

**Senate Committee on Environment and Public Works**  
**Information-Gathering Process entitled, “S. 2754, American Innovation and Manufacturing**  
**Act of 2019: Written Testimony and Questions for the Record”**

**March 25, 2020**

**Response to Questions for the Record for the Caesar Rodney Institute**

**Chairman Barrasso:**

1. Do you agree with the claim made by proponents of the AIM Act that the legislation will *prevent*, not encourage, monopolies from forming in the production of HFC replacements?

**Response** – I do not agree banning HFC will prevent refrigerant monopolies. U.S. refrigerant manufacturers make both HFC and HFO, and could continue to offer either from the same manufacturing facilities in Louisiana and Texas. HFC’s are an ideal refrigerant as it is economical and both inflammable, and non-toxic, along with having low ozone depletion potential. All of the replacement options have varying levels of flammability, and toxicity. There is already significant competition for HFC replacements in some applications, such as commercial refrigeration, where options include “natural” refrigerants such as ammonia, carbon dioxide, propane, ethane, and HFO’s where flammability is not so much a concern. In other applications, such as air conditioning, flammability and toxicity are a very big concerns, and HFO’s are the second best option to HFC. Two companies control the HFO market, Honeywell, and Chemours, through both patent protection, and a head start in having production scale manufacturing capacity. In applications where HFO is the best option, banning HFC eliminates the only real competitor. Common sense tells us banning a competitive product cannot possibly result in more competition. If competition is the goal, don’t ban HFC. For a great discussion on industry trends and competition please see the Department of Energy, National Renewable Energy Laboratory (NREL) study, “Refrigerants: Market Trends and Supply Chain Assessment”, <https://www.nrel.gov/docs/fy20osti/70207.pdf>

2. The Air-Conditioning, Heating, and Refrigeration Institute’s (AHRI) [testimony](#) claims that the AIM Act will do away with the ongoing process known as “dumping,” where overseas companies export inferior equipment to the U.S. at a price below the cost of manufacture. Do you agree with this claim? Why or why not?

**Response-** I do not agree the AIM Act will prevent dumping. We note the claim made by AHRI was for dumping HFC refrigerant, not HVACR equipment, and that antidumping duties were put in place. While not condoning dumping, who exactly was buying the below market priced HFC? If it was aftermarket users in the repair and maintenance industry that would not impact equipment manufacturers. If it was equipment manufacturers buying the product, the industry itself, maybe even AHRI members, could have self-policed, or refused to buy these dumped products. Europe has already banned HFC in favor of HFO, and is complaining about black market imports of

HFC from China. Apparently banning HFC won't stop illegal trade. In fact, it is more attractive to avoid \$60/pound HFO, then \$4/pound HFC.

3. The current text of the AIM Act states it will:

*Create 33,000 new jobs and sustain 138,400 existing jobs between now and 2030;  
Increase direct U.S. manufacturing output by \$12.5 billion, and total (direct and indirect) U.S. manufacturing output by \$38.8 billion between now and 2030;  
Improve the U.S. trade balance in equipment and chemicals by \$12.5 billion; and  
Increase the U.S. share of the global HVACR market by 25 percent.*

Do you agree with these claims? Why or why not?

**Response-** I do not agree with these claims of economic gains. The claims made in the Act are identical to a refrigerant industry financed study, "Economic Impacts of U.S. Ratification of the Kigali Amendment" by JMS Consulting, published in April, 2018. In this report we see the net balance of trade on HVACR equipment was zero in 2000, but had grown to a \$10 billion trade deficit by 2016. Eighty- five percent of the increase in the trade deficit was from U.S. equipment manufacturers themselves moving production to NAFTA countries Mexico and Canada, along with technology advances created in the U.S. Why would we expect these U.S. manufacturers to act any differently in the future? The economic growth numbers quoted in the AIM Act assume U.S. equipment manufacturers will obtain a larger share of the global market. Almost all global HVACR equipment growth will occur in Asia, and Latin America, and those areas have their own HVACR equipment industry. In fact, the first production scale HFO refrigerant manufacturing facility was built in China. The growth estimates in the AIM Act run through 2030. According to the Kigali Amendment, developing countries in the high growth HVACR countries will still be using HFC until 2030, and that equipment technology already exists in the U.S. for ready export. We are not exporting to these developing countries now, and the AIM Act won't change that.

4. The Nature Conservancy submitted [testimony](#), stating:

*U.S. companies are currently at the forefront of innovations for alternatives to hydrofluorocarbons and the United States is positioned to be a major production center for advanced refrigerants.*

Do you agree?

**Response** – I do not agree HFO refrigerant manufacturers have positioned the U.S. to be a major production center. According to the NREL study referenced above, foreign refrigerant manufacturers are quickly developing HFO variants (page 34). U.S. manufacturers Honeywell and Chemours have built HFO production facilities in China, Japan, and India (page 46). Both Honeywell, and Chemours have built HFO manufacturing facilities at the same facilities that produce HFC. Few new jobs will be created as production shifts from making HFC to making HFO. The same NREL report forecasts modest growth in synthetic fluorocarbon refrigerants which require recycling

during repair, maintenance, and de-commissioning, with most of the growth moving to natural, low cost refrigerants requiring no recycling.

5. The World Resources Institute [testified](#):

*The regulatory certainty provided by passage of the AIM Act could give rise to enhanced domestic demand, thereby incentivizing U.S. companies to build new next-generation facilities stateside.*

Do you agree?

**Response** – I do not agree the AIM Act will increase regulatory certainty. The refrigerant industry has regulatory certainty. The Kigali Amendment lies dormant as neither President Obama, nor President Trump has sent it to the Senate for advice, and consent. The industry can assume the U.S. will not be joining the treaty. The Environmental Protection Agency (EPA) attempted an end run around the failed treaty. They used the Significant New Alternatives Policy (SNAP) regulatory policy to list HFC's as not acceptable for use in stationary products, such as freezers, foam products, and air conditioners. The EPA lost a lawsuit that claimed the EPA had misused the Clean Air Act in their findings thus overturning the SNAP determination<sup>2</sup>. A request for rehearing to the U.S. Court of Appeals for the District of Columbia Circuit by the replacement HFO refrigerant suppliers Honeywell International, Inc., and Chemours Company, LLC, along with the National Resource Defense Council was denied. The EPA repealed the SNAP regulation in 2018. The refrigerant industry has clear certainty HFO's will have to be adopted in a competitive market, and can plan appropriately to invest in new products for the domestic, and global markets.

6. Is it true that the replacements for HFCs are more expensive than their counterparts? What impact will this have on the consumer?

**Response** – Price lists for HFO refrigerants are not public. A recent online search yielded prices of \$3 to \$4 a pound for HFC, and \$60 to \$65/pound for HFO. The NREL study provides a forecast price (page 44) of about \$55 per pound in 2020, and about \$35/pound in 2030. US fluorocarbon refrigerant use was about 123,000 tons in 2019. The current price premium for HFO's is over \$50 per pound, or \$100,000/ton. That cost differential between HFC and HFO yields \$12.5 billion a year in added cost to U.S. households, motorists, and businesses that rely on air conditioning and refrigeration. For example, higher refrigerant cost will add about \$100 per new car, and for new air conditioning equipment, or repair. Even at the 2030 differential price of \$30 per ton the impact would be an extra refrigerant cost of \$7.5 billion a year.

7. Can you explain who owns most of the patents for HFC replacement chemicals? When do these patents expire?

**Response** – The only good source for that information is the NREL study (pages 34-35) which estimates there are almost 400 patents just for one HFO version HFO-1234YF,

with Honeywell and Chemours owning about 40-percent. These are primarily application patents with the primary joint Honeywell/Chemours patents expiring in 2023 to 2025. Legal challenges abound.

8. Do you believe language should be added to ensure the bill appropriately addresses potential increases in consumer costs when setting regulations under the AIM Act?

**Response** – The estimated benefit of the AIM Act is \$12.5 billion in added export sales by 2030. The added refrigerant cost to consumers is initially \$12.5 billion falling to \$7.5 billion by 2030. Cost in Net Present Value probably exceed benefits. Let's not forget the underlying reason for this Act. It is to lower global warming. The latest EPA greenhouse gas inventory, just released, estimates fluorinated products account for 3-percent of net emissions. The EPA MAGICC climate change calculator yields an estimated 6 one-thousandths of a degree reduction in global warming by 2100 if all fluorinated emissions stop, essentially zero impact. Added language to the AIM Act is not the answer. This Act needs to be voted down.

#### **Senator Whitehouse:**

9. You criticize a report funded by the refrigeration industry as unreliable. Your apparent belief that knowing an organization's funding source is relevant to understanding its potential biases is one I share. As such, please disclose to the Committee all the ultimate sources (i.e., the original source as opposed to a pass through entity such as Donors Trust or an LLC) of funding for the Caesar Rodney Institute over the last five years and the amount of their donations.

**Response** – It is unfortunate we live in a world where illiberal activists will hound donors to non-profit entities they don't agree with. As it is now, it was when the U.S. Supreme Court decided 501C (3) organizations were protected from disclosing donors NAACP v. the state of Alabama. CRI protects donor privacy. We have about 650 individual donors, and receive a few grants each year from foundations.

10. It has been reported that the Caesar Rodney Institute has received funding from groups linked to the fossil fuel billionaire Koch brothers and their network of donors. Given their hostility to federal action to mitigate climate change, why should this Committee treat your testimony as credible?

**Response** – I can tell you we are not funded by the Koch brothers even though they should be funding us. A major goal of the Koch Foundation is Criminal Justice reform you probably agree with. Last year I partnered with the American Civil Liberties Union in an educational program for Delaware legislators on problems in the state's criminal justice system. About a dozen bills were considered with most passing. My motivation is Delaware's poor recidivism rate of almost 80-percent, and high incarceration rates. Ex-prisoners I have personally helped had a recidivism rate of about 15-percent.

You may also be interested in the fact I am a cofounder of Delaware's Green Building Council, lobbied successfully for Delaware's 2014 Energy Efficiency Act, and designed, built, and live in a net zero energy house that includes rooftop solar. I also believe we should be doing things that make economic sense like switching to lower CO<sub>2</sub> emission natural gas from coal that is saving American families \$2,000 a year, developing small modular nuclear reactors that will run almost continuously without emissions, and utility scale solar in appropriate amounts that don't harm electric grid reliability. Banning HFC does not make the cut on ideas that make sense. I'd be happy to discuss this with you personally.