science & Policy* estimates the costs of complying with the Kigali Amendment from the years 2018–2050 could be as high as \$350 billion euros (\$428 billion).²¹ The same study also projects a possible net savings of \$240 billion euros (\$294 billion), but assumes energy-efficiency improvements in new air conditioners and refrigerators and thus lower operating costs. However, those efficiency improvements are not causally related to a ban on HFCs, so they may well happen regardless. Indeed, any savings or efficiency improvements from using HFOs will bring consumers to shift of their own volition without the need for government mandates as an incentive.

Even with the more generous deadlines, the phase-out will be especially hard on developing countries where incomes are insufficient to provide widespread use of refrigeration and air conditioning. For example, only an estimated 5 percent to 10 percent of the Indian population uses air conditioning.²² Ajay Mathur, the director general of the Energy and Resources Institute in New Delhi told *The New York*

Times that when Indians receive pay raises, air conditioning unit sales increase tremendously because they can afford to pay for the unit and higher energy bills. Mathur said, “It is me of 10 years ago. It is many of my younger colleagues. It is my driver, who after 20 years working for me bought his first air conditioner. It is a marker of social mobility.”²³

A September 2016 study from the Council on Energy, Environment and Water projects the cost range of India’s compliance at \$13 billion to \$38 billion, depending on how the phase-out takes place.²⁴ The rest of the developing world whose citizens are striving to purchase their first air conditioner face similar costs increases. An HFC phase-out could make that social mobility for the world’s poorest citizens even more challenging.

No Harm Done to American Companies if U.S. Does Not Ratify

Proponents of Kigali have also asserted that failure to ratify the Kigali Amendment will disadvantage American companies. Paul Bledsoe, a former climate adviser for President Bill Clinton, said, “Now the question is, will the U.S. ratify the amendment so American chemical companies can gain full access to new global markets for replacement chemicals.”²⁵ However, failure to ratify the Kigali Amendment would not prevent U.S. companies from selling Kigali-compliant products to other countries that have chosen to phase out HFCs. So long as a domestic company chooses to produce HFOs or a different alternative compliant with the stipulations in Kigali, they could sell their product to any of those countries, including within the U.S.

But refusing to ratify Kigali will ensure that Americans have more choices. Homeowners or busi-

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20. David Eisen, “Phasing Out of HFCs to Have Impact on Hotel Industry,” *Hotel Management*, October 18, 2016, <https://www.hotelmanagement.net/operate/phasing-out-hfcs-to-have-impact-hotel-industry> (accessed April 9, 2018).
 21. Lena Höglund Isaksson, Pallav Purohit, Markus Amann, Imrich Bertok, Peter Rafaj, Wolfgang Schöpp, Jens and Borken-Kleefeld, “Cost Estimates of the Kigali Amendment to Phase-down Hydrofluorocarbons,” *Environmental Science & Policy*, Vol. 75 (September 2017), <https://www.sciencedirect.com/science/article/pii/S14629011730120X?via%3Dihub#abs0010> (accessed April 9, 2018).
 22. Josh Dzieza, “The Race Against Heat,” *The Verge*, September 14, 2017, <https://www.theverge.com/2017/9/14/16290934/india-air-conditioner-cooler-design-climate-change-cept-symphony> (accessed April 9, 2018).
 23. Ellen Barry and Coral Davenport, “Emerging Climate Accord Could Push A/C Out of Sweltering India’s Reach,” *The New York Times*, October 12, 2016, https://www.nytimes.com/2016/10/13/world/asia/india-air-conditioning.html?_r=0 (accessed April 9, 2018).
 24. Pallav Purohit, Lena Höglund-Isaksson, Imrich Bertok, Vaibhav Chaturvedi, and Mohit Sharma, “Scenario Analysis for HFC Emissions in India: Mitigation Potential and Costs,” International Institute for Applied Systems Analysis, *CEEW-IIASA Report*, September 2016, <http://pure.iiasa.ac.at/id/eprint/13861/> (accessed April 9, 2018).
 25. Somini Sengupta, “Treaty to Phase Out ‘Greenhouse Gases on Steroids’ to Enter Force,” *The New York Times*, November 17, 2017, <https://www.nytimes.com/2017/11/17/climate/hfcs-montreal-protocol.html> (accessed April 9, 2018).

nesses confronted with purchasing or repairing a new air conditioner or commercial unit will have the option of purchasing HFCs or costlier HFOs. U.S. ratification of the Kigali Amendment may benefit a select few companies who want to disadvantage their competitors through the treaty-imposed regulation, but it will adversely affect a large majority of Americans who benefit from the option to purchase cheaper alternatives.

The Trump Administration's Position

Following the decision of the Trump Administration to repudiate the Paris Agreement, supporters of the Kigali Amendment questioned whether the Administration would similarly reverse the Obama Administration's position on the amendment. At the November 2017 meeting of the Parties to the Montreal Protocol, the U.S. representative clarified:

The United States believes the Kigali Amendment represents a pragmatic and balanced approach to phasing down the production and consumption of HFCs, and therefore we support the goals and approach of the Amendment. There are a number of steps in our domestic process that we would need to complete before reaching a final decision on transmittal of the Kigali Amendment to the U.S. Senate for its advice and consent. There is no timeline currently determined for these steps, but we have initiated the process to consider U.S. ratification of the Amendment.²⁶

Consideration is not endorsement, even if some interested parties wish to interpret (and advertise) it as such.²⁷ However, the Trump Administration should move cautiously and take the following factors into account in its deliberation of the Kigali Amendment:

- The economic impact of phasing out HFCs has yet to be comprehensively estimated.
- The phase-out would in all likelihood disproportionately impact poor and middle-income families in southern and southwestern states.
- Any "benefits" to the climate and the ozone layer from an HFC phase-out would be barely detectable.
- The Kigali Amendment itself is an inappropriate effort to use a narrow treaty focused on ozone-depleting substances to address an unrelated climate change effort.

Next Steps

Prior to a final decision on the Kigali Amendment, Congress and the Trump Administration should take the following steps:

- **Affirm that the Kigali Amendment requires Senate advice and consent under Article II, Section 2 of the Constitution.** Precedent indicates that the advice-and-consent process is required. The Trump Administration should work, through its treatment of international agreements, to repair the damage done to the treaty power by the Obama Administration.
- **If the costs to families, businesses, and the U.S. economy outweigh the ozone benefits, reject ratification.** Advocates for the Kigali Amendment are, for the most part, manufacturers who stand to profit from the phase-out of cheaper HFCs and environmental groups whose views on climate change demand the HFC phase-out. So far, coverage of the amendment has ignored the impact it will have on homeowners and businesses. They will bear the brunt of more expensive air conditioning and refrigeration units, higher utility bills for less efficient units, and passed-on costs to consumers as businesses raise their prices. If the Kigali Amendment is truly about averting ozone depletion, Congress and the Administration should know what the alleged benefits are before subjecting Americans to higher appliance prices and repairs. As indicated above, the ozone and climate benefits are negligible. Similarly, the U.S. Senate should have a sound estimate of the economic impact of the phase-out on their constituents before giving advice and consent. If the

26. Judith G. Garber, "Remarks at the 29th Meeting of the Parties to the Montreal Protocol," November 23, 2017, <https://www.state.gov/e/oes/rls/remarks/2017/275874.htm> (accessed April 9, 2018).

27. Jean Chernick and Ben Hulac, "Trump Quietly Accepts an Obama-Era Climate Deal," *Scientific American*, November 29, 2017, <https://www.scientificamerican.com/article/trump-quietly-accepts-an-obama-era-climate-deal/> (accessed April 9, 2018).

costs outweigh the benefits, as current evidence suggests, the Senate should reject ratification of the Kigali Amendment.

Conclusion

The Kigali Amendment to phase out HFCs would restrict consumer choice and force a costlier substitute on millions of American households and business owners. An HFC phase-out would have negligible impact on both ozone depletion and abating global warming. Congress and the Trump Administration should affirm that the amendment must go through advice and consent in the Senate and the Senate consequently should not ratify Kigali.

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