2021 SAA Proposal Window to Support NJ OSW

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Transmission Expansion Advisory Committee

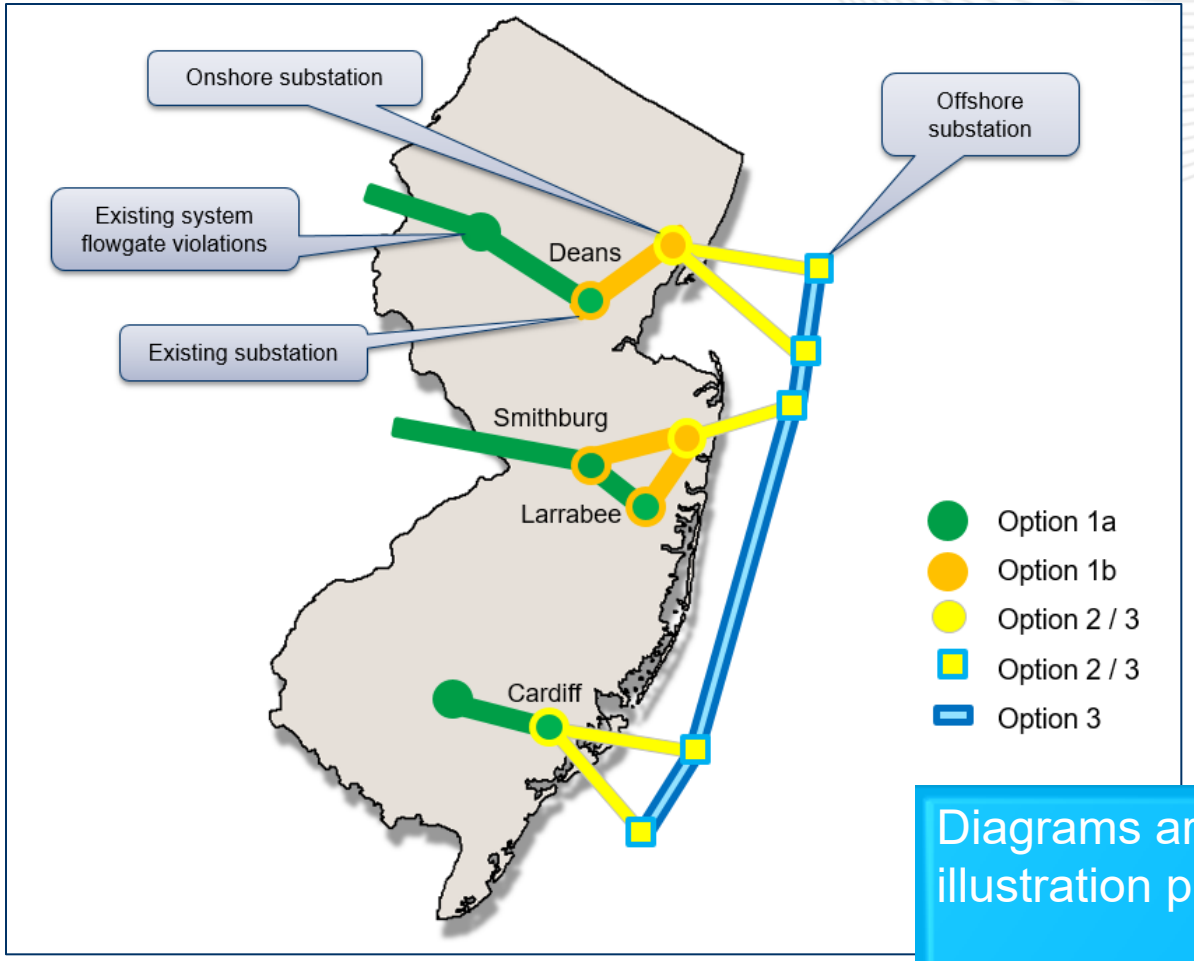
June 7, 2022

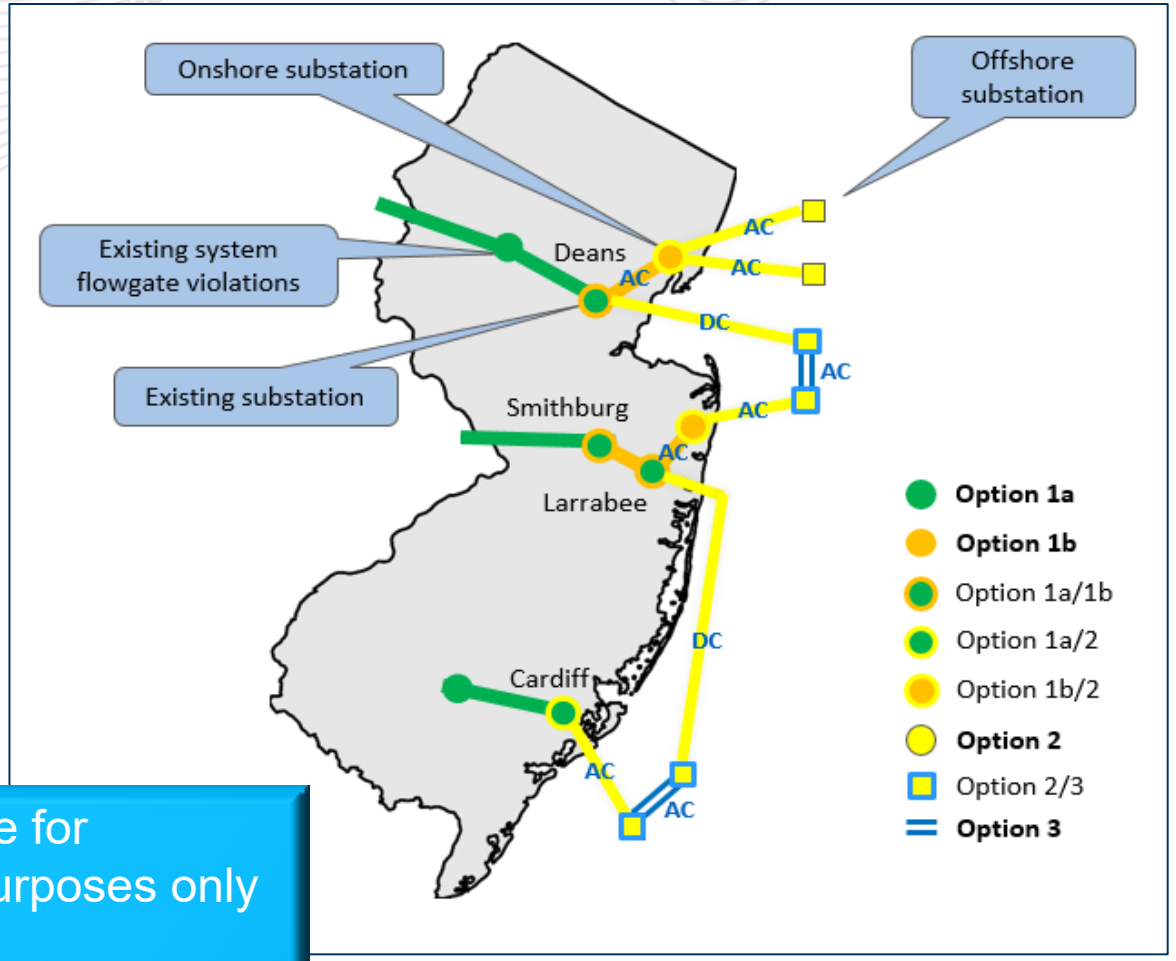
Proposal Window Options

Description of Options

- Option 1a, Onshore Upgrades on Existing Facilities
- Option 1b, Onshore New Transmission Connection Facilities
- Option 2, Offshore New Transmission Connection Facilities
- Option 3, Offshore Network

Project Overview – Potential Solution Options





Diagrams are for illustration purposes only

Option 1a Proposals

- PJM has divided the Option 1a proposals into multiple geographical clusters to facilitate reviews
  - Northern NJ
  - Central NJ
  - Southern NJ
  - Southern NJ Border
  - PA-MD Border

Note: Details regarding the constituent proposals for the clusters is located in the Appendix

Reliability Analysis for POI Scenarios

- PJM is currently performing reliability studies for about 26 POI scenarios, 18 of which are shown in the following slides and the remaining ~8 scenarios are under development
- All POI scenarios include NJ BPU OSW Solicitations #1 and #2
  - Some POI scenarios examine variations of the Solicitation #2 POIs
- Over half of the POIs in the POI scenarios are alternative POIs that have been proposed as part of this SAA window
- Scenario development and initial reliability studies expected to be complete in June
- The balance of reliability studies will be completed in July and August for selected scenarios

Reliability Analysis for POI Scenarios

- Initial reliability analysis is focusing on generator deliverability testing
  - Summer, winter & light load
  - Single contingency, common mode outages
- Onshore upgrade requirements are being identified
  - Option 1a proposals that address violations
  - Incumbent Transmission Owner upgrades as needed to address violations due to injections that were not previously identified

Reliability Analysis for POI Scenarios

- In the following slides, each POI scenario has been color coded to differentiate between proposals when more than one proposing entity is included in a single POI scenario
- A number of the POI scenarios have additional Option 1b and/or Option 2 MW capability that is not being dispatched as part of this phase of the reliability analysis in order to not exceed the desired 6,400 MW
  - The benefits of any additional capability will be considered as part of the overall performance evaluation
- Other proposals not listed are still under consideration. The initial order of analysis is based on discussions with NJ BPU in order to get to a suite of representative scenarios

Reliability Analysis for POI Scenarios

- Changes to previously presented scenarios since May TEAC
  - Revised proposing entities for scenarios 1.1 and 1.2
  - Removed scenarios 2 and 2b
  - Scenarios 3a, 13a and 14a are placed on hold
  - Scenario 1a.1 is placed on hold
  - Scenario 2c added
  - On the order of eight additional scenarios are under development

POI Scenarios - Option 1b Only

Scenario ID	Total (MW)	Proposing Entities	Option 1b Proposal IDs	Option 2 Proposal IDs	Excess Capacity (MW)	Alt POI New Freedom 500 kV (MW)	Default POI Cardiff 230 kV (MW)	Alt POI Half Acre 500 kV (MW)	Alt POI Lighthouse 500 kV (MW)	Default POI Smithburg 500 kV (MW)	Alt POI Atlantic 230 kV (MW)	Default POI Larrabee 230 kV (MW)	Alt POI Werner 230 kV (MW)
2a	6258	AE, JCPL	797 929.9 453.1-18,24,28-29	None	0		1510 1148			1200	1200	1200	
3	6458	AE, RILPOW, JCPL	797 127.8,9 490 376 453.9-11,16-17	None	200	1148	1510	2200				1200	400
12	6400	CNTLM	781	None	110		1510		4890				
13	6400	CNTLM	629	None	110		1510		4890				
14	6400	RILPOW, JCPL	490 171 453.18-27,29	None	710		1510	2400		1690			800
18	6400	JCPL	453	None	0		1510			2490	1200	1200	

Note 1: All POI Scenarios include Solicitation #1 (1,100 MW), which has been subtracted from the total MW.

Note 2: All MW assumed to be injected at the offshore platform.

Note 3: Excess capacity represents additional transmission capability to the POI beyond the amounts being studied.

LEGEND

Alt POI = Alternative POI

POI Scenarios - Options 1b/2

Scenario ID	Total (MW)	Proposing Entities	Option 1b Proposal IDs	Option 2 Proposal IDs	Excess Capacity (MW)	Alt POI Reega 230 kV (MW)	Default POI Cardiff 230 kV (MW)	Alt POI Fresh Ponds 500 kV (MW)	Default POI Deans 500 kV (MW)	Alt POI Lighthouse 500 kV (MW)	Default POI Smithburg 500 kV (MW)	Alt POI Atlantic 230 kV (MW)	Default POI Larrabee 230 kV (MW)	Alt POI Neptune 230 kV (MW)	Alt POI Sewaren 230 kV (MW)
1.1	6310	COEDTR, ANBARD	None	990 574 831	400		1510		2400		1200		1200		
1.2	6310	COEDTR, PSEGRT	None	990 613	0		1510		1200		1200 1148		1200		
2c	6258	AE, JCPL, MAOD	797 929.9 453.1-18,24,28-29	551	0		1510 1148				1200	1200	1200		
4	6010	NEETMH	None	461 27	0		1510	3000						1500	
5	6310	JCPL, MAOD	453	321	0		1510				2400	1200	1200		
6	6400	CNTLM	781	594	110		1510			4890					
7	6400	CNTLM	629	594	110		1510			4890					
10	6400	ANDBARD	None	831 841 921 131	510		1510		2290				1200		1400
11	6399	PSEGRT	None	683	459		1510		1247		1148		1247		1247
15	6400	NEETMH	None	250	1110		1510	4890							
16	6400	NEETMH	None	604 860	758	2658		3742							
17	6400	ATLPWR, NEETMH	None	210 172 15	510		1510		1890					3000	

Note 1: All POI Scenarios include Solicitation #1 (1,100 MW), which has been subtracted from the total MW.

Note 2: All MW assumed to be injected at the offshore platform.

Note 3: Excess capacity represents additional transmission capability to the POI beyond the amounts being studied.

LEGEND

Alt POI = Alternative POI

Next Steps

- Reliability analysis of various injection scenarios/combinations is ongoing
- Market Simulation analysis, consistent with the scope described in the Problem Statement FAQ, for the combinations selected for reliability analysis is ongoing
- Constructability and independent cost review of the proposals is ongoing for onshore and offshore proposals
- Cost commitment evaluation of the proposals with cost commitment is ongoing
- NJ BPU completed a series of four stakeholder meetings to collect stakeholder input regarding the evaluation of offshore wind transmission proposals. NJBPU is currently reviewing comments that were submitted in the docket, including responses to questions posted in the docket following the stakeholder meetings. Information can be found in NJBPU Docket No. QO20100630

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Reliability Analysis Update

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Revision History

Version No.	Date	Description
1	6/2/2022	• Original slides posted

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APPENDIX

NJ BPU OSW Solicitation Schedule

Solicitation	Capability Target (MW)	Capability Awarded	Issue Date	Submittal Date	Award Date	Estimated Commercial Operation Date
1	1,100[(1)]	1,100	Q3 2018	Q4 2018	Q2 2019	2024-25
2	1,200-2400[(2)]	2,658	Q3 2020	Q4 2020	Q2 2021	2027-29
3	1,200	N/A	Q1 2023[(3)]	Q2 2023	Q4 2023	2030
4	1,200	N/A	Q2 2024	Q3 2024	Q1 2025	2031
5	1,342	N/A	Q2 2026	Q3 2026	Q1 2027	2033

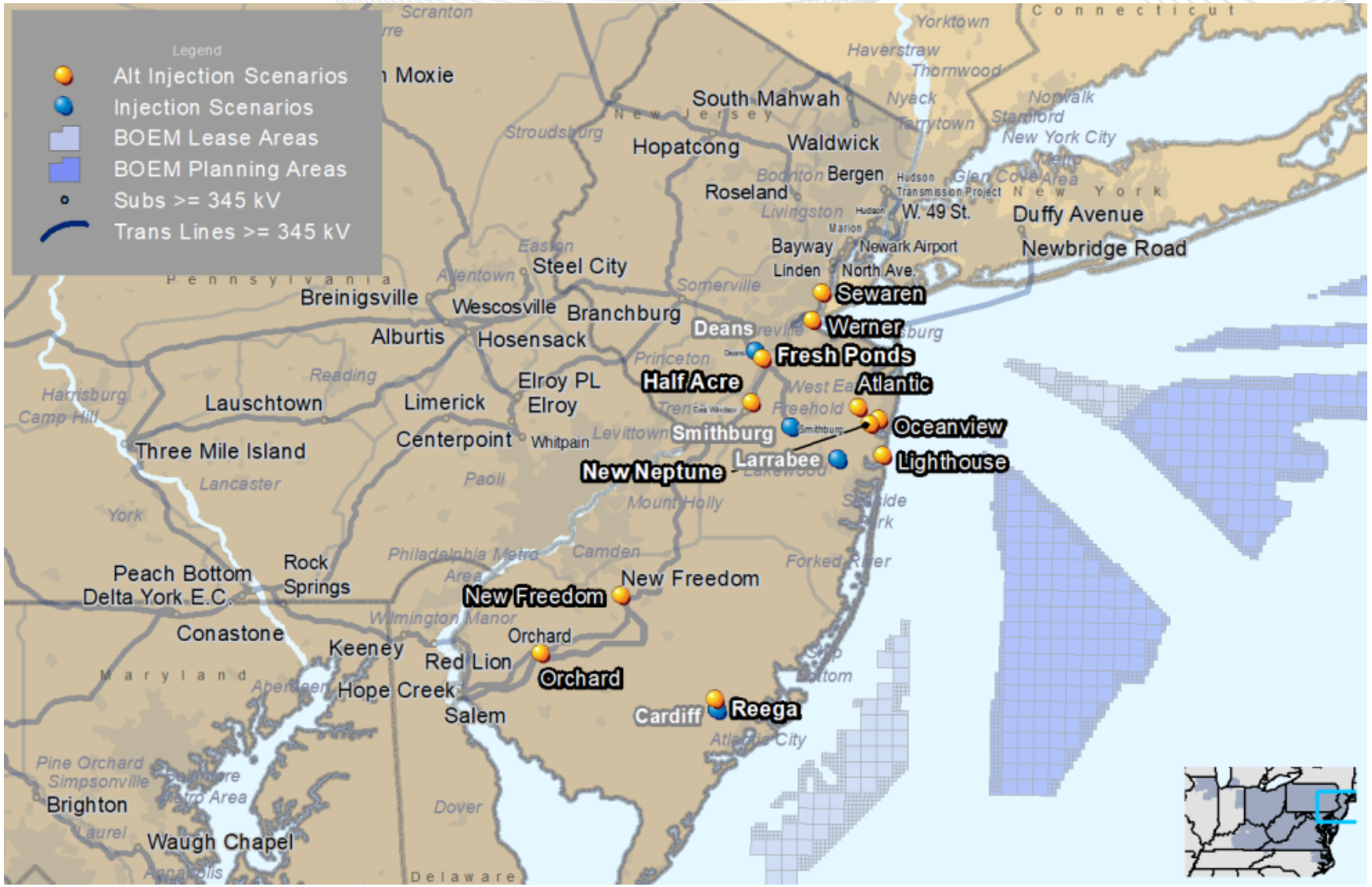
(1) NJ BPU Solicitation Award - June, 2019
(2) NJ BPU Solicitation Award - June, 2021
https://www.njcleanenergy.com/renewable-energy/programs/nj-offshore-wind/solicitations
(3) On February 28, 2022, New Jersey updated the Solicitation Schedule for third Offshore Wind Solicitation.

Changes to Offshore Wind Injection Assumptions

Default POIs and Injection Amounts		Prior to June 30, 2021		After June 30, 2021	
Solicitation	POI	Awarded MW	Modelled* MW	Awarded MW	Modelled* MW
1	Oyster Creek 230 kV	1100	816*	1100	816*
1	BL England 138 kV		432*		432*
2	Cardiff 230 kV		900	1510	1510
2	Smithburg 500 kV		1200	1148	1148
3-5	Deans 500 kV		3100		2542
3-5	Larrabee		1200		1200
TOTAL		**1100**	**7648**	**3758**	**7648**

* Solicitation #1 modeled MW per awarded queue position.

Default and Alternate Injection Locations



Alternative Points of Injection

- **New Substations**
  - Reega 230 kV substation that taps Cardiff-New Freedom 230 kV
  - Neptune 230 kV substation that taps Oceanview-Larrabee 230 kV and Oceanview-Atlantic 230 kV
  - Fresh Ponds 500 kV substation that taps Deans-Windsor 500 kV and Deans-Smithburg 500 kV
  - Half Acre 500 kV substation that taps Deans-Windsor 500 kV
  - Lighthouse 500 kV substation at the shore that connects to a new Crossroads 500/230 kV substation near Larrabee 230 kV
- **Existing Substations**
  - Atlantic 230 kV, Oceanview 230 kV, Sewaren 230 kV, Werner 230 kV, New Freedom 230 kV, Orchard 500 kV

Options 1a Proposal Clusters – See slide 4

Option 1a Proposals: Northern NJ Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
180.3, 180.4, 180.7	Linden & Bergen Subprojects	Northern NJ	PSEG	30.45
44.2, 44.3 or 651.7, 651.8 or 315.3, 315.4	New Aldene PAR Upgrade Bergen 138 kV bus section	Northern NJ	PSEG	18
651.4	Reconductor Pierson Ave H-Metuchen 230 kV	Northern NJ	PSEG	1

Option 1a Proposals: Central NJ Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
17.11, 17.18	Add third Smithburg 500/230 kV	Central NJ	JCPL	17.52
331.1, 331.11, 331.12 or 878.1, 878.3, 878.4	Build new Atlantic-Smithburg 230 kV	Central NJ	JCPL	81.04
44.4 or 315.5 or 878.7	Eliminate contingencies that derate Smithburg-East Windsor 230 kV winter rating	Central NJ	JCPL	5
17.8, 17.9, 17.10	Local 34.5 kV upgrades	Central NJ	JCPL	15.02
520.1, 520.4, 520.5	New Atlantic-Oceanview 230 kV; loop in existing Larrabee-Oceanview 230 kV into Atlantic 230 kV	Central NJ	JCPL	21.983
331.15, 331.16 or 878.8, 878.9	New Larrabee-Oceanview 230 kV	Central NJ	JCPL	61.97
17.4, 17.5, 17.6	New Smithburg-East Windsor 500 kV line	Central NJ	JCPL	174.11

Option 1a Proposals: Central NJ Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
651.6	Put Smithburg 500/230 kV spare transformer in service	Central NJ	JCPL	11.51
331.4, 331.5	Reconductor Atlantic-Smithburg 230 kV	Central NJ	JCPL	32.38
331.2, 331.3	Reconductor Larrabee-Smithburg 230 kV 1 & 2	Central NJ	JCPL	30.56
331.7	Reconductor Raritan River-Kilmer 230 kV	Central NJ	JCPL	7.91
331.10	Reconductor Smithburg-East Windsor 230 kV	Central NJ	JCPL	5
331.8, 331.9	Reconductor Windsor-East Windsor 230 kV 1 & 2	Central NJ	JCPL	6.86
17.17	Upgrade Hopewell-Lawrence 230 kV	Central NJ	JCPL	3.13
17.1, 17.2, 17.3, 17.12, 17.13, 17.21	Upgrade Oyster Creek-Manitou 230 kV 1 & 2	Central NJ	JCPL	46.06

Option 1a Proposals: Central NJ Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
793.3, 793.4	Upgrade Oyster Creek-Manitou 230 kV 1 & 2	Central NJ	JCPL	10
17.7	Upgrade Smithburg-Deans 500 kV	Central NJ	JCPL	13.24
21	Werner 230 kV BESS	Central NJ	JCPL	167.94
158.1 or 651.3	Reconductor Gilbert-Springfield 230 kV	Central NJ	JCPL/PPL	15.53
330	Reconductor Gilbert-Springfield 230 kV	Central NJ	JCPL/PPL	0.38
315.2 or 331.6 or 651.2 or 878.2	Reconductor Windsor-Clarksville 230 kV	Central NJ	JCPL/PSEG	10.09
17.14, 17.15	Upgrade Windsor-Clarksville 230 kV	Central NJ	JCPL/PSEG	3.81
180.5, 180.6	Windsor to Clarksville Subproject	Central NJ	JCPL/PSEG	5.77

Option 1a Proposals: Central NJ Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
180.1, 180.2	Brunswick to Deans & Deans Subprojects	Central NJ	PSEG	50.54
651.5	Increase Deans 500/230 kV #3 rating	Central NJ	PSEG	8.36
17.16	Reconductor Clarksville-Lawrence 230 kV	Central NJ	PSEG	32.10
44.1 or 315.1 or 651.1	Reconductor Deans-Brunswick 230 kV	Central NJ	PSEG	4.68
103	New Old York 500/230 kV substation	Central NJ	JCPL/PSEG	75.63
331.13, 331.14 or 520.2, 520.3 or 878.5, 878.6	Add PAR Red Oak-Raritan River 230 kV 1 & 2	Central NJ	PSEG/JCPL	30
17.19, 17.20	Upgrade Lake Nelson I-Middlesex 230 kV	Central NJ	PSEG/JCPL	5.09

Option 1a Proposals: Southern NJ Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
793.7, 793.10	Add PAR on Cardiff-Cedar 230 kV at Cardiff	Southern NJ	AE	19.03
127.8 or 734.9 or 929.9 or 975.9	Rebuild Cardiff 230 kV substation	Southern NJ	AE	70.10
793.1, 793.2	Reconductor Cardiff-Lewis 138 kV 1 & 2	Southern NJ	AE	5.27
793.8	Replace Cardiff 230/138 kV	Southern NJ	AE	10
793.9	Replace Cardiff 230/69 kV	Southern NJ	AE	10
127.1 or 734.1 or 929.1 or 975.1	Upgrade Cardiff-Lewis 138 kV	Southern NJ	AE	0.1
127.2 or 734.2 or 929.2 or 975.2	Upgrade Lewis No. 2-Lewis No. 1 138 kV	Southern NJ	AE	0.5
929.12	Upgrade Orchard 500/230 kV substation	Southern NJ	AE	38.22

Option 1a Proposals: Southern NJ Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
793.5, 793.6	Add PAR on New Freedom-Hilltop 230 kV at New Freedom	Southern NJ	PSEG	15
127.9 or 734.10 or 929.9	Rebuild Cardiff-New Freedom 230 kV as DCTL	Southern NJ	PSEG/AE	154.66
127.3 or 734.3 or 929.3 or 975.3	Upgrade Cardiff-New Freedom 230 kV	Southern NJ	PSEG/AE	0.3

Option 1a Proposals: Southern NJ Border Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
158.3	Red Lion 500 kV substation upgrade	Southern NJ Border	DPL	5
734.7 or 929.7 or 975.7	Install Smart Wire on Richmond-Waneeta 230 kV	Southern NJ Border	PECO	4.7
127.10 or 929.10	Reconductor Richmond-Waneeta 230 kV	Southern NJ Border	PECO	16
158.2	Reconductor Richmond-Waneeta 230 kV	Southern NJ Border	PECO	4.15
11.11, 11.12 or 793.11, 793.12	Add two PARs at Hope Creek 230 kV	Southern NJ Border	PSEG/SRE	30
419	New Bridgeport-Claymont 230 kV DE river crossing	Southern NJ Border	PSEG/SRE	193.07
894	One additional Hope Creek-Silver Run 230 kV submarine cable	Southern NJ Border	PSEG/SRE	71.92
229	One additional Hope Creek-Silver Run 230 kV submarine cables and rerate plus upgrade line	Southern NJ Border	PSEG/SRE	61.20

Option 1a Proposals: PA-MD Border Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
11.1-11.10	1A-Wiley1	PA-MD Border	PECO/BGE	179.58
982.1-982.10	1A-Wiley2	PA-MD Border	PECO/BGE	181.92
587.1-587.5	1A-Wiley3	PA-MD Border	PECO/BGE	96.44
203	Broad Creek to Robinson Run Project	PA-MD Border	PECO/BGE	104.18
63	North Delta Option A	PA-MD Border	PECO/BGE	109.75
296	North Delta Option B	PA-MD Border	PECO/BGE	87.02

Option 1a Proposals: PA-MD Border Cluster

IDs	Brief Description	Location	TO Zone	Cost Estimate($M)
127.4-127.6, 127.11 or 734.4-734.6, 734.11 or 929.4-929.6, 929.11 or 975.4-975.6, 975.11 127.7 or 734.8 or 929.8 or 975.8 Incumbent TO Incumbent TO	Reconductor Peach Bottom-Conastone 500 kV Reconductor Peach Bottom - Furnace Run 500 kV Replace Furnace Run 500/230 kV Transformers 1 & 2 Reconductor Furnace Run-Conastone 230 kV 1 & 2	PA-MD Border	PECO/BGE	88.10
345.1-345.3	Second Peach Bottom-Conastone 500 kV	PA-MD Border	PECO/BGE	104.29

Options 1b/2 and 3 Proposals

Options 1b/2 and 3 Proposal Overview
#321, 431, 551

- **Proposal Description:**

  3 proposals to bring 2400, 3600 or 4800 MW via Larrabee converter station. Four offshore 1200MW +/-320kV HVDC submarine cables to four offshore platforms, includes normally open ties between platforms, includes the converter station platforms
- **Points of Injection:** Larrabee, Smithburg, Atlantic
- **Project Cost:** 2400MW-$3B, 3600MW $4.41B, 4800MW $5.72B
- **Project In Service Date:** 1st Ckt – 4Q2029, 2nd CKT 4Q2030, 4th Ckt 4Q3032
- **Landfall location:** Sea Girt
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** NA
- **Cost commitment:** Yes

  Capping Capital Cost

  Exceptions: Taxes, AFUDC, Escalation, Force Majeure, Scope change

Options 1b/2 and 3 – Proposal Overview
#208, 214, 397, 230, 613, 683, 871

- **Proposal Description:**
  Multiple options ranging from 1200MW up to 4200MW,
  320 kV HVDC or 400kV HVDC
  with interlinks, normally closed for multiple platforms

- **Points of Injection:** Sewaren (1200/1400MW), Larrabee (1200/1400MW), Deans (1400MW)
- **Project Cost:** $2.5-9B
- **Project In Service Date:** 4Q2029-4Q2032
- **Landfall location:** Sea Girt, Key Port
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** NA
- **Cost commitment:** Yes
  Capping project cost, ROE, equity percentage
  Exceptions: Debt, Taxes, AFUDC, Escalation, Force Majeure, SOW change

Option 1b/2 Proposals Overview
#841, 831, 574, 944, 802, 183, 921, 802, 131, 145, 882, 568

- **Proposal Description (include AC/DC, Voltage, MW Capability)**
  8 options to inject power into Deans, Sewaren and Larrabee
  1400MW per ckt, +/-400kV HVDC for Solicitation #3-5
  Circuits for Solicitation #2 OSW projects sized to meet award amount
- **Points of Injection:** Deans, Sewaren, Larrabee
- **Project Cost:** $2B - $10B+
- **Project In Service Date:** 3Q2027-1Q2033
- **Landfall location:** Keyport (Deans), Bay Head (Larrabee), Perth Amboy (Sewaren)
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** 428, 889, 748, 896, 243, 258, 137
- **Cost commitment:** Yes
  Capping Project cost, ROE, Equity
  Exceptions: Taxes, AFUDC, Escalation, Force Majeure, Scope change

Option 3 Proposals Overview
428, 889, 748, 896, 243, 258, 137

- **Proposal Description:**
  7 options for HVDC Platform Interlinks
  700MW capacity, +/-400kV HVDC

- **Points of Injection:** NA
- **Project Cost:** $66-105M (for a single interlink)
- **Project In Service Date:** 2033
- **Landfall location:** NA
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** 841, 831, 574, 944, 802, 183, 921, 802, 131, 145, 882, 568
- **Cost commitment:** Yes
  Capping project cost, ROE, Equity percentage,
  Exceptions: Taxes, AFUDC, Escalation, Force Majeure, Scope change

Options 1b Proposals Overview
#781, 294, 629, 72, 627

- **Proposal Description:**
  Multiple Scenarios onshore to accommodate injections up to 6000MWs
  500 kV HVAC OH/UG cable, 4 new 500kV substations, multiple transmission line cut-ins
  450 Mvar dynamic reactive control
- **Points of Injection:** Alternate POI that extends to Deans-Windsor, Larrabee and/or Smithburg, Windsor
- **Project Cost:** $1.7-2.2B
- **Project In Service Date:** 1Q2028-1Q2030
- **Landfall location:** Sea Girt
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** #594
- **Cost commitment:** Yes
  Capping project cost, transmission revenue, ROE, Equity Percentage
  Exceptions: Force Majeure, Scope change

Option 2 - Proposal **# 594** Overview

- **Proposal Description:**
  2-platforms each with 4-345 kV AC cables to shore, expandable to 6 cables.
  4,000 MW (option for 6,000 MW)

- **Points of Injection:** NA
- **Project Cost:** $2.5B
- **Project In Service Date:** 2Q2029
- **Landfall location:** NA
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** #781, 294, 629, 72, 627
- **Cost commitment:** Yes
  Capping project cost, transmission revenue, ROE, Equity Percentage
  Exceptions: Force Majeure, Scope change

Options 1b/2 - Proposal Overview

#461, 860, 250, 44, 315,651, 27, 298, 15, 520, 878, 331, 604, 793

- **Proposal Description:**
- 7 options to inject power into Deans, Oceanview and Cardiff
- 1500MW +/-400kV HVDC circuits
  - Offshore 1500 MW VSC Converter Station and Supporting Platform
  - Onshore/offshore 1500 MW VSC Converter Stations
- **Points of Injection:** Deans (3000, 4500, 6000MW), Oceanview (1500, 2400, 3000MW), Cardiff (2700MW)
- **Project Cost:** $1.5-7.1B
- **Project In Service Date:** 4Q2027-2Q2029
- **Landfall location:** Raritan Bay, Asbury Park, Absecon Beach
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** 359
- **Cost commitment:** Yes
  - Capping project cost, ROE, Equity percentage, O&M
  - Exceptions: AFUDC, Force Majeure, Scope change

Options 3 - Proposal Overview **#359**

- **Proposal Description:**
- 4 Options for 800 MVA 230kV AC Platform links

- **Points of Injection:** NA
- **Project Cost:** $7-356M
- **Project In Service Date:**
- **Landfall location:** NA
- **Offshore Lease Areas targeted:** NA
- **Interactions with other proposals:** 461, 860, 250, 44, 315,651, 27, 298, 15, 520, 878, 331, 604, 793
- **Cost commitment:** Yes

  Capping project cost, ROE, Equity percentage, O&M

  Exceptions: AFUDC, Force Majeure, Scope change

Options 1b/2 and 3 – Proposal Overview #990

- **Proposal Description:**
  Base case – 2-1200 MW 320kV HVDC lines, 1 circuit to Larrabee and 1 circuit to Smithburg
  Ability to extend to Deans.
  Ability to connect platforms via AC cables

- **Points of Injection:** Larrabee(1200MW), Smithburg (1200MW) and Deans optional (1200MW)
- **Project Cost:** $1.3B-$5.2B
- **Project In Service Date:** 2Q2028
- **Landfall location:** Sea Girt
- **Offshore Lease Areas targeted:** NY Bight Hudson South, OW2/AS1
- **Interactions with other proposals:** NA
- **Cost commitment:** Yes
  Capping project cost (Soft cap)
  Exceptions: Cost of Debt, ROW, Force Majeure, Scope change

Options 1b/2 – Proposals Overview
#210, 172, 769

- **Proposal Description:**
  First, Second, Third submarine circuits, 1,200 MW, +/-320kV HVDC
  Offshore 1235MW Converter Station and Supporting Platform
  Onshore 1200 MW Converter Station
  Onshore Transmission - UG construction shore to converter station
- **Points of Injection:** Deans 500kV - 1200, 2400 or 3600MW
- **Project Cost Project Cost:** 1st 1200MW-$2B, 2nd 1200MW-$1.6B, 3rd 1200MW $1.5B
- **Project In Service Date:** 1st 1Q2030, 2nd 1Q2031, 3rd, 1Q2031
- **Landfall location:** Raritan Bay near existing retired generating power station
- **Offshore Lease Areas targeted:** NY Bight Hudson South/North, OW2/AS1
- **Interactions with other proposals:** 210 is base proposal, 172 and 769 options can be combined with base
- **Cost commitment:** Yes
  Fixed Revenue Requirement, Cost cap subject to initial adjustment for change based on foreign exchange rates and commodity price fluctuations
  Exceptions:, Force Majeure, Scope/cable length change

Option 1b Only Proposals

Option 1b- Proposal Overview
#582, 490, 376, 171, 21

- **Proposal Description:**
  One or two 1200 MW 320kV HVDC lines from Werner to new converter station
  Tie into existing Deans-East Windsor line and shore station and battery
  Option to inject up to 400 or 800 MW 275kV AC direct at Werner

- **Upgrade/Greenfield: Greenfield**
- **Points of Injection:** Werner, Tie into Deans-East Windsor
- **Project Cost:** $1b-1.8B
- **Project In Service Date:** 1Q2028
- **Landfall location:** Werner, Raritan Bay
- **Interactions with other proposals:** NA
- **Cost commitment:** Yes
  Capping partial project costs, ROE, Equity percentage
  Exceptions: Taxes, AFUDC, Escalation, Force Majeure, Scope change

Option 1b- Proposal Overview #797

- **Proposal Description:**

  Build new transition vault connecting 275 kV offshore cables (1200MW) and 275 kV onshore cables, build new 275 kV transmission lines between transition vault and new 275-230 kV substation near Cardiff, and build new 275-230 kV substation near Cardiff connected to existing substation at Cardiff

- **Upgrade/Greenfield:** Greenfield
- **Points of Injection:** Cardiff (1200MW)
- **Project Cost:** $243M
- **Project In Service Date:** 2Q2028
- **Landfall location:** Great Egg Harbor
- **Interactions with other proposals:** #127, 929, 975
- **Cost commitment:** No

Option 1b (Partial) - Proposal Overview #453

- **Proposal Description:**
  Upgrade/Expansion of Smithburg Substation and East Windsor Substation
  Upgrades to East Windsor – Smithburg 500 kV Line
  New Larrabee Converter – Smithburg 500kV Lines - 2 Circuits

- **Upgrade/Greenfield:** Upgrade and Greenfield components
- **Points of Injection:** Smithburg (1342MW), Larrabee (1200MW), Atlantic (1200MW)
- **Project Cost:** $660M
- **Project In Service Date:** 2027- 2032, work phased to solicitation schedule
- **Landfall location:** NA
- **Interactions with other proposals:** 431, 551, 321
- **Cost commitment:** No