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RE: Input about the NJ Energy Master Plan

Dear New Jersey Energy Planning Leaders,

Having spoken with many Rutgers faculty about innovation and entrepreneurship I feel qualified and compelled to provide input to the Energy Master Plan open solicitation of public stakeholders. We stand at a climate-change cross-roads: New Jersey has a long shore line and much economic wealth at stake, a huge and vibrant transportation sector, and thriving agriculture – with all of these at risk in different ways.

However, by noting the coming changes we can strategically position our basic operations, our investments, and our revenue intake to provide incentives so that New Jersey residents, inventors, and companies can grow to be leaders for economic growth and prosperity in our region. If we anticipate the changes and make suitable investments it will be natural for a green economy to thrive here and for us to capitalize on that as other slower-reacting regions choose to follow along behind us. We can be at the forefront of developing new technologies (and the associated industry base) that will *supply* these technologies to other states when they finally follow suit. Our economic development can dovetail nicely with improving our own energy self-sufficiency.

My comments fall into two broad areas: (1) investment in cutting-edge technology development, and (2) investment in human capital. Together these can enable us to grow that green energy economy here in New Jersey. Interestingly, university research labs provide *both* by nurturing the next generation of talent as they investigate cutting-edge technologies in the lab – and sometimes spin those out into new companies.

Some more specific examples of tactics that could be utilized to stimulate this growing green economy include:

- Help build incubator spaces near research-active campuses around the state: this is especially good for bringing multiple stakeholders together to facilitate sharing of resources, sharing of ideas, brainstorming, and ecosystem growth;
- Organize state-backed centralized services for small companies (based on hourly rates) which would not be needed on a full time basis when new companies are just starting up: Accounting (especially of the type needed for Federal grant requirements or various government proposals); HR; Legal; Federal proposal pre-review for SBIR/STTR and other similar proposals aimed at bringing external investment to the state;
- Provide state-level safety-net support for federal Small Business Innovative Research (SBIR) programs as they transition from Phase I to Phase II. Bridge funding could avoid support gaps that can inhibit the growth of fledgling high-tech companies;
- Create specific fellowship programs aimed at supporting new graduates from universities within the state to keep talent in New Jersey. This could be constructed to keep talent at university in a post-doctoral role for a time or might bring a newly minted PhD into a small company locally where he/she would contribute to economic growth in a cleantech business;

- Create specific programs for direct commercialization seed funding (something like an in-state SBIR-like grant);
- Provide vouchers for new companies to sponsor university-based studies and build expertise that is helpful for new technology startups;
- Work aggressively to bring manufacturing here -- especially types that might be needed more intensely for future clean energy projects (such as off-shore wind turbine installations, for example). Relevant technologies might include advanced structural materials, advanced wind turbine design, lighter magnets for turbine generators, concrete with carbon capture capabilities, lightweight polymers with improved strength, etc;
- Encourage in-state supply-chain at all levels. This is especially important for new high-tech products that might not be sufficiently field tested, but which are being designed with capabilities that could be transformational. An example would be support for utility or large in-state corporate customers to pilot test new technology being built in state (say, new battery systems pilot testing for grid stability, etc.),

Rutgers is already working aggressively to accelerate commercialization of high-tech inventions developed at our institution, as evidenced by our $500,000, 5-year National Science Foundation I-Corps grant aimed at helping students, faculty, and staff develop skills at understanding the marketplace for their ideas. NJIT also has a similar NSF I-Corps site. Still, these are just a small fraction of what is needed – and the need is especially great in the green-energy area because of the difficulties that new technologies encounter during early stages of development. The state should be flexible and forward-looking in finding ways to assist entrepreneurs who have the talent to grow this green economy here in New Jersey.

The examples given above require financial input, of course. However, we already levy the "societal benefits charge" on electricity in the state, which should be directed to projects like these that would provide real benefits to society (both through a cleaner environment and by economic growth). Meanwhile, we should also consider applying market forces to redirect economic investment in energy technologies that have lower carbon footprint. One such method is a Carbon Fee and Dividend (CFD) program (as advocated by the Citizens Climate Lobby and others). If applied at a state level this would provide a revenue stream mostly returned to citizens to offset slightly higher energy costs – but would provide a market-based driving force for new technology development as it would make wind, solar, and battery technologies more cost effective. In addition, a fraction of the revenue from the carbon fees could be plowed back into the technology and workforce investments that were listed above. Such models have bipartisan support, but haven't become a priority yet at the federal level. New Jersey could take a leadership role in promoting climate policy that would stabilize our fragile shoreline while also generating the high-technology economy here in state for generations to com.

Sincerely,

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