Raquel J. Webster
Senior Counsel

February 19, 2016

BY HAND DELIVERY AND ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket 4592 - National Grid's Proposed FY 2017 Electric Infrastructure, Safety, and Reliability Plan
Presentation

Dear Ms. Massaro:

I have attached the presentation that National Grid[1] will present at the fiscal year 2017 Electric Infrastructure, Safety, and Reliability hearing at the PUC on February 22, 2016. The Company is filing this presentation pursuant to the PUC's request dated February 12, 2016.

Thank you for your attention to this matter. If you have any questions, please contact me at 781-907-2121.

Very truly yours,

Raquel J. Webster

Enclosures

cc: Docket 4592 Service List
Leo Wold, Esq.
Steve Scialabba, Division
Greg Booth, Division

[1] The Narragansett Electric Company d/b/a National Grid.

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Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing were hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.

Joanne M. Scanlon

February 19, 2016
Date

Docket No. 4592 National Grid's Electric Infrastructure, Safety and Reliability Plan FY 2017 - Service List as of 12/10/15

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File an original & nine copies w/: Luly E. Massaro, Commission Clerk Public Utilities Commission 89 Jefferson Blvd. Warwick, RI 02888	Luly.massaro@puc.ri.gov; Cynthia.WilsonFrias@puc.ri.gov; Alan.nault@puc.ri.gov; Todd.bianco@puc.ri.gov;	401-780-2107

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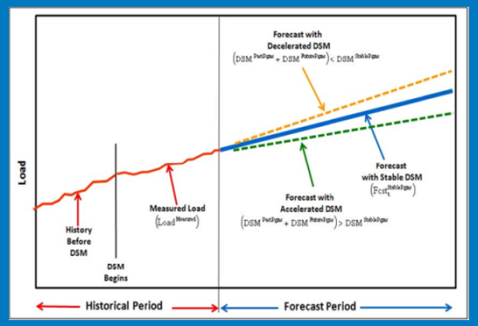
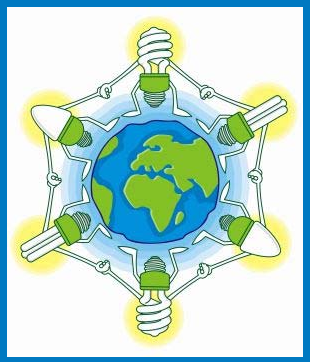
Overview of National Grid's Distribution Planning & Forecasting Processes





February 22, 2016

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Abbreviations

- MW = megawatts
  - 1,000 kilowatts
  - 1,000,000 watts
- MWH = megawatt * hour
- RES = Renewable Energy Standard - 2004-2014
- REG = Renewable Energy Growth – 2015 +
- DR = Demand Response
- DER = Distributed Energy Resources
- DG = Distributed Generation
- DP = Distribution Planning
- DSM = Demand-side Management (same as EE)
- EE = Energy Efficiency
- NWA = Non-wires Alternatives

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Agenda

- Forecasting
  - How do we do these forecasts?
  - How to account for customer side resources
    - Energy Efficiency
    - Demand Response
    - Distributed Generation
  - Latest Forecasts
- Distribution Planning
  - What is Distribution Planning
  - Why do we plan
  - How do we plan
  - Planning Analysis Concepts
  - Energy Efficiency & Distributed Generation Considerations
  - Planning Challenges

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How do we do these Forecasts?

- Econometrics
- Weather adjustments
- Reductions for Existing and Emerging Technologies & Programs (Energy Efficiency, Distributed Generation, Demand Response, etc.)

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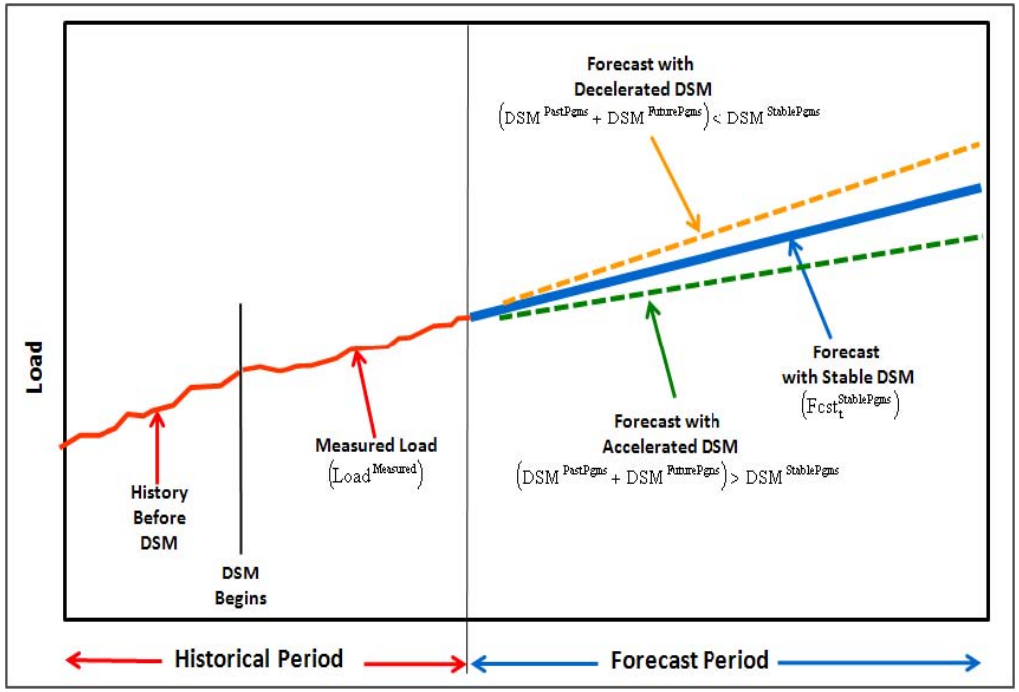
Energy Efficiency & Demand Response

- Energy Efficiency
  - Cumulative ~230 MWs peak load reduction
  - >10% of state peak
- Demand Response
  - Administered by ISO-NE
  - Approximately 25 MWs
  - ~1.4% of state peak
  - not Company controlled



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Distributed Generation - Solar

- First Step in New Forecasting Process
  - Track historical DG installations
  - Project for future installations
    - Review queue status
    - Review state policy
  - “Top-Down” approach
  - 40% nameplate peak contribution factor

- Future?
  - Contractual Arrangements

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Forecasting Energy Efficiency[1]

Rhode Island SUMMER Peak (MW) and Energy Efficiency (EE) Impacts				Total			
	DELIVERIES			EE REDUCTIONS			EE % of
Calendar Year	Reconstituted (before reductions)	Econometric Model	Final Forecast (after reductions)	Historical + Forecast	Historical + Trend	Post Model Additional EE	'Reconstituted' Deliveries
2005	1,783	1,751	1,751	32	32	0	1.8%
2006	1,837	1,793	1,793	44	44	0	2.4%
2007	1,884	1,830	1,830	54	54	0	2.9%
2008	1,841	1,776	1,776	65	65	0	3.5%
2009	1,881	1,799	1,799	82	82	0	4.3%
2010	1,841	1,746	1,746	95	95	0	5.2%
2011	1,954	1,846	1,846	108	108	0	5.6%
2012	1,947	1,818	1,818	129	129	0	6.6%
2013	1,995	1,837	1,837	158	158	0	7.9%
2014	1,974	1,775	1,775	199	199	0	10.1%
2015	2,053	1,822	1,822	231	231	0	11.2%
2016	2,073	1,825	1,822	255	249	3	12.3%
2017	2,106	1,840	1,831	277	266	8	13.2%
2018	2,139	1,855	1,842	299	284	13	14.0%
2019	2,166	1,865	1,849	319	302	16	14.7%
2020	2,192	1,872	1,854	338	320	18	15.4%
2021	2,217	1,880	1,860	357	337	19	16.1%
2022	2,243	1,888	1,869	374	355	19	16.7%
2023	2,272	1,899	1,879	391	373	19	17.2%
2024	2,301	1,910	1,891	407	391	19	17.7%
2025	2,330	1,922	1,902	422	408	19	18.1%
2026	2,360	1,934	1,914	436	426	19	18.5%
2027	2,390	1,946	1,927	449	444	19	18.8%
2028	2,422	1,960	1,941	462	462	19	19.1%
2029	2,454	1,974	1,955	475	480	19	19.3%
2030	2,485	1,988	1,969	486	497	19	19.6%

1 – RI Energy Efficiency Table from National Grid's New England 2016 Electric Peak (MW) Forecast

Forecasting Distributed Generation – Solar[1]

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Year	50/50 Peak	Annual	Solar % of 50/50 Forecast Peak	Summer	Solar % of 50/50 Forecast Peak	Coincident	Solar % of 50/50 Forecast Peak
2005	1,751	0	0.0%	0	0.0%	0	0.0%
2006	1,793	0	0.0%	0	0.0%	0	0.0%
2007	1,830	1	0.0%	1	0.0%	0	0.0%
2008	1,776	1	0.0%	1	0.0%	0	0.0%
2009	1,799	1	0.1%	1	0.0%	0	0.0%
2010	1,746	1	0.1%	1	0.1%	0	0.0%
2011	1,846	2	0.1%	2	0.1%	1	0.0%
2012	1,818	3	0.2%	3	0.2%	1	0.1%
2013	1,837	13	0.7%	11	0.6%	5	0.3%
2014	1,775	20	1.1%	18	1.0%	8	0.4%
2015	1,822	30	1.7%	27	1.5%	12	0.7%
2016	1,822	55	3.0%	48	2.7%	22	1.2%
2017	1,831	82	4.5%	75	4.1%	33	1.8%
2018	1,842	116	6.3%	106	5.8%	46	2.5%
2019	1,849	144	7.8%	136	7.4%	58	3.1%
2020	1,854	163	8.8%	158	8.5%	65	3.5%
2021	1,860	170	9.1%	168	9.0%	68	3.6%
2022	1,869	174	9.3%	173	9.2%	70	3.7%
2023	1,879	177	9.4%	176	9.4%	71	3.8%
2024	1,891	179	9.5%	179	9.5%	72	3.8%
2025	1,902	182	9.5%	181	9.5%	73	3.8%
2026	1,914	184	9.6%	183	9.6%	73	3.8%
2027	1,927	186	9.6%	185	9.6%	74	3.9%
2028	1,941	188	9.7%	187	9.7%	75	3.9%
2029	1,955	190	9.7%	190	9.7%	76	3.9%
2030	1,969	192	9.8%	192	9.7%	77	3.9%

1 – RI Summer Peak Reductions by Solar Capacity Table from National Grid's New England 2016 Electric Peak (MW) Forecast

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What is Distribution Planning

- Distribution planning is the analysis of historical data with forecasting information to prepare recommendations for National Grid to provide safe, reliable, and efficient electric service
  - Historical Data
    - Physical Characteristics = Asset Condition
    - Electrical Characteristics = Current, Voltage, and Power
  - Analysis
  - Recommendation
    - Infrastructure
    - System modifications or operational guidelines

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Why do we plan?

- SAFE
  - Maximize safety of workers, equipment, and the public
- RELIABLE
  - Proactive (Predictive)
  - Reactive (Historical)
- EFFICIENT
  - Maximize use of existing assets
  - Economic expansion
  - Minimize environmental impacts
  - Minimize societal impacts

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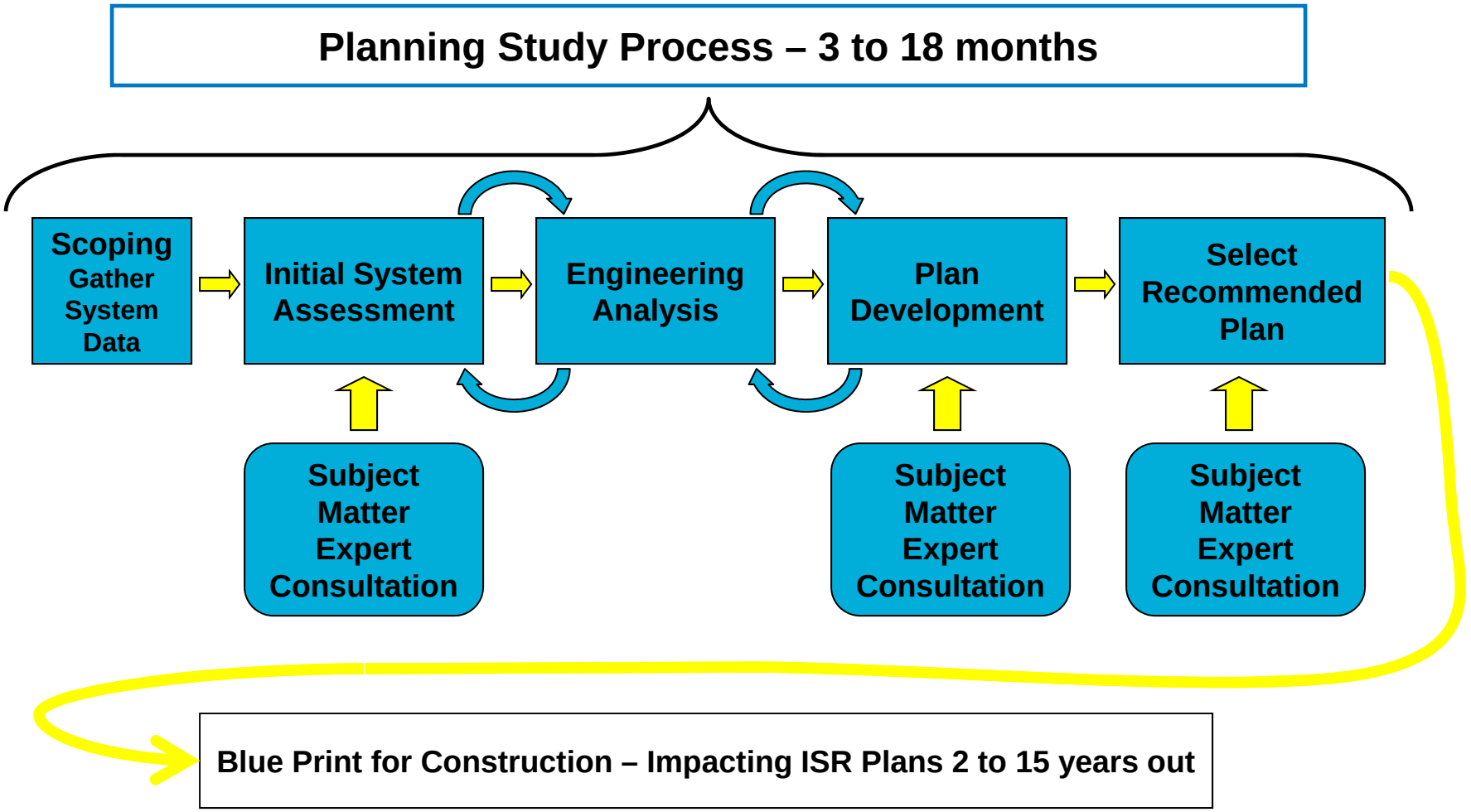
How do we Plan?



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Planning Analysis Concepts

- Should apply criteria and strategies reviewed by regulatory entity
  - System Performance Criteria (including Asset Condition)
    - Acceptable = Continue to analyze and plan
    - Not Acceptable = Infrastructure Investment or System Modification
- Should allow customer choice – Plan for worst case
- Status of System Monitoring
- Comprehensive Plans
- Distribution Planning address Capacity, not Energy
  - Discrete and Large
  - Familiarity with cost, schedule, and capabilities

Energy Efficiency & Distributed Generation Considerations

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- Energy Efficiency – Included in Forecast
  - Targeted EE considered in NWA
- Distributed Generation – NEW & EVOLVING
  - Subject Matter Expert consulted during studies?
  - Intermittency / Weather
  - Customer Choice Impacts – DG is not under control of National Grid
  - Treat as special or treat as a negative load?
  - Targeted DG can be considered in NWA
- Non-wires Alternatives (Distributed Energy Resources)
  - Subject Matter Expert consulted during studies
  - Fixed screening analysis

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Planning Challenges

- Emerging Issues
  - System Resiliency
  - Climate Change
  - Continued Operational Efficiency
  - Vehicle Electrification?
- Emerging Technologies
  - DER
  - Advanced Distribution Automation
  - Volt / Var Optimization
  - Advanced Distribution Monitoring
  - Time of Use Rates

- **COMMUNICATIONS**
- **NEED FOR GREATER SYSTEM VISIBILITY**

Questions