Dear EPA Administrator,

We the Students for Environmental Awareness group at UMBC applaud the EPA's completion and release of regulations that will help mitigate the effects of the climate crisis. As an organization existing to promote the protection of the environment, we support the Clean Power Plan Rule as a first major step to induce actions that, all together, will allow the United States to lead the fight against climate change. However, we have a few comments to make about the Plan. This is the first time our group of over 20 students has written a collaborative document expressing our collective opinion. We hope this reflection of student dedication to research and to a long-term joint effort demonstrates the importance of the issues we have outlined in the following sections.

On Re-dispatch to Natural Gas Combined Cycle Units

We believe that we should focus on the other three building blocks (heat-rate improvements, expansion of less carbon-intensive generating capacity, and demand-side energy efficiency), because natural gas is not sustainable or renewable, and we do not know enough about the impacts. In places where fracking has occurred, there has been negative economic change. It is harder to sell homes in areas near fracking, because the property values have declined where there is damage to land due to the destructive process. Mortgage companies sometimes refuse loans to people with properties near fracking. Local economies near fracking are likely to boom and bust because most money is earned in the first year, then drilling companies leave, leaving taxpayers to deal with damages. Other industries leave towns in response to fracking, turning towns into industrial zones, reducing tourism and recreation.

There are many health implications to fracking as well. The use of natural gas is prone to "gas migration, contaminant transport through induced and natural fractures, wastewater discharge, and accidental spills" (Vidic et al, 2013). Numerous studies reflect contaminants moving from fractured shale to aquifers (Myers, T., 2012, Warner, 2012, Jackson, 2011) and later causing drastic health impacts that range from congenital heart and neural tube defects (McKenzie et al, 2014) to increased rates of cancer (Mckenzie et al, 2012). Large percentages of

the chemicals being used can harm the human organism. More than 75% of the chemicals could affect sensory organs; ~40-50% could affect the nervous, immune and cardiovascular systems and the kidneys; 37% could affect the endocrine system and 25% could cause cancer and mutations (Colborn et al, 2011). Fracking uses an extensive amount of water. Two to four million gallons of water is needed at each site. 15,000-60,000 gallons of chemicals are added to this. Only 10-30% of flowback is recovered. These fluids are dumped into surface waters. This causes water contamination to rise. Three hundred to thirteen hundred trucks are needed for every well. This increases air pollution and degrades the quality of roads due to increased traffic. There are also earthquakes associated with gas drilling. While we understand the reasons why natural gas is an easy way to address our CO_2 emissions, the risks outweigh the potential short-term benefits. Natural gas is a band-aid we should not use. It could be a quick solution, but our safest and healthiest future is a renewable energy future.

On Expanded Use of Low- or Zero-carbon Generating Capacity

We feel it is not necessary to give a strong push towards new nuclear plants. Nuclear energy suffers from low public support, and most modern plants produce too much dangerous waste to be worthwhile in place of other less volatile sources of energy. We suggest investing in new nuclear plants once research finds safer and more efficient methods of waste disposal, or once thorium salt reactors become cost effective and widely-used.

We do stress greater use of solar, wind, and other renewable sources of energy. Solar power eliminates toxic products that would accumulate naturally through use of nuclear power. A 1,000 megawatt nuclear plant is equivalent to 150,000 to 180,000 acres of wind farms or 54,000 acres of solar farms, but this issue would be solved if solar panels were installed on top of existing buildings and homes. Solar power also does not disrupt the environment, produces no

greenhouse gases (as chemicals and solvents used in manufacturing the photovoltaic cells are small in impact compared to other sources), is very versatile (cars, cooking, electricity for homes and businesses, water heaters and treatment plants), is a perpetual resource, and the world is capable of harnessing it with very little maintenance. For instance, some public buildings can pay solar panels off monthly for a total of 20 years with an annual savings of around $15,000, made possible by the Solar Power Purchase Agreements (SPPA). In terms of wind power, we want to express the importance of onshore wind, with the development of smaller and quieter windmills being crucial to the harvesting of valuable energy. In regards to geothermal, biomass, and biogas energies, we believe we should not rely upon these forms of fuel due to their restricted geographical applications and lack of environmentally sustainable returns on the investments they require.

Waste-to-Energy (WtE) facilities are economically and electrically inefficient, as well as wasteful of resources that could be recycled (which would save more energy than a WtE facility produces). In terms of economics, WtE plants hold the municipal system hostage in that there are usually quotas to be fulfilled in order for the contractor company to make a profit, which results in the incineration of potentially recyclable and compostable materials, as well as less composting and less recycling by the city overall. Incinerator-style WtE facilities also emit potentially harmful particulates that increase the risk of cancer in the surrounding areas (see later notes for more specific information on health effects). Currently, there are 86 WtE facilities in the US, mostly in the Northeast. The CO_2 emissions caused by "Separated Municipal Solid Waste (MSW)" WtE facilities are not counted in Greenhouse Gas inventories because they are considered to be "closing the loop" of carbon creation and harvest. In Separated MSW facilities, the recyclable material has been removed and only organic (often compostable) material

remains, the waste comes from plant and animal sources, and therefore, the generation of energy from it is considered renewable. In most WtE facilities, however, some of the waste also comes from plastics, glass, and even metals. Hazardous and toxic ash produced in the combustion process is collected and buried in a landfill. In the Waste Management hierarchy, the EPA explains that waste reduction is most preferable, recycling and composting is second most preferable, energy generation is the third most preferable, and treatment and disposal is least preferable (rather than building WtE facilities we should focus on waste reduction, reuse, and recycling). Most incinerators are not efficient enough to justify their high cost to the city, and the energy generated does not offset the debt that the municipal system owes to the contractors.

The following is the list of effects from various compounds produced during incineration: Nitrogen Oxides, Sulphur Oxides, Vanadium, Antimony, and PM10's (Particulate Matter<10mm) cause respiratory problems. Dioxins and PCB's are Class 1 Carcinogens, affect development and reproduction and are highly toxic, persistent, and bioaccumulative. Carbon monoxide reduces oxygen in the blood. Hydrochloric acid and hydrofluoric acid irritate the skin and lungs. PAHs (polycyclic aromatic hydrocarbons), Cadmium, Chromium III and VI, Arsenic, Cobalt, Lead, and Nickel are all highly carcinogenic. Thallium weakens several organs and the nervous system. Mercury affects kidney functions (and when bioaccumulated through the food chain affects many other organs as well). For our economy and health, EPA’s efforts should be focused towards the research and investment of solar, wind, and new nuclear technologies rather than WtE facilities.

On Demand-Side Energy Efficiency

Greater efforts need to be made regarding energy efficiency awareness, especially encouraging demand-side management (DSM). There are existing DSM businesses that effectively work with industries and commercial businesses to regulate their energy usage during

peak consumer usage hours, as well as properly compensate them for their green efforts. We propose that DSM businesses be encouraged to suggest to their clientele that they cut down their power usage during off season (non-peak) energy use hours as well as continuing this practice during peak hours. If green energy office practices were promoted on a grander scale in large factories, much less energy would be wasted.

Greater institutional transparency should be encouraged between businesses that participate in energy self-regulation and the consumers that the businesses serve. As consumers become more and more educated on energy use, they will better understand the benefits of curbing excessive energy usage. This would allow them to support institutions that have taken this step towards greener, energy efficient practices as well as pressure non-participating businesses to consider making a change to their practices.

We also need to acknowledge the importance of consumer energy education in improving energy efficient practices nationwide. There needs to be a greater effort in our schools and workplaces to educate our public about what energy regulation looks like, and why it is important. We propose that a larger effort be dedicated towards social media campaigning, factsheet building and advertising, as well as campaigns such as the "More you Know." Social media is currently our best tool for spreading messages as important as reduced energy usage.

We appreciate the EPA opening the Rule for comment to the public and taking the time to read our comment. Please consider the suggestions we have proposed as more than ideas about economic, health, and environmental management. They are based in research. Furthermore, this Rule determines our future: the future of the youth and of people suffering disproportionately from the effects of climate change, living in countries that do not contribute close to the amount CO_2 emissions that the U.S. is producing.

The Clean Power Plan Rule can be a gateway to focusing on expanded renewable and demand-side management programs. The EPA can take steps now to make the U.S. an example for the world on climate action. Do not miss this opportunity! Thank you for your time and your efforts!

Sincerely from the Students for Environmental Awareness, UMBC

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