



8.1: Delaware/Delmarva Peninsula RTEP Overview

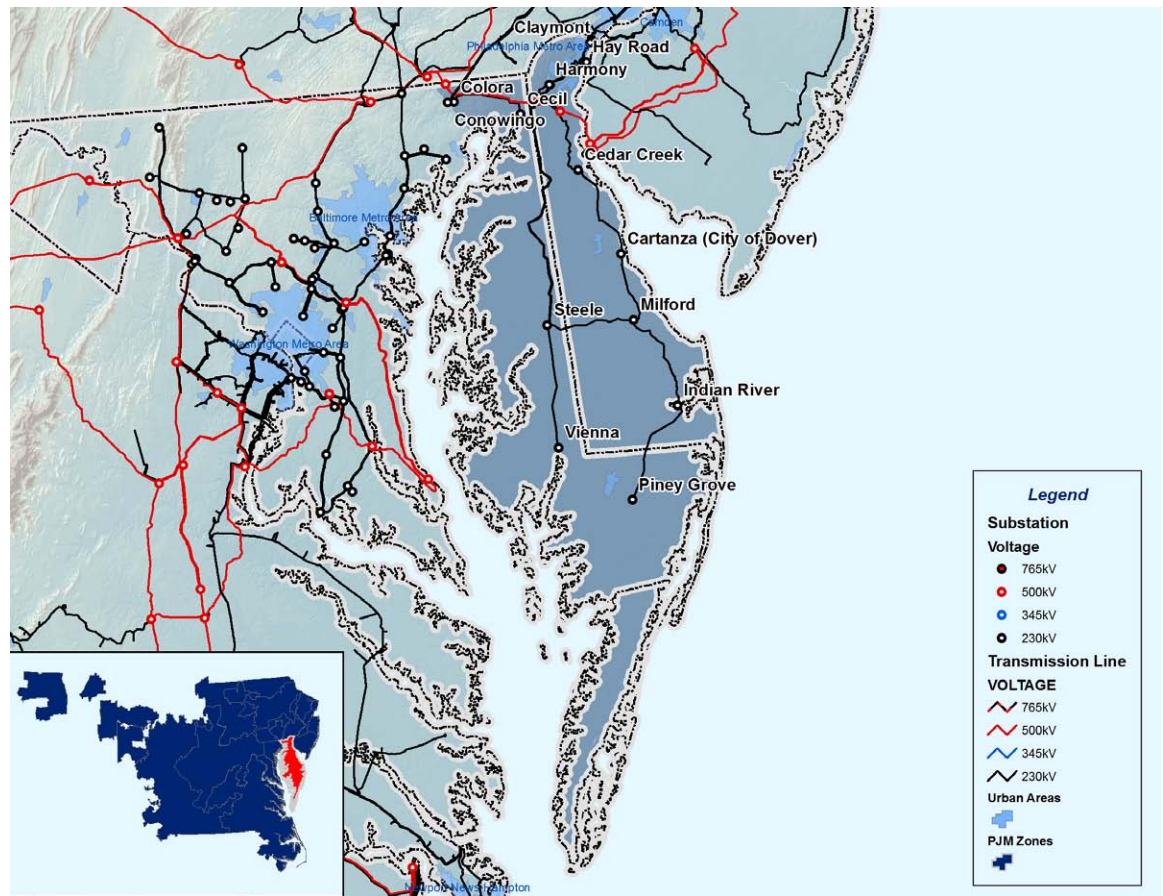
PJM operates the electric transmission system shown on Map 8.2 for Delmarva Power & Light (DPL) and Old Dominion Electric Cooperative (ODEC), transmission owners on the peninsula. Other LSEs include the Delaware Municipal Electric Corporation, Easton Maryland Utilities Commission, Occidental Power Services, Inc., and Old Dominion Electric Cooperative.

The transmission system on the Delmarva Peninsula delivers power to customers in Delaware, Maryland’s eastern shore of the Chesapeake and a portion of Virginia at the south end of the peninsula. These customers are served by local generation and power transfers across tie-line facilities in the north of the peninsula from sources in other parts of PJM and beyond.

Critical RTEP Issues and Upgrades

PJM continues to address a number of factors with a bearing on reliability on the Delmarva Peninsula and the regional transmission expansion planning required to maintain it. These are discussed in **Sections 3, 4 and 5**. Key Critical issues facing the Delmarva Peninsula are summarized in Table 8.3.

Map 8.2: PJM Service Area on the Delmarva Peninsula



The extent to which eastern Mid-Atlantic PJM continues to rely on transfers into the area to meet load-serving needs also has a quantifiable, negative impact on the high voltage backbone transmission system west and southwest of New Jersey.

In particular, four major new backbone transmission facilities have been approved by the PJM Board to resolve NERC reliability criteria violations in the PJM Mid-Atlantic sub-region, lines that are now a key part of PJM’s transmission expansion plans

Susquehanna – Roseland 500 kV Transmission Line

PJM 2008 RTEP studies have confirmed the need for this facility as early as 2012. The circuit would create a strong link from generation sources in northeastern and north-central Pennsylvania, including the Susquehanna nuclear station, across northeastern Pennsylvania into New Jersey. In addition, the line could also be extended from Susquehanna at its western end to integrate with a cluster of new coal-fired generation resources in central Pennsylvania, currently under development through PJM’s interconnection process.

Amos – Kemptown 765 kV Transmission Line (PATH Line)

PJM 2008 RTEP studies have confirmed the need for this facility as early as 2013. As proposed, the Amos – Kemptown circuit will bring a strong source into Kemptown and will reduce the flow on existing PJM 500 kV west to east transmission paths and provide significant benefits to the constrained Baltimore / Washington area, resolving a number of reliability criteria violations revealed by deliverability analyses. Amos is a relatively strong source with 2,100 MW of generating capacity that ties into the AEP 765 kV system.

Table 8.3: Critical issues on the Delmarva Peninsula

RTEP Topic	Report Section	Importance
Load Growth Trends		10-year forecasted peak power demand for individual TO zones
Load Management Trends		Impacts of Load Management as a capacity resource.
Generator Interconnection Plans		New sources of electric power to meet customer demand.
Wind and other renewable fuel sources		Potential for wind and other renewable fuel generating resources to meet RPS requirements.
Generator Deactivations		Impact on transmission requirements from generation removed from operation.
Merchant Transmission Interconnection Plans		Impact of merchant transmission interconnection requests.
502 Junction - Loudoun (TRAIL) 500 kV Line Validation		Resolving NERC reliability criteria violation overloads beginning in 2011
Amos-Kemtown 765 kV Line (PATH) Validation		Resolving NERC reliability criteria violation overloads beginning in 2013
Susquehanna - Roseland 500kV Line Validation		Resolving NERC reliability criteria violation overloads beginning in 2012
Possum Point - Salem (MAPP) 500 kV Line Validation		Resolving NERC reliability criteria violation overloads beginning in 2013
Branchburg - Roseland - Hudson 500 kV Line		Resolving NERC reliability criteria violation overloads beginning in 2013
2013 Baseline Upgrades Below Backbone 500 kV Level		Resolving zone-specific NERC-based reliability criteria violations.
Additional Backbone Facilities Under Construction		Ongoing assessment of need for new backbone transmission facilities.
Market Efficiency Studies		Assessing RTEP upgrades for potential market efficiency benefits.

Possum Point – Salem 500 kV Circuit Mid-Atlantic Power Pathway (MAPP)

PJM 2008 RTEP studies have identified the need for the Possum Point to Vienna and Indian River segments of the line in 2013. The addition of the MAPP project resolves load deliverability violations on the Delmarva peninsula beyond PJM’s 15-year planning horizon and provides a robust long term solution for the future needs of the area. The MAPP project also provides another transmission path across the PJM eastern interface and provides a conduit into the Delmarva Peninsula and New Jersey from new generation in southern Maryland and northern Virginia.

Branchburg – Roseland – Hudson 500 kV Transmission Line

PJM 2008 RTEP studies have revealed the need for this facility as early as 2013. This line will alleviate more than 20 thermal and reactive reliability criteria violations identified in Northern New Jersey. Two alternatives – one at 500 kV and one at 230 kV – were studied for their ability to resolve these issues, Studies revealed that for a number of reasons, the 500 kV alternative is the preferred choice.

A complete listing of all system reinforcements approved by the PJM Board can be found on PJM’s Web site via the following URL: <http://www.pjm.com/planning/rtep-upgrades-status.aspx>.

8.1.1 – Load Growth and Existing Generation

Internal Load Growth

The peak load specific to the Delmarva Peninsula is served primarily over the transmission systems of Delmarva Power & Light and Old Dominion Electric Cooperative. Load Growth for Summer and winter periods is shown in Table 8.1 in **Section 8.0.2**. Peak summer load growth is expected to average 1.9% per year over the 10-year period through 2018 and the peak winter load growth rate is expected to average 1.4% per year for DPL TO zone over the 10-year period through 2017/18.

Forecasted loads are modeled in power flow studies used to develop PJM’s RTEP through December 2008. PJM’s RTEP includes baseline transmission upgrades on the Delmarva Peninsula to meet expected 2013 peak load conditions.

PJM’s ongoing RTEP process continues to study anticipated needs for additional transmission expansion plans to meet load growth requirements beyond 2013 as well.

Existing Generating Capability

Figure 8.3 provides a snapshot of the existing installed capacity by fuel type on the Delmarva Peninsula.

Figure 8.4 provides a snapshot of the existing installed capacity by fuel type for the state of Delaware alone.

Figure 8.3: Existing Installed Capacity by Fuel Type on the Delmarva Peninsula

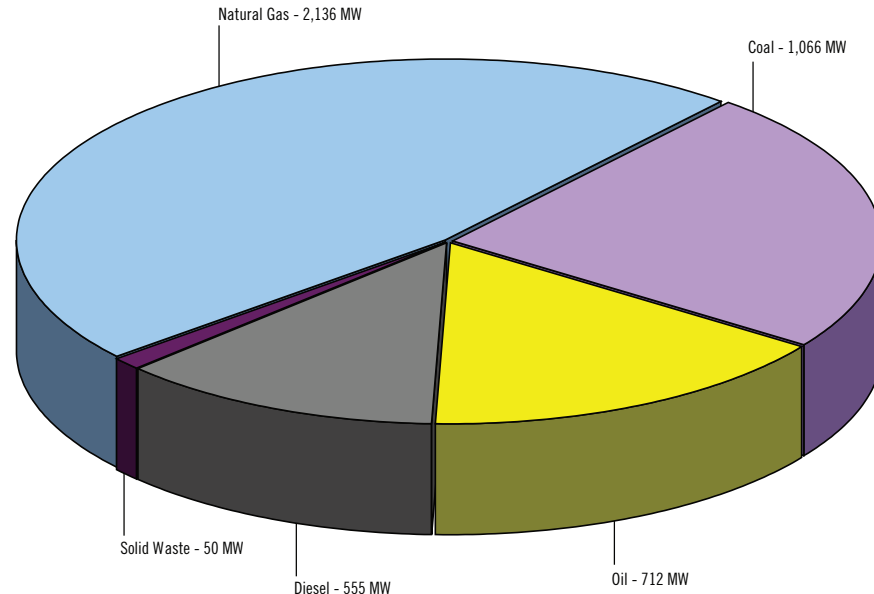
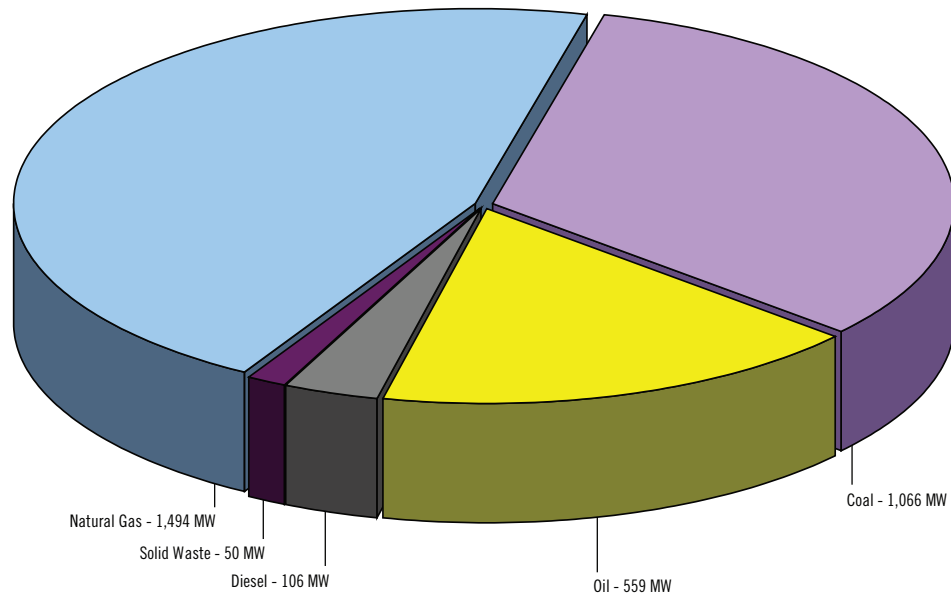


Figure 8.4: Existing Installed Capacity by Fuel Type in the State of Delaware



8.1.2 – Generation Interconnection Requests

PJM has received interconnection requests for 58 new generating resources on the Delmarva Peninsula since 1999, summarized in the Table below.

	MW	# of Projects
In-Service	1,861	26
Under Construction	23	2
Active	1,376	13
Withdrawn	4,988	17
Total	8,249	58

Table 8.4 includes generating resource interconnection requests located on the Delmarva Peninsula, shown on Map 8.3. PJM received these requests during Queues A through U4. The generator interconnection projects in this Table are either under construction or active in PJM’s interconnection process. **Section 2.2** earlier in this report describes how generation interconnection requests are modeled in RTEP studies.

Table 8.4: Queued Generation Interconnection Requests on the Delmarva Peninsula

Queue	Project Name	MW	MWC	Status	Schedule	TO	Fuel Type
G44	Dupont Seaford 69 kV	10	10	IS-NC	6/1/2002	DPL	Natural Gas
H12	Edgemoor 230 kV	10	10	ISP	12/1/2005	DPL	Natural Gas
N34	Motiva	250	142	ISP	12/31/2005	DPL	Oil
R36	Bethany 138 kV	450	90	ACTIVE	6/1/2014	DPL	Wind
R72	Indian River 230 kV	18	18	UC	6/1/2008	DPL	Coal
R73	Indian River 138 kV	5	5	UC	6/1/2008	DPL	Coal
T40	South Harrington	225	225	ACTIVE	6/1/2012	DPL	Natural Gas
T51	Hay Road	13	13	ACTIVE	5/1/2008	DPL	Natural Gas
T52	Red Lion 500 kV	20	20	ACTIVE	5/1/2008	DPL	Natural Gas
T56	Christiana	8.4	8.4	ACTIVE	4/1/2009	DPL	Oil
T66	Tasley	6.7	6.7	ACTIVE	4/1/2009	DPL	Oil
T67	West	5.3	5.3	ACTIVE	4/1/2009	DPL	Oil
T68	Edgemoor	5.2	5.2	ACTIVE	4/1/2009	DPL	Oil
T122	Ocean Bay 138 kV	600	120	ACTIVE	6/1/2015	DPL	Wind
T144	Pocomoke	19.8	10	ACTIVE	1/1/2010	DPL	Biomass
T187	Reybold	20	20	ACTIVE	1/1/2009	DPL	Other
U3-003	Mt. Olive 69 kV	2	0	ACTIVE	11/30/2008	DPL	Methane
U3-004	Cecil	1	0	ACTIVE	9/1/2009	DPL	Methane

For the sake of reporting, generating resources that are fully in-service (designated “IS”) are included in the summary tabulation above but are NOT separately enumerated in Table 8.4.

A status code of “IS-NC” (in-service, no capacity) indicates a generator that is in-service for energy only. Such units have not requested consideration for capacity status.

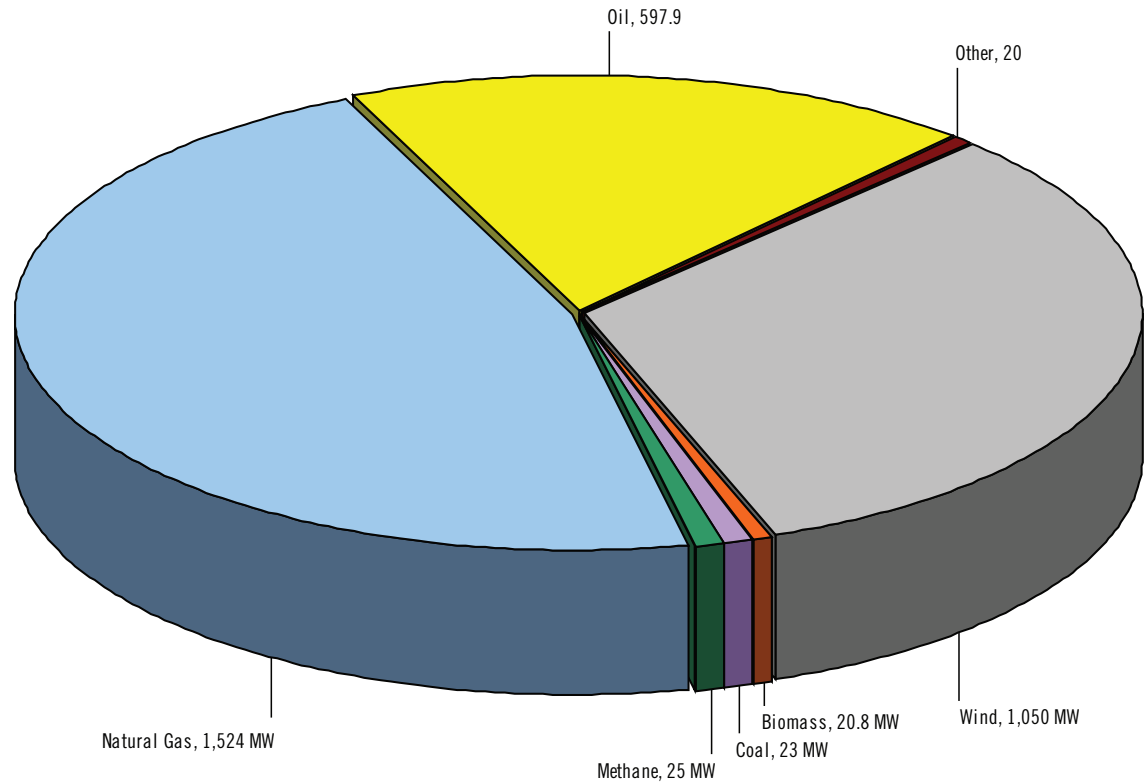
A status code of “ISP” (in-service, partial) denotes a generating resource that is only partially in-service and has not reached full capacity status.

A generating unit is ineligible for full capacity status until all transmission upgrades needed to ensure deliverability are completed. Only then will PJM grant capacity status designation.

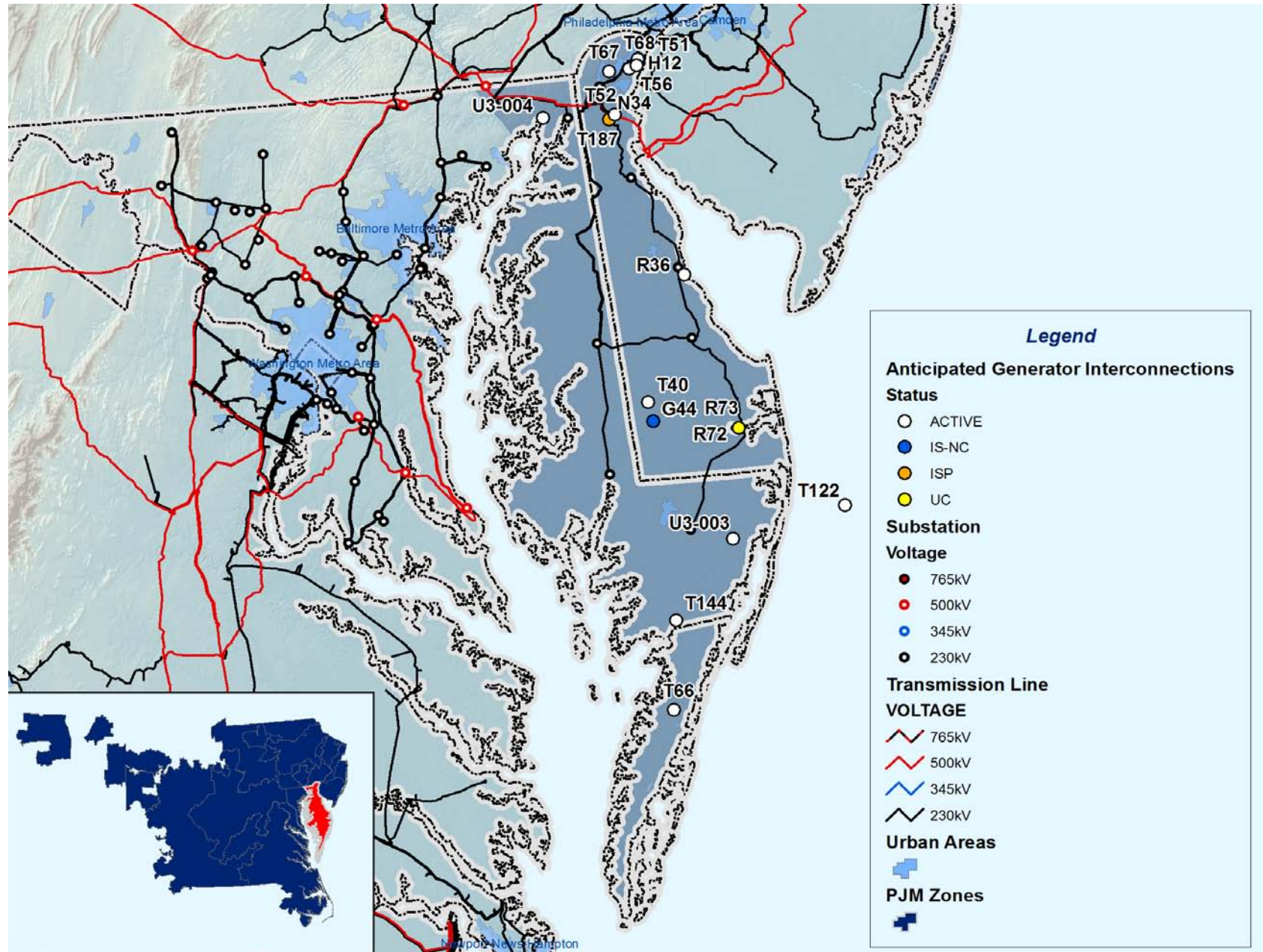
Figure 8.5 shows the capacity rights requested, by fuel type, for generator interconnection requests in Queues A through U4 that are located on the peninsula and are in-service, under construction or active in PJM’s interconnection process.

Map 8.3 shows the locations of each generation interconnection request on the Delmarva Peninsula.

Figure 8.5: Queued Capacity by Fuel Type on the Delmarva Peninsula



Map 8.3: Queued Generation Interconnection Requests on the Delmarva Peninsula



8.1.3 – Anticipated Generation Deactivations

Generating unit deactivation requests on the Delmarva Peninsula are summarized in Table 8.5 and shown on Map 8.4.

Specific sensitivity results regarding Indian River are discussed in **Section 5.2.3**, earlier in this report.

8.1.4 – Merchant Transmission Interconnection Requests

As of January 31, 2009, PJM’s interconnection queues did not contain any requests for merchant transmission interconnection on the Delmarva Peninsula.

Map 8.4: Generation Deactivation Requests on the Delmarva Peninsula

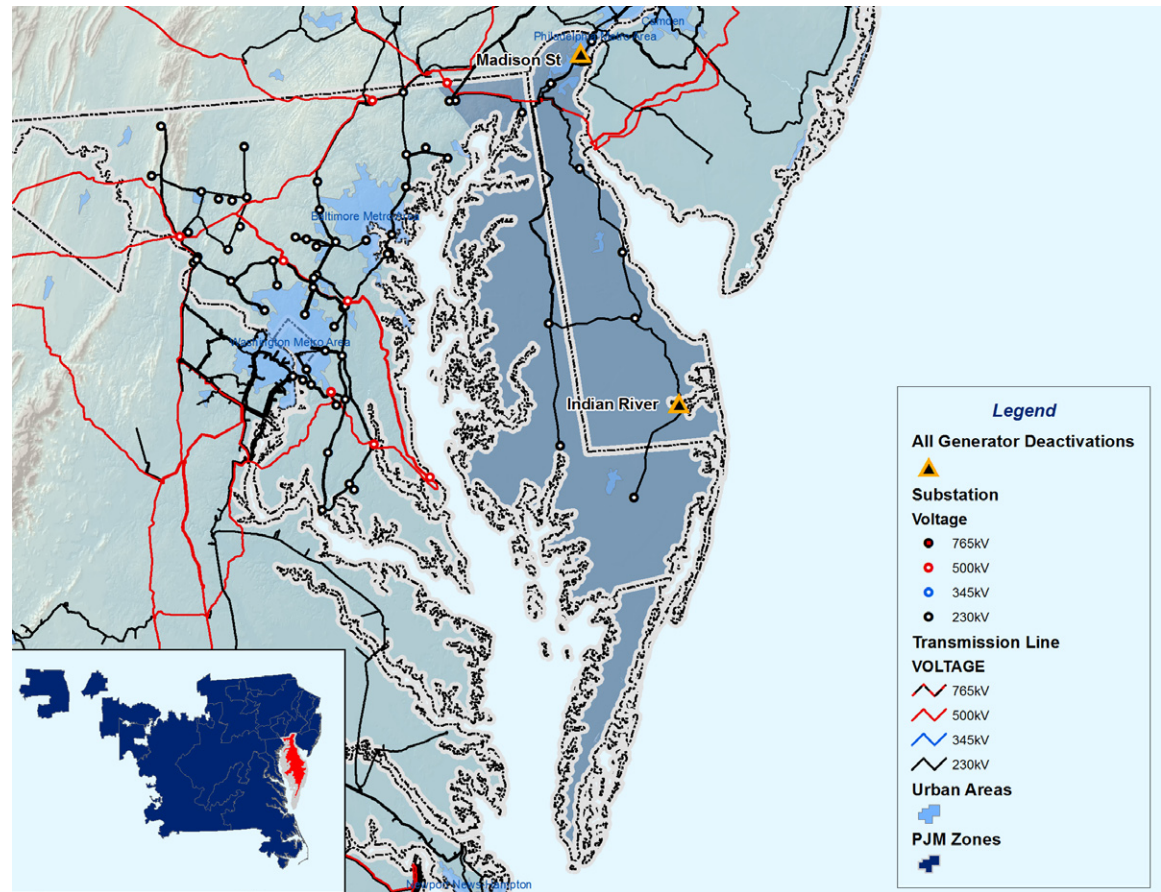


Table 8.5: Generation Deactivation Requests on the Delmarva Peninsula

Retirement Date	Generator	TO	Capacity (MW)	Status
Jan-05	Madison St. CT	DPL	10	No Reliability Issues
May-10	Indian River 2	DPL	89	Reliability issues identified and expected to be resolved by 5/1/2010
May-11	Indian River 1	DPL	90	Reliability issues identified and expected to be resolved by 5/1/2011

Table 8.6: Major 2008 RTEP Plans on the Delmarva Peninsula

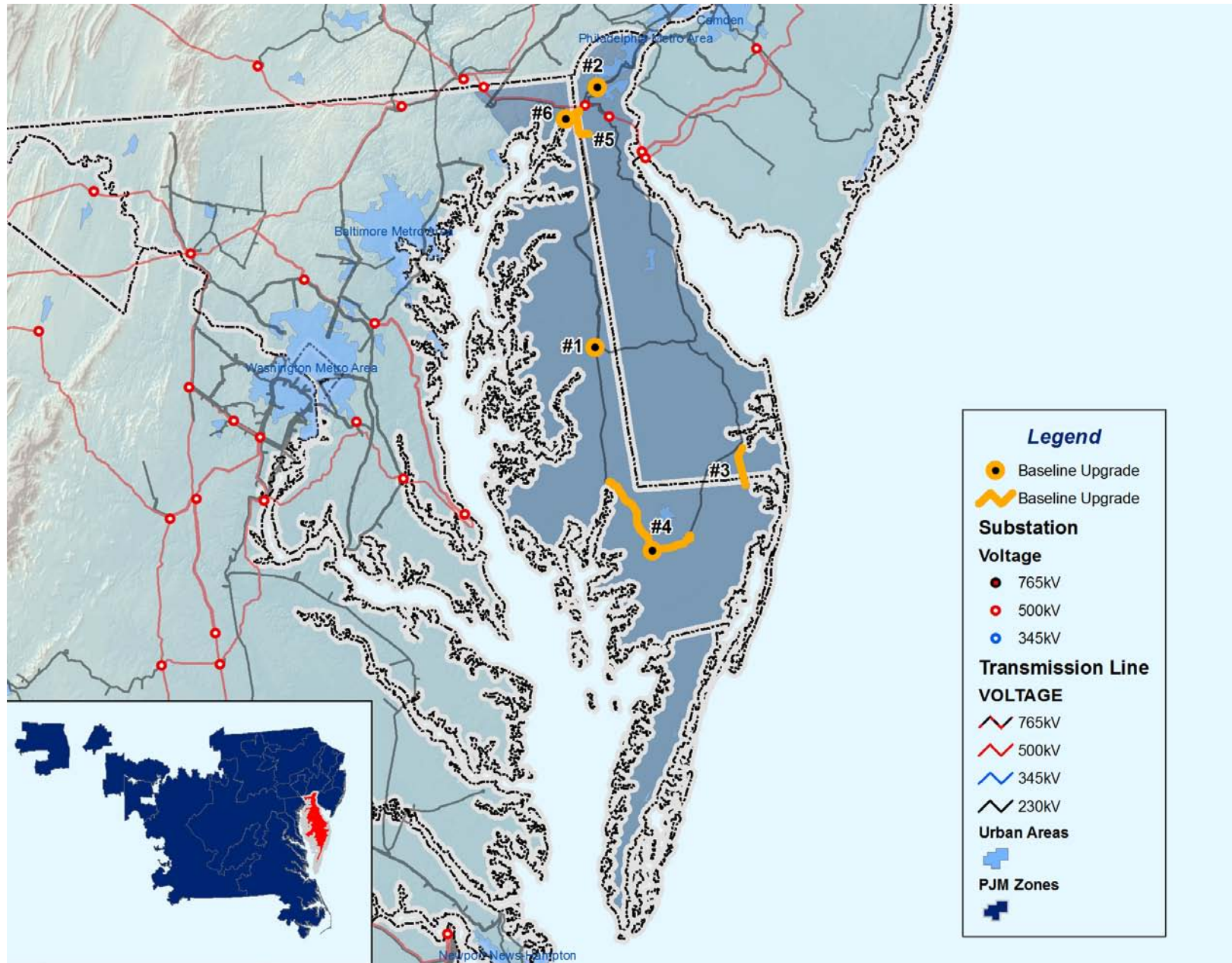
		System Upgrade Drivers								Date	Cost (M)	TO Zone(s)	2008 TEAC Review	
		Baseline Upgrades					Network Upgrades		Supplemental Upgrade					
Upgrade		Baseline Load Growth / Deliverability & Reliability	Congestion Relief - Economic	Operational Performance	Generator Deactivation	TO Criteria Violation	Generation Interconnection	Merchant Transmission Interconnection	Long-term Firm Transmission Service	Criteria Compliance other than for Baseline				
1	Add a 3rd Steele 230/138 kV transformer	▲									June 2013	8	DPL	8/20/2008
2	Add a 2nd Harmony 230/138 kV transformer	▲									June 2013	7.5	DPL	9/17/2008
3	Build a new Indian River-Bishop 138 kV line	▲									June 2013	18	DPL	9/17/2008
4	Convert 138 kV network path from Vienna – Loretto – Piney Grove to 230 kV, add 230/138 kV transformer to Loretto 230 kV	▲									June 2013	40	DPL	9/17/2008
5	Rebuild 10 miles of Glasgow to Mt. Pleasant 138 kV line to bring the normal rating to 298 MVA and the emergency rating to 333 MVA	▲									June 2013	5.7	DPL	9/17/2008
6	ReconFigure Cecil Sub into 230 and 138 kV ring buses, add a 230/138 kV transformer, remove relay limits on Cecil-Colora 230 kV line & Cecil-Glasgow 138 kV line ,and operate the 34 kV bus normally open	▲									June 2013	6	DPL	10/15/2008
7	Milford - Steele - Reconductor 230kV line						R37				June 2014	10.225	DPL	9/17/2008

8.1.5 –Transmission Expansion Plans on the Delmarva Peninsula

Table 8.6 summarizes new RTEP planned transmission upgrades greater than \$5 million on the Delmarva Peninsula as approved by the PJM Board during 2008. Map 8.5 shows the location of upgrades enumerated in Table 8.6.

A complete listing of all system reinforcements approved by the PJM Board can be found on PJM’s web site via the following URL: <http://www.pjm.com/planning/rtep-upgrades-status.aspx>.

Map 8.5: Major 2008 RTEP Plans on the Delmarva Peninsula



8.1.6 – Interconnection Requests for Generation Powered by Renewable Resources

PJM’s RTEP process offers a structure that assures consistent, equal opportunity across fuel types while flexible enough to adapt to specific technical realities and market challenges. Presently, PJM’s queues include interconnection requests on the Delmarva Peninsula for plants powered by wind, methane and biomass fuels, as summarized in Table 8.7 and shown on Map 8.6.

While some renewable resources can operate in a manner similar to the traditional fossil fueled power plants, other renewable energy sources, such as wind, are recognized as intermittent resources. Their ability to generate power is directly determined by the immediate availability and/or magnitude of their specific “fuel.” For example, wind turbines can generate electricity only when wind speed is within a range consistent with the physical specifications of the related turbines. This presents challenges with respect to real-time operational dispatch and specific capacity value. To address the latter issue, PJM has established a set of business rules unique to intermittent resources that provide for the determination of credible capacity values robust enough to represent capacity during the PJM summer peak period.

Map 8.6: Interconnection Requests on the Delmarva Peninsula by Renewable Fuel Type

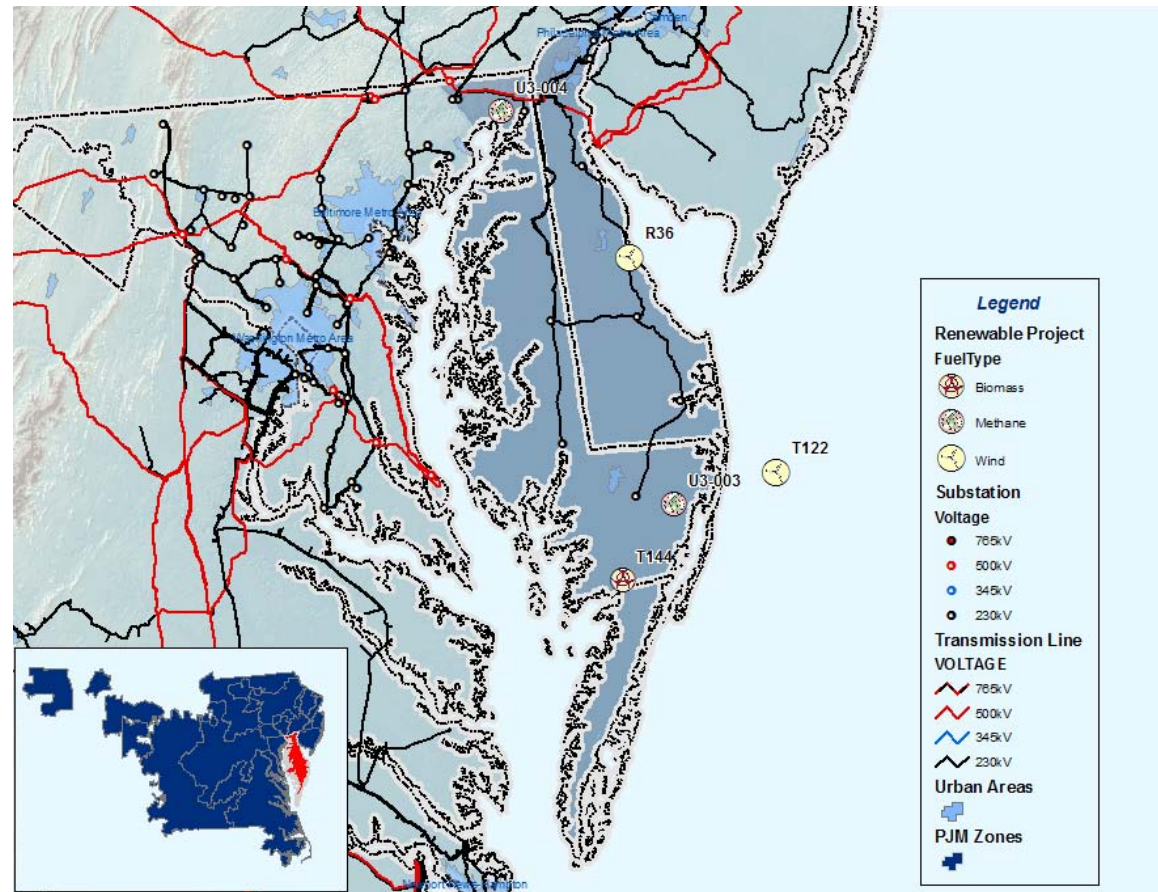


Table 8.7: Interconnection Requests on the Delmarva Peninsula by Renewable Fuel Type

Queue	Project Name	MW	MWC	Status	Schedule	TO	Fuel Type
R36	Bethany 138kV	450	90	ACTIVE	6/1/2014	DPL	Wind
T122	Ocean Bay 138kV	600	120	ACTIVE	6/1/2015	DPL	Wind
T144	Pocomoke	19.8	10	ACTIVE	1/1/2010	DPL	Biomass
U3-003	Mt. Olive 69kV	2	0	ACTIVE	11/30/2008	DPL	Methane
U3-004	Cecil	1	0	ACTIVE	9/1/2009	DPL	Methane