Honeywell

Vehicle Emissions Working Group
The Department of Infrastructure and Regional Development
GPO Box 594
Canberra ACT 2601
Australia

7th April 2016

Re: Honeywell Inc's Comments on the Vehicle Emissions Discussion Paper

Dear Sir/Madam,

Honeywell International Inc. ("Honeywell") submits these comments in response to the paper issued by the Australian Governments Department of Infrastructure and Regional Development titled, "Vehicle Emissions Discussion Paper". The paper omits, perhaps inadvertently, any discussion of the impact of hydroflurocarbon (HFC) emissions from the air conditioning system of the vehicles. To provide a more comprehensive assessment of the total greenhouse gas emissions of a motor vehicle, the Department's assessment should also include the impact of emissions of a high global warming potential (GWP) refrigerant, such as HFC-134a, from the air conditioning system. We therefore offer the following information for your consideration.

OVERVIEW

Honeywell is a global leader in providing energy efficient technologies and innovations that can help the world solve its energy and environmental challenges. We are a recognized leading innovator in the development of environmentally preferable fluorocarbons for use as refrigerants, blowing agents, solvents, propellants, and other uses.

Honeywell has been working diligently to develop and commercialize technologies to reduce greenhouse gas emissions in a wide variety of applications. Honeywell has invested over $500 million thus far and projects to invest another $400 million in its new platform of low- and lower-GWP hydrofluoroolefin (HFO) and HFO blend compounds for use by equipment and product manufacturers worldwide.

We continue to work with original equipment manufacturers (OEMs) to evaluate and implement new compounds in their products and equipment. Regulatory incentives and drivers such as the US regulations under the Significant New Alternative Policy (SNAP) program, Canada's proposed HFC regulations, the European Union's F-gas Regulations and most recently Korea's mobile air conditioning regulations, have helped lead companies to commercially adopt these new HFO and HFO blend compounds that will yield substantial environmental benefits.

To implement the European Union's Mobile Air Conditioning (MAC) Directive, which requires all new cars to use an air conditioning refrigerant with a GWP of less than 150, Honeywell has worked cooperatively with the automotive OEMs to develop a solution that meets the EU's climate change objective without sacrificing on energy efficiency or performance.

HFO-1234yf, launched in 2012, is a refrigerant for motor vehicle air conditioning with a GWP of less than 1, lower than that of carbon dioxide (GWP=1). Today, over 8 million cars on the road in the EU and the US use HFO-1234yf and that number is expected to grow to over 17 million by the end of 2016.

To support the growth in use of this product, Honeywell announced plans to invest $300 million in building a new facility in Geismar, Louisiana and a toll manufacturing arrangement with Juhua in China to produce HFO-1234yf. The US plant is expected to be operational in early 2017. Honeywell estimates that the broad adoption of HFO-1234yf in the United States and the EU in motor vehicle air conditioning could alone result in emissions reductions of nearly 30 million metric tons of carbon dioxide equivalent ($MtCO_2e$) annually.

CONTROL MEASURES

This review of vehicle emissions gives the Department an opportunity to look beyond the engine of the motor vehicle and include other greenhouse gas emission reductions, such as the elimination of high-GWP HFC emissions from the vehicle air conditioning system.

Most existing vehicle air conditioning systems use the refrigerant HFC-134a which has a GWP of 1,430, producing emissions of about 850kg of carbon dioxide from the average passenger vehicle as refrigerant leaks into the atmosphere over the life of the car.

Eliminating the use of HFC-134a in light-duty vehicle air conditioning applications could result in emissions reductions of around 1 million $mtCO_2e$ annually in Australia. An alternative refrigerant such as HFO-1234yf, has a very low-GWP (less than 1) and is a near drop-in replacement; it requires minimal equipment changes from existing air conditioning systems because it has similar pressure and materials compatibility to HFC-134a..

Honeywell strongly supports the global phase out of HFC-134a in MAC applications and believes that the local transition to low GWP replacements can be completed as soon as the 2018 model year (MY) in Australia. All of the local Australian car manufacturers are expected to have shut down by January 1, 2018. After that time, all light duty vehicles will be imported, likely from countries that have already transitioned to MAC systems using low GWP refrigerants such as HFO-1234yf.

Honeywell also supports phasing out HFC-134a in heavy-duty vehicle air conditioning applications and is prepared to work with industry to demonstrate this use of low-GWP refrigerants in these applications. The same low-GWP products being used for light-duty automotive applications can be used in this application. For a practical phase-out to occur the heavy-duty OEMs would need to evaluate the safe and effective implementation of low-GWP alternatives, much like the light-duty automotive vehicle

manufacturers have done.

Finally, Honeywell supports the phase-out of high-GWP refrigerants such as R-404A (GWP= 3922) in transport refrigeration because multiple lower-GWP options now exist for this application.

SUGGESTED PROGRAMS

Regulations requiring, or incentivizing the use of, low-GWP solutions are already in place in many countries and regions including the US (eg the joint EPA and NHTSA[1] greenhouse gas emission tailpipe standard and fuel economy program[2]), the EU, Japan, and South Korea. Most vehicle manufacturers already offer models with low-GWP refrigerants in several markets.

Honeywell suggests that Australia consider a mandatory phase out program like the EU MAC directive or the US SNAP program.

Alternatively, the Government could establish an incentive program to promote the use of low GWP refrigerants in the air conditioning system, resulting in lower greenhouse gas emissions from vehicles.

Australia could offer credit to vehicle importers who voluntarily import post 2017 MY vehicles that use low-GWP refrigerants in the air conditioning system instead of high GWP HFC134a.

The US has successfully implemented such a mechanism as part of joint EPA/NHTSA program referenced above. That program allows auto manufacturers to generate credits from the use of low GWP refrigerants that can be used, to a limited extent, to comply with the fuel economy requirements. The US conversion statistics would suggest that there has been a 20% voluntary conversion to HFO 1234yf in 2016 and more HFO1234yf vehicles are expected each year moving forward.

Honeywell also supports the implementation of Government Fleet Purchasing programs that would favor low emission and low GWP refrigerant vehicles. Also, we would like to suggest that the Government may also consider a vehicle sales tax system that can encourage the purchase of fuel efficient and low-GWP refrigerant vehicles.

References:

[1] NHTSA is the acronym for the US National Highway Traffic Safety Administration

[2] The US regulation can be found at https://www.gpo.gov/fdsys/pkg/FR-2012-10-15/pdf/2012-21972.pdf

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CONCLUSION

Honeywell strongly supports the inclusion of the refrigerant from the vehicle air conditioning system in the calculation of overall CO_2e emissions of the vehicle and hopes the Department will take a holistic view to vehicle emissions reduction.

To that end, Honeywell would like to suggest that the Vehicle Emissions Working Group take the initiative and liaise with the Department of the Environment to coordinate a MAC emissions reduction proposal that includes a phase out of the use of HFC-134a refrigerant as part of the overall motor vehicle CO_2e emissions reductions effort.

We appreciate this opportunity to provide additional input into the Departments process to craft a strategy to reduce noxious and greenhouse gas emissions and to foster the introduction of more environmentally beneficial alternatives to assist in achieving Australia's 2030 greenhouse gas reduction targets.

If you require any further information please do not hesitate to contact me.

Yours faithfully
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