

# Regional System Plan 2009 (RSP09) Public Meeting Video Presentation Materials

2009 Regional System Plan Public Meeting  
September 10, 2009

# ISO-NE System Planning Process

- Regional System Plan
  - RSP is a detailed summary of the system planning activities for each year
  - RSP looks at system needs over a ten-year horizon
  - Regular updates on status of transmission projects in the plan are provided throughout the year consistent with national, regional, and ISO New England requirements
- Objectives
  - Provides opportunities for market solutions
    - e.g., generation, demand-side measures, and elective or merchant transmission
  - Provides a regulated transmission plan as a backstop for reliability and economic needs
    - Can be modified based on market solutions that develop
  - RSP does not constitute an integrated resource plan



# Short-Run Forecasts of New England's Annual Use of Electric Energy

Parameter	2008 <sup>(a)</sup>	2009	2010	% Change 2008–2009	% Change 2009–2010
<b>Annual use of electric energy (1,000 MWh)<sup>(b)</sup> (Net Energy for Load)</b>	131,505	131,315	131,330	(0.1)	0.0
<b>Summer peak (MW)</b>	27,765	27,875	28,160	0.4	1.0
<b>Winter peak (MW)<sup>(c)</sup></b>	22,130	22,100	22,105	(0.1)	0.0

(a) The weather-normal actual load is shown for the 2008 annual energy use and summer peak load.

(b) “MWh” refers to megawatt-hours.

(c) The winter peak could occur in the following year.

# New England Economic and Demographic Forecast Summary

Factor	1980	2008	CAGR	2009	2018	CAGR
Summer peak (MW)	14,539	27,765	2.3	27,875	30,960.00	1.2
Net Energy for Load (1,000 MWh)	82,927	131,505	1.7	131,315	142,125	0.9
Population (thousands)	12,378	14,306	0.5	14,343	14,659	0.2
Real price of electricity (cents per kilowatt-hour [kWh], 1996 \$)	11.99	11.40	(0.2)	11.71	11.71	0.0
Employment (thousands)	5,534	7,037	0.9	6,847	7,409	0.9
Real income (millions, 2000 \$)	252,449	571,456	3.0	568,676	716,455	2.6
Real gross state product (millions, 2000 \$)	267,595	643,217	3.2	635,864	815,095	2.8
Energy per household (MWh)	18.954	23.716	0.8	23.586	24.280	0.3
Real income per household (thousands) (2000 base year)	57.700	103.060	2.1	102.144	122.394	2.0

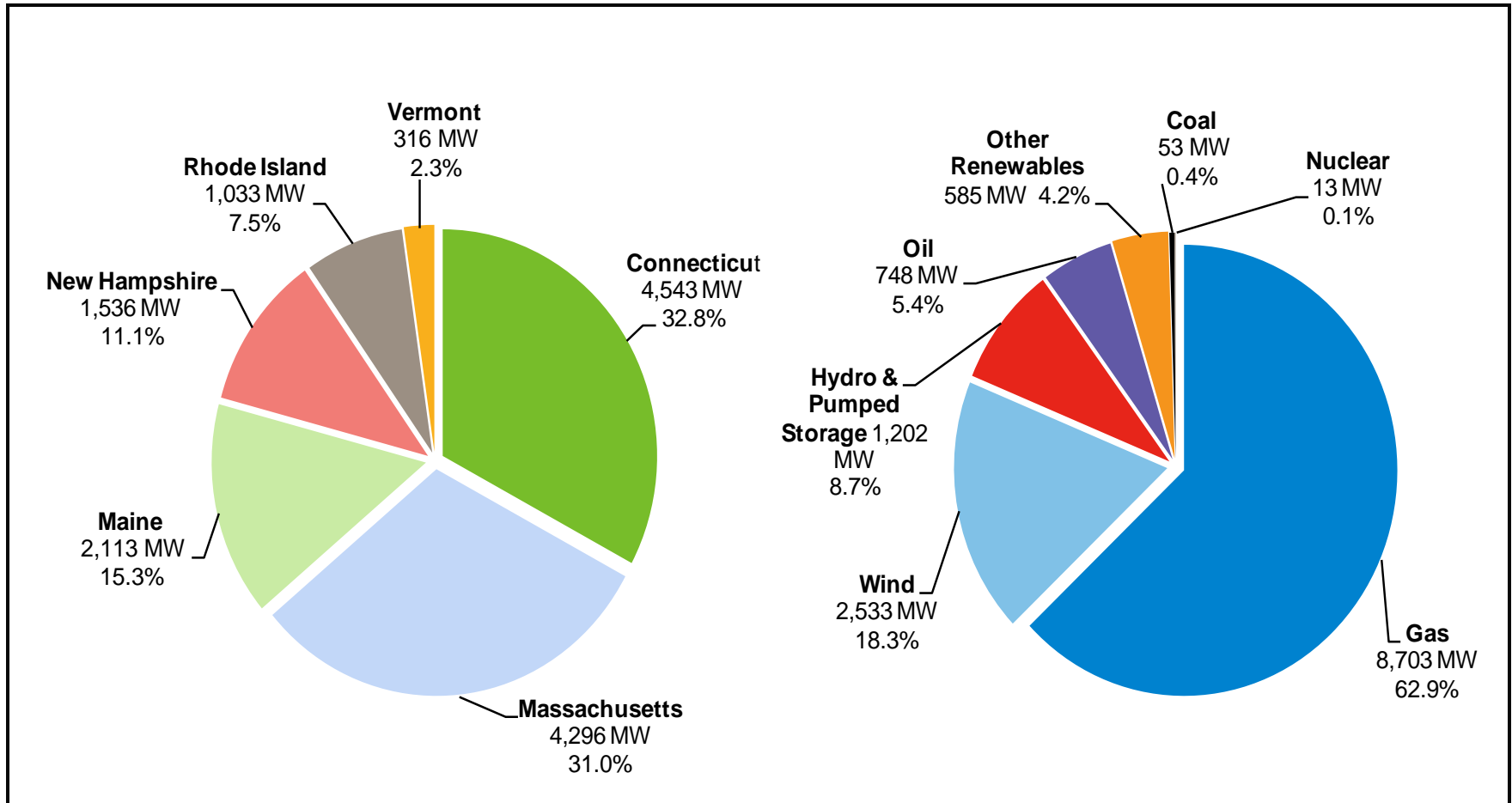
CAGR - Compound Annual Growth Rate

# Actual and Representative Future New England Net Installed Capacity Requirements

Year	Forecast 50/50 Peak	Representative Future Net ICR	Assumed Existing ICAP	Potential Surplus ICAP
2010/2011	28,160	32,137	34,021	1,884
2011/2012	28,575	32,528	37,021	4,493
2012/2013	29,020	31,965	37,021	5,056
2013/2014	29,365	32,411	35,091	2,680
2014/2015	29,750	32,901	35,091	2,190
2015/2016	30,115	33,370	35,091	1,721
2016/2017	30,415	33,757	35,091	1,334
2017/2018	30,695	34,120	35,091	971
2018/2019	30,960	34,454	35,091	637

ICR - Installed Capacity Requirement  
ICAP - Installed Capacity

# Resources in the ISO Generator Interconnection Queue, 3/15/09



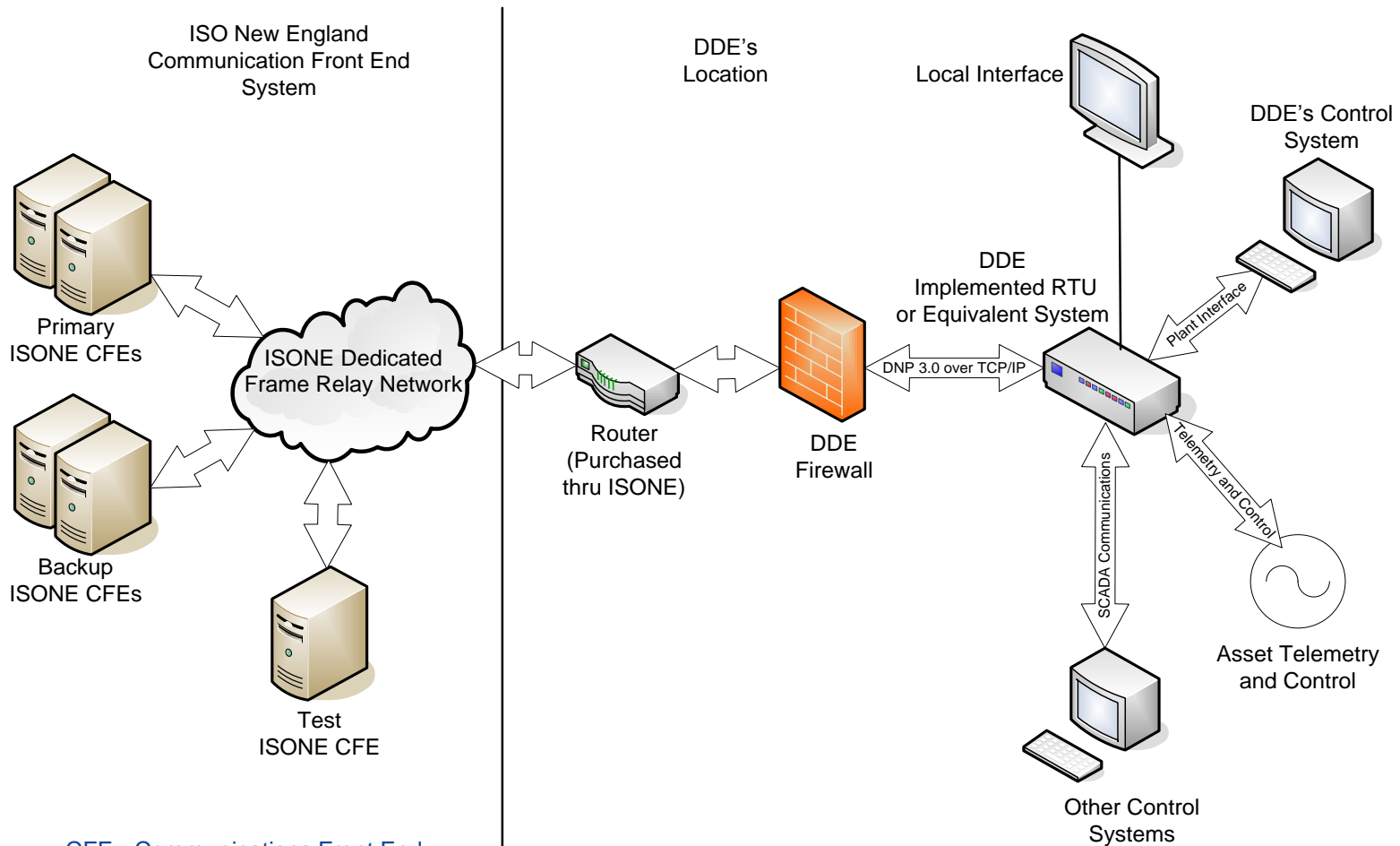


# Forward Capacity Market (FCM) Eligible Resources

- Supply Resources
  - Traditional Generation (Oil, Coal, Natural Gas, etc.)
  - Intermittent Generation (Wind, Solar, etc.)
  - Renewable Generation
- Demand Resources
  - Energy Efficiency
  - Load Management
  - Distributed Generation

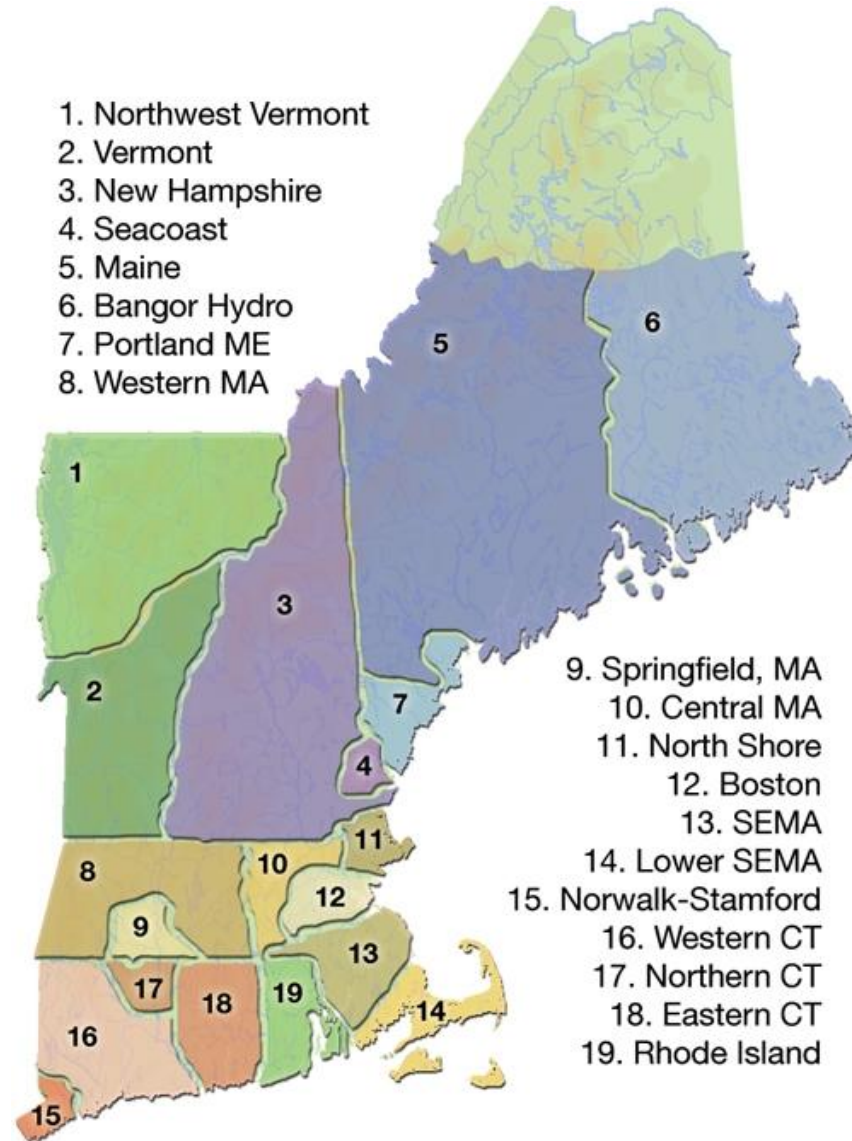


# Communication Overview under FCM



CFE - Communications Front End  
DDE - Demand Designated Entity  
DNP - Distributed Network Protocol  
SCADA - System Control and Data Acquisition  
RTU - Remote Terminal Unit  
TCP/IP - Transmission Control Protocol/Internet Protocol

# Dispatch Zones under FCM

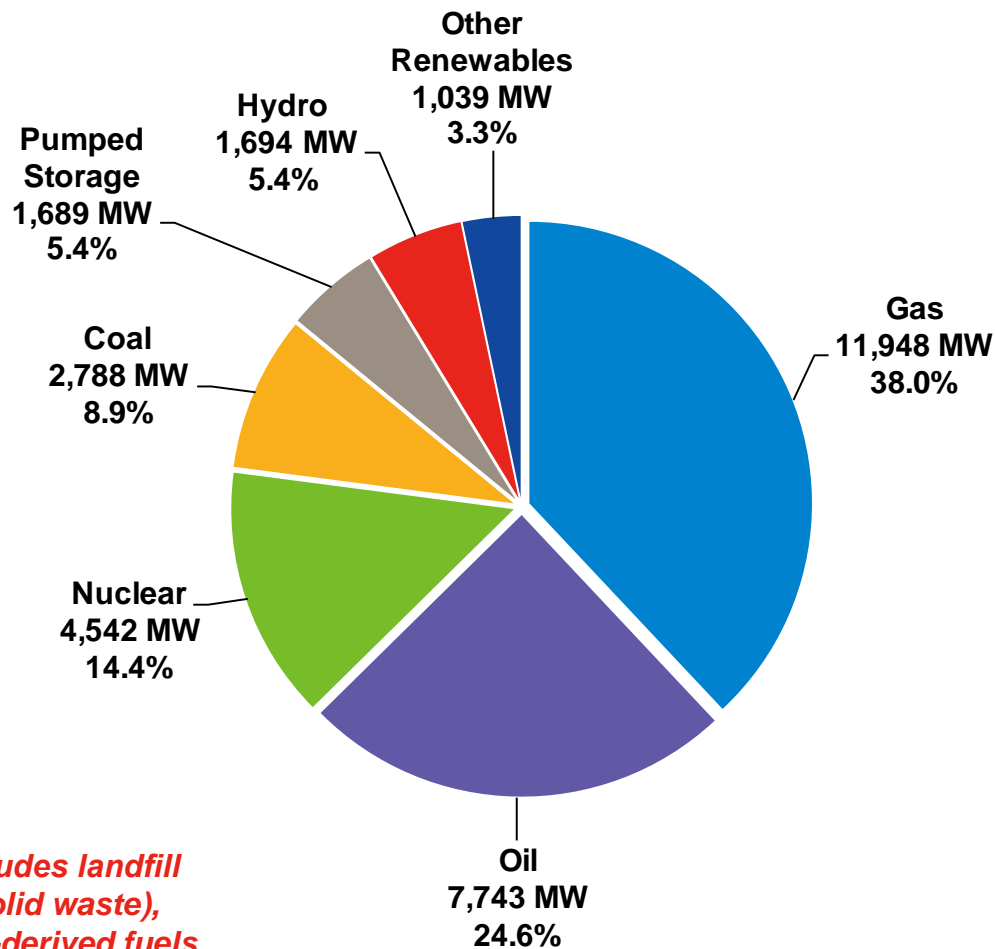


# 2009 Summer Capacity Mix by Fuel Type

## Summer 2009 (MW and Percent)

Total ~ 31,500 MW

\* Values include existing generation and expected generation capacity additions. Values do not include Hydro-Québec Interconnection Capability Credits (HQICC), demand response resources, or external purchases and sales.

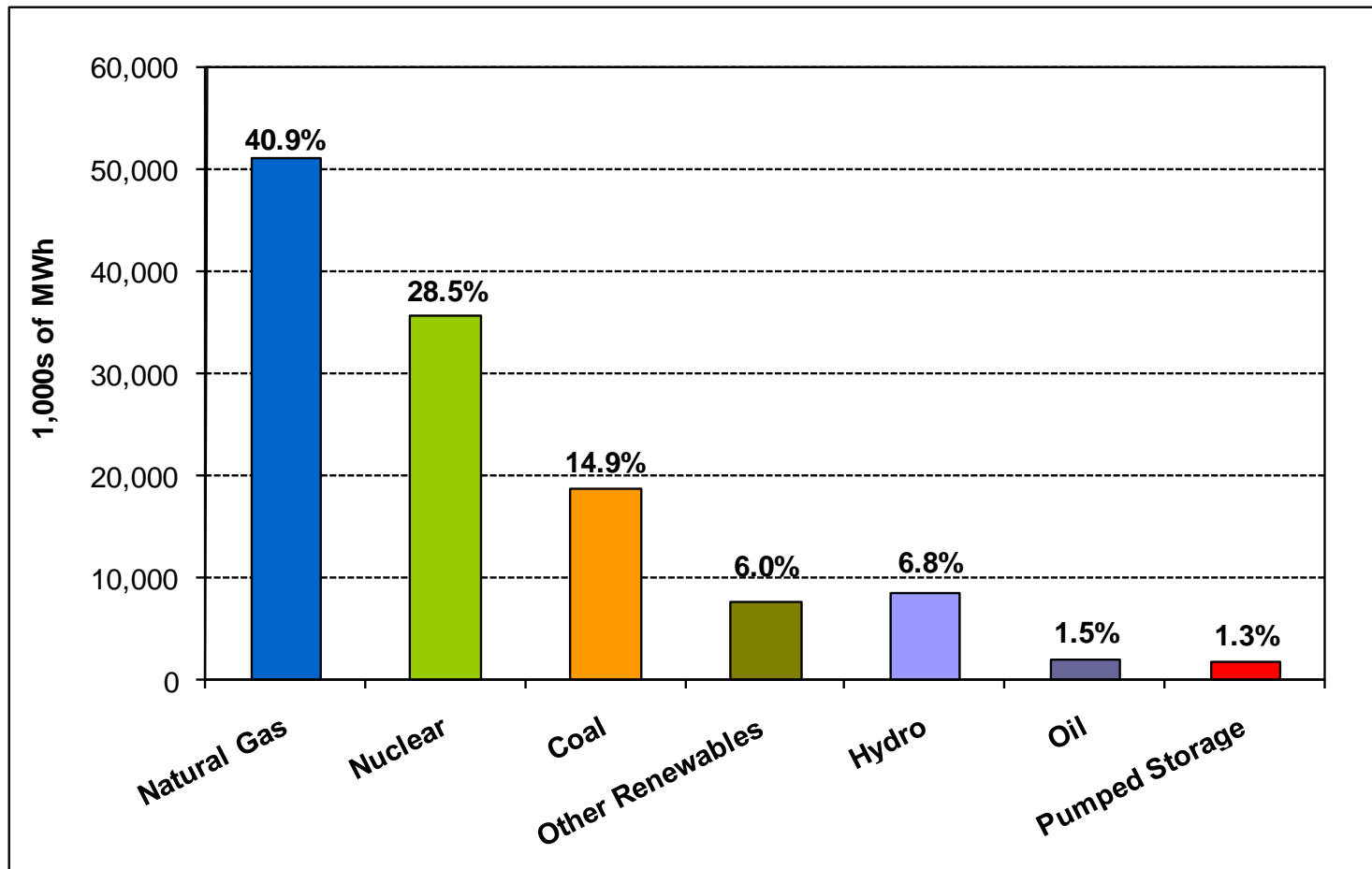


*Note: The "Other Renewables" category includes landfill gas, other biomass gas, refuse (municipal solid waste), wood and wood-waste solids, wind, and tire-derived fuels.*

# New England's Generation Capacity Mix by Fuel Type Compared with the Nationwide Capacity Mix (%)

Fuel	New England	United States
Coal	8.9	31.0
Natural Gas	38.0	39.6
Oil	24.6	5.6
Nuclear	14.4	9.9
Hydro (including pumped hydro) and other renewables	14.1	13.9

# 2008 Energy Production by Fuel Type

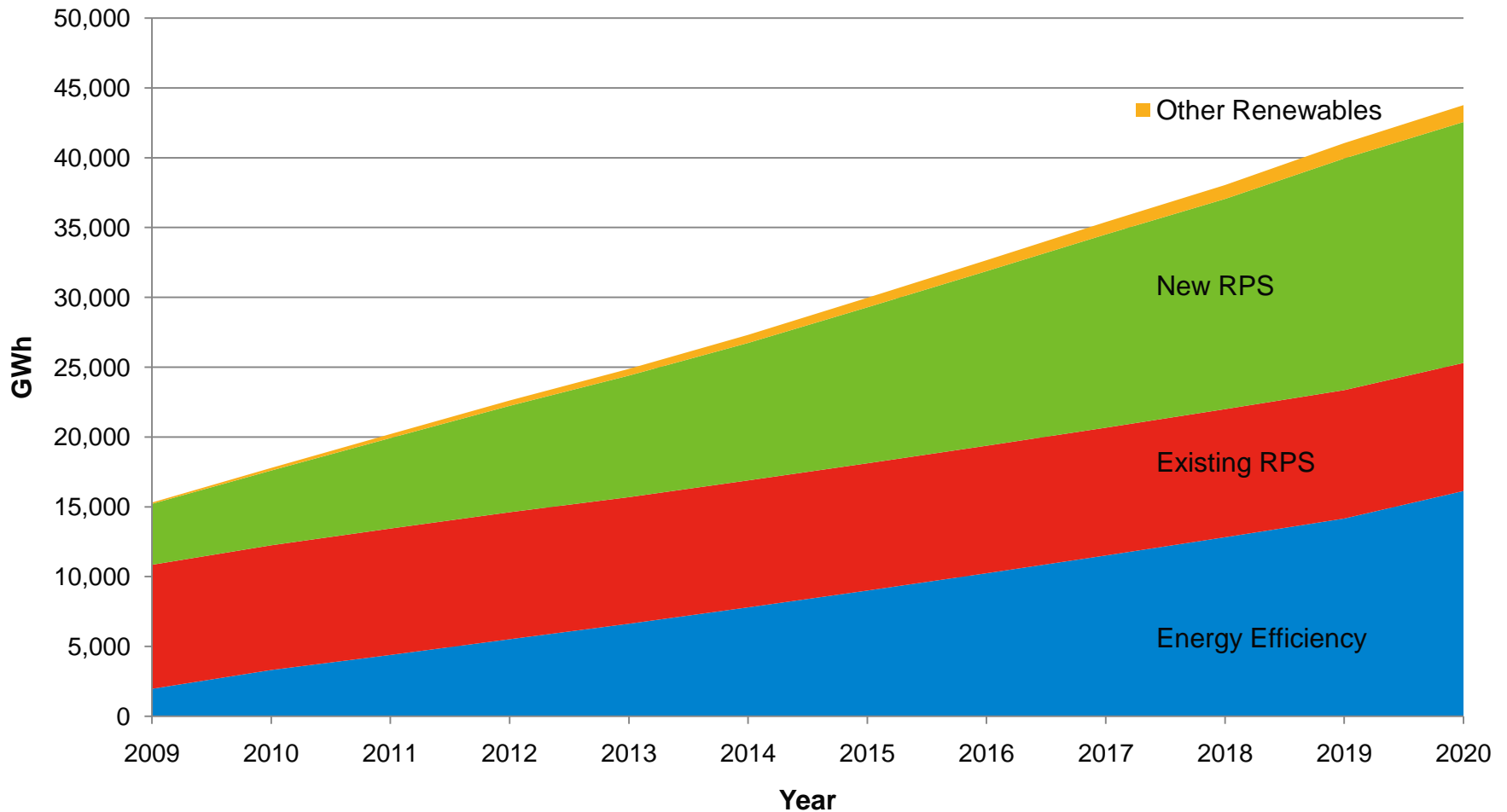


**Note:** The “Other Renewables” category includes landfill gas, other biomass gas, refuse (municipal solid waste), wood and wood-waste solids, wind, and tire-derived fuels. New England has low emitting generation: 40% is zero emitting nuclear and zero and low emitting renewables and over 40% is the lowest emitting fossil generation: gas

# New England's Energy Mix by Fuel Type Compared with the Nationwide Energy Mix (%)

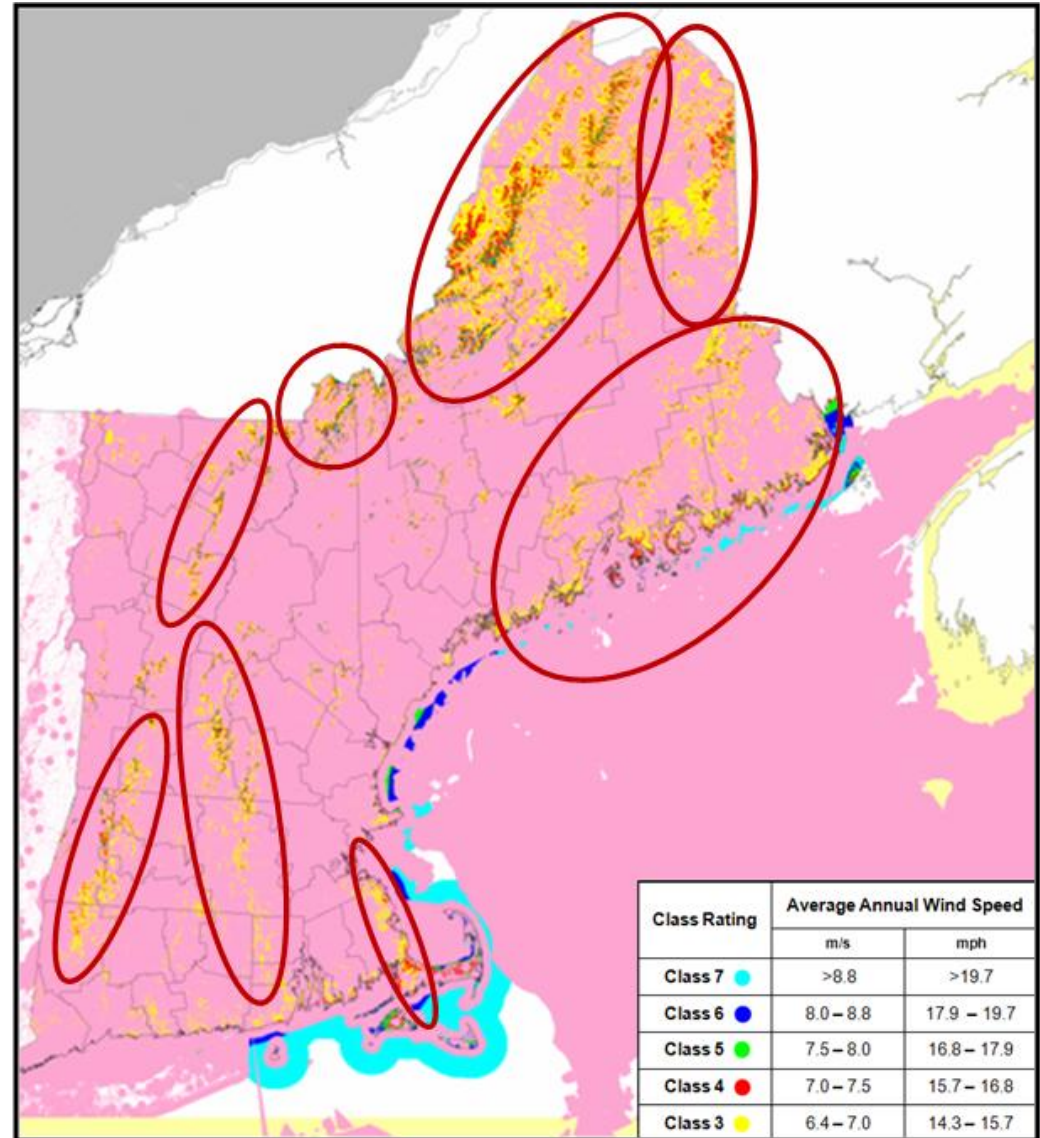
Fuel	New England	United States
Coal	14.9	48.5
Natural Gas	40.9	21.3
Oil	1.5	1.1
Nuclear	28.5	19.6
Hydro (including pumped hydro) and other renewables	14.1	9.4

# Renewable Portfolio Standards (RPS)

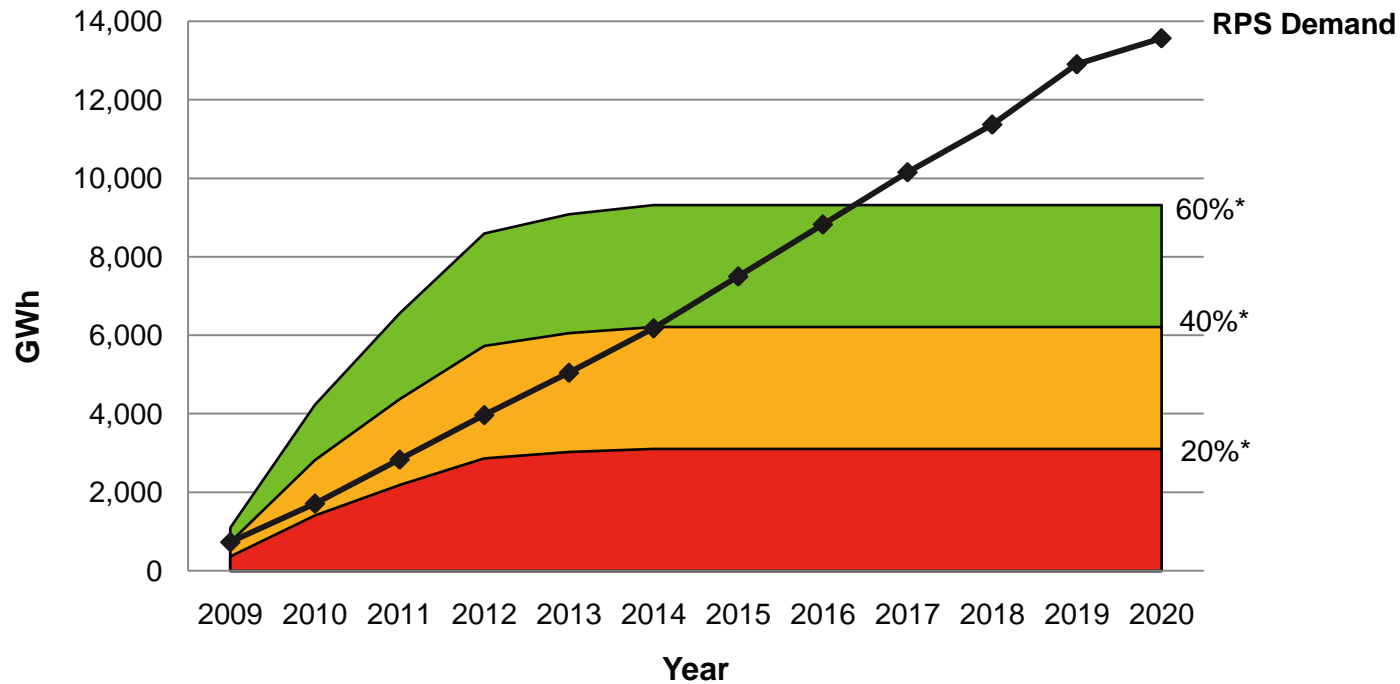


# Potential Wind Resource

- 2003 AWST 70 m map
- Screened out areas are pink
- Red ovals are large regions of onshore wind
- Approx 115 GW onshore
- Approx 100 GW offshore



# RPS Compared with Resource Production in the ISO Queue

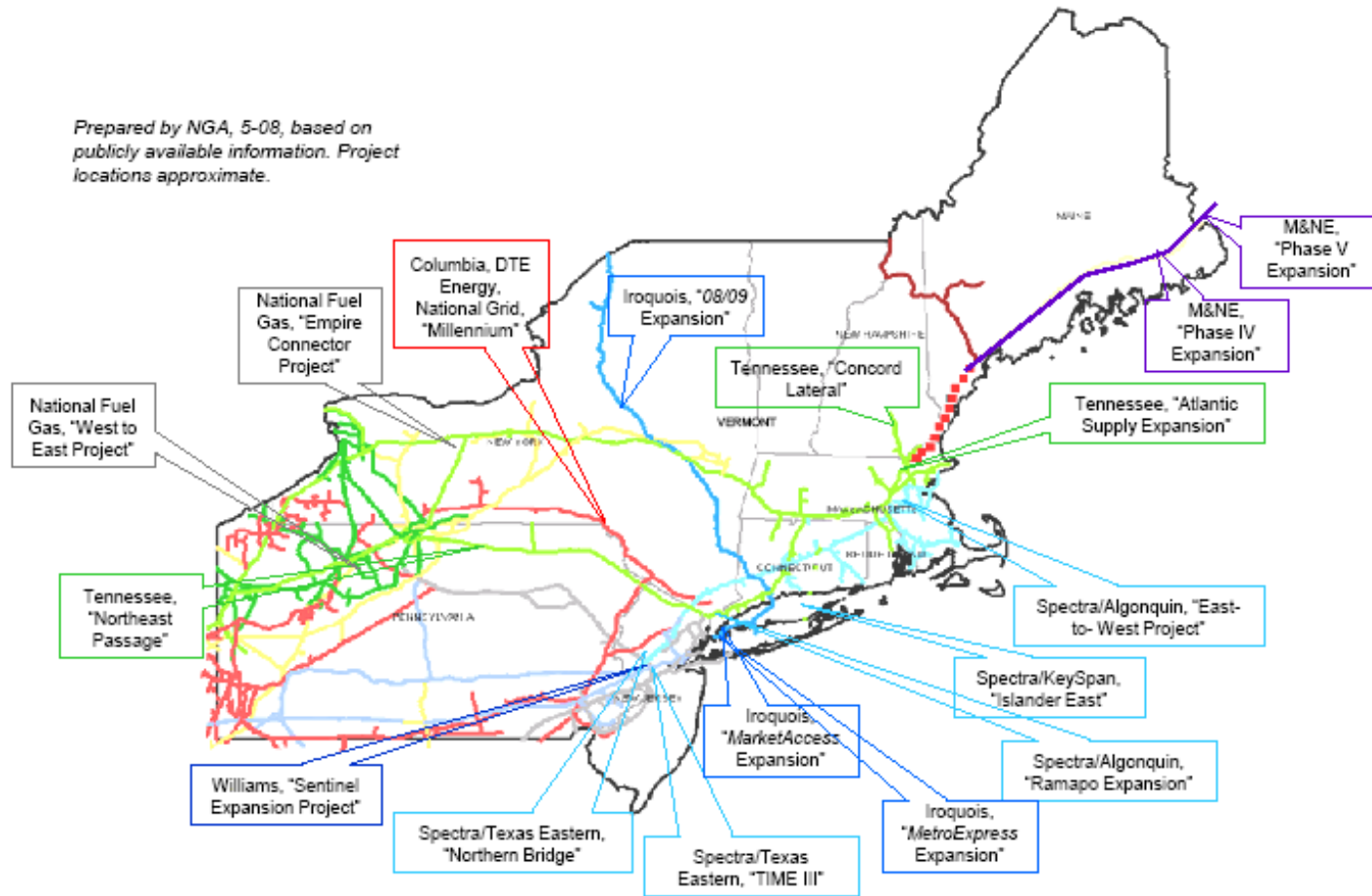


\*% of cumulative energy from queue additions

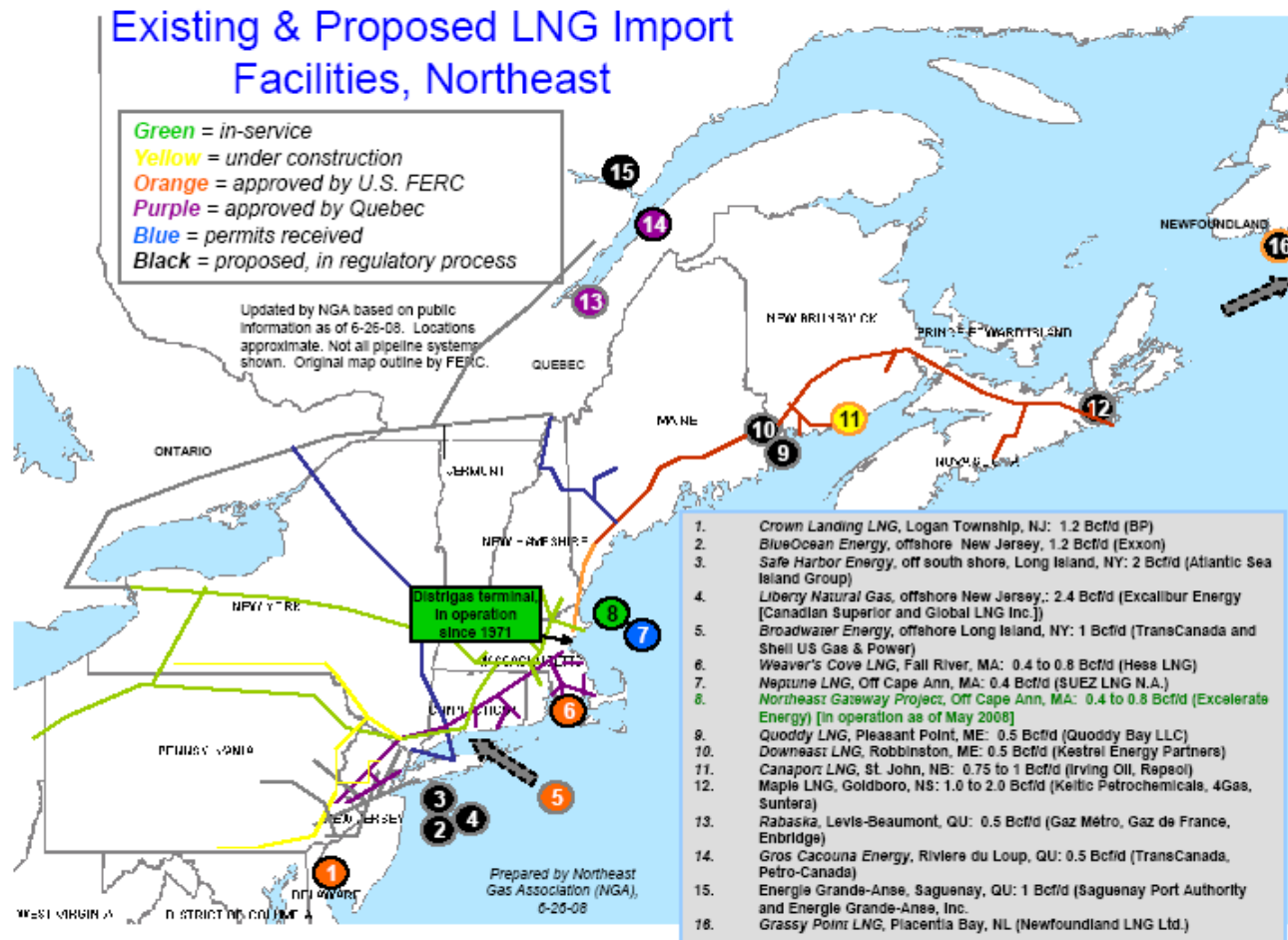
# New Natural Gas Infrastructure

## PROPOSED NORTHEAST PIPELINE PROJECTS

Prepared by NGA, 5-08, based on publicly available information. Project locations approximate.



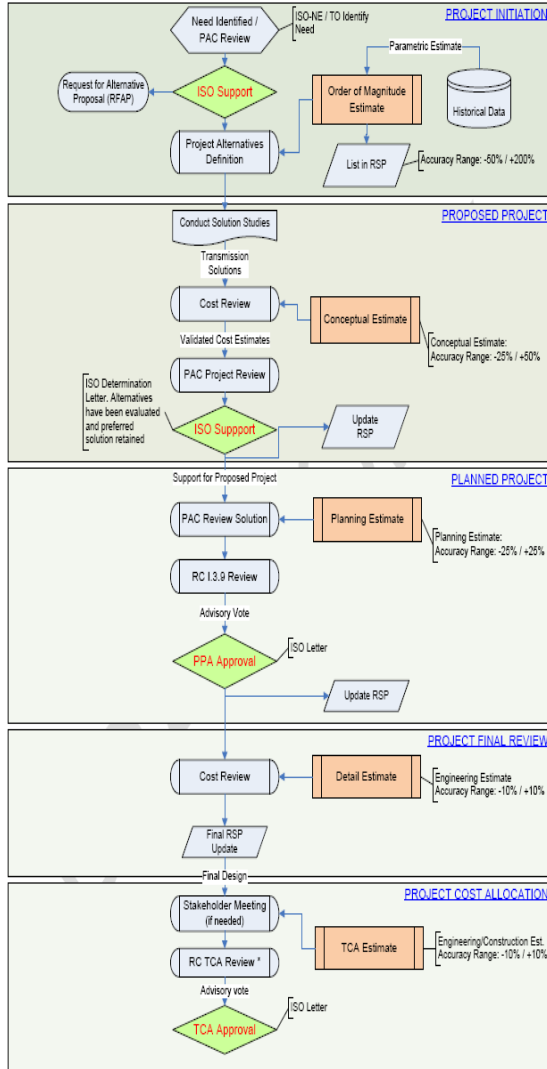
# New Natural Gas Infrastructure, *cont.*



# Periodic Project Cost Reporting to the Planning Advisory Committee

Project Cost Estimating Guidelines

Procedure #CRC-001 Rev. 2



RC: Reliability Committee  
 PAC: Planning Advisory Committee  
 PPA: Proposed Plan Application  
 TCA: Transmission Cost Application  
 (\*): If cost increase by more than 10% of PTF funding refer to PPA for details

## PROJECT COST ESTIMATE & SCHEDULE SHEET

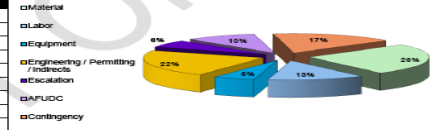
Transmission Owner: \_\_\_\_\_ RSP Project #: \_\_\_\_\_  
 Project Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Estimate Grade: \_\_\_\_\_

### 1. Project Scope Summary

### 2. Project Cost Summary

Prior Estimated Cost:

Project Cost Summary			
Cost Category	PTF	Non-PTF	Total
Material			
Labor			
Equipment			
Engineering / Permitting / Indirects			
Escalation			
AFUDC			
Contingency			
<b>Total Project Cost</b>			



Detailed Cost Summary by Project Element									
	Material	Labor	Equipment	Indirects	Escalation	AFUDC	Contingency	Total	PTF Amount
2.2.1 Component A (Substation)									
2.2.2 Component B (Line)									
<b>Total</b>									

### 3. Project Milestone Schedule

## PROJECT COST ESTIMATE UPDATE SHEET

Transmission Owner: \_\_\_\_\_ RSP Project #: \_\_\_\_\_  
 Project Name: \_\_\_\_\_ Estimate Grade: \_\_\_\_\_  
 Base Estimate: \_\_\_\_\_ PPA Approval: \_\_\_\_\_  
 TCA Application #: \_\_\_\_\_ Date: \_\_\_\_\_

### 1. Project Scope Summary

### 2. Project Update

### 3. Project Cost Summary

Project ABC							
Project ABC Components	Base Estimate	Base Estimate With Contingency	Scope Change	Actuals Cost	Project Forecast	Estimated % Completion	Forecast vs. Estimate
Substation A							On Track
Line B							Off Track
<b>Grand Total</b>							On Track

**Note:** On track & Off Track are indicators comparing forecasted cost to the baseline estimate for PTF funding in accordance to PP-4.

### 4. Project Forecast

