Rhode Island State Energy Plan

Advisory Council Meeting #4

April 1, 2013

Advisory Structure

Advisory Council

- Meets on a monthly basis
- Evaluates and provides feedback on research to assist staff in preparing a Preliminary Draft Plan
- Recommends Preliminary Draft Plan to the State Planning Council's Technical Committee for forwarding to the State Planning Council for public hearing, revision, and adoption

Timeline

Project Phases

Phase I: Research & Data Collection (December 2012 – May 2013) Gather and synthesize the best available energy data; Set measurable goals based on modeling analysis and stakeholder feedback; Design an actionable implementation strategy
Phase II: Preparation of Preliminary Draft Plan (June 2013 – September 2013) Distill research developed during Phase I into a Preliminary Draft Plan
Phase III: Technical & Public Review (October 2013 – March 2014) Vet Preliminary Draft Plan through a technical and public review process; Adopt Plan as State Guide Plan Element

Today

April Meeting

Agenda:

- Presentation of preliminary results from Task 1: Baseline & Task 2: Forecast
- Presentation of updated directional objectives
- Introduction to Task 3: Scenarios

Preliminary Findings

TASK 1: BASELINE

Rhode Island State Energy Plan Scope

- ***Gather Data*: Analyze and quantify the amount, cost, supply, and environmental effects of all forms of energy resources—currently used, and potentially available to use—within all sectors in Rhode Island.**

- ***Set Goals*: Identify measurable targets for providing energy services using a resource mix that meets a set of criteria advancing the health, environmental, economic, and human wellbeing of the people, communities, and environment of Rhode Island.**

- ***Recommend Action*: Design a comprehensive implementation strategy to meet the goals of the Plan through public, private, and individual efforts.**

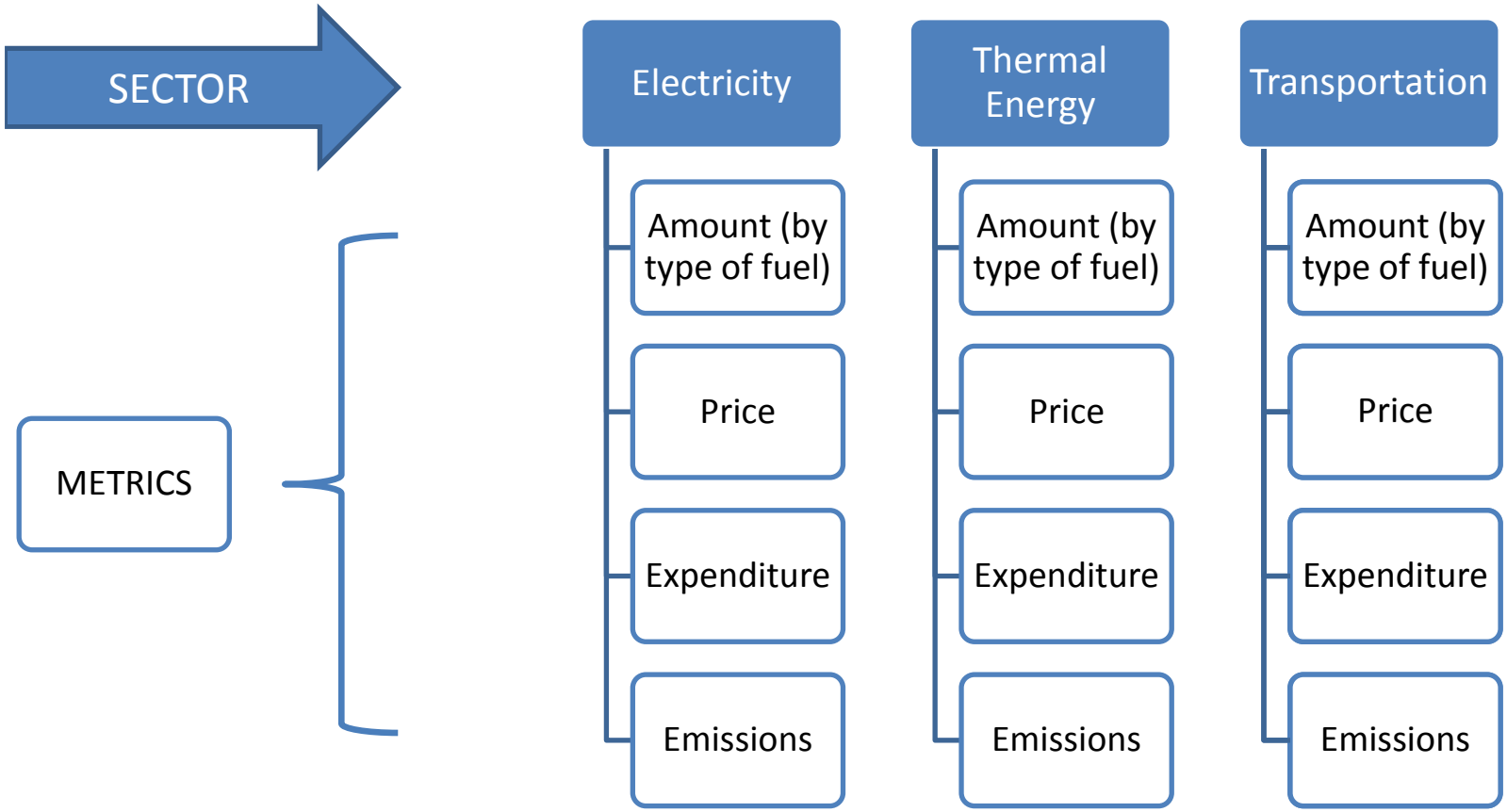
Step 1 - *Gather Data*

"What do we face?"

- ***Gather Data*: Analyze and quantify the amount, cost, supply, and environmental effects of all forms of energy resources—currently used, and potentially available to use—within all sectors in Rhode Island.**

Step 1 - *Gather Data*

TASK 1: BASELINE



TASK 1 - *Baseline*

Whole Energy System

- In **2010**, Rhode Island consumed **199,000 Billion BTUs** of energy. This fuel consumption cost **$3.6 billion** and generated **11 million tons** of C02 emissions

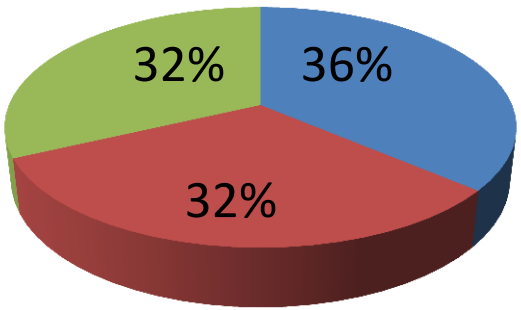
Sector	Consumption (Billion BTU)	Expenditure (Million $)	Carbon Emissions (Metric Tons)
Electricity	72,132	$ 1,097.80	2,934,632
Thermal	63,269	$ 1,108.90	3,909,238
Transportation	63,627	$ 1,378.20	4,486,604
Total	**199,028**	**$ 3,584.90**	**11,330,473**

Source: EIA SEDS, EIA-923

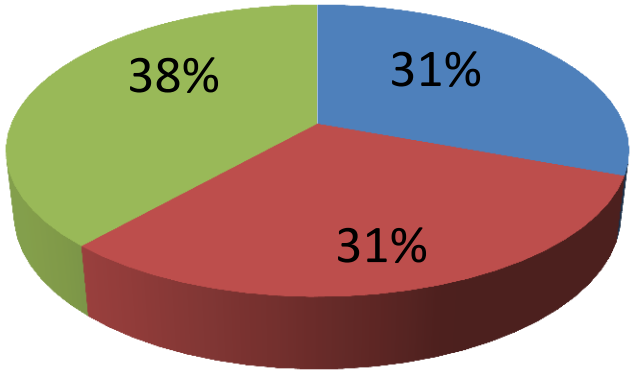
TASK 1 - *Baseline*

Whole Energy System

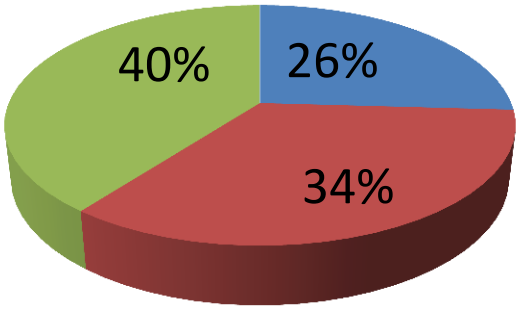
Consumption (Billion BTU)



Expenditure (Million $)



Carbon Emissions (Metric Tons)

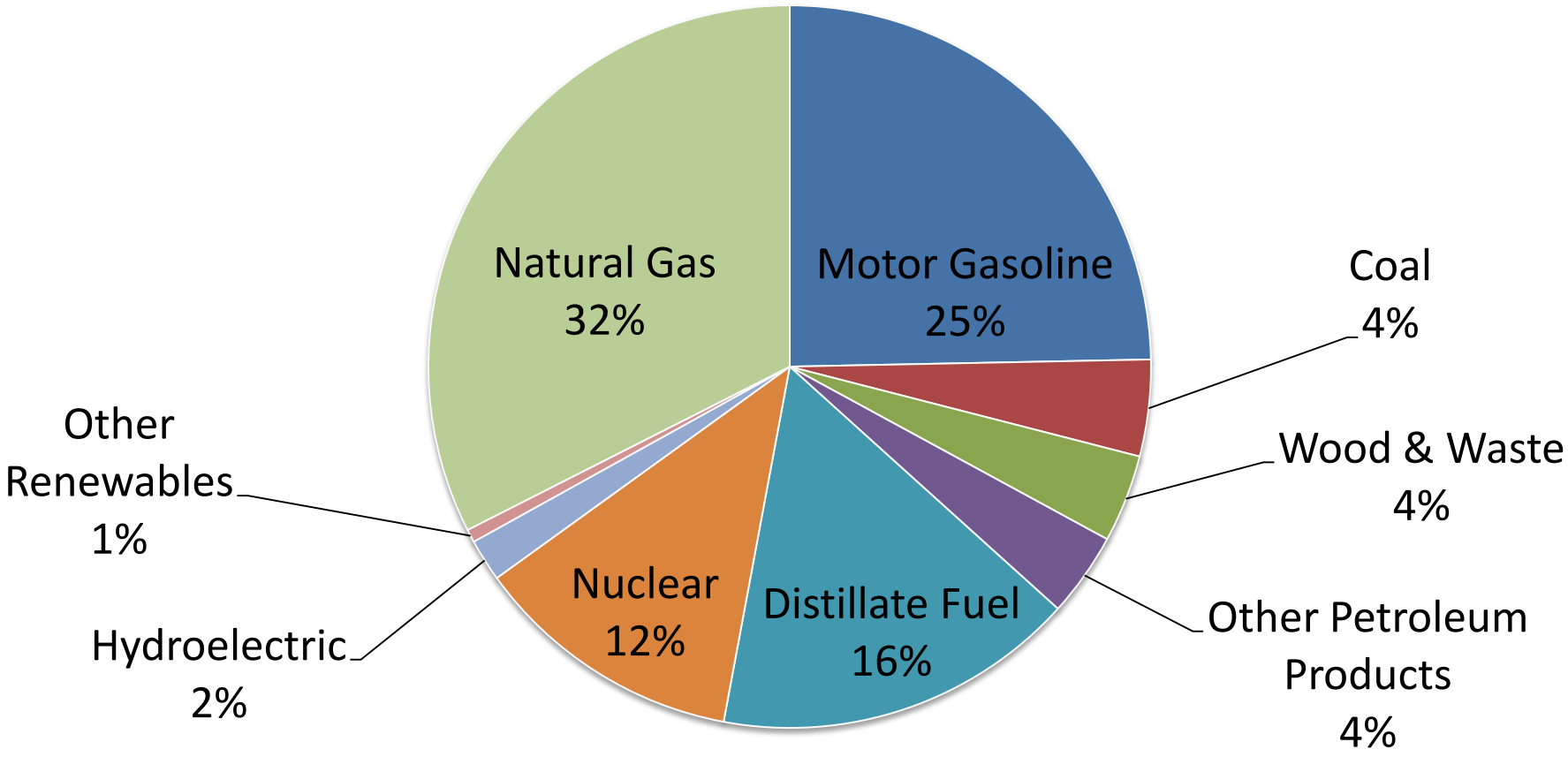


Electricity Thermal Transportation

TASK 1 - *Baseline*

Whole Energy System

Rhode Island Fuel Consumption 2010 - All Sectors



Source: EIA SEDS, EIA-923

TASK 1 - *Baseline*

Electricity: Summary

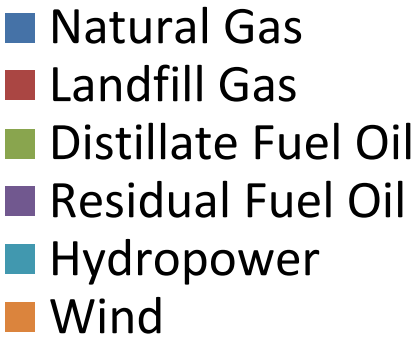
- In **2010**, Rhode Island's electric sector consumed **8,346 GWh** of energy. This fuel consumption cost **$1.1 billion** and generated **2.9 million tons** of C02 emissions

Source: EIA SEDS, ISO-NE

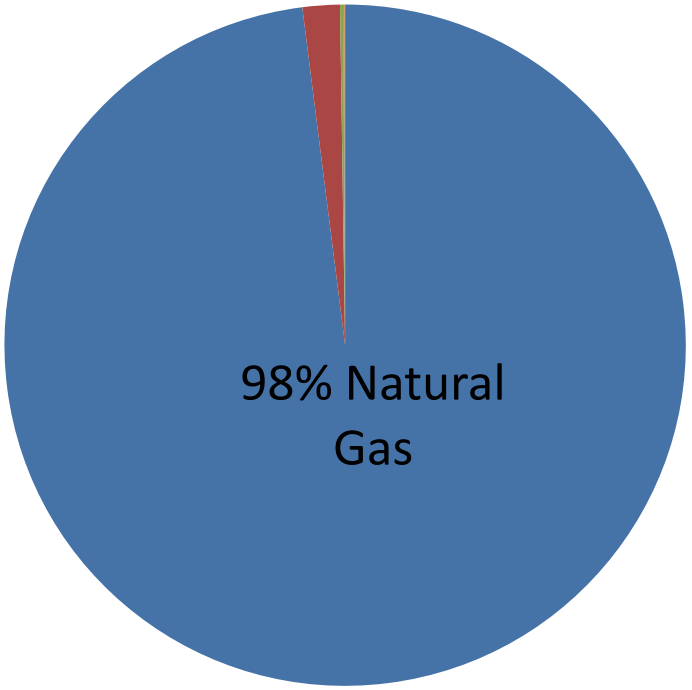
TASK 1 - *Baseline*

Electricity: In-State Generation

Fuel	Net Generation (MWh)
Natural Gas	7,583,281
Landfill Gas	136,949
Distillate Fuel Oil	11,546
Residual Fuel Oil	113
Hydropower	3,706
Wind	3,124
Grand Total	**7,738,719**



Rhode Island Net Generation (MWh) - 2010

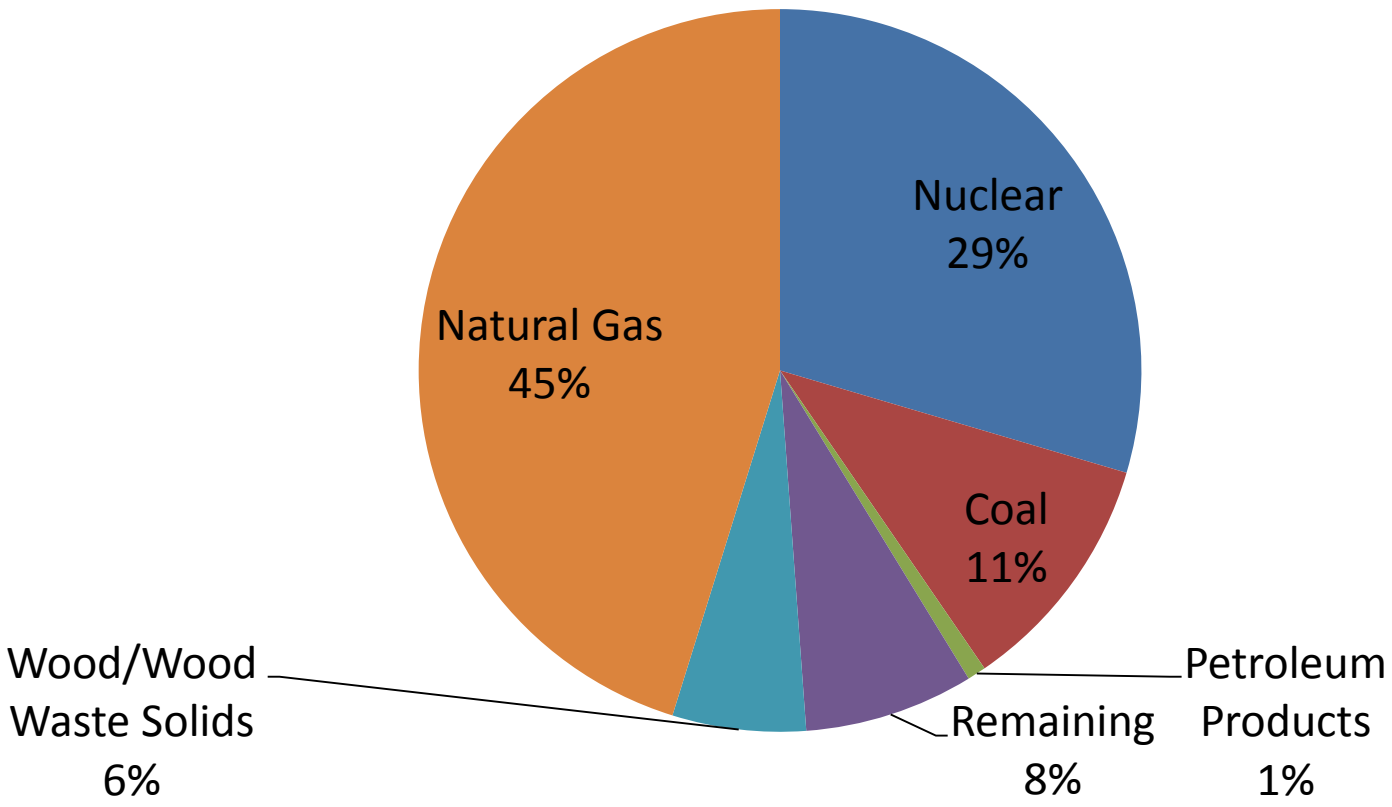


Source: EIA-923

TASK 1 - *Baseline*

Electricity: Regional Generation

New England Net Generation (MWh) - 2010

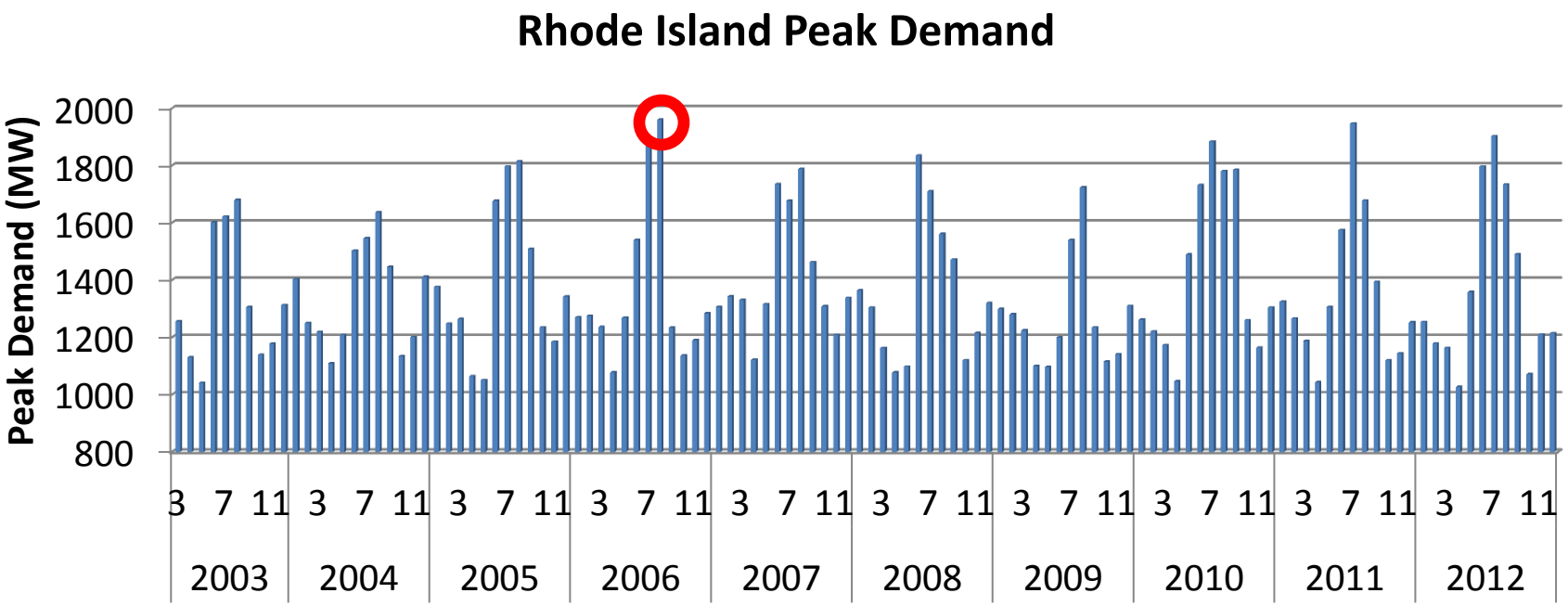


Source: EIA-923

TASK 1 - *Baseline*

Electricity: Peak Demand

- Rhode Island's record historical peak load of **1960 MW** occurred during **August 2006**



Source: ISO-NE

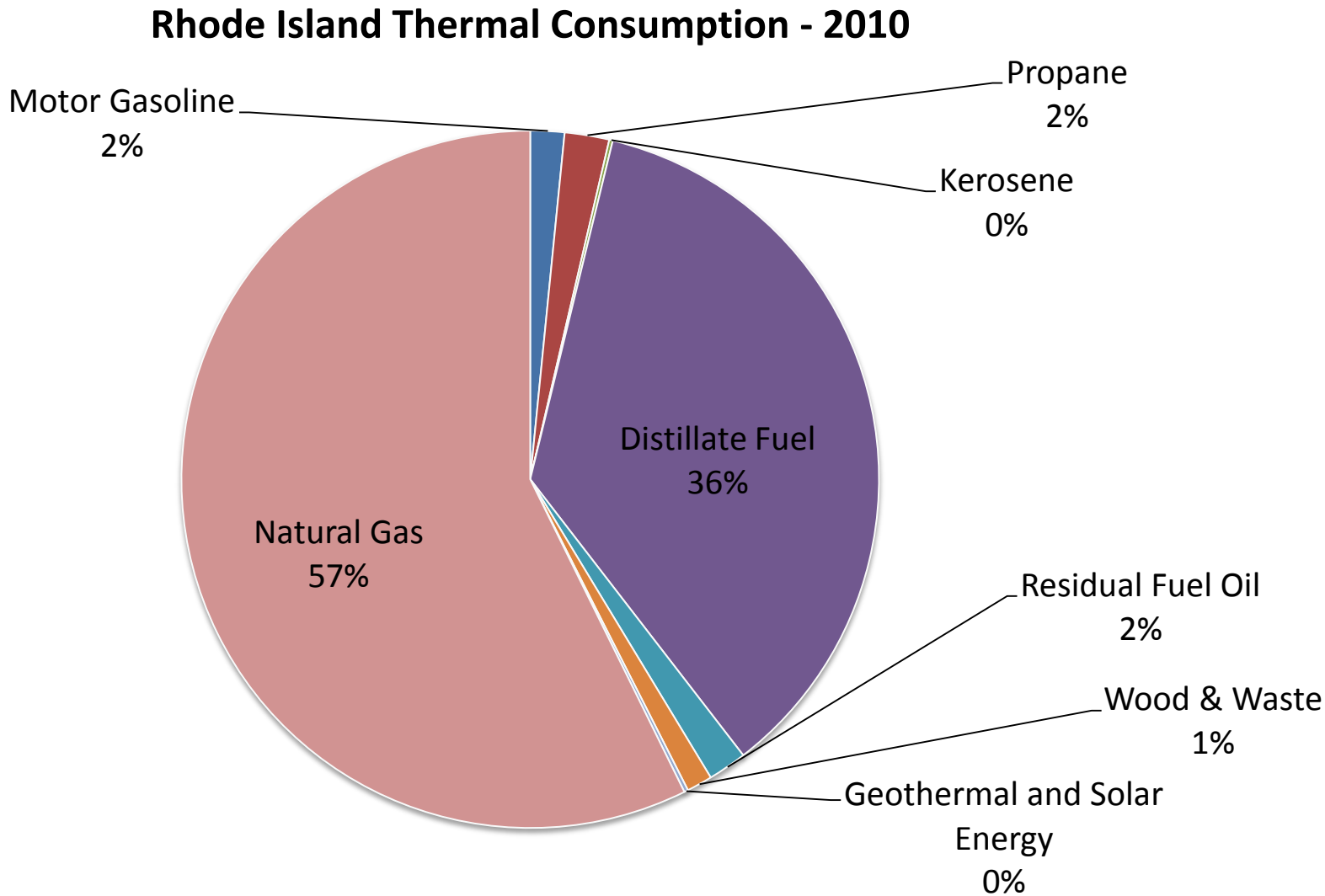
TASK 1 - *Baseline*

Thermal: Summary

- In **2010**, Rhode Island's thermal sector consumed **63,269 Billion BTUs** of energy. This fuel consumption cost **$1.1 billion** and generated **3.9 million tons** of C02 emissions

TASK 1 - *Baseline*

Thermal: Summary



Source: EIA SEDS

TASK 1 - *Baseline*

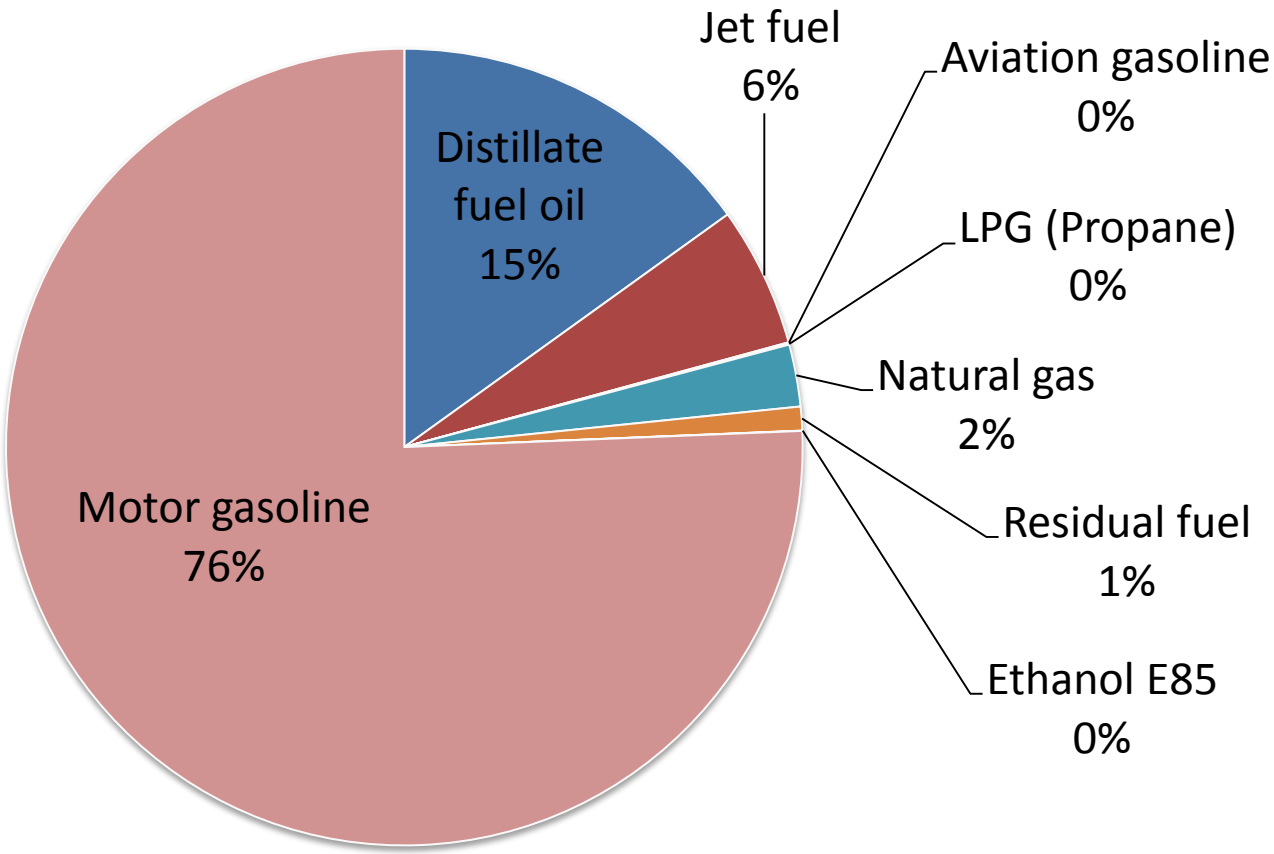
Transportation: Summary

- In **2010**, Rhode Island's transportation sector consumed **63,627 Billion BTUs** of energy. This fuel consumption cost **$1.4 billion** and generated **4.5 million tons** of C02 emissions

TASK 1 - *Baseline*

Transportation: Summary

Rhode Island Transportation Consumption - 2010

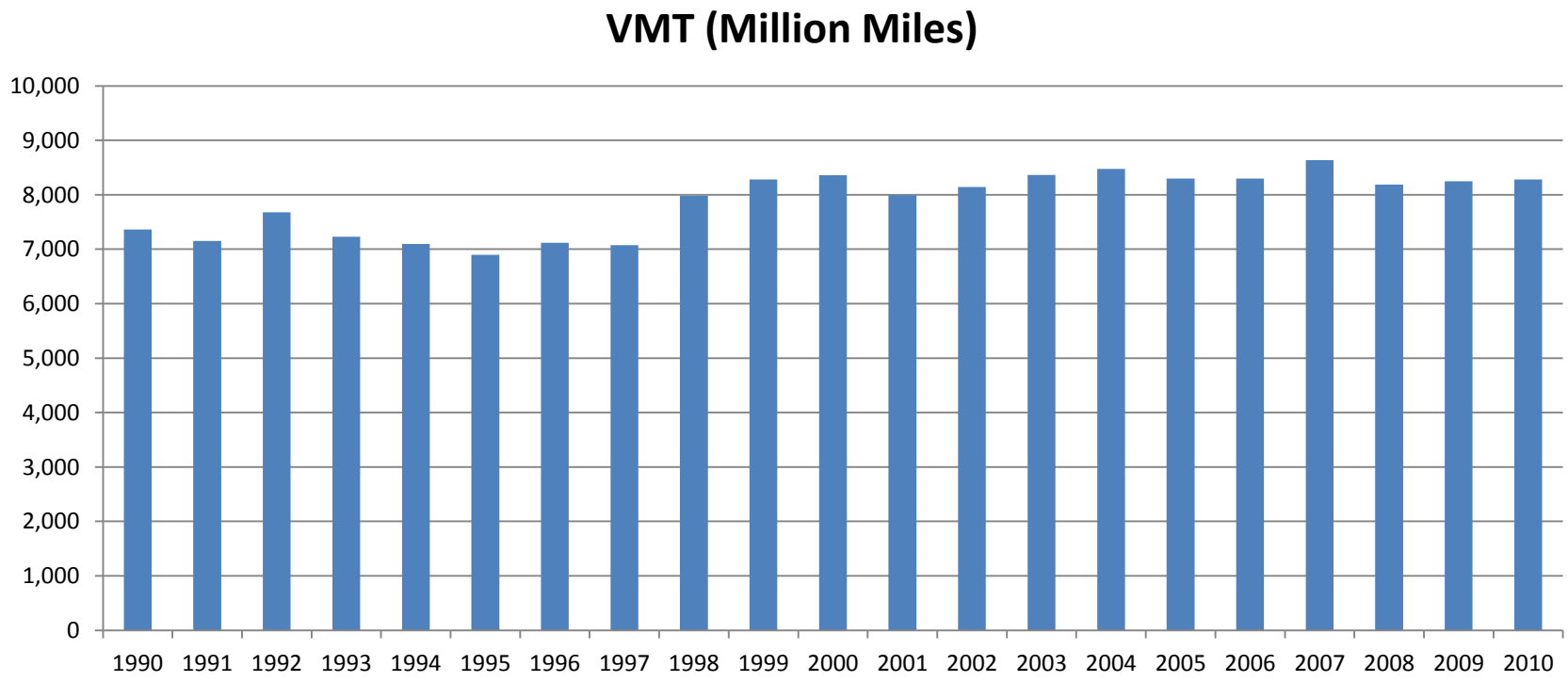


Source: EIA SEDS, EIA Alternative Fuel Data

TASK 1 - *Baseline*

Transportation: VMT's

- In **2010** Rhode Islanders drove **8,280,000 miles**



Source: Federal Highway Administration

Preliminary Findings

TASK 2: FORECAST

RISEP Task 2 - Future State Energy Profile Report Preliminary Results

RISEP, Advisory Council Meeting

April 1, 2013

Rhode Island

Varun Kumar, Policy and Data Analyst and Jamie Howland, Director, ENE Climate and Energy Analysis Center (ENE CLEAN Center), Environment Northeast

National Forecasts

RISEP BAU Base Case	• This scenario is based on the AEO 2013 Early Release AEO 2013ER reference case. The AEO case was adjusted to include the impacts of increase in energy efficiency .
RISEP BAU Low Oil Price Case	• This scenario differs from the RISEP BAU Base case with a lower price for petroleum-based fuels. It is based on AEO 2012 Low Oil Price case.
RISEP BAU High Oil Price Case	• This scenario differs from the RISEP BAU Base case with a higher price for petroleum-based fuels. It uses the AEO 2012 High Oil Price case. Further, impacts of the Rhode Island Petroleum Savings and Independence Advisory Commission's recommended targets are included.
RISEP BAU Low Natural Gas Price Case	• This scenario differs from the RISEP BAU Base case with a lower price for natural gas. It uses the AEO 2012 Oil and Gas: High Technically Recoverable Resources (TRR) case.
RISEP BAU High Natural Gas price Case	• This scenario differs from the RISEP BAU Base case with a higher price for natural gas. It uses the AEO 2012 Oil and Gas: Low EUR case.
RISEP BAU Carbon Fee Case	• This scenario differs from the RISEP BAU case with an applied economy wide carbon fee starting at 15$ and rising by 5 percent per year from 2013 through 2035.

ENE
Environment Northeast

Energy Sectors

Electricity

- Power Generation - Distillate Fuel Oil, Residual Fuel Oil, Natural Gas and Coal.
- Electricity consumption - Residential, Commercial, Transportation and Industrial..

Thermal

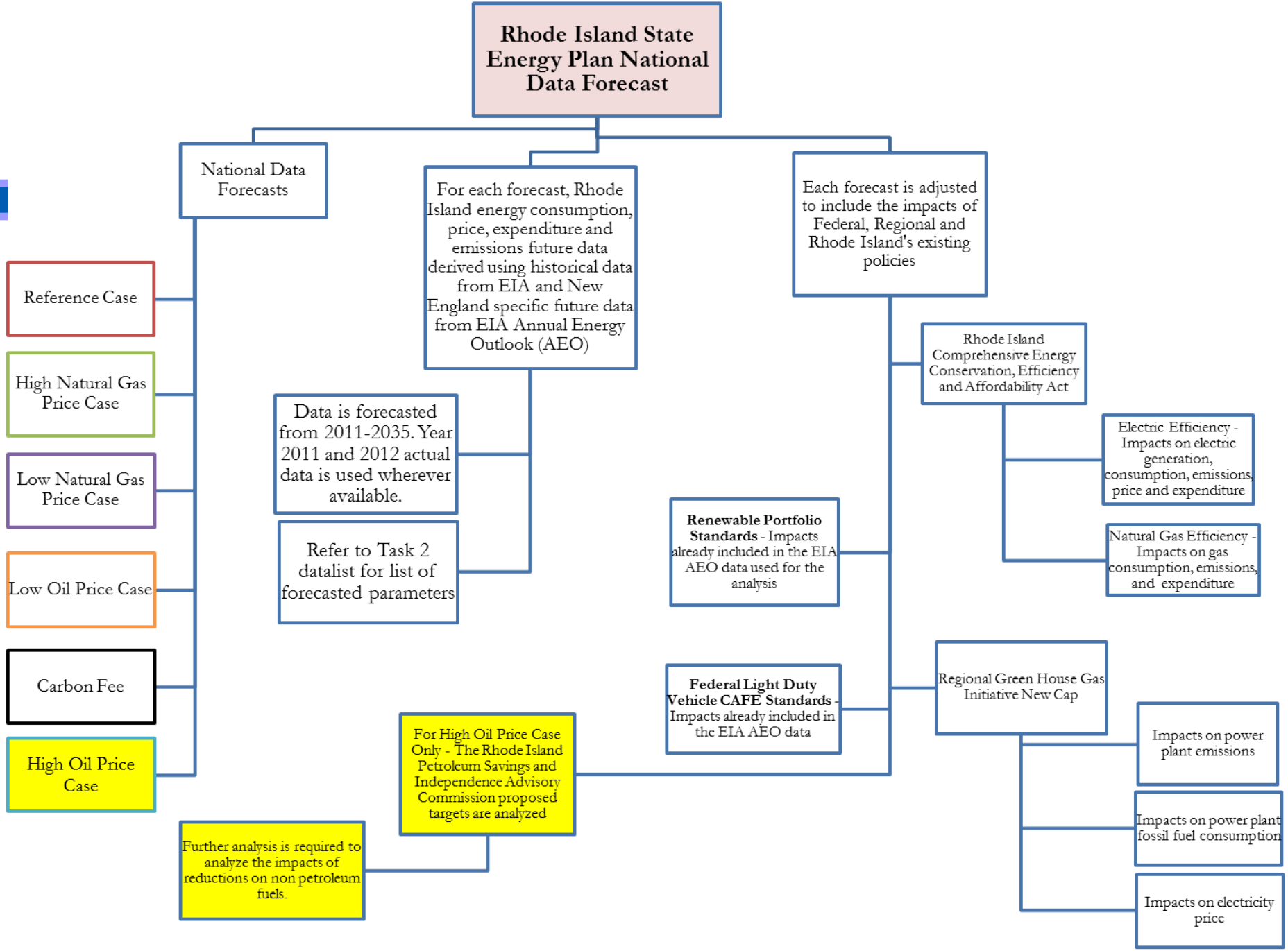
- Residential – Propane, Distillate Fuel Oil (heating oil), Kerosene and Natural Gas.
- Commercial - Propane, Distillate Fuel Oil, Residual Fuel Oil, Kerosene and Natural Gas.
- Industrial - Propane, Distillate Fuel Oil, Residual Fuel Oil, Natural Gas and Coal.

Transportation

- Propane, Distillate Fuel, Motor Gasoline, Jet Fuel, Residual Fuel Oil, E85 and Natural Gas.

Pictures from Freedigitalphotos.net

ENE Environment Northeast


Rhode Island State Energy Plan National Data Forecast
National Data Forecasts
Reference Case
High Natural Gas Price Case
Low Natural Gas Price Case
Low Oil Price Case
Carbon Fee
High Oil Price Case
For each forecast, Rhode Island energy consumption, price, expenditure and emissions future data derived using historical data from EIA and New England specific future data from EIA Annual Energy Outlook (AEO)
Data is forecasted from 2011-2035. Year 2011 and 2012 actual data is used wherever available.
Refer to Task 2 datalist for list of forecasted parameters
Each forecast is adjusted to include the impacts of Federal, Regional and Rhode Island's existing policies
Rhode Island Comprehensive Energy Conservation, Efficiency and Affordability Act
Electric Efficiency - Impacts on electric generation, consumption, emissions, price and expenditure
Natural Gas Efficiency - Impacts on gas consumption, emissions, and expenditure
Renewable Portfolio Standards - Impacts already included in the EIA AEO data used for the analysis
Federal Light Duty Vehicle CAFE Standards - Impacts already included in the EIA AEO data
Regional Green House Gas Initiative New Cap
Impacts on power plant emissions
Impacts on power plant fossil fuel consumption
Impacts on electricity price
For High Oil Price Case Only - The Rhode Island Petroleum Savings and Independence Advisory Commission proposed targets are analyzed
Further analysis is required to analyze the impacts of reductions on non petroleum fuels.

DATA SOURCES AND ANALYSIS METHODOLOGY

Forecast Model Input Data

- Baseline data is from Energy Information Administration (EIA) State Energy Data System (SEDS).

- Projected data from :

  - ✓ EIA Annual Energy Outlook (AEO) -
    - EIA AEO 2013 ER Reference Case – New England specific data through 2040.
    - EIA AEO 2012 Alternative Cases – New England specific data through 2035.

ENE
Environment Northeast

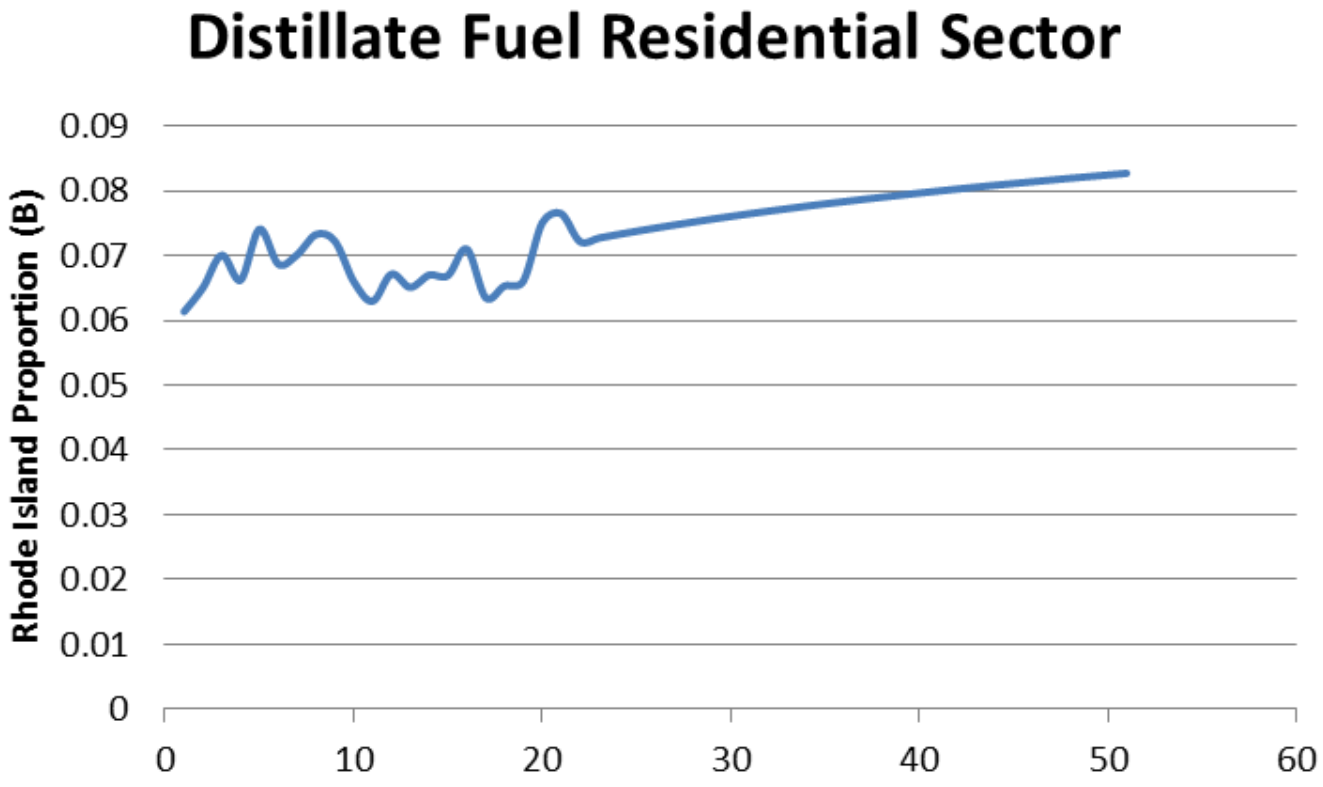
Derivation of Rhode Island Results Based on EIA AEO New England Data

- EIA AEO results are region specific and are available in aggregated form for New England.
- Rhode Island specific results were derived by analyzing historical relationship between region and the state.
- Key parameters used to analyze relationship are historical proportions (B):
- B1 = Rhode Island Consumption/New England Consumption.
- B2 = Rhode Island Price/New England Price.

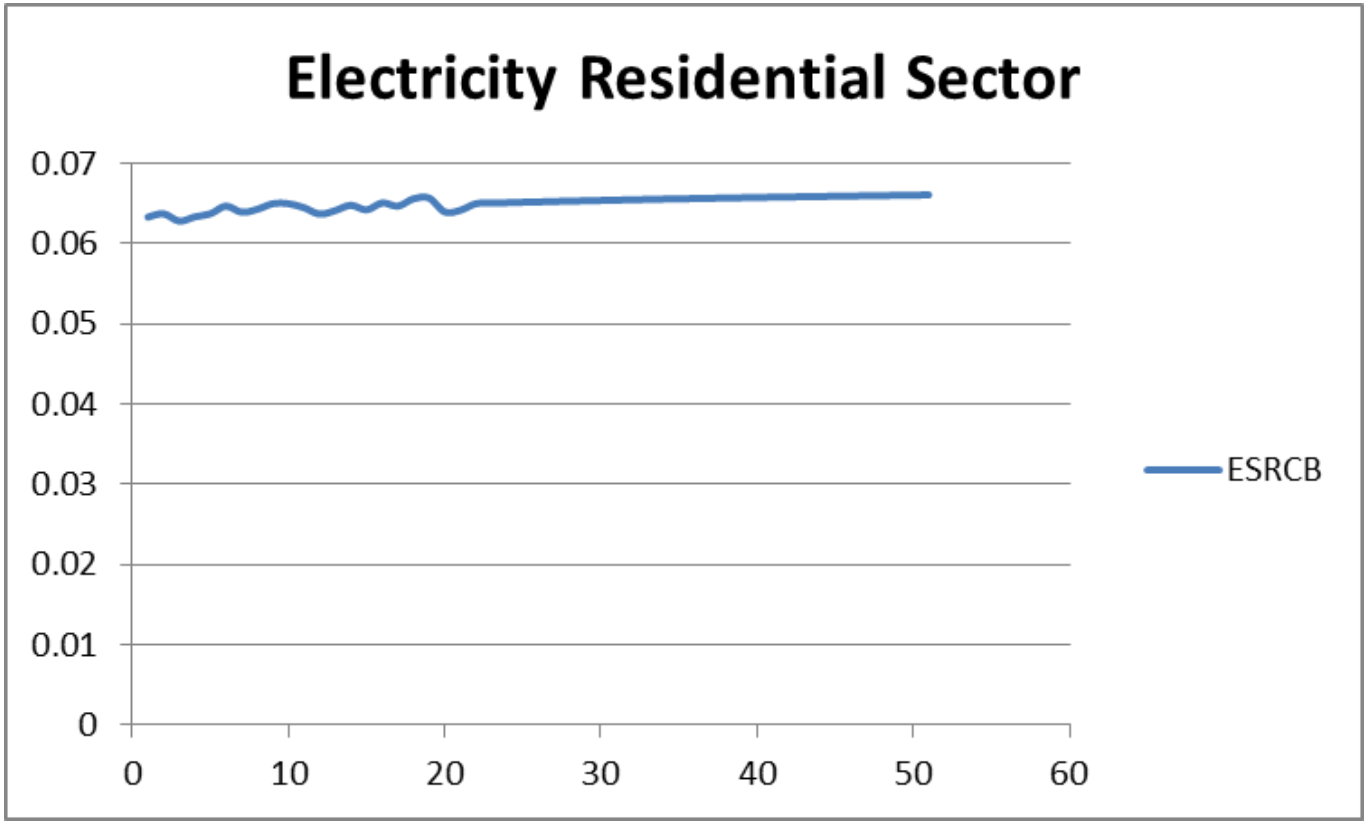
Derivation of Rhode Island Results Based on EIA AEO – Fuel Consumption Parameter B Data

- For fuel consumption parameter B was forecasted using historic time series data.
- Considering future uncertainty regarding changes in Rhode Island demand compared to New England we made a conservative assumption that existing trends will stabilize and used logarithmic trend line.
- Logarithmic trend line is suitable to capture recent trends which stabilizes in future.

Some of the consumption historical proportion (B1) trends



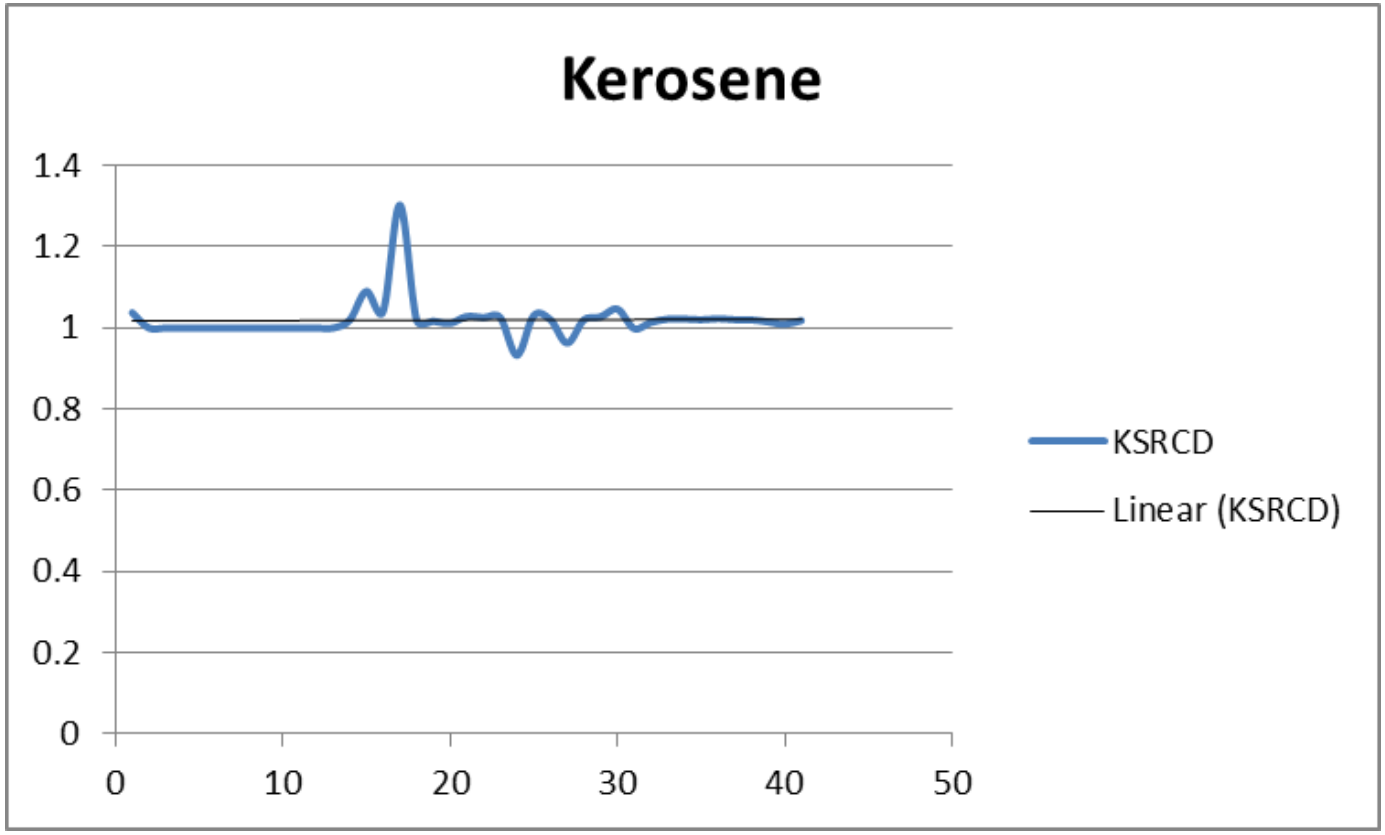
Some of the consumption historical proportion (B1) trends



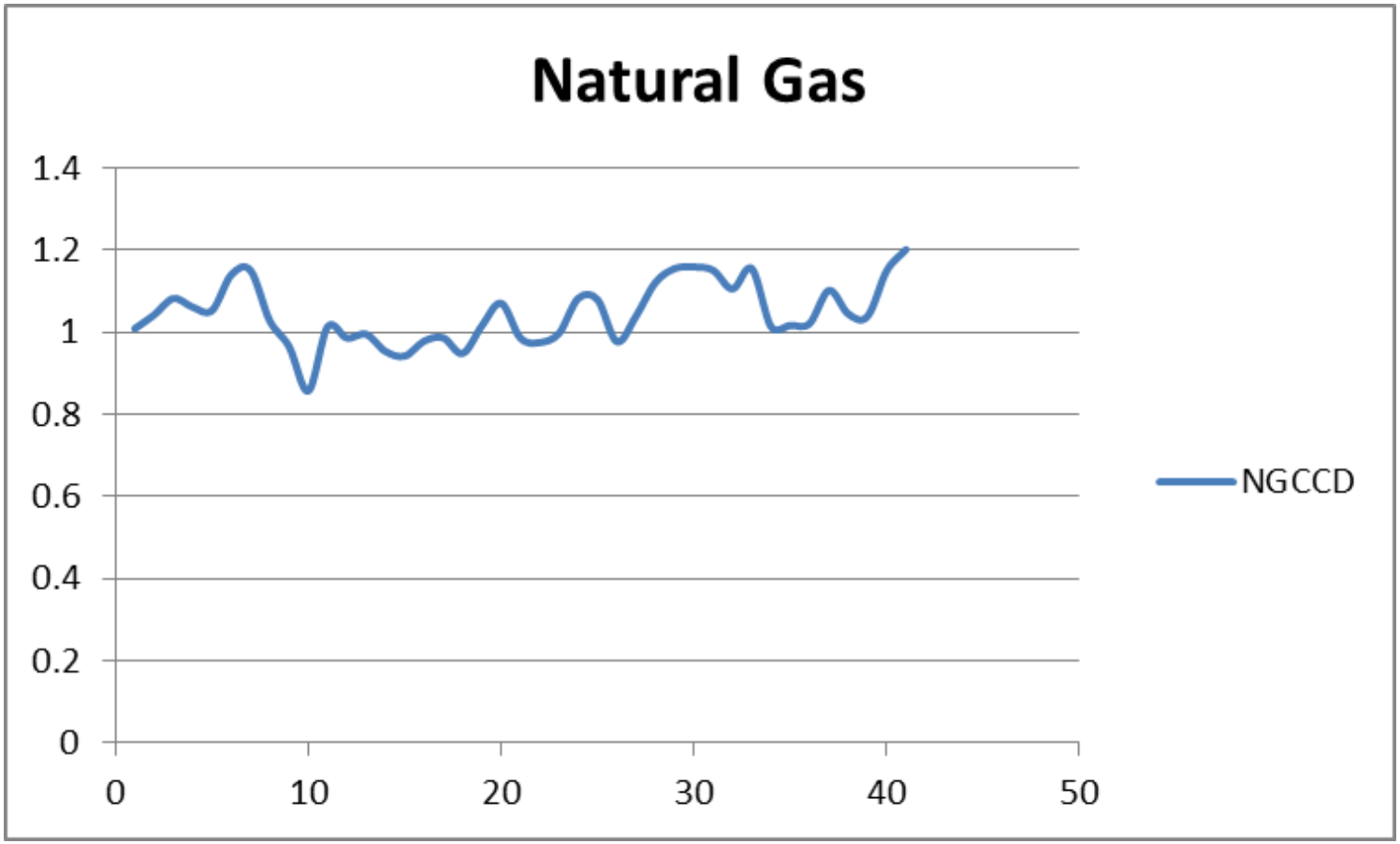
Derivation of Rhode Island Results Based on EIA AEO – Fuel Price Data

- For price parameter B2 data was random and without historical trends

Some of the price historical proportion (B2) trends



Some of the price historical proportion (B2) trends



Continued….

- Rhode Island specific Energy Price and Consumption is derived by applying forecasted B1 and B2 on New England Data
- Energy expenditure is derived using consumption and price data.
- Greenhouse gas emissions are derived using consumption and emission factors data.

ENE
Environment Northeast

Policy Impacts- Energy Efficiency

- Results derived from the AEO were adjusted by the impacts of increased energy efficiency based on assumed savings targets.
- Electricity and Natural Gas consumption and price was adjusted for residential and commercial sector.
- Electricity Generation was adjusted for Fossil Fuels based Power Plants.
- Price suppression impact or Demand Reduction Induced Price Impact (DRIPE) was included while evaluating electricity price impact using National Grid Energy Efficiency Plan Data.

Electric Efficiency

Year	Electric Efficiency Savings Target (Percentage of Sales)	Source
2012	1.7%	RI Energy Efficiency Procurement Plan 2012-14
2013	2.1%	
2014	2.5%	
2015-2021	2.7%	ENE proposed based on KEMA RI Energy Efficiency Opportunity Report
2022-2024	2%	ENE proposed conservative estimate based on anticipated new opportunity.
2025-2035	1.5%	

ENE
Environment Northeast

Natural Gas Efficiency

Year	Natural Gas Efficiency Savings Target (Percentage of Sales)	Source
2012	0.6%	RI Energy Efficiency Procurement Plan 2012-14
2013	0.8%	
2014	1%	
2015-2017	1%	ENE proposed based on VEIC Optimal Consultant Team RI Opportunity Report.
2018-2020	1%	ENE proposed conservative estimate based on anticipated new opportunity.
2021-2035	0.5%	

ENE
Environment Northeast

Regional Green House Initiative (RGGI) New Cap

- Following parameters were adjusted:
  - Natural gas power generation consumption
  - Electricity energy and capacity price
- RGGI Inc. IPM model forecasted old and new cap differences were used to evaluate impacts
- Above mentioned parameters were adjusted.

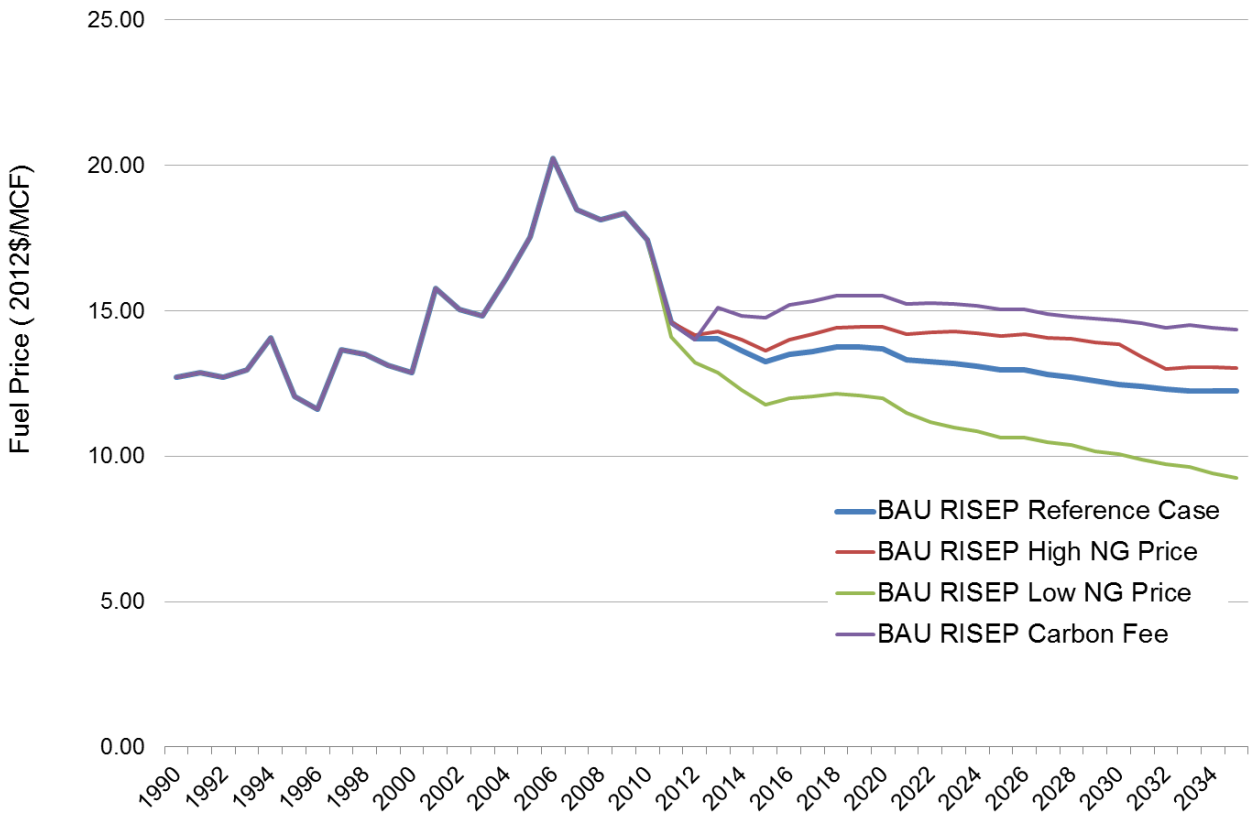
Petroleum Voluntary Target Analysis Methodology For High Oil Price Case

- Petroleum target for 2030 was found to be met for the results of High Oil Price case
- Required reductions to achieve 2050 target were annually distributed.
- Reductions till 2035 were derived by adjusting forecasted key petroleum products consumption values with required yearly reductions to meet the 2050 target.

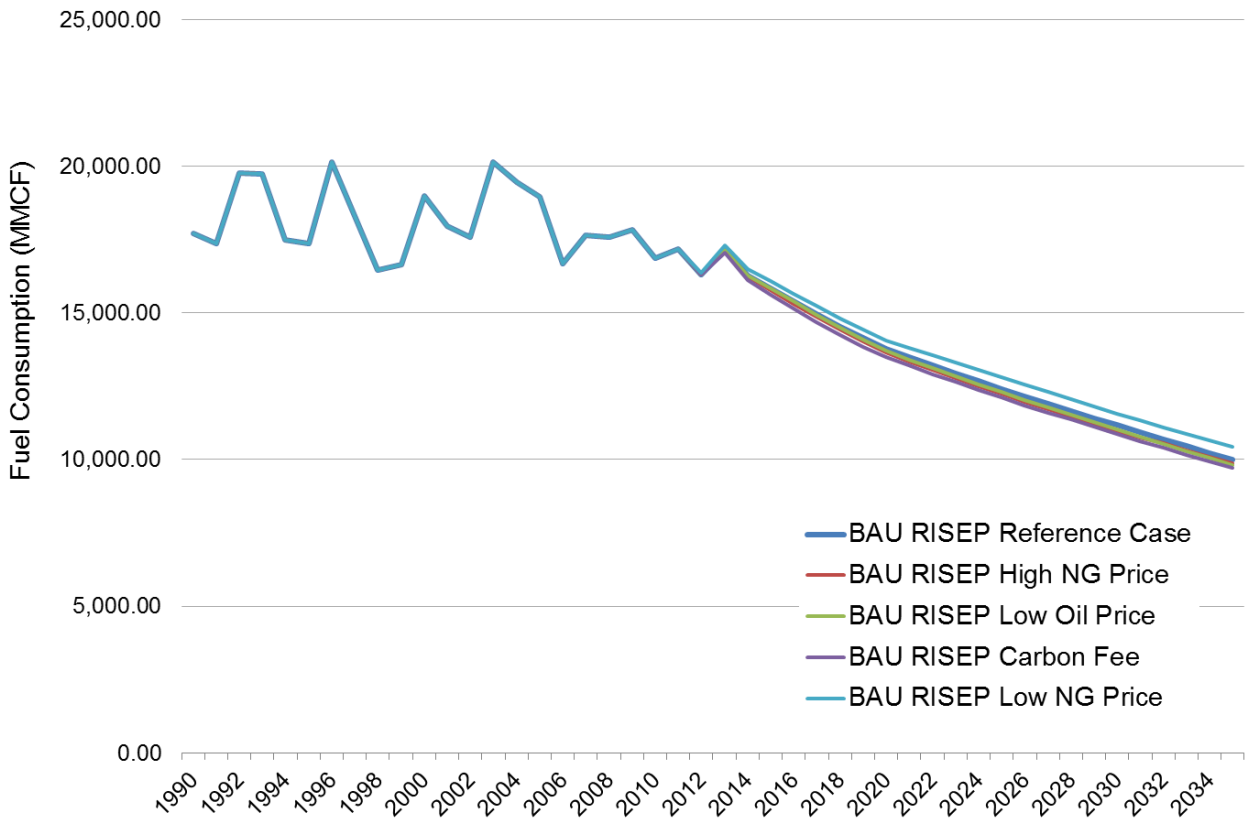
ENE
Environment Northeast

SUMMARY RESULTS

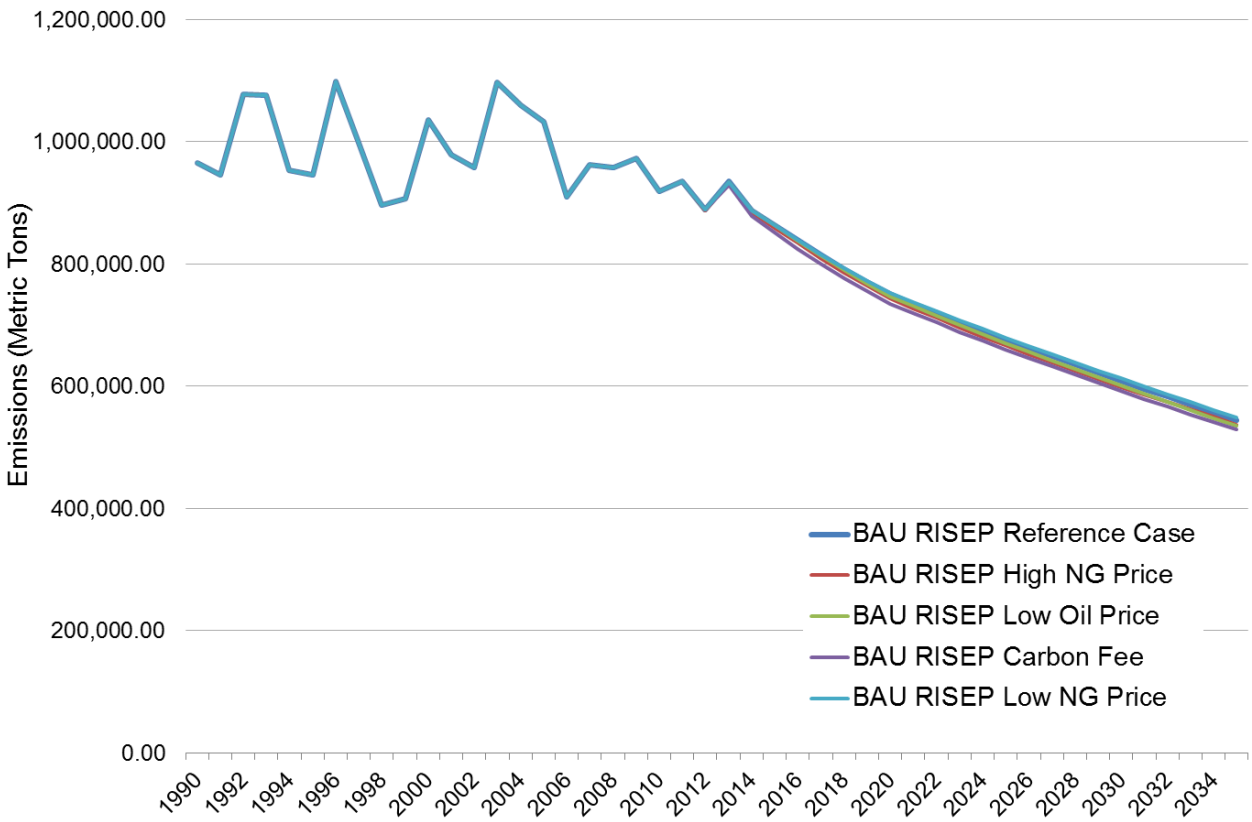
Thermal Sector – Residential Sector Natural Gas Prices



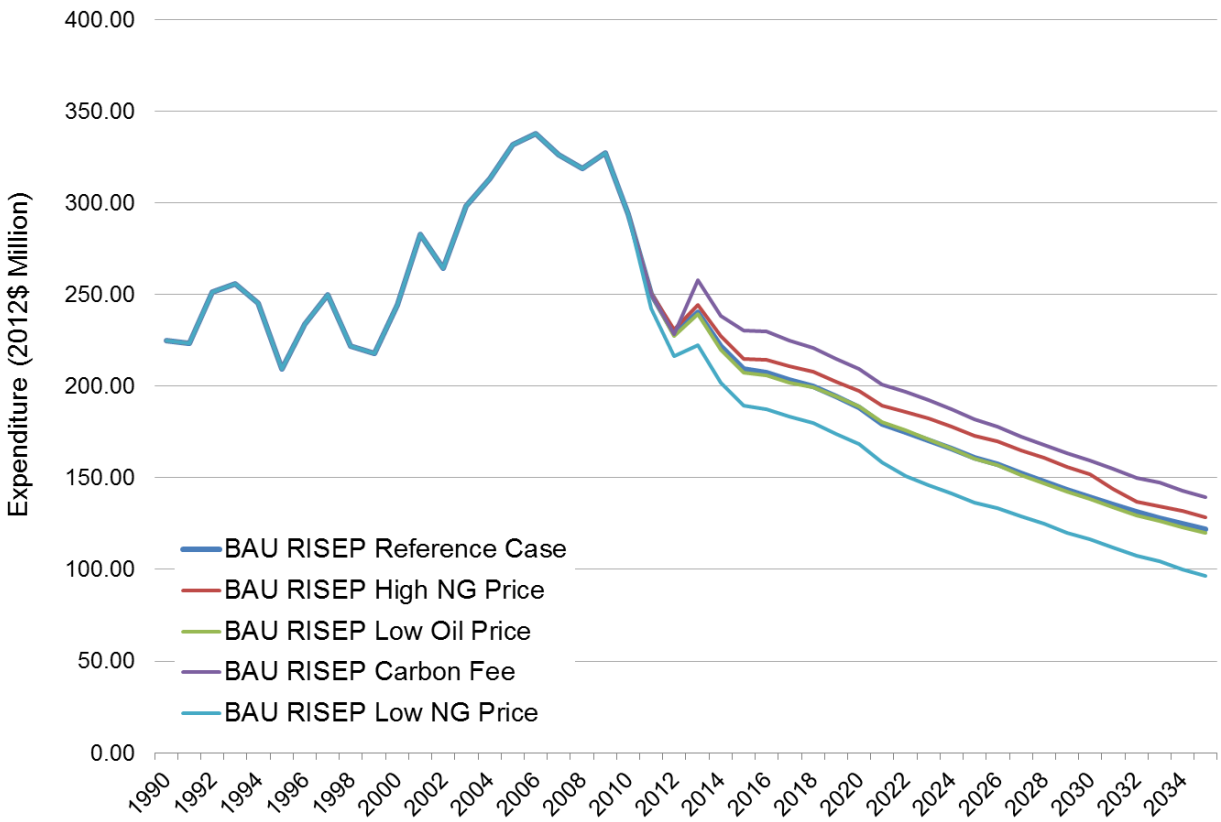
Thermal Sector – Residential Sector Natural Gas Consumption – Shows NG Efficiency Impact



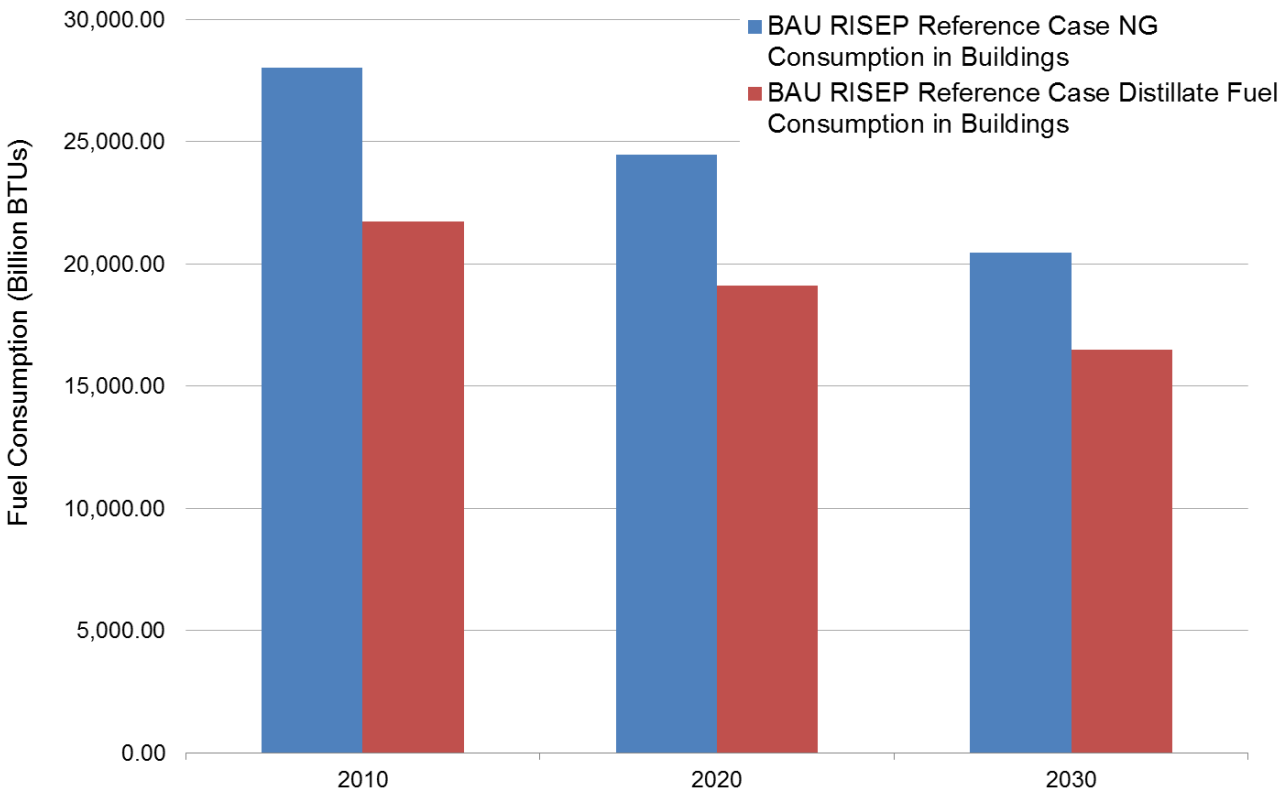
Thermal Sector - Residential Sector Natural Gas Emissions



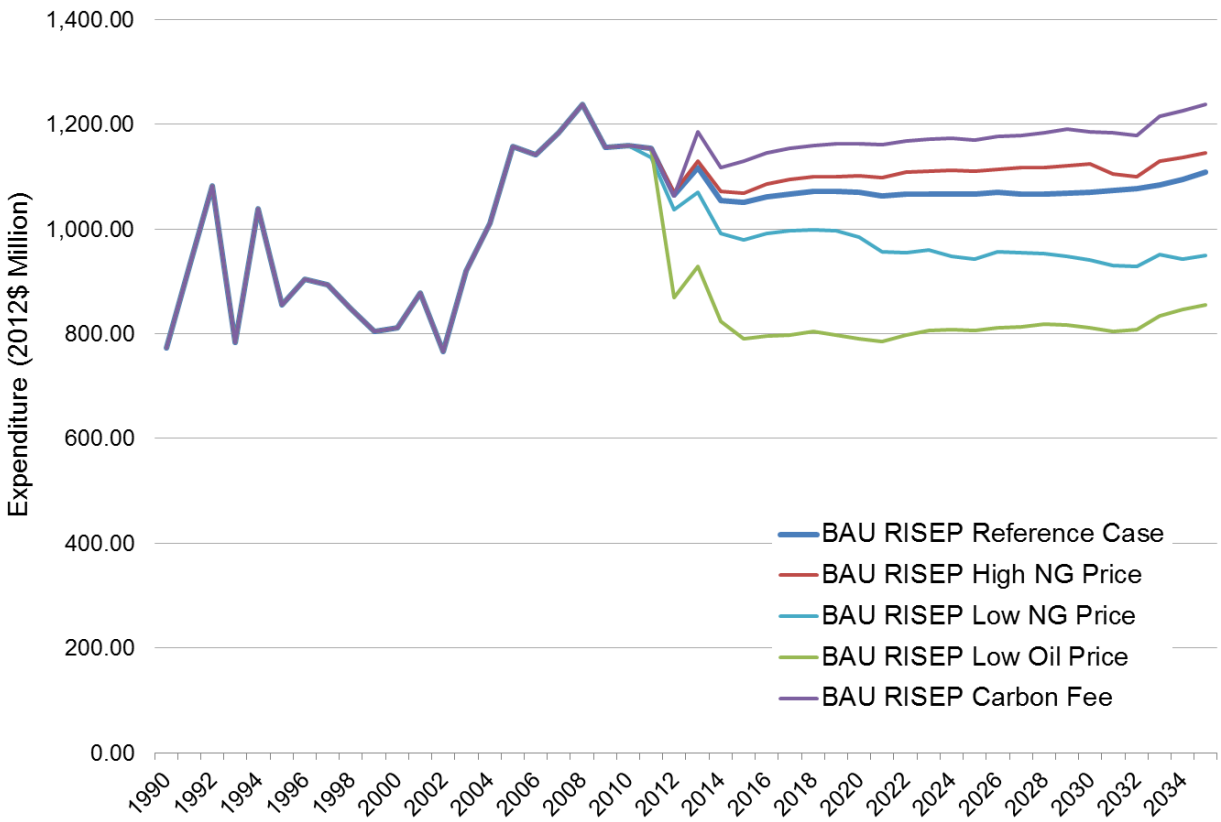
Thermal Sector - Residential Sector Natural Gas Expenditure



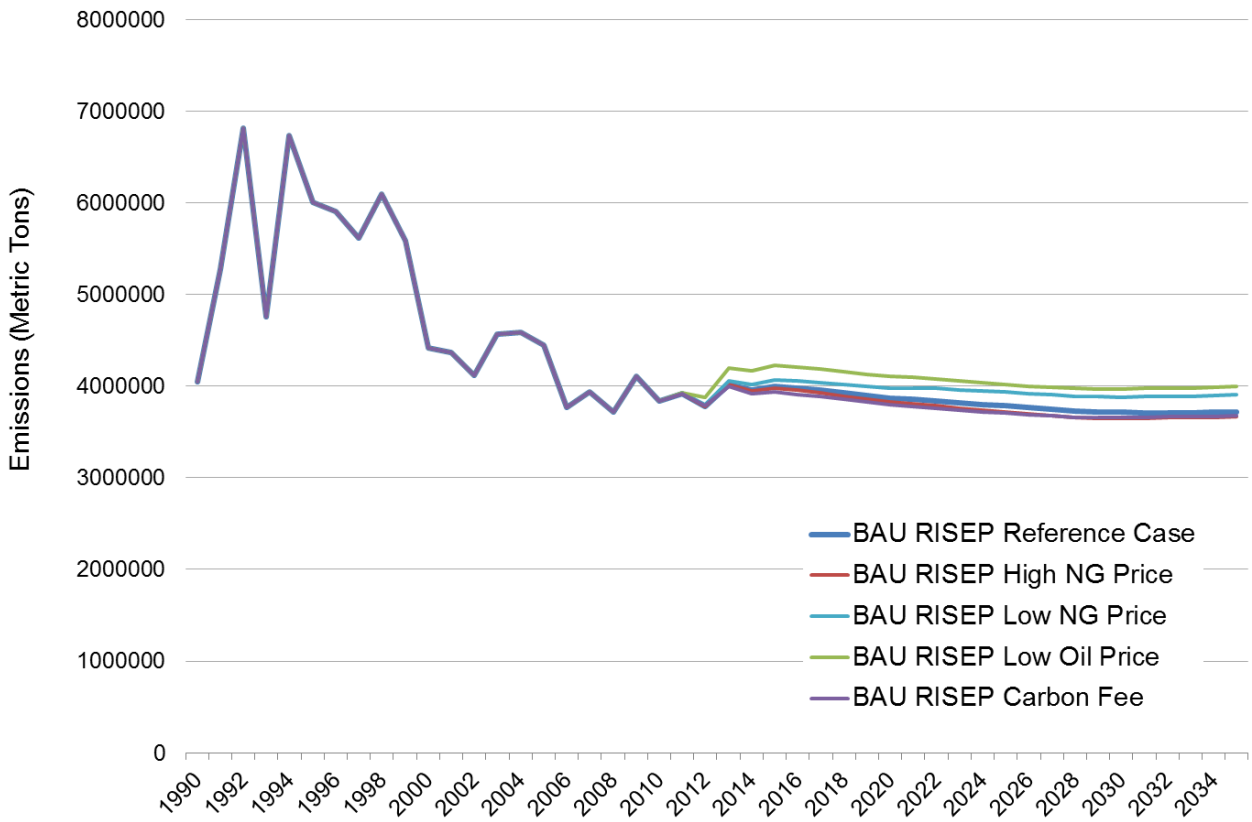
Natural Gas vs Distillate Fuel in Rhode Island Buildings



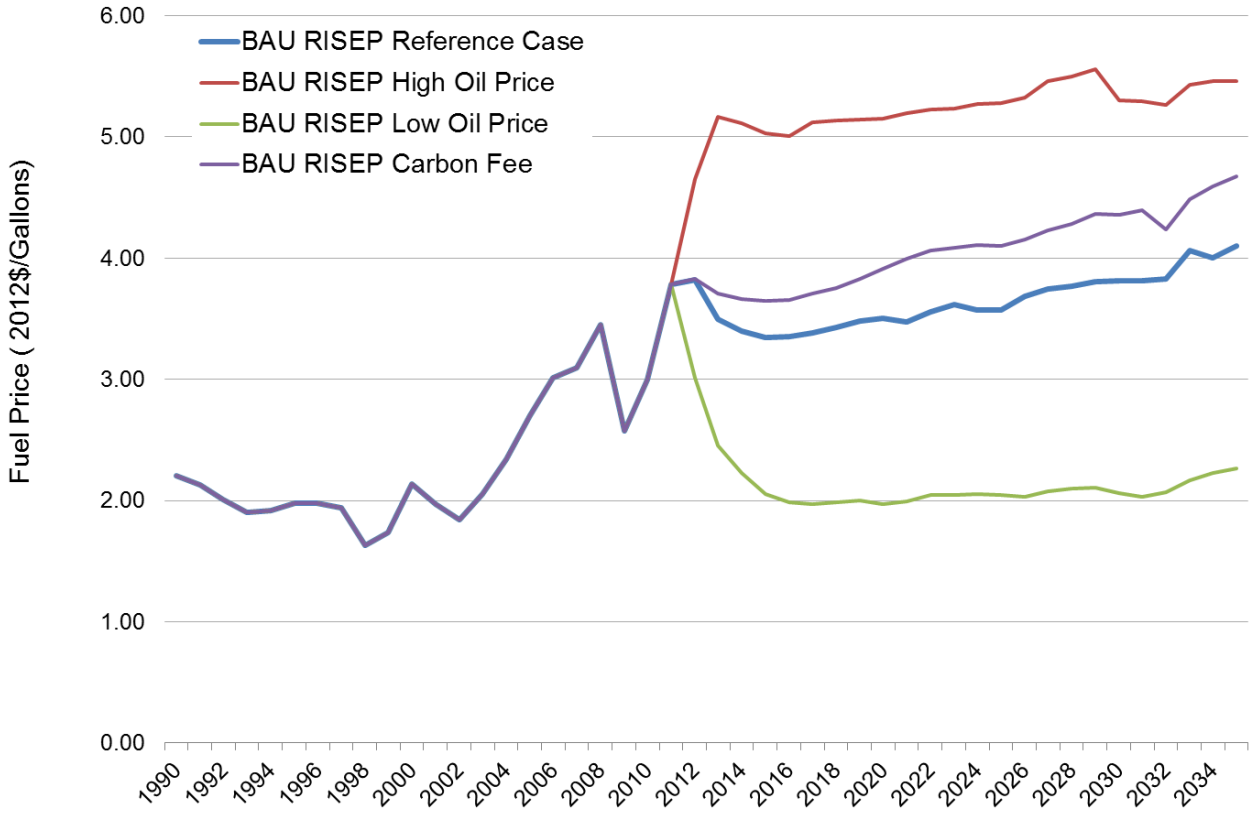
Thermal Sector Total Expenditure For Analyzed Fuels



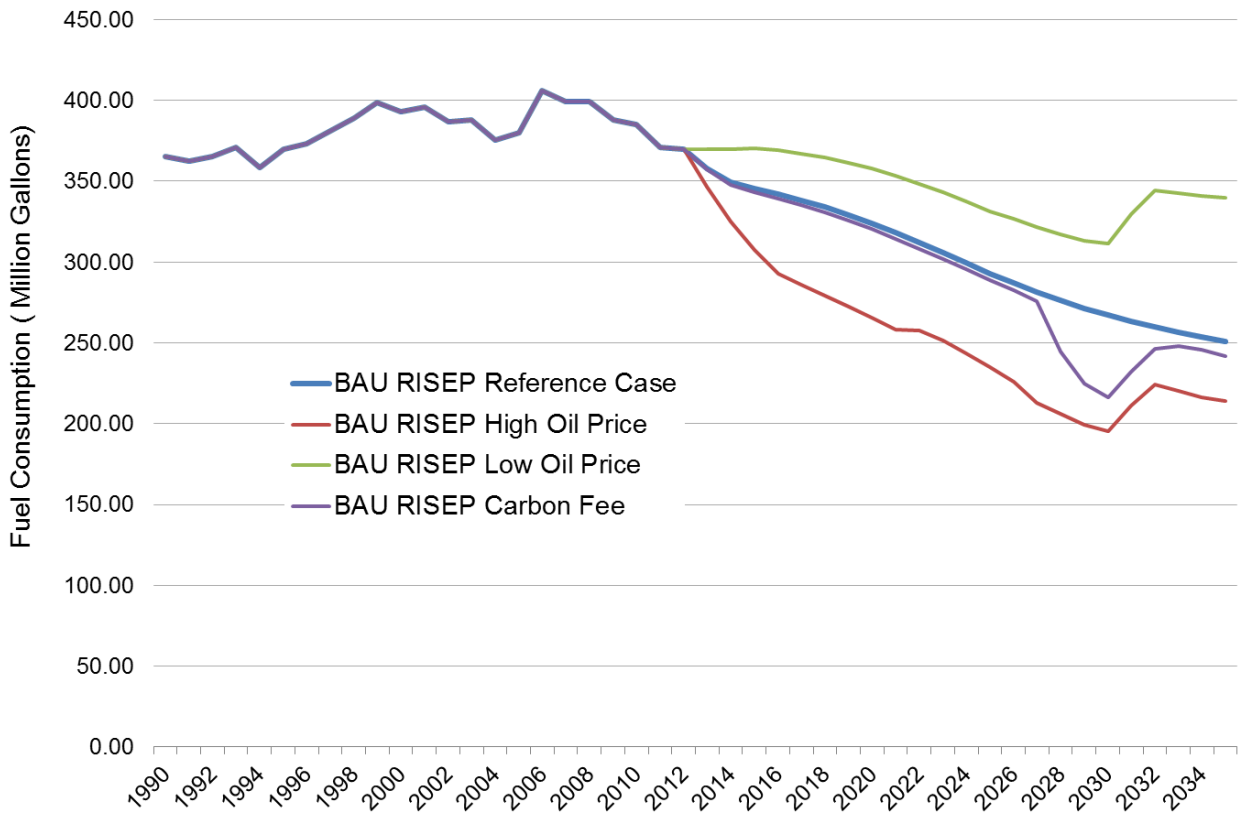
Thermal Sector Total Emissions For Analyzed Fuels



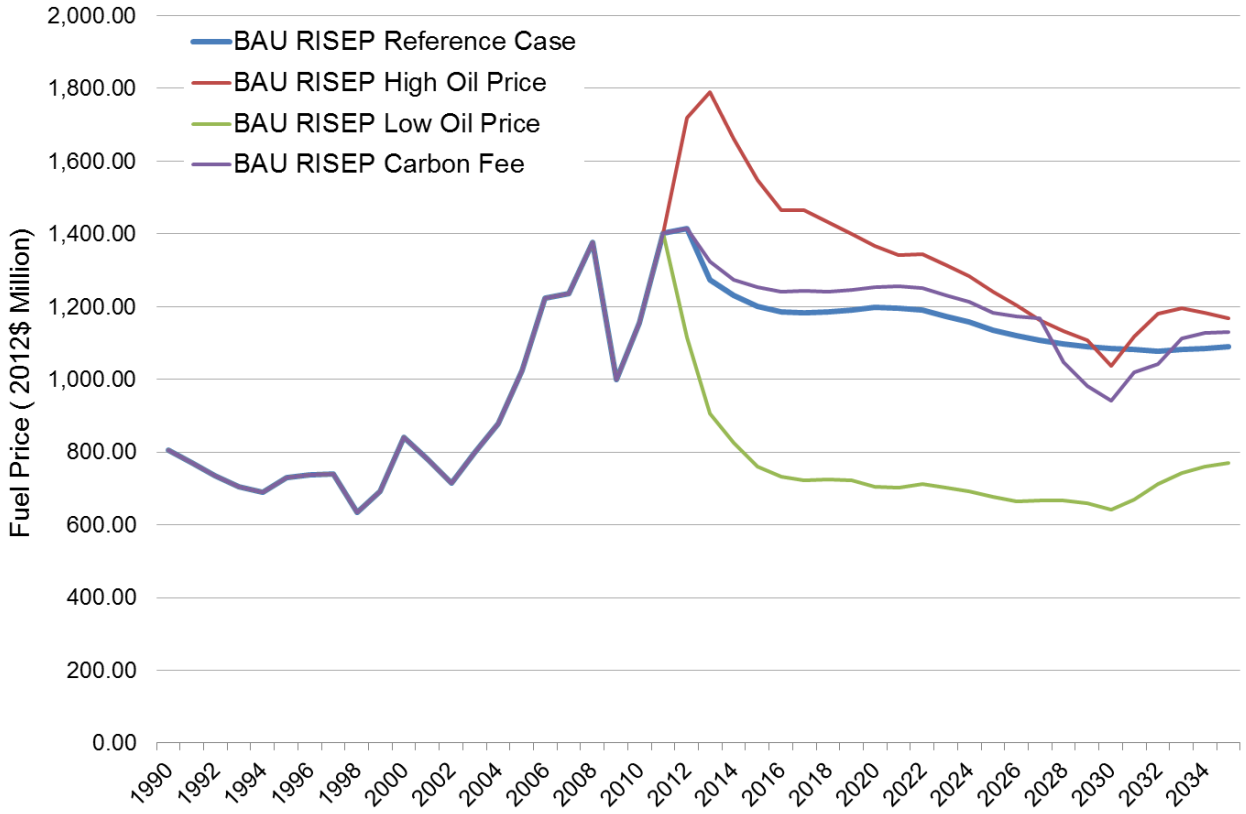
Transportation Sector –Gasoline Prices



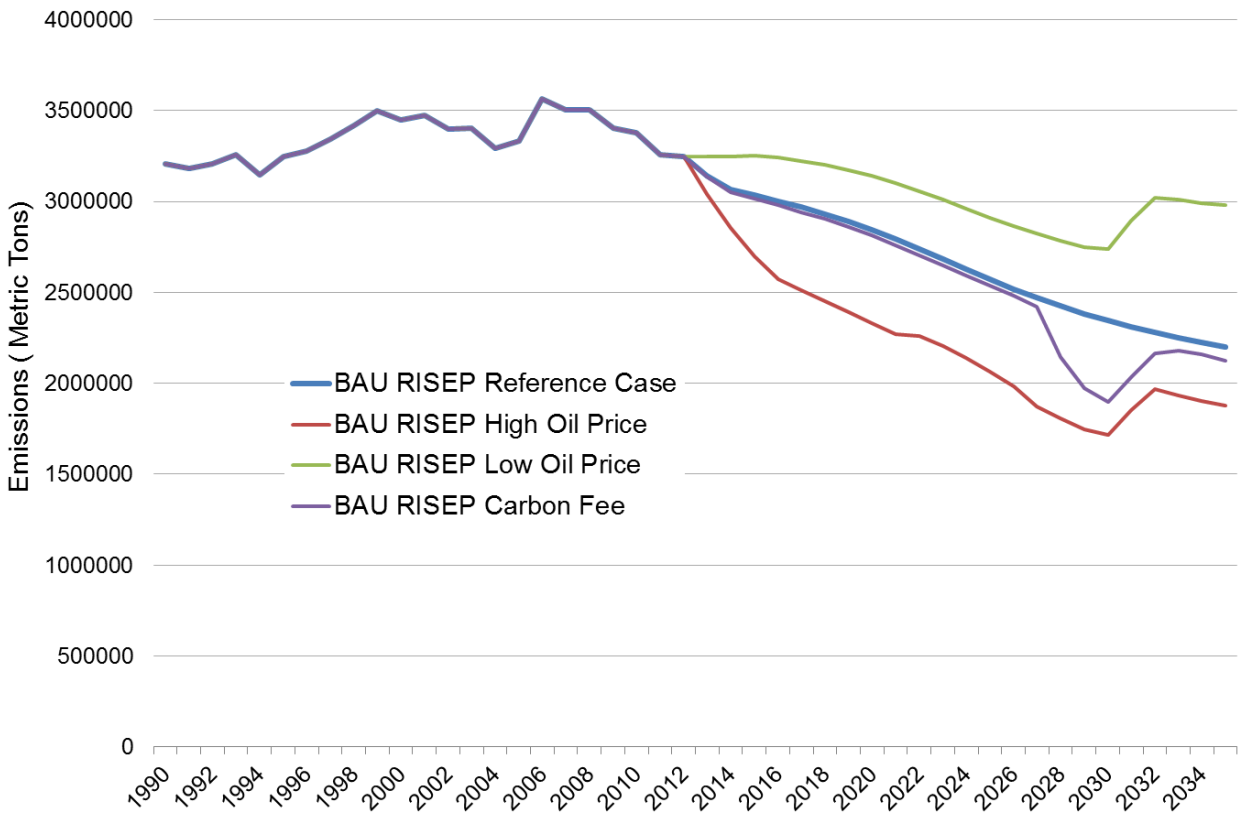
Transportation Sector –Gasoline Consumption (Shows Impact of CAFÉ)



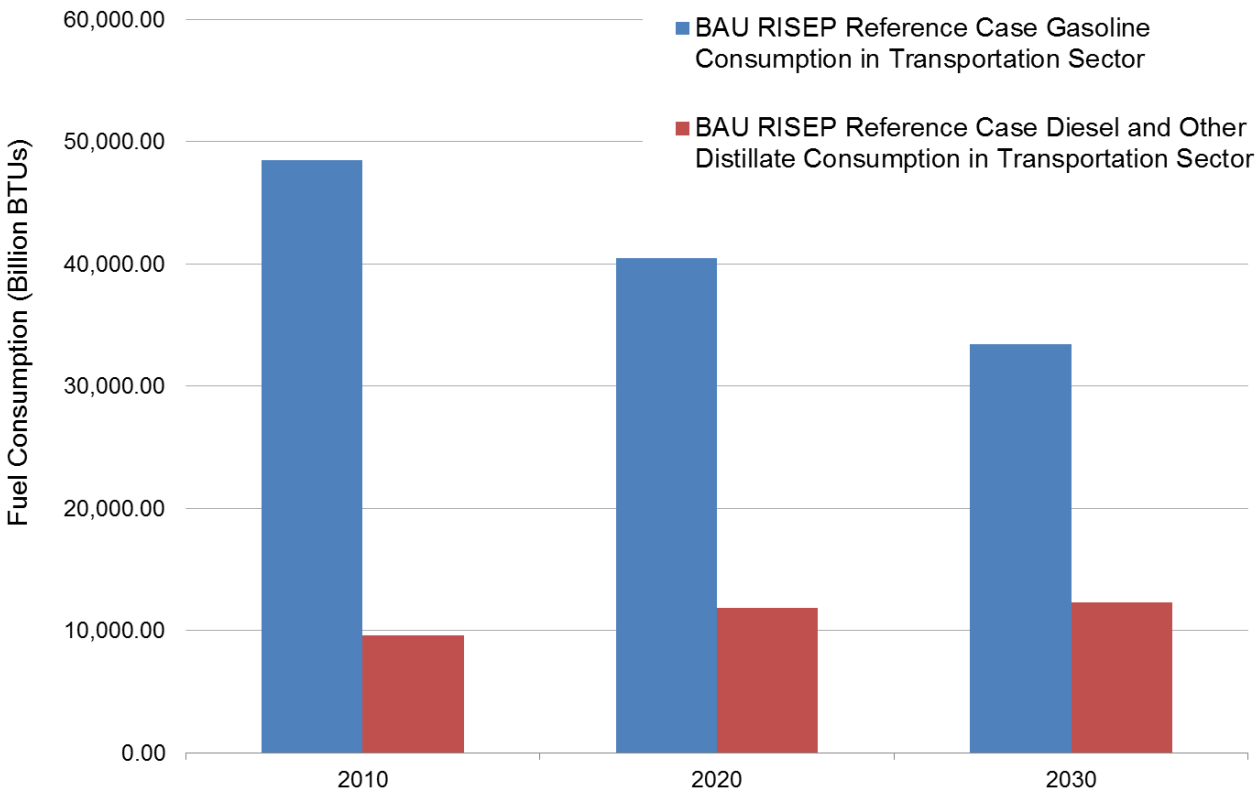
Transportation Sector –Gasoline Expenditure



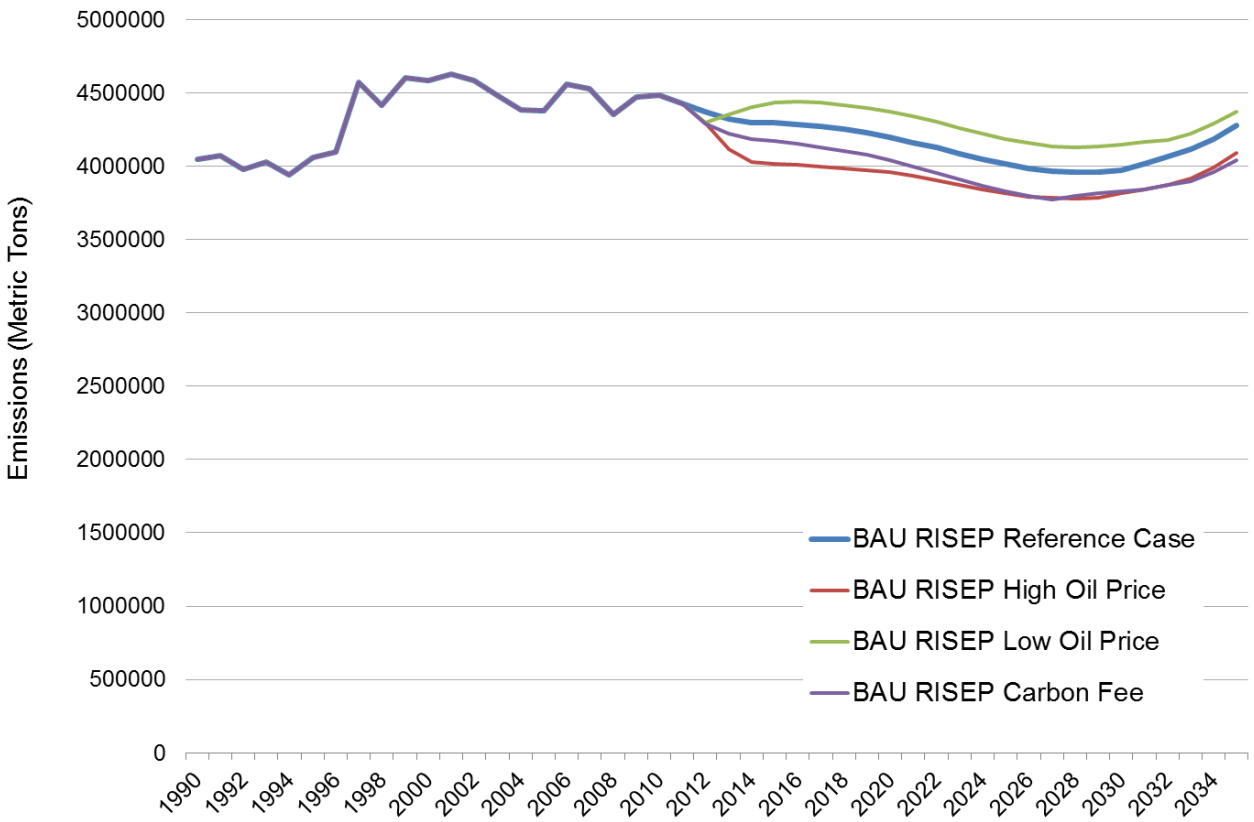
Transportation Sector –Gasoline Emissions



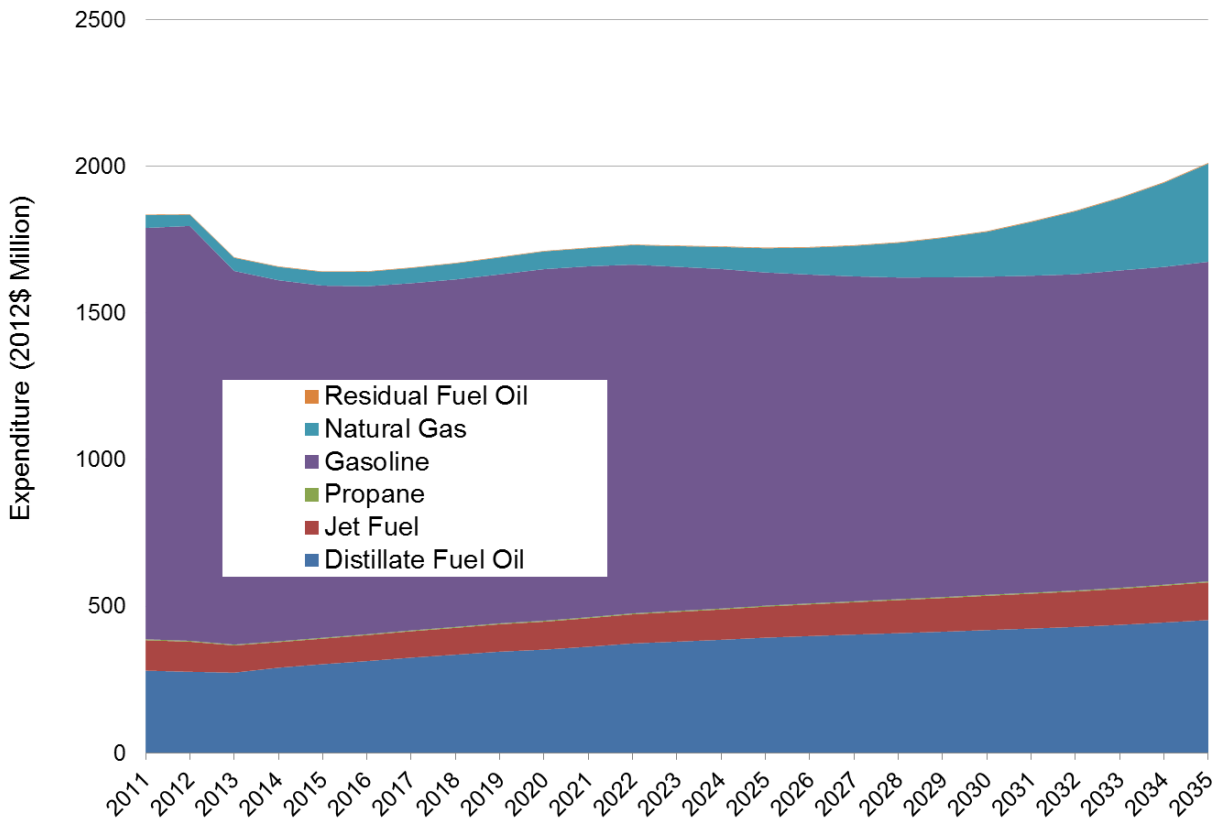
Gasoline vs Diesel and Other Distillate Consumption in Transportation Sector



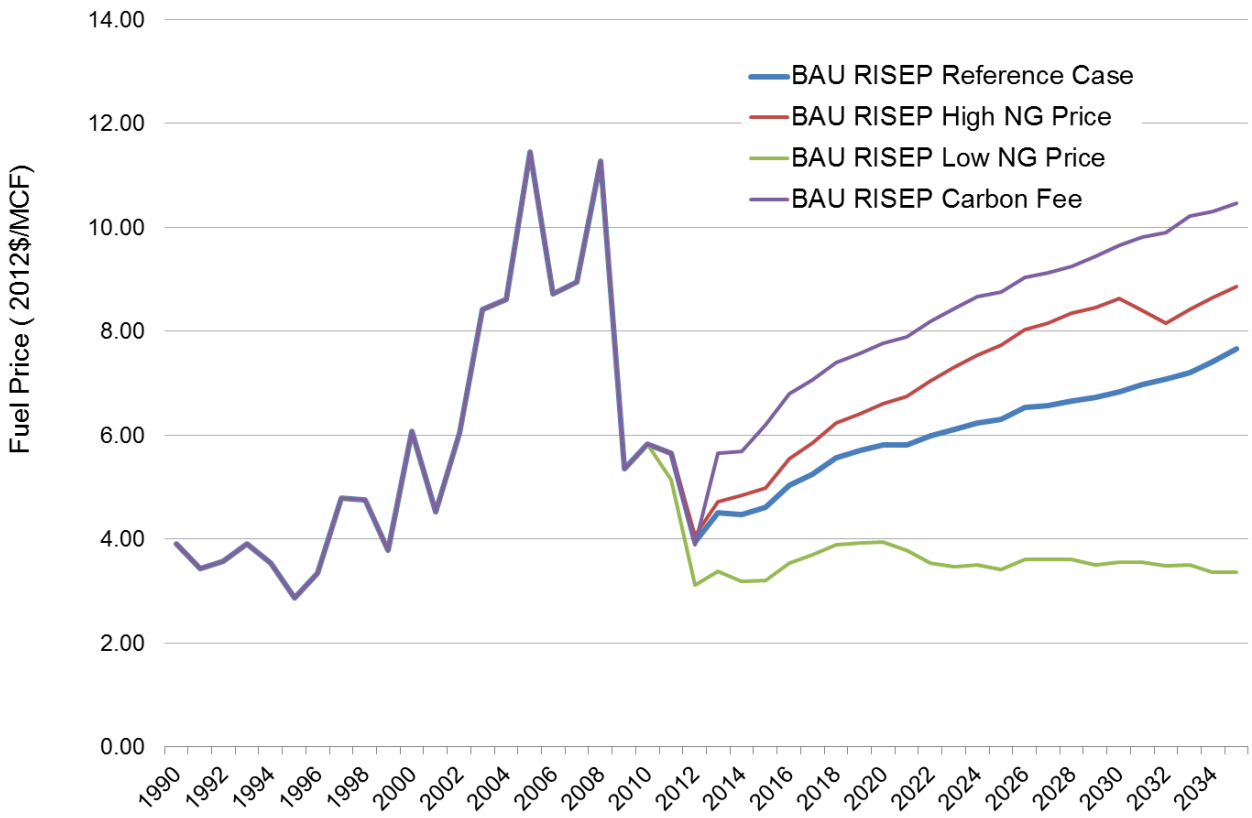
Transportation Sector Total Emissions For Analyzed Fuels



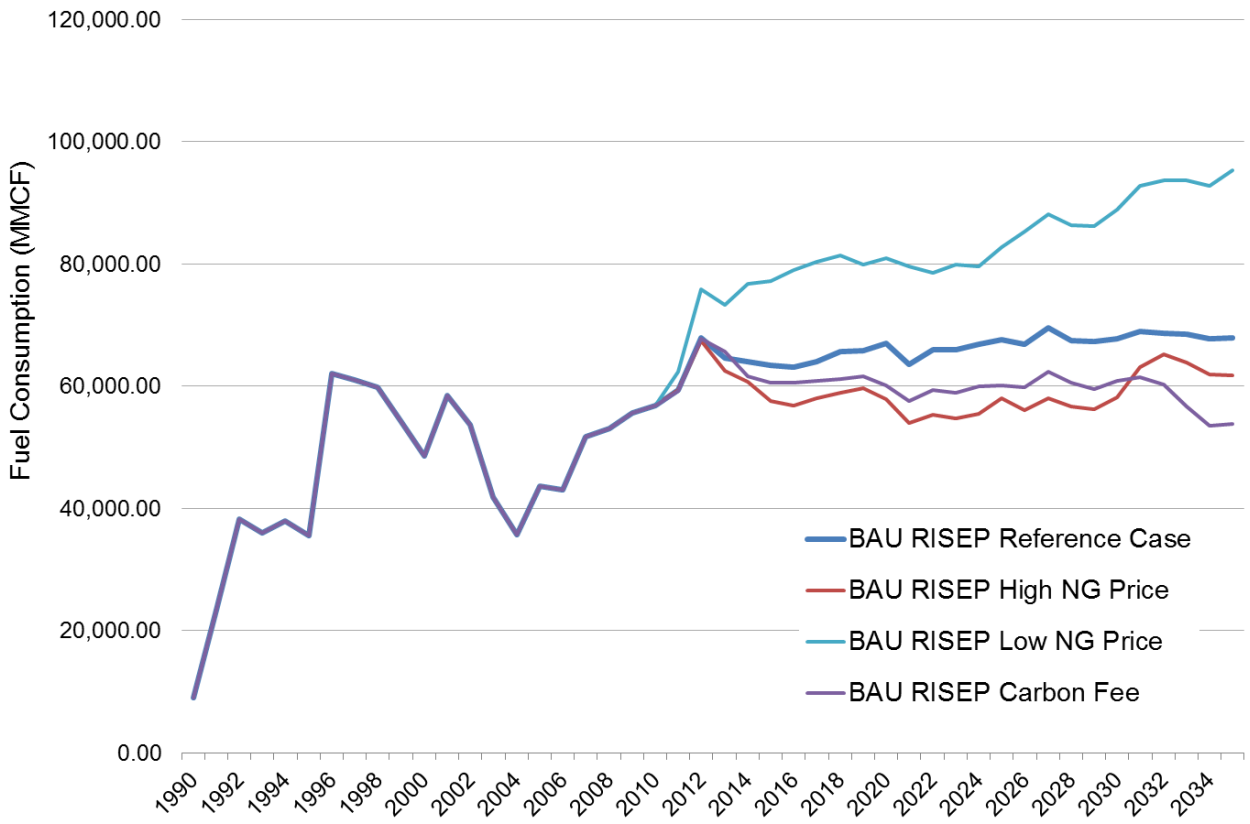
Transportation Sector Total Expenditure For Analyzed Fuels



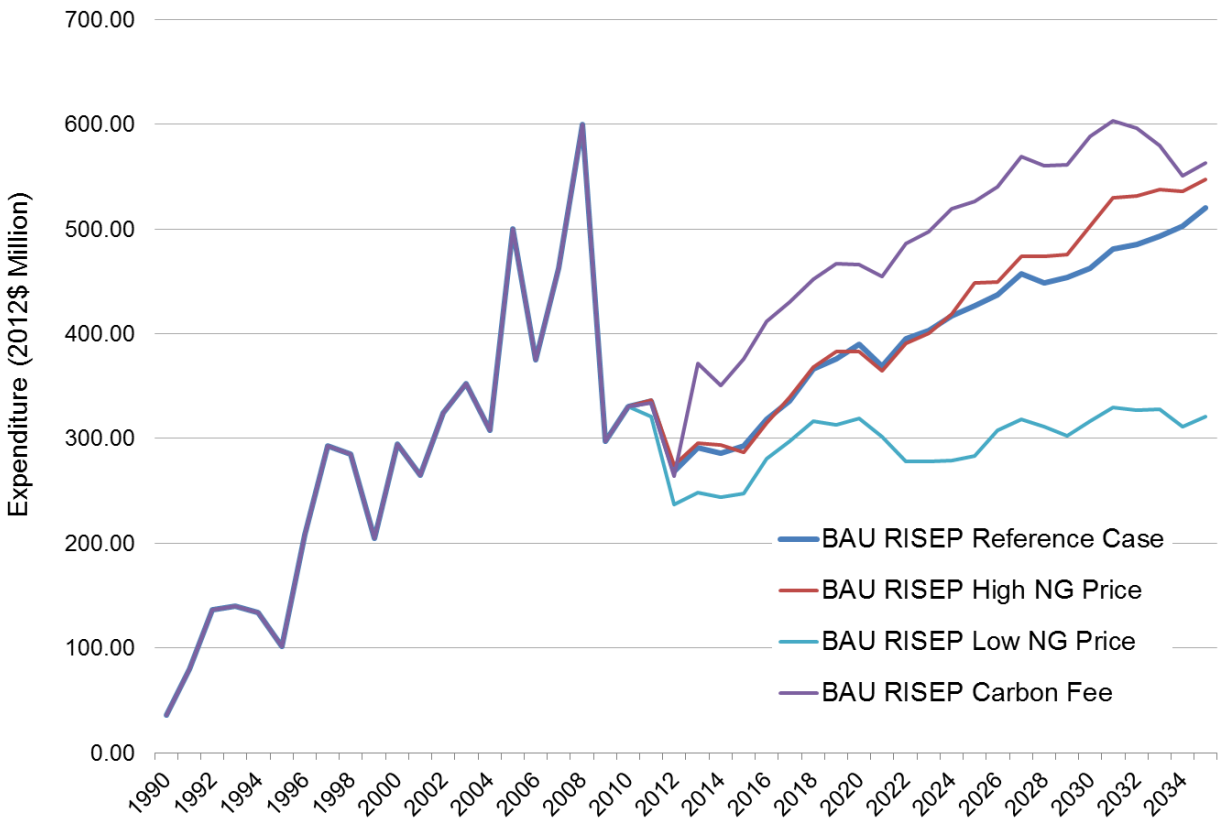
Electricity Sector – Natural Gas Price



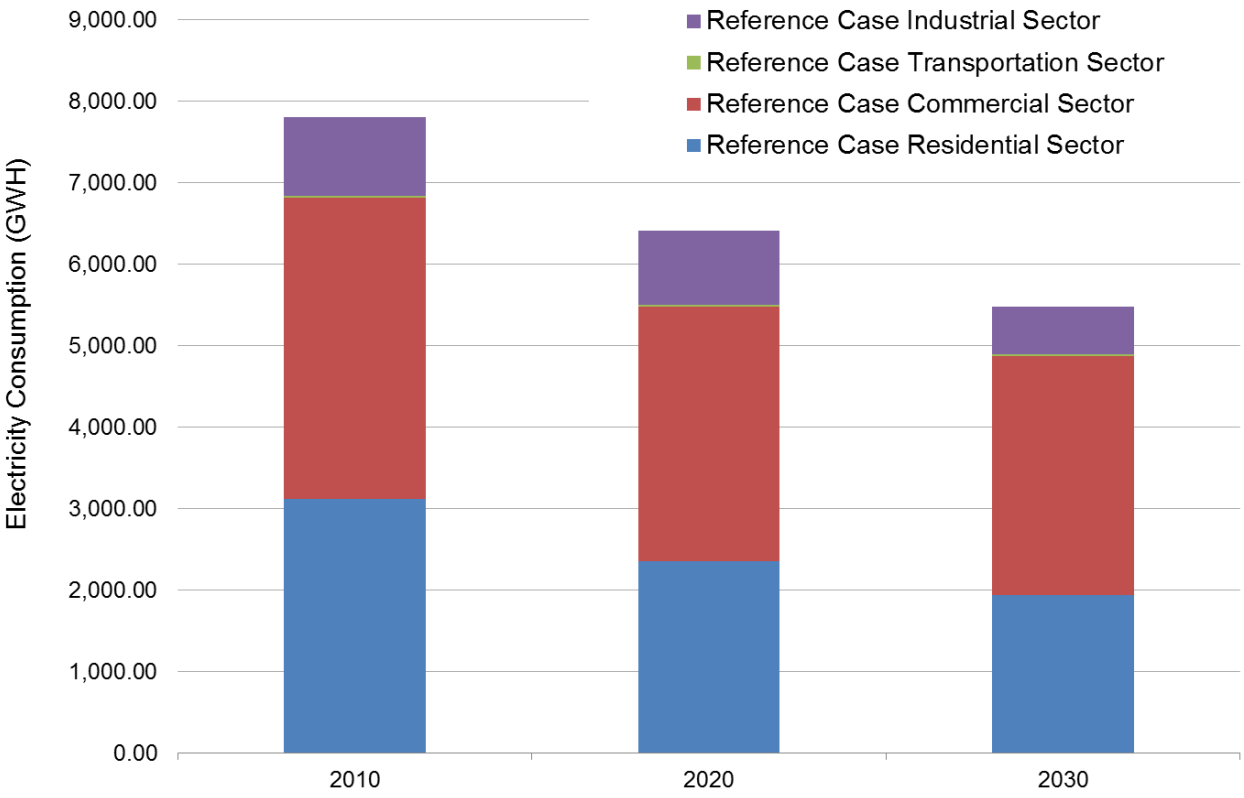
Electricity Sector – Natural Gas Consumption (Shows RGGI Impact)



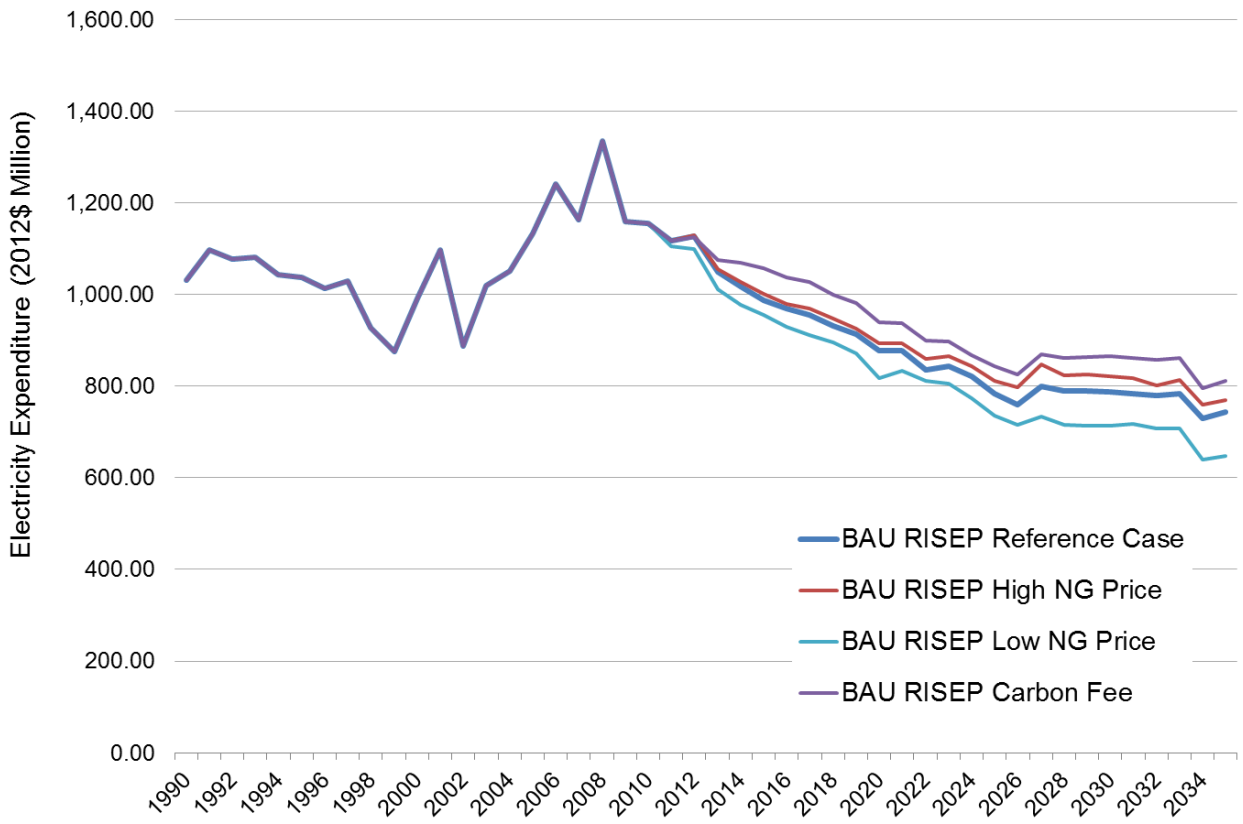
Electricity Sector – Natural Gas Expenditure



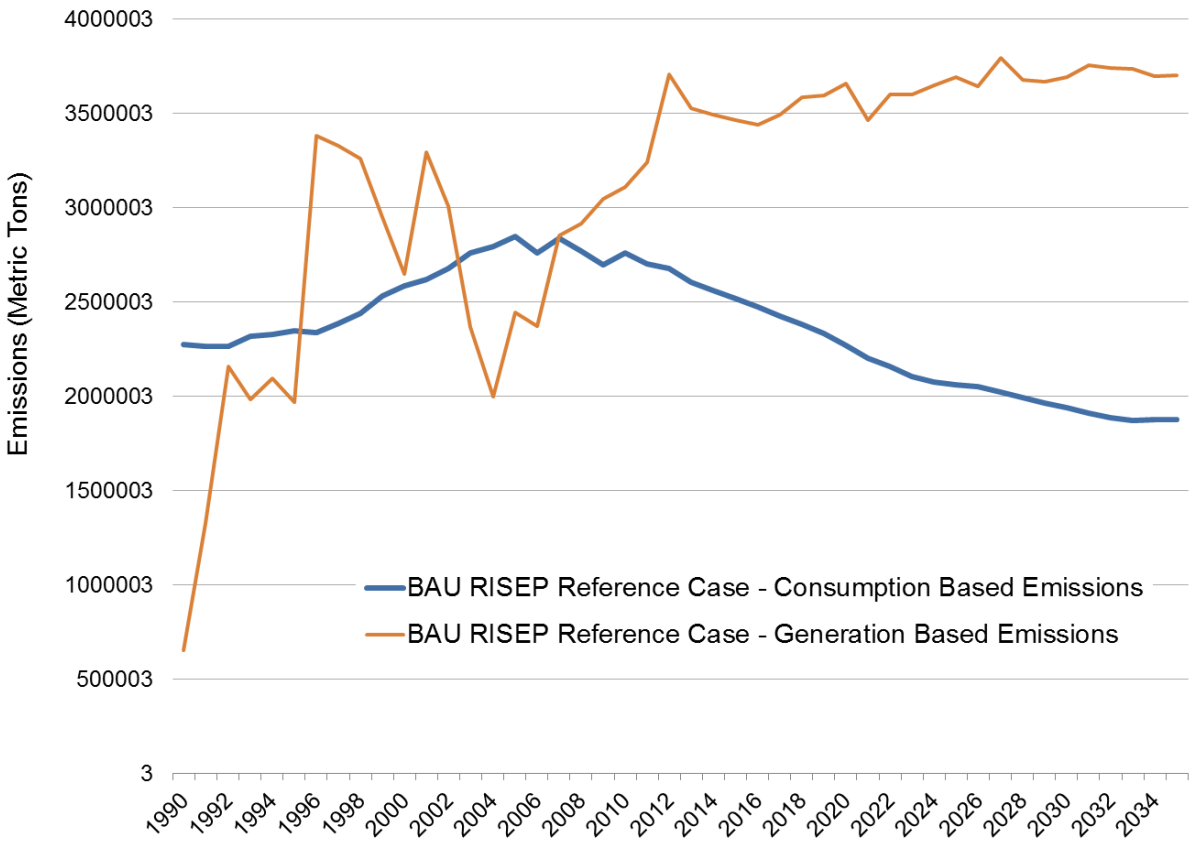
Rhode Island Electricity Consumption (Shows Electric Efficiency Impacts)



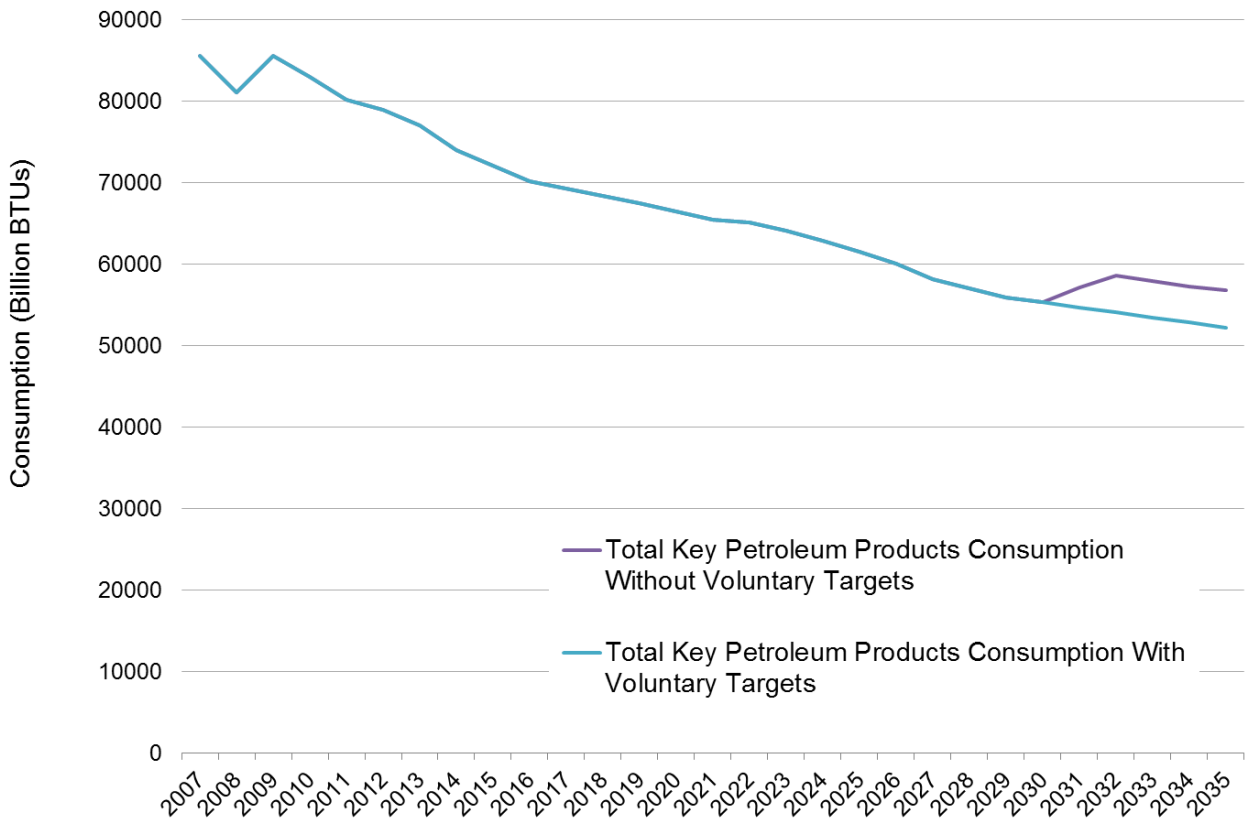
Rhode Island Electricity Expenditure (Shows RGGI Impact)



Electric Sector Consumption vs Generation Based Emissions



Petroleum Consumption Voluntary Targets Impact



Sources

- Comprehensive Energy Efficiency, Conservation, and Affordability Act of 2006, R.I.G.L. § 39-1-27.7, http://www.rilin.state.ri.us/Statutes/TITLE39/39-1/39-1-27.7.HTM.

- The Rhode Island Petroleum Savings and Independence Advisory Commission, http://webserver.rilin.state.ri.us/Statutes/TITLE42/42-140.4/42-140.4-1.HTM

- EIA AEO 2012 Assumption Document, http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554(2012).pdf

- Based on VEIC Optimal Consultant Team RI Opportunity Report, http://www.rieermc.ri.gov/documents/RI%20Gas%20Opportunity%20Report%202012.pdf

- Rhode Island Public Utilities Commission Docket 4202, Electric and Natural Gas Least Cost Procurement Savings Targets for 2012-2014, http://www.ripuc.org/eventsactions/docket/4202-EERMC-EST-Filing(9-1-10).pdf

- Based on KEMA RI Energy Efficiency Opportunity Report, http://www.ripuc.org/eventsactions/docket/4202-EERMC-EST-KEMARept.pdf

ENE Environment Northeast

Contact Information

Varun Kumar
Policy and Data Analyst
vkumar@env-ne.org

Jamie Howland
Director
jhowland@env-ne.org

ENE CLEAN Center, 860-246-7121

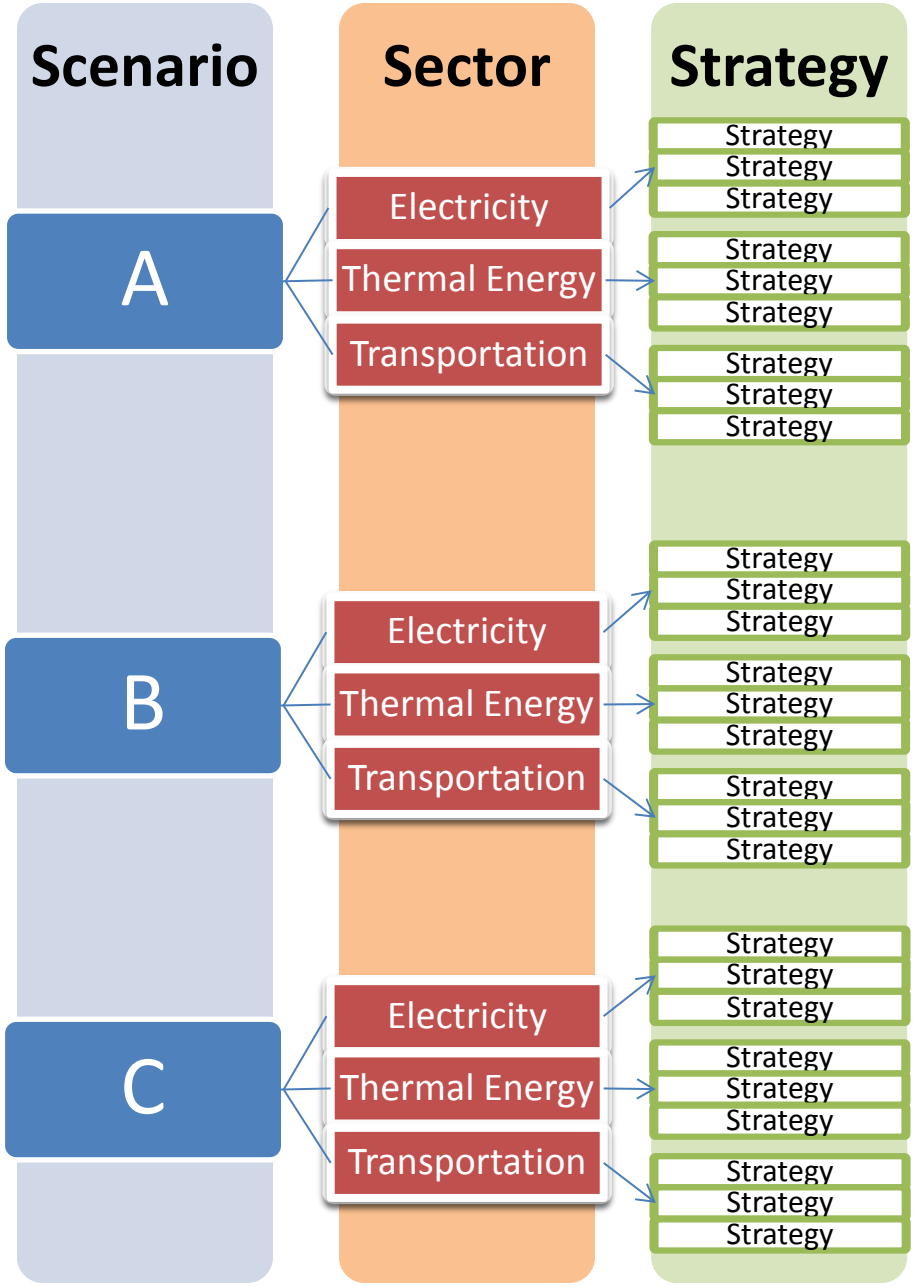
ENE (Environment Northeast)

www.env-ne.org

Updated Directional Objectives

TASK 3: Goals

Modeling Analytical Framework



Directional Objectives (Criteria)

1	2	3	4	5
+	-	+	+ +	- -
+ +	+ +	-	-	-
+	- -	- -	+ +	+
-	+ +	-	+	+
+ +	- -	- -	+ +	-
+	- -	-	+	+
+	+	+ +	-	-
-	+	+ +	- -	-
+ +	+ +	-	-	+

Updated RISEP Vision Statement

VISION STATEMENT
*"In **2035**, Rhode Island will provide energy services across all sectors—electricity, thermal, and transportation—using a secure, cost-effective, and sustainable energy system."*

Updated Directional Objectives

PLAN CRITERIA	DIRECTIONAL OBJECTIVES	POSSIBLE METRICS
SECURITY	A. **ADEQUACY.** Plan to meet overall energy supply needs	Supply=Forecasted Demand
	B. **SAFETY.** Increase the safety of energy conversion and use	Risk, frequency, and length of supply disruptions; Fuel diversity; Capacity and # of storage or backup power systems
	C. **RELIABILITY.** Increase the system's ability to withstand disturbances	
	D. **RESILIENCY.** Increase the system's ability to rebound from disturbances	
COST-EFFECTIVENESS	E. **AFFORDABILITY.** Lower overall energy bills	Annual expenditure (total, by sector, and per capita)
	F. **STABILITY.** Reduce the impacts of energy price volatility on consumers	Derivative of price, energy cost variance
	G. **ECONOMIC GROWTH.** Grow and maintain a healthy state economy	Gross State Product, annual in-state energy expenditure
	H. **EMPLOYMENT.** Increase employment	Job-years
SUSTAIN-ABILITY	I. **CLIMATE.** Reduce greenhouse gas emissions from energy consumption	CO_2, CH_4, N_2O emissions
	J. **AIR QUALITY.** Reduce criteria pollution from energy consumption	SO_2, NO_x, particulate matter emissions
	K. **WATER USE & QUALITY.** Reduce the water impacts of energy consumption	Water use & quality indicators
	L. **LAND & HABITAT.** Reduce the impacts of energy projects on ecosystems	Area of land use conversion
	M. **HUMAN HEALTH.** Reduce the impacts of energy consumption on human health	Mortality, labor loss

Introduction

TASK 3: SCENARIOS

DRAFT

NAVIGANT ENERGY

AQUINERGY

Experts in Renewable Energy and Sustainable Development

RHODE ISLAND STATE ENERGY PLAN TECHNICAL ASSISTANCE

Advisory Council Meeting

RIEDC Rhode Island Economic Development Corporation

Rhode Island, Working Again.

REF Renewable Energy Fund

A Program of the Rhode Island Economic Development Corporation

April 1, 2013

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

DISPUTES & INVESTIGATIONS • ECONOMICS • FINANCIAL ADVISORY • MANAGEMENT CONSULTING

DRAFT

Today's agenda includes the following:

1. Introduction and Scope of Work
2. Task 3: Approach, Strategies, and Preliminary Scoring
3. Straw-man Scenarios
4. Next Steps

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

1. **Introduction and Scope of Work**
2. **Task 3: Approach, Strategies, and Preliminary Scoring**
3. **Straw-man Scenarios**
4. **Next Steps**

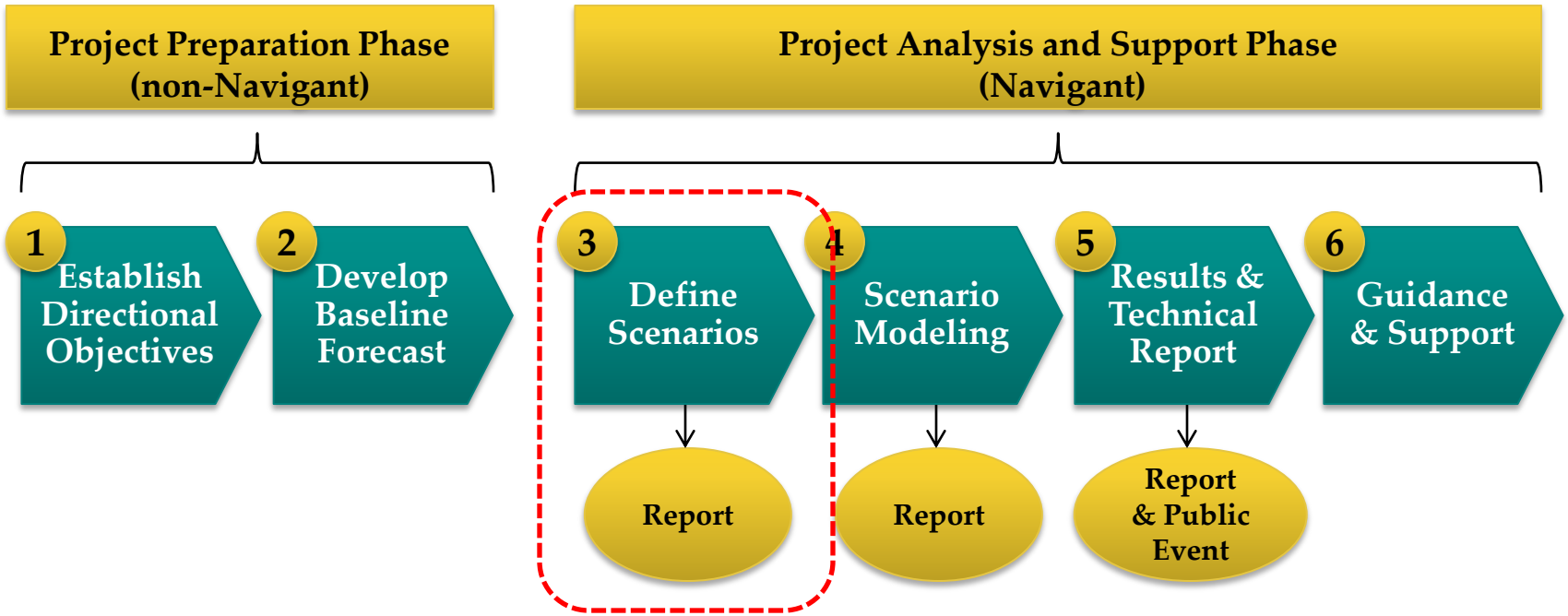
©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Navigant's approach follows tasks 3 through 6 of the RFP: Define scenarios, model scenarios, summarize results, and support RISEP.

Overview of Approach : Rhode Island State Energy Plan Technical Assistance



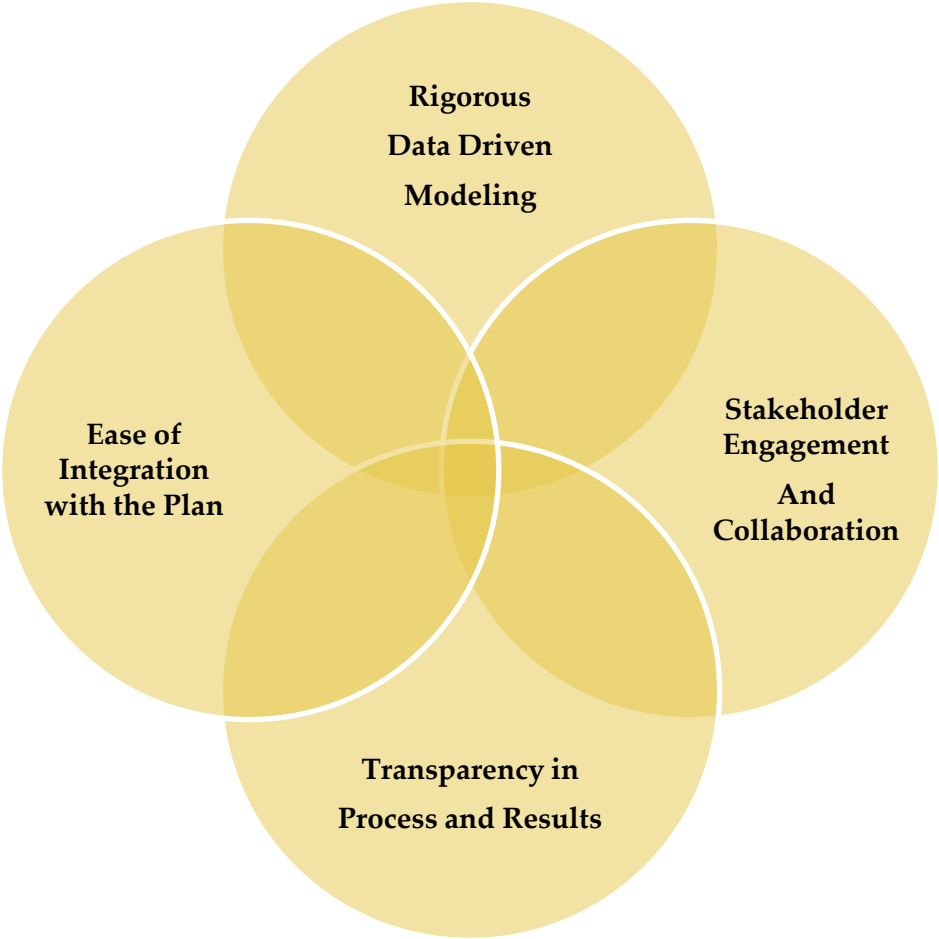
©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Navigant's role is to provide analysis that will inform the selection of goals, strategies, and policies for the Rhode Island State Energy Plan

- Identify realistic, actionable strategies across the electrical, thermal, and transportation sectors
- Define a set of rational, justifiable policy scenarios designed to meet Plan criteria; and
- Perform detailed economic and energy modeling analyses to quantify how well each scenario meets the Plan criteria



©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

1. Introduction and Scope of Work
2. Task 3: Approach, Strategies, and Preliminary Scoring
3. Straw-man Scenarios
4. Next Steps

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

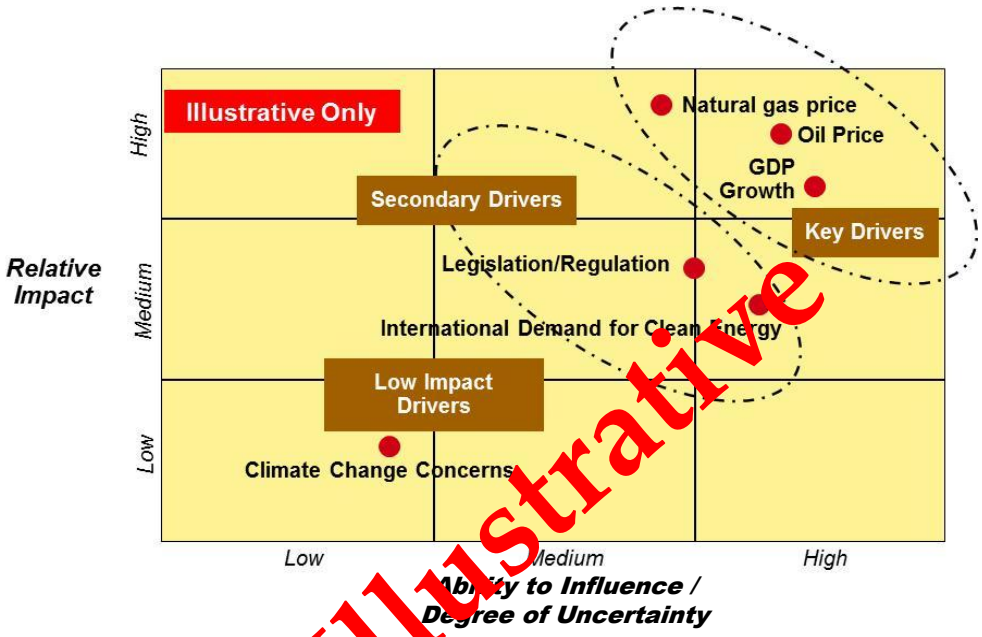
NAVIGANT ENERGY

DRAFT

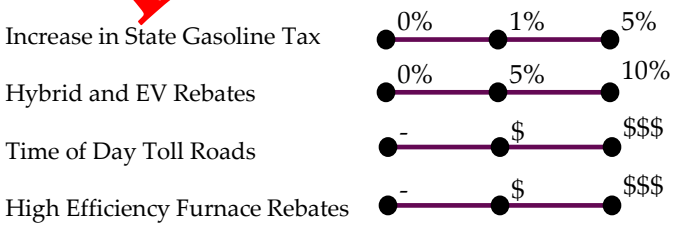
Navigant has identified strategies spanning electric, thermal, and transportation, and mapped these according to their potential impact.

Modeling Analytical Framework

Scenario (examples)	Sector	Strategy	1	2	3	4	5
			Directional Objectives (Criteria)				
Lowest Consumer Cost	Electricity	Strategy Strategy Strategy	+	-	+	+ +	- -
	Thermal Energy	Strategy Strategy Strategy	+ +	+ +	-	-	-
	Transportation	Strategy Strategy Strategy	+	- -	- -	+ +	+
Transform Energy Economy	Electricity	Strategy Strategy Strategy	-	+ +	-	+	+
	Thermal Energy	Strategy Strategy Strategy	+ +	- -	- -	+ +	-
	Transportation	Strategy Strategy Strategy	+	- -	-	+	+
Climate Protection	Electricity	Strategy Strategy Strategy	+	+	+ +	-	-
	Thermal Energy	Strategy Strategy Strategy	-	+	+ +	- -	-
	Transportation	Strategy Strategy Strategy	+ +	+ +	-	-	+



- Develop and prioritize a list of actionable strategies for each key sector.
- Propose and refine preliminary binding parameters to quantify the impact of each strategy.



©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

The strategy identification process yielded over 100 discrete tactics, policies and programs to create change in Rhode Island's energy future.

Sector	Category	Strategy	Tactics/Policies/Programs
Transportation	Any	Upgrade Existing Infrastructure	Restore Obsolete Bridges and Highways
	Electic Vehicles	Promote the Deployment of Electric Vehicles	Expand Network of Electric Vehicle Charging Stations: Set a Goal
			Electric Vehicle Educational Program
			Financial Incentives
			Use of Electric Vehicles for State and Municipal Fleets
	Natural Gas	Promote the Conversion and Deployment of Natural Gas Fleets	Financial Incentives for Conversion to Natural Gas
			Increase the Number of CNG Stations: Set a Goal
	Efficiency	Promote Public Transit as a Viable Mean of Transportation	Develop a Park and Ride Program
			Expand RIPTA Services
		Increase Fuel Economy and Decrease Emissions in Traditional Vehicles	Tail-Pipe Emissions Standards
			Financial Incentives for Fuel Efficient Vehicles: Vehicle Fee Waivers, Vehicle Tax Incentives
			Energy Efficiency Recognition Program
		Increase Use of Biofuels in Transportation Mix	Financial Incentives for Biofuel Consumptions
			Develop an E85 Infrastructure
	Any	Increase Transportation Funding	Vehicle Miles Traveled Fee
			Increase State's Gas Tax and Vehicle Registration Fees
			New Petroleum Products Gross Receipts Tax
			Tolling on Interstate 95
			Revenue Bonds
		Promote Energy Research and Innovation in Universities	Energy Research Program at University of RI
		Launch a Jobs in Energy Program	Clean Energy Business Solutions Program
			Community College Training for Energy Jobs

- Sourced from:
  - State energy plans from CT, VT, MD, CO, and IA.
  - RI BRP Transportation
  - RI Transportation 2030
  - Initiatives outlined by the Advisory Council
  - Additional Brainstorming

- 59 Electric, 36 Thermal, and 22 Transportation tactics, policies and programs were bundled into higher level strategies directed at shifting Rhode Islands energy future relative to the BAU.

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Strategies were scored based on the degree to which they meet each high level directional objective.

Following this meeting, we would like your input on strategy scoring, the development of additional strategies, and scenario refinement.

Current Sceanrio: Scenario 2 - Environmental Leader

#	STRATEGY	SECTOR	SELECTED? (binary)	SECURITY B. Safety C. Reliability D. Resiliency	COST EFFECTIVENESS E. Affordability F. Stability	ECONOMIC DEVELOPMENT G. GSP Growth H. Employment	SUSTAINABILITY I. Climate J. Air Quality K. Water Quality L. Land & Habitat M. Human Health	PARTICIPATION N. Choice O. Information	Composite Score Based on Current Weighting
				Directional Objective Weightings for Scenario					
				20%	10%	10%	60%	0%	
1	Increase Energy Efficiency Awareness and Recognition	Electric	0	2.0	7.0	1.0	1.0	4.0	1.8
2	Advance Energy Efficiency Measures in New Construction	Electric	0	4.0	6.0	10.0	4.0	1.0	4.8
3	Advance Energy Efficiency Measures in Existing Construction	Electric	1	7.0	5.0	10.0	5.0	4.0	5.9
4	Advance Energy Efficiency for Appliances	Electric	0	4.0	10.0	1.0	[illegible]	10.0	4.3
5	Set/Maintain Energy Efficiency Targets for Utilities	Electric	1	10.0	10.0	7.0	7.0	10.0	7.9
6	Promote Use of Combined Heat and Power Equipment	Electric	0	4.0	7.0	4.0	4.0	1.0	4.3
7	Deploy Smart Grid Technologies and Programs at a Large Scale	Electric	1	10.0	5.0	[illegible]	4.0	10.0	5.5
8	Increase T&D efficiency	Electric	1	10.0	4.0	4.0	4.0	1.0	5.2
9	Increase Renewable Energy Awareness and Recognition	Electric	0	1.0	1.0	4.0	1.0	7.0	1.3
10	Promote the Development of Solar PV Projects	Electric	1	4.0	[illegible]	7.0	6.0	7.0	5.2
11	Promote the Development of Wind Projects	Electric	1	[illegible]	4.0	7.0	6.0	1.0	5.5
12	Promote the Development of Biomass Projects	Electric	1	7.0	4.0	7.0	4.0	1.0	4.9
13	Promote the Development of Hydro Projects	Electric	0	4.0	1.0	4.0	1.0	1.0	1.9
14	Purchase Electricity from Quebec Hydro Projects	Electric	0	7.0	7.0	1.0	4.0	1.0	4.6

Illustrative

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

Electric Sector Goals and Strategies

- Expand Efficiency Initiatives Beyond Energy Conservation Efficiency and Affordability Act of 2006
  - Set more aggressive energy savings targets (i.e., go beyond the 'prudent and reliable' energy efficiency and energy conservation measures)
  - Perform regular review of targets in light of newly available technology
- Modernize Grid Infrastructure
  - Invest in grid modernization measures such as the deployment of new smart grid technologies
  - Micro-Grid pilot programs and distributed storage should also be considered in areas with critical services
- Roll-out New Programs to Reduce Peak Demand
  - Extend demand response to disaggregated customers incenting residential participation
  - Develop pricing programs to reduce peak demand through market signals
- Promote the Development of Renewable Energy Projects to Surpass Target of 16% by 2019
  - Offer creative financing mechanisms and streamline the interconnection process
- Procure Cheap Out-of state Electricity such as Hydroelectric Power from Quebec
- Expand Combined Heat and Power (CHP) Program
  - Extend Rhode Island's CHP program to include residential applications (micro-CHP) and broaden its reach by easing the permitting process
- Increase In-state Capacity by Up-rating Natural Gas Fired Power Plants

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

Thermal Sector Goals and Strategies

- Expand Efficiency Initiatives Beyond Energy Conservation Efficiency and Affordability Act of 2006
  - Set more aggressive energy savings targets (i.e., go beyond the 'prudent and reliable' energy efficiency and energy conservation measures)
  - Perform regular review of targets in light of newly available technology
- Expand Access to Natural Gas
  - Invest in the expansion of Rhode Island's natural gas distribution network to increase its capacity and the number of customers with direct access to natural gas
- Participate in Regional Planning to Obtain Secure Natural Gas Supply to RI
- Promote Equipment Conversion to Natural Gas
  - Market efficiency gains through pilot programs
  - Offer financial incentives to promote conversion market mechanisms
- Phase Out Electric Heating in RI
  - Implement state mandates
- Expand Combined Heat and Power (CHP) Program
  - Extend Rhode Island's CHP Program to include residential applications (micro-CHP) and broaden its reach by easing the permitting process
- Promote Adoption of Solar Thermal and Geothermal

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

Transportation Sector Goals and Strategies

- Promote the Deployment of Electric Vehicles
  - Set goals for expanding the network of charging stations
  - Offer direct financial incentives to promote adoption
- Support the Conversion of State Fleet Vehicles to NGVs
  - Develop a pilot program and expand the network of public CNG/LNG filling stations
- Increase Fuel Options at Gas Stations
  - Develop an E85 infrastructure
- Increase Fuel Economy and Decrease Vehicle Emissions
  - Tail-pipe emissions standards
  - Aggressive fuel efficient vehicles fee waivers and tax incentives
- Encourage the Use of Public Transit
  - Extend RIPTA services, concentrating expansion around transportation nodes and most used networks
- Reduce Congestion
  - Planning between RIDOT and city planning organizations
  - Time of day tolling
  - Traffic monitoring and smart signaling technology
- Modernize RI's Existing Transportation Infrastructure
  - Upgrade bridges, highways and other critical infrastructure.

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

DRAFT

1. Introduction and Scope of Work
2. Task 3: Approach, Strategies, and Preliminary Scoring
3. Straw-man Scenarios
4. Next Steps

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Navigant created 3 straw-man scenarios for discussion. These will be modified based on feedback from the Advisory Council.

Scenario 1: Least Cost Energy

- Prioritizes cost-effective, common-sense energy solutions to promote economic development, while minimizing energy prices and expenditures in Rhode Island.

Scenario 2: Environmental Leader

- Aims to cut GHG emissions and position Rhode Island as an environmental leader through significant investment in energy efficiency, smart grid solutions, and renewable energy.

Scenario 3: Balanced Approach

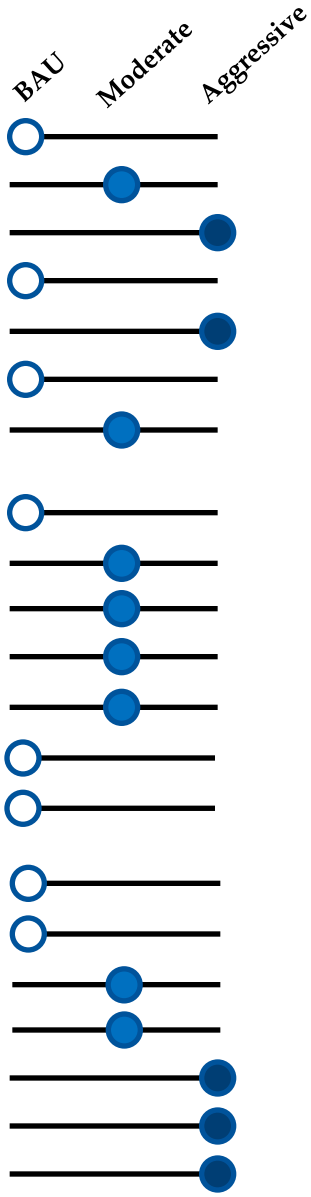
- Strikes a balance, focusing on creating long term stable energy prices and economic development while considering the long term environmental impact.

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Scenario 1: Least Cost Energy Prices



Electric

- Expand Efficiency Initiatives Beyond ECEAA
- Modernize Grid Infrastructure
- Roll-out New Programs to Reduce Peak Demand
- Promote the Development of Renewable Energy Projects to Surpass RES Requirements
- Procure Cheap Out-of-State Electricity such as Hydroelectric Power from Quebec
- Expand CHP Program
- Increase In-state Capacity by Up-rating Natural Gas Fired Power Plants.

Thermal

- Expand Efficiency Initiatives Beyond ECEAA
- Expand Access to Natural Gas
- Participate in Regional Planning to Obtain Secure Natural Gas Supply to RI
- Promote Equipment Conversion to Natural Gas
- Phase Out Electric Heating in RI
- Expand CHP Program
- Promote Adoption of Solar and Geothermal

Transportation

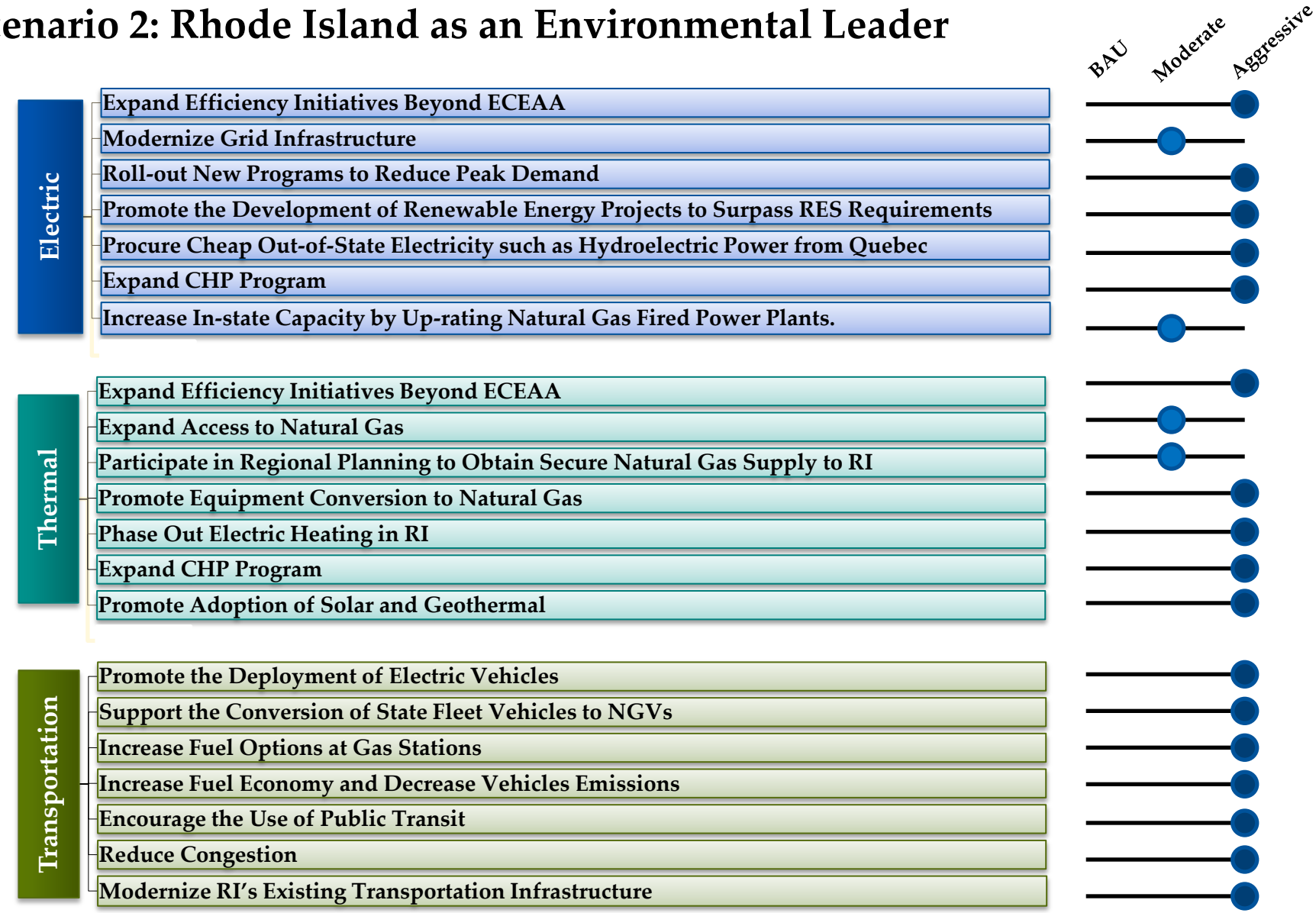
- Promote the Deployment of Electric Vehicles
- Support the Conversion of State Fleet Vehicles to NGVs
- Increase Fuel Options at Gas Stations
- Increase Fuel Economy and Decrease Vehicles Emissions
- Encourage the Use of Public Transit
- Reduce Congestion
- Modernize RI's Existing Transportation Infrastructure

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Scenario 2: Rhode Island as an Environmental Leader

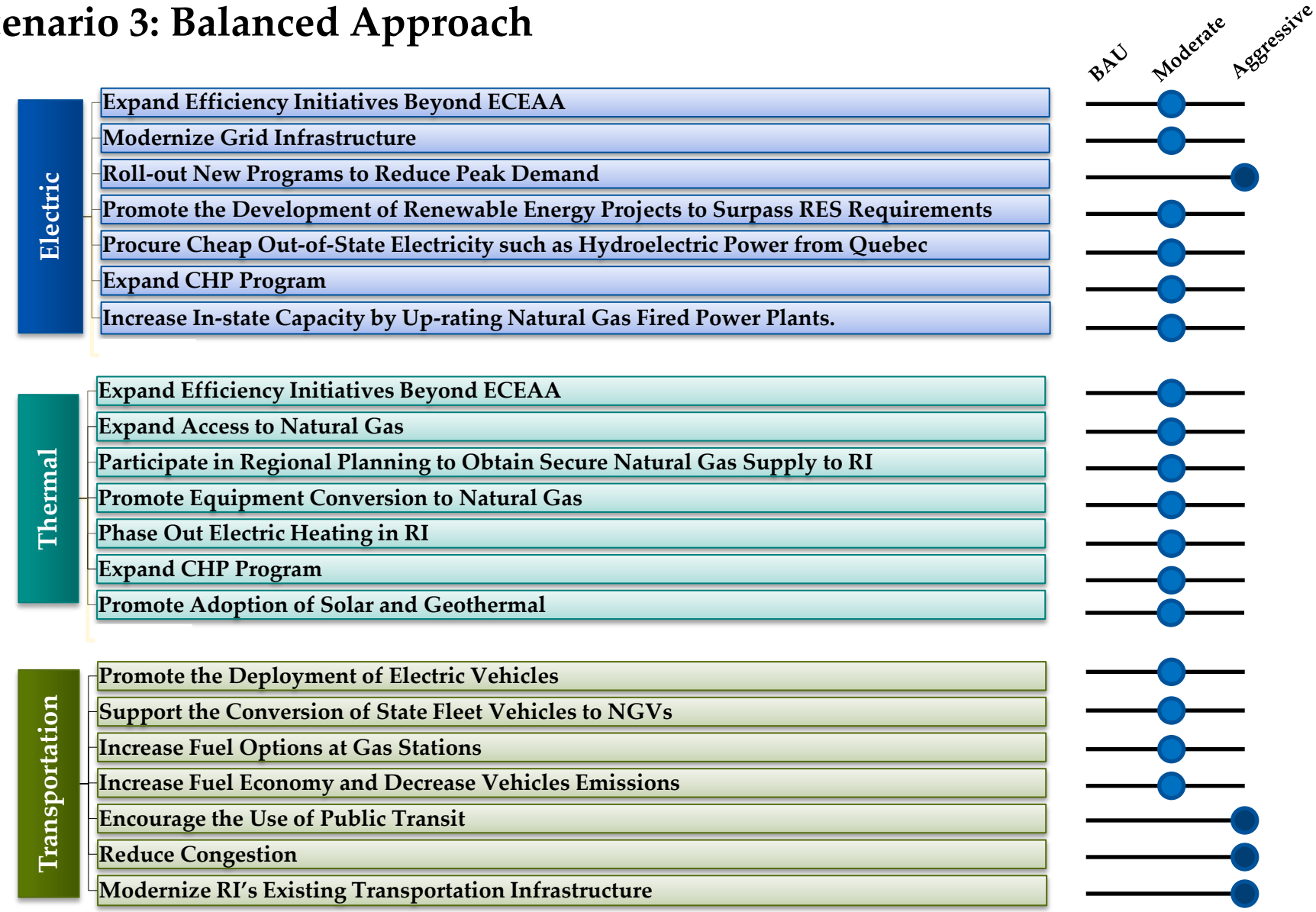


©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Scenario 3: Balanced Approach



©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

1. Introduction and Scope of Work
2. Task 3: Approach, Strategies, and Preliminary Scoring
3. Straw-man Scenarios
4. Next Steps

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Following this meeting, Navigant will solicit feedback from the Advisory Council, finalize the scenarios, and proceed with Task 4.

Solicit Feedback from Advisory Council

- Survey to review and score strategies
- Identify additional strategies for consideration
- Propose modifications to scenarios

Finalize Scenarios

- Integrate feedback from Advisory Council
- Finalize Scenarios
- Quantify effects of strategies on directional objective metrics and determine set-points

Begin Task 4

- Tailor Model to work with designated inputs
- Run model and iterate as necessary

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

Key CONTACTS

DRAFT

Lisa Frantzis
Managing Director in Charge
Burlington, MA
781-270-8314
lfrantzis@navigant.com

Ben Barrington
Day to Day Program Manager
Burlington, MA
781-354-7070
ben.barrington@navigant.com

Andrew Kinross
Director
Burlington, MA
781-270-8486
akinross@navigant.com

Lea Poquerusse
Senior Consultant
Burlington, MA
781-270-8344
Lea.poquerusse@navigant.com

Kially Ruiz
Subcontractor / MBE
President, Aquinergy LLC
Portsmouth, RI
401-835-4033
kruiz@aquinergy.com

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Electric Sector Strategies Database (1 of 2)

Sector	Category	Goal/Strategy	Tactic/Policy/Program
Electric	Efficiency	Increase Energy Efficiency Program Funding	Tariff Rider Surchage
			Public Benefit Funds
		Increase Energy Efficiency Awareness and Recognition	State-wide Energy Efficiency Marketing and Branding
			Energy Efficiency Recognition Program: Annual Awards for Best in Class
			Energy Efficiency Educational Program
		Advance Energy Efficiency Measures in New Construction	Energy Efficiency Standards/Codes
			Creative Project Financing: On-bill Financing
			Easier Permitting Process and Reduce Permitting Fee
			Financial Incentives: Tax Credits
			Define Green Building Requirements
			Push for Net Zero Buildings
		Advance Energy Efficiency Measures in Existing Construction	Energy Efficiency Standards/Codes
			Creative Project Financing: On-bill Financing
			Require Efficiency Upgrades at the Time of Sale
			Ease the Energy Efficiency Retrofit Process (one-stop shop) - *notably for residential market*
			Financial Incentives: Tax Credits
			Define Green Building Requirements
		Advance Energy Efficiency for Appliances	Energy Efficiency Appliances Standards
			Financial Incentives: Rebates for Energy Efficient Appliances
		Set/Maintain Energy Efficiency Targets for Utilities	Energy Efficiency Portfolio Standards (EEPS)
			Use of "White Tags" - Market Mechanism to Facilitate ESCO Involvement
			Revenue Decoupling *(removes barriers to EE)*
			Lost Margin Recovery *(removes barriers to EE)*
		Promote Use of Combined Heat and Power Equipment	Offer Incentives: Favorable Tax Treatment, Special Rates
			Ease Interconnection Requirements
		Deploy Smart Grid Technologies and Programs at a Large Scale	Advanced Metering Programs: TOU/CPP
			Smart Grid Pilot
			Flat or Inverted Block Rates
			Demand Response Program
			Net Meters Installation
		Increase T&D efficiency	Utilities to Identify and Upgrade T&D System to Reduce Losses
			Protect the Electric Grid

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Electric Sector Strategies Database (2 of 2)

Sector	Category	Goal/Strategy	Tactic/Policy/Program
Electric	Renewables	Increase Renewable Energy Awareness and Recognition	State-wide Renewable Energy Marketing and Branding
			Renewable Energy Recognition Program: Annual Awards for Best in Class
			Renewable Energy Educational Program
		Promote the Development of Solar PV Projects	Net Metering Program
			Creative Financing Mechanisms: Property Assessed Clean Energy
			Financial Incentives
			Set Solar PV Deployment Targets
			Increase the Dead Load Requirements for Flat and Sloped Roofs (rooftop solar PV)
		Promote the Development of Wind Projects	Streamline Interconnection Process
			Net Metering Program
			Creative Financing Mechanisms: Property Assessed Clean Energy
			Financial Incentives: Sales Tax Exemption, Federal Investment Tax Credit
			Set Wind Deployment Targets
		Promote the Development of Biomass Projects	Streamline Interconnection Process
			Creative Financing Mechanisms
			Financial Incentives: Sales Tax Exemption, Federal Investment Tax Credit
		Promote the Development of Hydro Projects	Streamline Interconnection Process
			Creative Financing Mechanisms
			Financial Incentives: Sales Tax Exemption, Federal Investment Tax Credit
		Purchase Electricity from Quebec Hydro Projects	Negotiate Long-Term Power Purchase Agreement with Hydro Generators
		Become a Renewable Energy Manufacturing Hub	Financial Incentives to Manufacturers: Tax Breaks
			Promote RI as a Center of Excellence for Renewable Energy R&D
	NG	Deploy Additional Natural Gas Fired Power Plants in RI	Secure Long-Term Supply of Natural Gas from Marcellus Shale
	Any	Purchase Lowest Price Electricity from Neighboring States	Negotiate Long-Term Power Purchase Agreement with Low Price Generators
		Promote Energy Research and Innovation in Universities	Energy Research Program at University of RI
		Launch a Jobs in Energy Program	Clean Energy Business Solutions Program
			Community College Training for Energy Jobs

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Thermal Sector Strategies Database

Sector	Category	Goal/Strategy	Tactic/Policy/Program
Thermal	Efficiency	Increase Energy Efficiency Program Funding	Tariff Rider Surchage
			Public Benefit Funds
		Increase Energy Efficiency Awareness and Recognition	State-wide Energy Efficiency Marketing and Branding
			Energy Efficiency Recognition Program: Annual Awards for Best in Class
			Energy Efficiency Educational Program
		Advance Energy Efficiency Measures in New Construction	Energy Efficiency Standards/Codes
			Creative Project Financing: On-bill Financing
			Easier Permitting Process and Reduce Permitting Fee
			Financial Incentives: Tax Credits
			Define Green Building Requirements
		Advance Energy Efficiency Measures in Existing Construction	Energy Efficiency Standards/Codes
			Creative Project Financing: On-bill Financing
			Require Efficiency Upgrades at the Time of Sale
			Ease the Energy Efficiency Retrofit Process (one-stop shop) - *notably for residential market*
			Financial Incentives: Tax Credits
			Define Green Building Requirements
		Set/Maintain Energy Efficiency Targets for Utilities	Energy Efficiency Portfolio Standards (EEPS)
			Use of "White Tags" - Market Mechanism to Facilitate ESCO Involvement
			Revenue Decoupling *(removes barriers to EE)*
			Lost Margin Recovery *(removes barriers to EE)*
		Promote Use of Combined Heat and Power Equipment	Offer Incentives: Favorable Tax Treatment, Special Rates
			Ease Interconnection Requirements
			Streamline Permits and Approvals (one stop)
		Promote Equipment Conversion to Natural Gas	Financing Options for Equipment Conversion to NG
			Financial Incentives for Equipment Conversion to NG
		Expansion of Natural Gas Pipeline Network	Natural Gas Pipeline Expansion
			Gas Main Connections Regulations
			Ease Permitting and Siting Process: Streamline Permits and Approvals (one stop-shop)
			Participate in Regional Planning to Obtain a Secure NG Supply to RI
		Phase Out Electric Heating	Regulations
			Financial Incentives
	Renewables	Promote Solar Thermal	Ease Permitting Process
			Financial Incentives
	Any	Promote Energy Research and Innovation in Universities	Energy Research Program at University of RI
		Launch a Jobs in Energy Program	Clean Energy Business Solutions Program
			Community College Training for Energy Jobs

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

DRAFT

Transportation Sector Strategies Database

Sector	Category	Goal/Strategy	Tactic/Policy/Program
Transportation	Electic Vehicles	Promote the Deployment of Electric Vehicles	Expand Network of Electric Vehicle Charging Stations: Set a Goal
			Electric Vehicle Educational Program
			Financial Incentives
			Use of Electric Vehicles for State and Municipal Fleets
	Natural Gas	Promote the Conversion and Deployment of Natural Gas Fleets	Financial Incentives for Conversion to Natural Gas
			Increase the Number of CNG/LNG Stations: Set a Goal
	Efficiency	Promote Public Transit as a Viable Mean of Transportation	Develop a Park and Ride Program
			Expand RIPTA Services
		Increase Fuel Economy and Decrease Emissions in Traditional Vehicles	Tail-Pipe Emissions Standards
			Financial Incentives for Fuel Efficient Vehicles: Vehicle Fee Waivers, Vehicle Tax Incentives
			Energy Efficiency Recognition Program
		Increase Use of Biofuels in Transportation Mix	Financial Incentives for Biofuel Consumptions
			Develop an E85 Infrastructure
	Any	Increase Transportation Funding	Vehicle Miles Traveled Fee
			Increase State's Gas Tax and Vehicle Registration Fees
			New Petroleum Products Gross Receipts Tax
			Tolling on Interstate 95
			Revenue Bonds
		Promote Energy Research and Innovation in Universities	Energy Research Program at University of RI
		Launch a Jobs in Energy Program	Clean Energy Business Solutions Program
			Community College Training for Energy Jobs
		Ease Congestion	Coordinated transporation infrastructure planning
			Time of day tolling in urban centers
			Active Transit Monitoring and Signalling Sytems
		Upgrade Existing Infrastructure	Restore Obsolete Bridges and Highways

©2013 Navigant Consulting, Inc.
Confidential and proprietary. Do not distribute or copy.

NAVIGANT ENERGY

Next Steps

Next Steps

Next Steps:

- A survey tool will be sent around for Advisory Council members to complete post-meeting
- **The next meeting will be the week of May 22nd – A doodle will be circulated**