Department of Environmental Protection
Montgomery County, Maryland

To Whom it May Concern:

Montgomery County Maryland has produced a most comprehensive document outlining a multifaceted approach to their concerns related to Green House Gas Emissions (GHG). The County has requested comments on this proposal and while the action plan is comprehensive, these comments shall pertain mostly to the use of fossil fuels in residential and commercial buildings.

Let us start with the basic underpinning of the project, GHG or carbon emissions are bad and must be eliminated. While certainly the science indicates there is a significant impact from carbon emissions, it is not necessarily true that these emissions must be eliminated. For proof, one only has to realize that the county does not ban breathing by all living creatures, although should these proposals be fully adopted, it would not be an unrealistic expectation that the costs to live in Montgomery County Maryland would drastically reduce its population. In truth, emissions need to be reduced to sustainable levels.

Key in this discussion is the forced electrification of buildings and the elimination of fossil fuels, specifically natural gas, from residential and commercial buildings. The program makes minor reference to propane and fuel oil as fossil fuels but the focus of the plan is to eliminate the most commonly used, cost effective form of energy; natural gas. Natural gas cooks food, dries clothes, heats water, heats buildings, powers electrical generation in utility plants, and provides automatic back-up power generation in critical applications.

Can all of this be done electrically? Perhaps yes, perhaps no, it depends on who you ask. Many people prefer cooking with gas and find comfort in diversifying their energy suppliers. Others believe it doesn't matter what the method as long as the required output is achieved, a hamburger is cooked, the house is warm, whatever. Does that guarantee reductions in GHG Emissions?

No, it doesn't. If the source of power comes from fossil fuels, GHG emissions will increase. Losses inherent in the electrical system require more power to be generated at the source than is used at the site. If this cannot be all derived from non-fossil fuel generated power, GHG emissions will absolutely go up. To solve this dilemma, it is necessary to force the issue, pick the winners if you will. More solar collectors are needed.

Solar collectors are indeed a technology that works, but at what cost. These devices must be manufactured, transported and installed. The plan envisions rooftop installations becoming more routine, perhaps even mandated. Of all the ways to install PV solar, rooftop installations may be the most expensive. Moving to this mode will also necessitate battery storage otherwise where does the power come from at night? Battery technology is available but again at a cost both in terms of upfront and maintenance but also environmental related to manufacture and disposal. Additionally, collectors must be sized larger to carry daytime loads while also charging batteries for off sun cycle hours.

Setting that aside for the moment, buildings will need heat pumps to control indoor climate conditions and heat pump water heaters. Currently there is ample technology on the market to implement this part but again, at what cost. Heat pump water heaters and HVAC units have a significant price premium over conventional systems. If consumers do not have air conditioning or electric water heaters, these products represent additional load on their service equipment. Heat pump HVAC systems are typically sized for heat output so buildings maintain temperatures on inclement days. This results in higher capacity units when compared to traditional cooling only equipment (A/C loads are typically lower than heating). If air source heat pumps are used, there will be a need for supplemental heating. As the outdoor air temperature goes down, the air source heat pump heating capacity goes down as well but at the same time the building heat loss increases; the two functions are going in opposite directions. If there is no gas allowed, the supplemental heat will need to be supplied from an electric resistance source, perhaps the most expensive way to provide heat. All of this has to come from the electric grid, will that grid have the capacity to take on the additional load; sufficient generating capacity; sufficient distribution capacity? Likely it does not, but there is a solution, provide jobs to build more capacity. Who pays for that? I think the answer is clear, ultimately the consumer.

There are of course geothermal heat pump systems, these do solve the supplemental heating issues as they rely on the stable earth loop temperatures. However, there is the related expense of that earth loop. This is a significant factor, these installations sell well when there are incentives, either from tax relief or utility programs, to offset those costs. When the incentives go away, the market shrinks dramatically. Of course, this can be incentivized, another form of picking the winners.

Lastly on heat pumps, these are certainly products that have been around and are not new technology. Modern type equipment has been evolving from at least the early 1960's and lots has been learned. Having said that, it is a more complex technology with more components. Compressors must operate many more hours than in an air conditioner, compressors have a lifetime that is highly governed by operating hours. Controls systems have more complexity as well. All of these factors expose these products to higher maintenance costs, not every unit, every time but on average, these costs will likely be higher and require a more skilled workforce to install and service them.

Can directing money at these issues solve them? If there is enough money, probably, but is there a better way to spend that money? Likely there are many ways. Spending money on building envelopes is always a better move. If the indoor climate conditions are more effectively separated from the outdoor conditions, everyone wins. It takes less energy overall, that costs less to operate, it takes less electrical infrastructure, it takes less generating capacity. The parts of the plan that focus on insulation, weatherization, improving losses related to windows and doors, all of that unloads the system.

Reducing loads in buildings lowers equipment capacities, replacement equipment can be smaller with less fuel consumption; automatically reducing GHG emissions. Selecting the highest efficiency products on the market drives even more reductions. These are sensible solutions.

Requiring all building to move to the electric grid will pose problems to the grid, problems that money can likely solve but whose money? It seems unconscionable that a building owner would have to completely overhaul their climate control systems and likely electrical systems to sell or lease a building. The plan would effectively make existing structures valueless unless these changes are made. The HVAC industry and the electrical industry would likely benefit, but only if they can be paid for this work. Owners that cannot afford this will likely walk away from assets, similarly Montgomery County is willing to walk away from the installed infrastructure of the natural gas distribution system. Once the system is shut down, generating capacity comes off-line, distribution is stopped, it will be very difficult to go back.

A problem with idealistic planning is the more work done and the more thorough the presentation, the harder it is to realize that the world is not an idealistic place. This plan shows that a lot of thought has gone into it, probably a lot of money went into it as well. The realities of the world can be harsh, rolling blackouts or miscalculations are expensive and people get hurt or die. It is fashionable and stylish these days to want to put all of your eggs in the basket of renewable electricity but sometimes there is a high price to being stylish. People who don't want to pay the price find a cheaper place to go.

Respectfully submitted,

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