CAC Draft Scoping Plan Comments

I have been interested in all things green for at least two decades. I did a green gut rehab of my house and expanded the livable floor space, improved the window envelope, installed ENERGY STAR® appliances, rooftop solar and a geothermal heat pump. I later added a new bedroom and an irrigation system to my property. Last year we bought a Tesla and started charging it from home.

I live in LIPA territory, with the second highest electric rates in the state. My combined utility costs in 2021 have almost increased to match what they were in 2009, before we started construction and before we had air conditioning.

Now, not many people will go to that kind of trouble. But they can follow one or more suggestions in your excellent scoping plan. I have only a few reservations about it not going far enough in some initiatives and too far when it comes to hydrogen gas. I will address these concerns below.

The biggest issue with the plan is that it does not prepare people for decarbonizing existing buildings and building new ones all-electric. As a result, the gas utilities have put on an expensive and massive disinformation plan to build public sentiment against it.

We have no time to lose in shifting to a clean energy economy. The UN IPCC reports and others baldly state the urgency. We know what we need to do. But the general public treats these dire reports as if it were Chicken Little ravings. I believe the science making these predictions is sound.

The plan must address public outreach in a big way. As soon as possible, the CAC should launch a major, sustained statewide public education and information campaign to support climate-friendly choices by consumers for building improvements and equipment. This is especially important if this plan is changed in any major way.

I support the following recommendations in the CAC draft scoping plan and hope they are carried into the final plan:

1. **Building electrification**. Contractors applying for building permits for new construction in 2024 is the best starting date. Delaying the inevitable need for electrification now only adds costs later on when decarbonizing these same buildings. It is cheaper to build all-electric with cold climate heat pumps at the time of construction. It makes no sense to incur more costs in new building by continuing to install gas lines and appliances when gas is increasing in cost and being phased out.

   Heat pumps are both highly efficient and a mature technology in use for more than four decades. They are the best and least expensive choice in providing both space and water heating in buildings.

   New all-electric construction adds little strain on the economy, builds safer housing without threats of gas leaks, fires, explosions, or the more everyday occurrence of polluting the indoor air. New buildings should be *better* than older ones.

   What is done in new construction filters down into upgrades and renovations in existing buildings. This has always been the trend. So the sooner we start bringing in heat pumps for heating and cooling when home and building owners have to replace their failing system the better.

Even though Long Island has the dirtiest electric generation in the state, it is still better for the environment if the buildings are electrified. This does not mean the electric grid should not be greened, but the processes should be done in parallel, not sequentially.

Installing a new heating system is an expensive and long-term investment. New furnaces and boilers replacing old ones will have an expected lifespan of 20-30 years. Aging out heating systems should be converted to *cold climate* heat pumps as soon as possible. Cold climate heat pumps include high efficiency cold climate air source heat pumps (ASHPs) that can heat even when the outdoor temperature is 5°F and ground source heat pumps (GSHPs)

Building electrification is a gradual process. The transition to GSHPs—in particular—will actually improve system reliability, because it will shave peak electric demand and help New York transition from a summer-peaking system (because energy-intensive air conditioners will be replaced with more efficient heat pumps for cooling) to a winter-peaking system.

Building electrification must be done as equitably as possible to ensure lower-income residents are included in this grand undertaking.

2. **Clean, electric transportation**. Transportation accounts for 28% of New York's emissions, mostly from the cars, SUVs, pickups, and other personal vehicles New Yorkers drive. Public transportation (in the form of buses and school buses) and trucks that use diesel are terrible polluters and no one likes to be stuck behind a vehicle that spews out dark clouds of diesel fumes and particulate matter.
   This is the easiest lift because the marketplace is already fueling the transition to electric vehicles. However, lower income people, who tend to drive older, more polluting cars need more incentives to be able to buy first or second-hand electric vehicles. Perhaps a “turn in your clunker program.” Especially with the cost of gasoline nowadays, we cannot leave these people behind.
3. **Clean, renewable electric grid**. Electrifying homes and buildings will require more electricity delivery. Even though Long Island has the dirtiest electric generation in the state, it is still better for the environment if the buildings are electrified. This does not mean the electric grid should not be greened, but the processes should be done in parallel, not sequentially.

   Soon wind turbines will significantly green Long Island’s grid. That will make every electric appliance greener as a result, without doing anything to them. Buying energy efficient electric appliances is an investment in a greener future.

   To expand solar generation, every building that is suitable for solar panels should be encouraged to have them installed. More, and better incentives are needed for landlords of both commercial and residential buildings to do this, since most often they do not pay to utility bills. The current value of distributed energy resources (VDER) system is a disincentive because it is too involved and variable to be an effective economic tool in helping potential owners determine their costs and ability to use their systems as community solar systems. It needs to be simplified.

   One important outcome of electrification that has been overlooked is that switching to electricity diverts money from out-of-state fossil fuel (fracked gas, propane and heating oil) companies to the local electric utilities. According to the Energy Information

Administration, New York in 2019 it spent $35B on energy for the building sector (residential, commercial and industrial). Three-quarters ($26B) left NYS in 2019 and it is probably similar each year. As we electrify using renewables, more and more of these funds will stay in-state and go to the electric utilities. The state as a whole will be richer and the electric utilities will have more funds to invest in making the grid greener, more reliable and resilient. Keeping the money in-state is good for the economy.

Another important outcome is the reduction is peak load in the summer from the use of heat pumps, especially GSHPs. In most of the state of our electricity grid currently experiences peak use during the summer and has excess capacity during the winter. Both GSHPs, and to a lesser extent ASHPs, **reduce peak demand in the summer** and **add load in the winter when the demand is low**. According to the Long Island Power Authority, adding heat pumps to the grid actually will help bring down the per kilowatt cost of electricity because they level out electricity use, which improves grid utilization.

Greg Hale former I Senior Advisor for Energy Efficiency Markets and Finance, reported in 2015 that the NYS Department of Public Service estimates that each 1% improvement in system efficiency (i.e. annual power plant capacity utilization) will yield between $221 to $330 million in *annual savings* to ratepayers across the state. This results from lower needs for supply and delivery investments. As the former Senior Energy Advisor to Governor Cuomo's Chair of Energy and Finance, he estimated New York ratepayers could save $2 billion a year by increasing our use from 51% to 59% of our power plant capacity. On Long Island this efficiency during this time period was 44%. There is a lot of potential savings in increasing the electric system utilization.

I disagree with the recommendation to include RNG and hydrogen gas as natural gas replacements in the CAC draft scoping plan and I hope it is downgraded in the final plan.

RNH offers little in reducing greenhouse gases since it will result in pollutant emissions similar to fossil gas combustion. It might be useful if produced and used onsite.

Hydrogen is the "great new thing" that will not pan out in the long run.

First of all, using the methane in so-called "natural gas" to produce hydrogen gas keeps us dependent on it and keeps the wells flowing. It is better to keep that gas in the ground!

Secondly, "green hydrogen" is produced using electricity that will directly compete with other all-electric, emissions-free technologies, such as heat pumps and electric vehicles (EVs). Both of these are mature technologies already helping to lower our GHG emissions.

Green hydrogen combustion still emits NOx, which puts them on a par with natural gas, so it is not a solution for use in homes and buildings. So much of the gas infrastructure already leaks and needs replacing that distributing it far from its source is a ridiculous proposition.

Green hydrogen will also consume dollars in research, development and implementation costs that would be better disbursed on existing and proven technologies. Why waste research dollars on a nascent technology that may or may not work when we already have solutions that just require more implementation dollars?

There are some limited industrial and commercial uses for hydrogen that need either a flame or high temperatures that only burning a gas can attain. The Climate Action Council should focus only on cases where hydrogen gas is the only viable alternative choice.

Power Generation

Producing hydrogen gas from the electrolysis of water is very energy-intensive. It is 75% efficient and produces less energy than the electricity it consumes to produce it! **Making hydrogen with electricity to then generate electricity (with at best 95% efficiency) is a circular process with no advantage.**

Electricity Storage

Electricity storage will become more important as electrification enters the mainstream. Hydrogen gas is very explosive and may not be the best choice for electricity storage. Battery technology is advancing at a breakneck pace and will be the answer by the time we need it in 2040.

Transportation

Replacing diesel with renewable diesel and green hydrogen until the trucking sector is fully electrified by midcentury is unnecessary as the electric trucking technology is being propelled by market forces. Green hydrogen and renewable diesel (?) will not be ready soon enough to reduce harmful PM2.5 emissions in Disadvantaged Communities, while electric trucks will.

Buildings

Replacing NG with hydrogen or hydrogen/NG blends for building space and water heating needs presents a myriad of technical, distribution, and health issues associated with simply using small of amounts of hydrogen in natural gas “blends,” while the benefits are small.

There are no hydrogen fuel equipment offerings on the market today for the HVAC (Heating, Ventilating, and Air Conditioning) trade to specify and install; this, in particular, includes hydrogen-based cooling products.

There are also no manufacturer certified conversion kits for existing deployed NG furnaces and boilers; there are thousands and thousands of models/makes that would need to be addressed. It is not clear if and when such units would become available or what such a conversion would cost. If they are converted, the combustion will be less than 100% efficiency; the end-to-end efficiency of a hydrogen-based heating system is virtually guaranteed to be at least 25% less efficient than electric resistance elements.

What’s been ignored in the discussion of simply replacing NG with NG/hydrogen blends for buildings is the need to replace all the existing steel NG piping, which is not sized for hydrogen, and that also subject to leaking with numerous threaded fittings. We’d have to upgrade existing building stock containing NG-rated piping as well as upgrade the gas grid. In addition, all buildings on that grid branch would have to be simultaneously converted as well. This does not appear feasible or practical. And the GHG emission issues remain unresolved.

Having multiple avenues for heating homes and buildings will also create uncertainty in the HVAC trades. We know of no commercially available hydrogen-compatible furnaces or boilers, or certified conversion kits for existing NG systems on the market today. HVAC businesses will need to make large investments in equipment, training, and their workforce to meet the challenge but will be rightfully reluctant to do so if the playing field might change. There must be a clear pathway to heating electrification in the near-term with an eye to breakthrough innovation in the future.

Please, remove any and all references to using hydrogen in buildings.

In summary, RNG and hydrogen are false solutions. Building and transportation electrification is the way to reduce our greenhouse gases. Making the electric grids as renewable, reliable and resilient as possible will also strengthen the NYS economy.