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## AN ENVIRONMENTAL AND ENERGY LAW PRACTICE

### **Innovative Technology and Business Opportunities**

The draft EMP acknowledges New Jersey's long history of innovation and the abundant availability of academic, research and entrepreneurial resources to develop new, clean, cost effective sources of electricity, utilize fuels and electricity more efficiently and lessen reliance on gasoline and diesel as the primary transportation fuels. The draft EMP examines the following energy technology options that have the potential to stimulate economic growth:

- **Fuel Cells** – The draft EMP notes that the generation efficiency of fuel cells can be high and the environmental impacts low, but that the high capital cost has stymied their technical promise. The EMP recommends only monitoring the progress of these technologies, with specific reference to a joint venture being pursued by PSEG Global and the development of solid oxide fuel cells.
- **Tidal Energy** – Tidal energy is identified as the most consistent and predictable source of renewable energy with large direct, indirect and induced socioeconomic benefits on account of New Jersey's extensive Atlantic shoreline. NJDOT's Office of Maritime Resources is involved in one concept project that will install a turbine system in Point Pleasant in 2012 and is evaluating other sites.
- **Energy Storage** – The draft EMP indicates that storage becomes increasingly important as the percentage of intermittent renewable energy use – solar and wind – increases. The EMP identifies several energy storage technologies (e.g., pumped storage hydroelectricity, thermal energy storage, compressed air energy storage, flywheels), but indicates that the challenge is to make them robust, reliable and economically competitive. The draft EMP recommends only continued monitoring of the developments in this field.
- **Offshore Wind Turbines** – Offshore wind is identified as an innovative technology, presumably because of the absence of any constructed New Jersey offshore wind projects and comparatively fewer offshore projects as compared to onshore throughout the world,. Offshore wind's advantages (higher wind speeds and capacity factors, fewer siting issues) and disadvantages (higher installation and operating costs) as compared to onshore are identified. Wind energy is addressed in further detail in the Renewable Energy section of the Plan.

- **Smart Grid** – The draft EMP identifies the importance of the deployment of smart grid technology for the accelerated development of demand reduction technologies which in turn will help achieve economic, environmental and reliability objectives. According to the EMP, it is already “widely used in the commercial and industrial sectors,” however, it has yet to be extended to the residential sector and “widespread implementation is years away.” The EMP recommendations for action are limited to evaluating a JCP&L demonstration project.
- **Smart Metering** – As a necessary counterpart to the smart grid, smart meters face several barriers, including the cost of the meters and the necessary two-way communication between the consumer and the electricity distributor, and the lack of standardized communications protocols. The draft EMP recommends expanded implementation of smart meters and dynamic pricing, but does not indicate how that will be accomplished

The draft EMP also examines the following technology opportunities in the transportation sector:

- **Freight** – The draft EMP identifies limited alternative energy strategies for shipping (onshore or dockside steam and electric service for ships import) and railroads (use of bio-diesel in the fuel supply). For trucks, the Plan indicates the potential to use much lower cost compressed natural gas versus diesel, but notes that the absence of a refueling infrastructure system is a major impediment to large scale deployment. The draft EMP acknowledges the need for State and regional incentives to make the conversion a reality.
- **Mass Transit** – The draft EMP notes the future potential for use of compressed natural gas vehicles, hybrid diesel electric buses, the use of regenerative braking in electric trains, advanced diesel technology and the blending of bio-fuels as innovative technologies to support mass transit.
- **Passenger vehicles** - In general, the draft EMP is not optimistic when it comes to passenger vehicles, noting the lack of acceptance of compressed natural gas vehicles, the uncertainty concerning the market for electric vehicles and advanced battery design, and the questionable adequacy of the electric distribution system to handle more than limited numbers of recharging vehicles without an expansion in infrastructure. The negative impact of electric vehicles on gas tax revenues to fund highway improvement is noted.

In terms of specific policy recommendations for the transportation sector, the draft EMP calls for the BPU to work with NJ Transit to pursue the use of newer more efficient fuels for trains and buses and to work with the DOT and DEP to monitor the impact of battery powered vehicle design on the grid. It also notes the “enormous potential of Marcellus Shale gas” to promote natural gas powered vehicles, that market forces alone may not be sufficient to induce transition of the trucking fleet, and that “regulatory inducements may be required,” starting with inducements for waste haulers and short run delivery truckers to switch fuels. For passenger vehicles, the Plan recommends monitoring technology developments affecting natural gas use and notes the “the state supports the growth of the EV [electric vehicle] industry” and will encourage infrastructure investment.