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(PAT MILLER)

Building a Modern Grid (by 2050 100% clean) build by 2030

- * PSEG 2.2 M cust dec. also gas grid dating from 1900's must be upgraded for reliability battery storage & EV charging accommodate larger amt of renewables stress importance of upgrading transmission 600 MW storage by 2021 - gov. target 2000 MW by 2030
- * LCV - Demand response methods, impacts of climate change Discourage fossil fuel investment Advanced metering initiative
- * Retail suppliers assoc. AMI - 3 yrs, not 6 - communic. outages, opt-out - cust owns data - access to data for problems alt. supplier
- * Envir NJ - growth of renewables, esp solar 2007-2017 energy storage - 20th (NJ) - need focus & also offshore wind smart meters for demand response programs pricing growth of EV - more chargers
- * Dept Energy ^{DOE} - energy security & resilience fuel diversity - fossil fuel/biofuel local resilience transition? natural gas hybrid micro grid CHP renewables Combined Heat & Power
- * Sun Run - multi state region - largest resid. solar + storage working in Puerto Rico located (sited)
Decentraliz, cust, battery storage encourage compet. & partner w. utilities to resilience avoid unnecessary buildout at taxpayer expense non-wire solns
- New tariff idea Bring your own device ^{cust} purchase battery storage + utility can access & use
- * BPU in agreement w. energy competition

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NLX company

* Demand-response 30 countries - cust. sited solar & storage
hydro, solar, wind

Clean peak standard - storage + so renewable supplies peak
Incentives to meet goal

Non-wire solns - all alternative to wire upgrades.

Demand-response

Competition

Interconnection - & speed of construc.

EV infrastruc

* Gaylord Olsen - MW hours.

Pumped hydro is largest ^{storage} grid worldwide

Need source of water at bottom & pump water up to reservoir

Can excavate a resv. without a dam

NJ Sierra Club news letter - p. 13

* Blue Wave NJ

take into account most important stakeholders - children
climate change - greatest econom. & moral challenge

complete ban on new fossil fuel infrastruc.

not econ. anyway - will have to abandon in future

* Gable Ashleigh ^{Han} Shantz IEP-NJ 70% of power suppliers
competition

* Thermal energy storage - manuf. in Fair Lawn →
Integ. wind + storage - long duration battery 60 co's
Buy almost free wind from TX + store

Can drive a market - Incentives - large bldgs,
schools & hospitals for all cust types in cities

* Univ Del. - EVs in addit to stationary storage for
EVs → grid earn \$/Veh for providing power storage
2-way charging adds ~\$700 to cost of EV

330,000 EVs (NJ's goal)

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could meet NJ's entire storage goal

Look at safety standards

Need credit/incentive to push elec back into grid
or retail credit for export

* Utility workers union - water & power-field workers
want resilience esp. for storms

don't want smart meters - afraid they will destroy jobs of

* Jonathan Lu - Princeton students field workers

Carbon pricing proposal - paper to be presented at 1st
" " conf in New Delhi

Know what price will be into future \$30 (27¢/gal) ^{price}

Envir justice in low-income commun - dedicate amt to

stop methane leaks by charging ^{those commun.} price

* Jean Fox - regulation (3 BPU commissioners here)

Offshore wind - RFP - replace nuclear

Backbone transmission should be part of PJM syst, needs
to be part of offshore wind study/plan

Needed to get cheaper elec to north Jersey (most congested)

Wave buoys connected to transmiss. ^{& most expens}

Smart inverters to use own solar when power out after storm

Microgrids - any commun. for essential services after ^{offsystem} storm

Susan
stopped
our

Aggreg.

* Micro turbines for micro grids

CHP - Combined heat power (eg gas)

Eliminate barriers

* Rutgers - Internet of things - demand-response via EVs

planning optimal capac. mix
analyze hist. data for PJM

fast charging uses a lot
more power than home
& 2 way charge/discharge

Power quality issues (when no sun or wind)

to manage peaks & valleys of supply

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* Rate counsel

- modern grid in 2030, 2050 - decentralized w smart
- gradually moderniz, not over build
- climate change - decrease outage & cost
- fuel diversity & renewable adoption
- distrib. mgt
- global warming - more renewable & demand response
- performance metrics for utilities
- accel. investment
- energy effic
- cost effectiveness
- gas leak detection

* Fuel cell mfg. - when grid goes down