TASK 2 QUESTIONS (COMMENT PERIOD CLOSES 5:00 PM 11/30/17) Send comments to: EVSTAKEHOLDER.GROUP@BPU.NJ.GOV

- What goals for EV Infrastructure should be established?
    - See below

- What role should the Board, other government agencies; electric utilities, non-governmental organizations and the private market have in addressing EV/infrastructure adoption?

    - ANS: The primary role of NJ **government agencies** should be to take a highly proactive profile on the defining, stating (and tracking/publicizing achievement of) key adoption targets in the primary vehicle segments, and a promoting a desired adoption and risk/benefit balance across ratepayer classes. In order to support this, the following actions should be considered:

        - State and Municipal fleets should have a target conversion schedule and appropriate/standardized procedural requisition methods.
        - Select strategic "zones" that will host major ultrafast recharging "nodes" should be designated and granted special economic incentives and regulatory waivers to strongly encourage public-private partnerships with utility investment.
        - Support of NGO missions to develop outreach and education campaigns on building community awareness of benefits and paths to adoption of electric drive transportation and also its growing interoperability with Distributed Energy Resource (DER).

    - ANS: Another important role of NJ **government agencies** should be to establish forums such as this NJ EV Stakeholder group where specific innovations, modifications, etc may be discussed and evaluated objectively (through agreed baseline scenarios and modeling) in a highly public forum. This should lead to advancing the utility regulatory reform agenda and maintaining a level playing field that keeps a fair allocation and balance of risk and reward for private investment.

    - ANS: The primary role of the **private market** should be to respond with investment and innovation for optimizing the growing EV charging infrastructure, to quickly and efficiently meet the growing needs of drivers and fleet managers. This will accelerate the conversion to electric drive platforms.

Regarding electric utilities, please address:

- EV Grid integration

Whereas,

- the ability to implement low cost sensors and actuators that are collectively known as the Internet of Things (IoT) is rapidly evolving, and
- new standards are emerging that will allow utilities to effectively and securely communicate "grid service" requests and obtain timely data on load response and payment clearing at the local level, and
- there is increasing importance of considering ***connected*** and ***charging*** EVs as being an integral part of maintaining the electric grid state.

- EV Rates (ToU, Demand Charges, etc.)

Whereas,

- Availability of public recharging facilities that can operate at high power transfer rates can fundamentally lower EV adoption barriers through several mechanisms:
  - Building general public awareness of ubiquitous fast recharging facilities can remove initial purchase objection of the EV and enables many additional viable use cases
  - Reducing driver range anxiety can drive higher utilization rates for existing electric drive vehicles, displacing more ICE miles.

- Next generation EVs will increasingly be equipped with several key transformative technologies:
  - larger batteries
  - suitable high power standard couplers
  - autonomous driving capabilities
  - precision charge (and discharge) power flow control

- The adoption and deployment of Distributed Energy Resource (DER) is accelerating and bringing
  - Economic forms of flexible microgrid configuration and operation
  - An increasing need for EDC grid control and balancing services
  - More practical and cost-effective applications for Energy Storage
- The current practice of Utility Demand Charge imposition at each individual metered customer account strongly penalizes hosting and operation of EV charging through several means

- Drives available power levels lower which forces longer dwell times, system dependability, and lower utilization rates.
- Forces the disaggregation and geographic scattering of DC Fast charger facilities, leading to less "availability certainty" in driver's route planning.
- Applies *hyper-local* (and likely redundant) charges to multiple individual accounts against opaquely defined *system-level* cost.

▪ An order of magnitude expansion of high speed recharging (aka DC Fast) power levels is becoming possible and, is in fact is currently being deployed in Europe. Vehicle manufacturers are responding with drivetrains and batteries capable of utilizing these ultra fast recharges.

- Role in EVSE a/o infrastructure, if any

Therefore,

▪ A tiered structure approach to DC Fast Charging policies should be defined and supported so that the public charging infrastructure may be optimized, reasonable business models may be supported, risk and reward is fairly balanced, and a maximum level of private investment can be achieved. NOTE: This is relative to Light Duty vehicle class, although higher power facilities could support some commercial truck drivetrains.

Public Charging Treatment Protocol (Nameplate Capacity)				
Topical Policy Area	**AC, DC Charging <18kW**	**<50kW**	**50kW to 120kW**	**>120kW**
Preferred Setting	SFH, MFD	Retail, Municipal	Commercial	Regional Charging Center
Utility Direct Investment	Limited to basic Make Ready	Potential Infrastructure Upgrade and Energy Storage Investment		Custom Microgrid Partner[1]
Demand Charge Treatment	No Change	Aggregated through EVSP Tariff[2]		Not Allowed
Typical Port Count	1-10	1-2	2-4	8+
Maximum Power (typ)	<100kW	<100kW	<500kW	> 2MW

[1] This envisions a carefully developed plan for creating specific zones that support high concentration clusters of ultra fast chargers to be collocated along a major utility secondary branch, and also be configured within a designated community microgrid area that can host and manage significant levels of local DER. Multiple benefit streams are unlocked – but sharing these requires **targeted policy modifications** on utility regulation, land use zoning, tax treatment, etc.

[2] Avoiding the punitive impact of demand charges to **individual** site host, while preserving a reasonable and justified mechanism to recovering true utility distribution **system impact** costs. This will also incent the EV Service Provider (EVSP) to develop, utilize, and refine sophisticated managed charging tools that will deliver better system wide balancing and impact mitigation.

- ANS: EV has been weakly adopted in NJ due to several underlying root causes. Some of these* may be directly addressed by BPU/Legislature policy and incentives and others are best left to technology advancement and market scale development.

  - Relatively low (and stable) gasoline prices
  - High price premiums for battery drivetrain
  - Limited electric range and performance degradation in cold weather*
  - Lack of high visibility commitment from public authorities*
  - Misunderstanding and uncertainty on EV adoption paths and economics*

- What EV/EV infrastructure developments can be expected in the short/medium term under a Business as Usual scenario?

  - ANS: Suppressed motivation for much needed private investment in both vehicle drivetrains and recharging infrastructure. This will lock our state and the auto industry in to a path of long term subsidy to drive basic ZEV compliance – rather than let the market dynamics of private investment reach the “tipping point” sooner to become the primary mitigation to adoption barriers.