State of Rhode Island and Providence Plantations
Department of Administration
Division of Planning
Statewide Planning Program
(401) 222-7901
www.planning.ri.gov

RHODE ISLAND STATE PLANNING COUNCIL

MEETING AGENDA / SUPPLEMENTAL NOTICE

August 8, 2013
9:00 a.m.

William E. Powers Building
Conference Room A – Second Floor
One Capitol Hill, Providence, RI

1. Call to Order
2. June 13, 2013 Meeting Minutes – *for action.*
3. Public Comment on Agenda Items – *for discussion.*
4. Rhode Island Energy Plan Update – *for discussion.*
5. State Planning Council Rules of Procedure Update – for *action.*
6. 2013 Legislative Update – *for discussion.*
7. Associate Director's Report – *for discussion.*
8. Other Business – *for discussion.*
9. Adjourn

Posted: 7/30/13

This meeting place is accessible to individuals with disabilities. Any individual requiring a reasonable accommodation in order to participate in this meeting should contact James A. Pitassi, Jr. at 222-6395 (voice) or #711 (R.I. Relay) at least three (3) business days prior to the meeting. Any individual requiring the services of an interpreter to participate in this meeting should contact Michael Moan at 222-1236 (voice) at least three (3) business days prior to the meeting.

Rhode Island State Energy Plan

Statewide Planning Council

Thursday, August 8, 2013

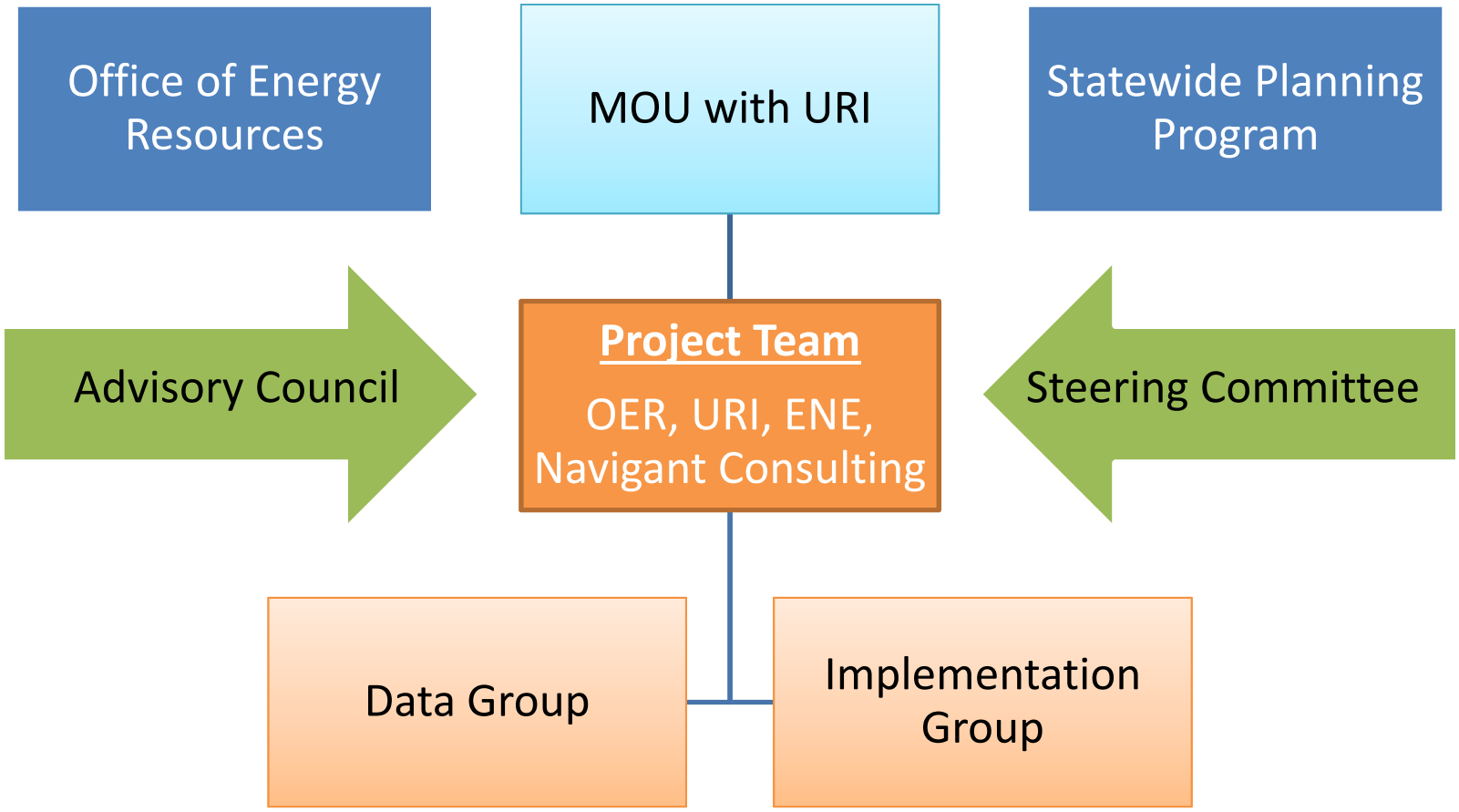
RISEP Update

1. **Process & Advisory Structure**
2. Scope & Framework

The Rhode Island State Energy Plan

- Housed in the State Guide Plan
  - Sets long-range policy (generally 20 years)
  - Provides a means to evaluate and coordinate projects of proposals of state importance
  - Sets standards for local comprehensive plans
  - Serves as a general background information source on various topics
- Element 781 (Energy) was last updated in 2002
- The Office of Energy Resources is leading the development of a new update by March 2014

Advisory Structure



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 – October 2013) Distill research developed during Phase I into a Preliminary Draft Plan
Phase III: Technical & Public Review (November 2013 – March 2014) Vet Preliminary Draft Plan through a technical and public review process; Adopt Plan as State Guide Plan Element

The Rhode Island State Energy Plan

1. Process & Advisory Structure
2. **Scope & Framework**

What do we want?

- Toast some bread
- Read a book at night
- Stay warm in the winter
- Stay cool in the summer
- Visit family and friends

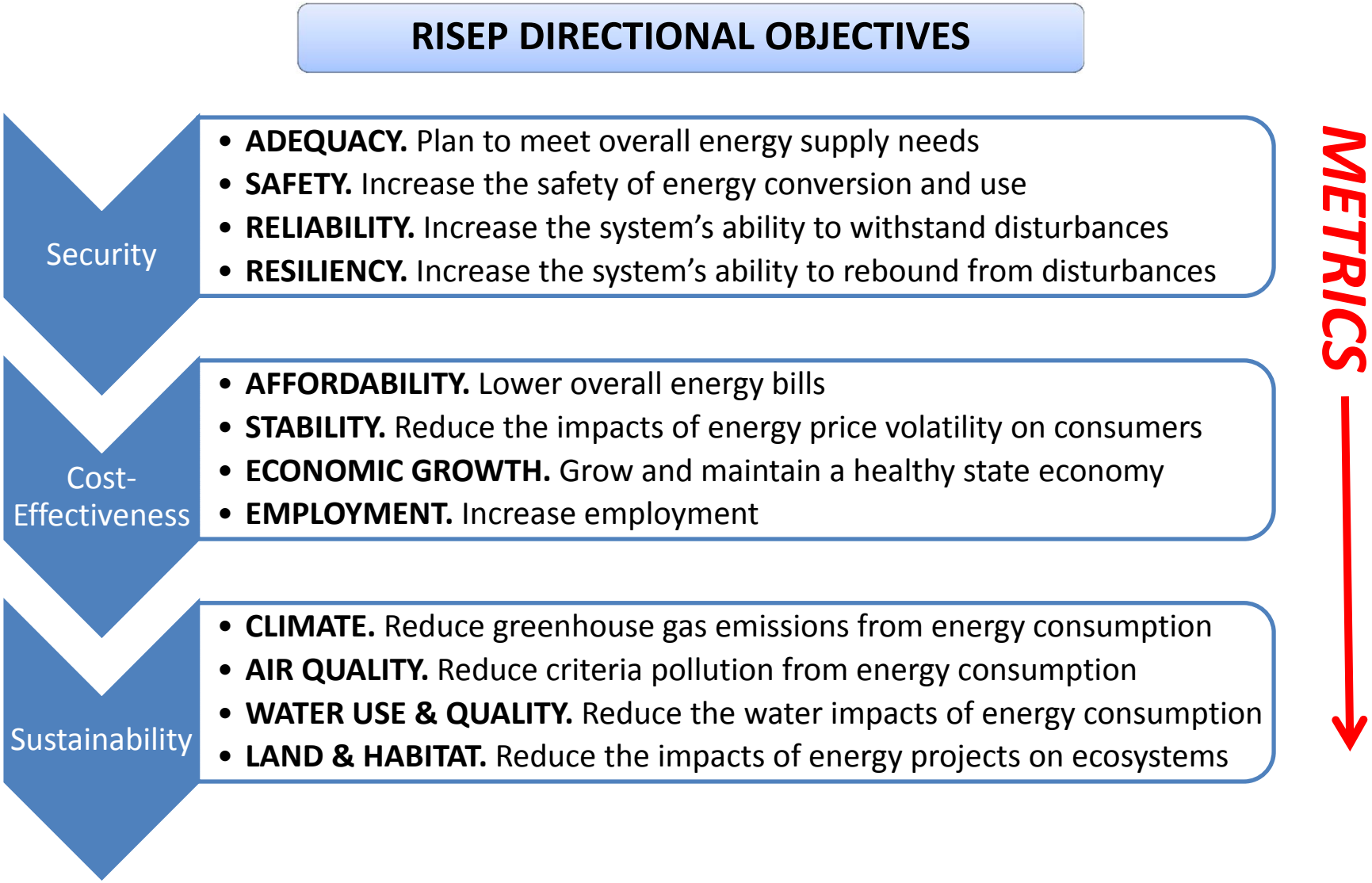
➢ *At the end of the day, what we want is to* ***provide energy services***

What do we want?

RISEP 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."*

What does secure, cost-effective, and sustainable mean?



What does secure, cost-effective, and sustainable mean?

RISEP DIRECTIONAL OBJECTIVES

Security

- **ADEQUACY.** Plan to meet overall energy supply needs
- **SAFETY.** Increase the safety of energy conversion and use
- **RELIABILITY.** Increase the system's ability to withstand disturbances
- **RESILIENCY.** Increase the system's ability to rebound from disturbances

Cost-Effectiveness

- **AFFORDABILITY.** Lower overall energy bills
- **STABILITY.** Reduce the impacts of energy price volatility on consumers
- **ECONOMIC GROWTH.** Grow and maintain a healthy state economy
- **EMPLOYMENT.** Increase employment

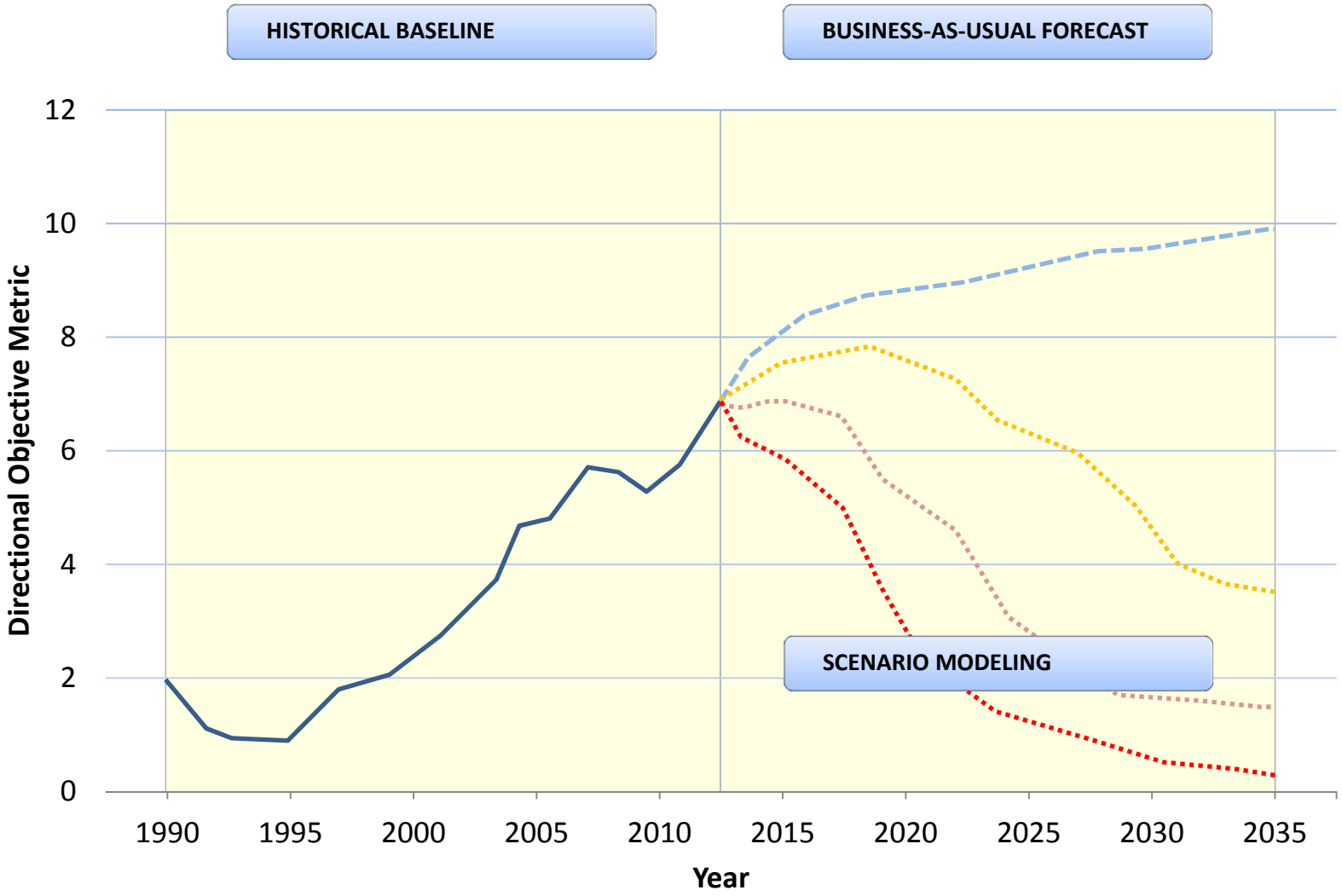
Sustainability

- **CLIMATE.** Reduce greenhouse gas emissions from energy consumption
- **AIR QUALITY.** Reduce criteria pollution from energy consumption
- **WATER USE & QUALITY.** Reduce the water impacts of energy consumption
- **LAND & HABITAT.** Reduce the impacts of energy projects on ecosystems

The RISEP Process – Illuminating Choices

It is unlikely we can maximize every Directional Objective simultaneously, therefore any path we take will likely involve tradeoffs – we want to measure these tradeoffs:

The RISEP Process – Illuminating Choices



The RISEP Process – Illuminating Choices

HISTORICAL BASELINE

- How well have we met our criteria in the past?

- ***In 2010…***

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**

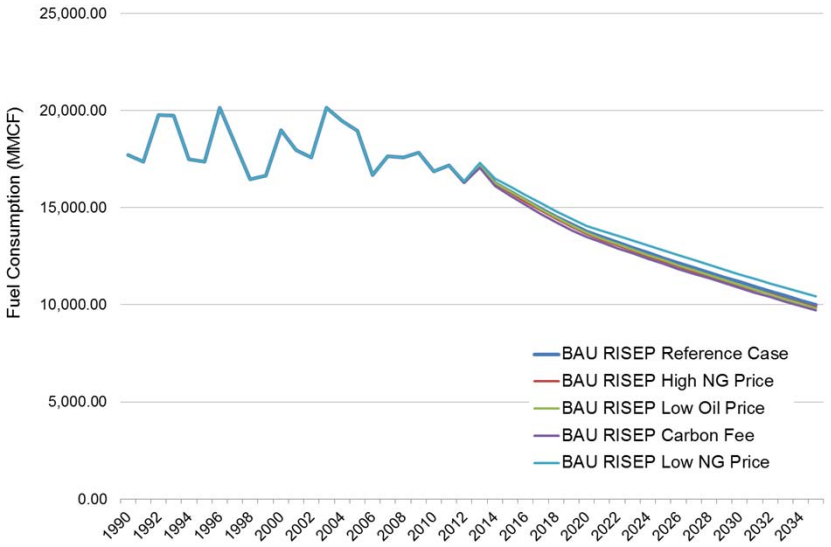
Source: EIA SEDS, EIA-923

The RISEP Process – Illuminating Choices

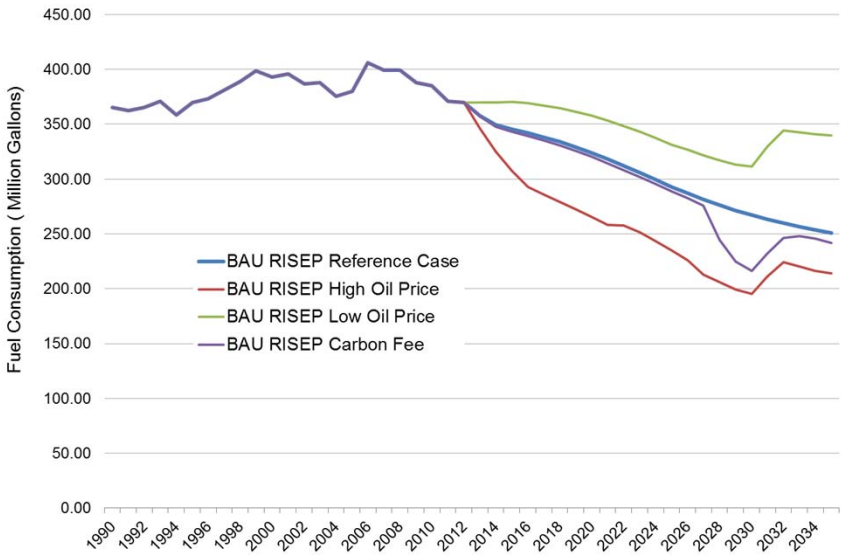
BUSINESS-AS-USUAL FORECAST

- How well are we poised to meet our criteria going forward?

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



Transportation Sector –Gasoline Consumption (Shows Impact of CAFE)

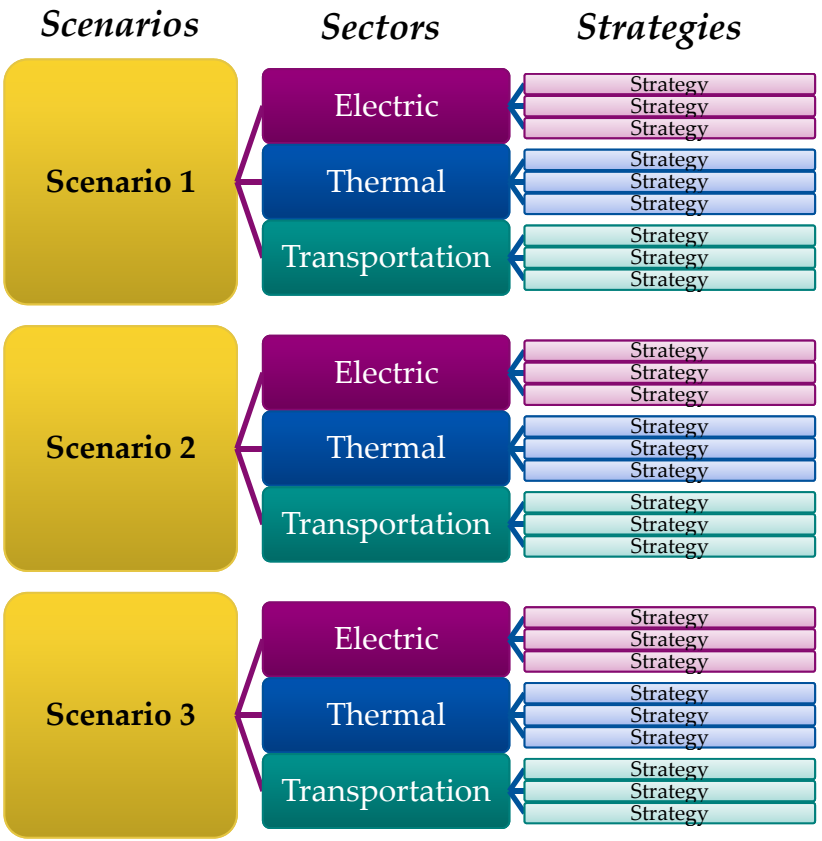


Source: ENE

The RISEP Process – Illuminating Choices

SCENARIO MODELING

- Can we do a better job of meeting our criteria going forward?



Security	Cost-Effectiveness	Sustainability
+++	-	+
-	++	+++
+	+++	+

ILLUSTRATIVE

Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices

SCENARIO MODELING

- Can we do a better job of meeting our criteria going forward?

Define Scenarios

- 3 Alternative Energy Futures
- Each Scenario includes different weights for each Directional Objective (Security, Cost-Effectiveness, Sustainability)

Set Targets

- Changes in the Future Supply Infrastructure and Demand Profile
- Low, Moderate, and Aggressive Targets
- EG: 17, 35, or 150 MW of Residential Solar by 2023

Develop Strategies

- Develop a suite of policies and programs directed at meeting each target
- EG: On-bill financing, renewed FIT, Statewide SREC fixed value

Model Effects

- For each scenario, select the group of strategies and targets that best fulfill the prioritized directional objectives
- Model the aggregate effects of the chosen strategies on the directional objectives

Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices

Set Targets

ELECTRIC

- Develop Offshore Wind Resources
- Develop Onshore Wind Resources
- Develop Rooftop Solar PV (Residential & Commercial)
- Develop Ground Mount Solar PV (Utility-Scale)
- Develop In-State Hydropower Resources
- Procure Electricity from Out-of-State Hydropower
- Develop Biomass Resources
- Expand Natural Gas Fired Power Generation Capacity
- Expand Combined Heat and Power Capacity
- Develop Grid Tied Electric Storage
- Reduce Peak Demand
- Promote Residential Electric Efficiency
- Promote Commercial Electric Efficiency
- Promote Industrial Electric Efficiency

THERMAL

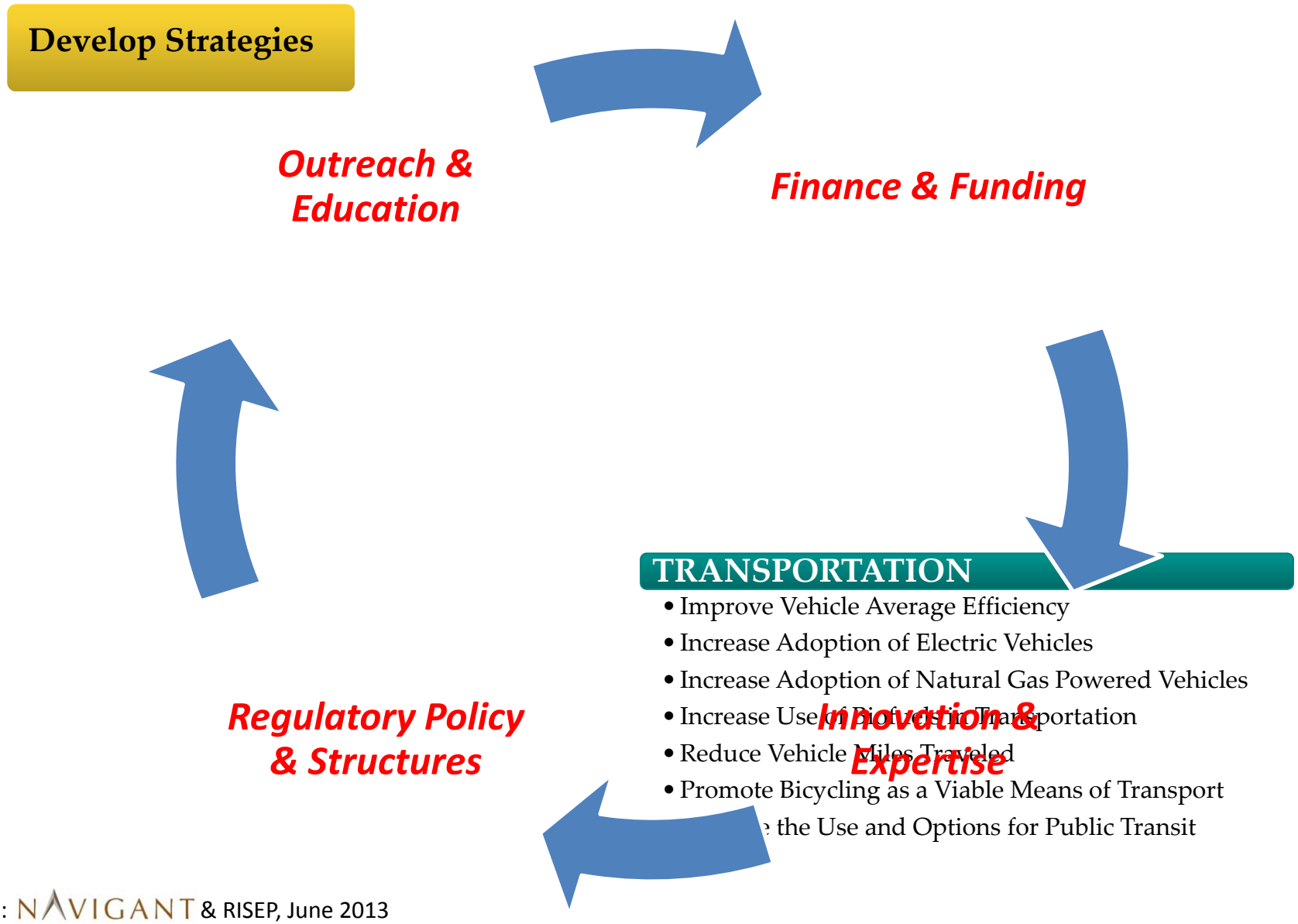
- Expand Combined Heat and Power Capacity
- Increase Thermal Efficiency in Residential Applications
- Increase Thermal Efficiency in Commercial Applications
- Increase Thermal Efficiency in Industrial Applications
- Increase Heating from Natural Gas
- Develop Solar Thermal Resources
- Develop Geothermal Resources
- Deploy Electric Thermal Storage (ETS)

TRANSPORTATION

- Improve Vehicle Average Efficiency
- Increase Adoption of Electric Vehicles
- Increase Adoption of Natural Gas Powered Vehicles
- Increase Use of Biofuels in Transportation
- Reduce Vehicle Miles Traveled
- Promote Bicycling as a Viable Means of Transport
- Increase the Use and Options for Public Transit

Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices



Source: NAVIGANT & RISEP, June 2013

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Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices

Scenario 1 prioritizes energy security through fuel diversification and grid modernization.

Electric	Thermal	Transportation
• Targets a diverse power generation portfolio which does not rely on any one fuel source for more than 30% of generation by 2035. • Aims to increase grid reliability through deployment of smart meters and grid tied storage.	• Aims to reduce demand and promote the adoption of a diverse set of options for heating and space conditioning across the residential, commercial, and industrial sectors.	• Promotes energy security in the transportation sector through a diverse portfolio of transportation options, including CNG, biofuels, PEVs.

Directional Objectives	SECURITY *Adequacy* *Safety* *Reliability* *Resiliency*	COST-EFFECTIVENESS *Affordability* *Stability* *Economic Growth* *Employment*	SUSTAINABILITY *Climate* *Air Quality* *Water Use & Quality* *Land & Habitat*
Weighting	**60%**	**10%**	**30%**

Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices

Scenario 2 prioritizes cost effectiveness and economic development while hitting key targets for GHG reduction.

Electric	Thermal	Transportation
• Minimizes electricity expenditures through demand side management while promoting economic development and meeting established targets for GHG reduction.	• Targets a 20% reduction in total thermal energy expenditures by 2035 through deep energy efficiency retrofits and fuel switching.	• Aims to cut transportation related fuel expenditures by 20% through programs that dramatically increase vehicle average efficiency and provide for cost effective public transit options.

Directional Objectives	SECURITY *Adequacy* *Safety* *Reliability* *Resiliency*	COST-EFFECTIVENESS *Affordability* *Stability* *Economic Growth* *Employment*	SUSTAINABILITY *Climate* *Air Quality* *Water Use & Quality* *Land & Habitat*
Weighting	**10%**	**60%**	**30%**

Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices

Scenario 3 prioritizes sustainability through the widespread deployment of renewables, deep efficiency gains, and vehicle electrification.

Electric	Thermal	Transportation
• Targets a generation portfolio comprised of 25% renewables by 2023 and 75% by 2035. • Targets a reduction of total and peak loads by 5% and 20% in the same years through aggressive efficiency measures and demand response.	• Aims to minimize GHG emissions in 2035 through substantial adoption of heating by solar thermal, geothermal, ETS, and biodiesel blending with traditional home heating oil.	• Aims minimize transportation related emissions in 2035 through widespread vehicle electrification and increased options for public transit.

Directional Objectives	SECURITY *Adequacy* *Safety* *Reliability* *Resiliency*	COST-EFFECTIVENESS *Affordability* *Stability* *Economic Growth* *Employment*	SUSTAINABILITY *Climate* *Air Quality* *Water Use & Quality* *Land & Habitat*
Weighting	**10%**	**30%**	**60%**

Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices

SCENARIO MODELING

- Can we do a better job of meeting our criteria going forward?

Define Scenarios

- 3 Alternative Energy Futures
- Each Scenario includes different weights for each Directional Objective (Security, Cost-Effectiveness, Sustainability)

Set Targets

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- EG: On-bill financing, renewed FIT, Statewide SREC fixed value

Model Effects

- For each scenario, select the group of strategies and targets that best fulfill the prioritized directional objectives
- Model the aggregate effects of the chosen strategies on the directional objectives

Source: NAVIGANT & RISEP, June 2013

The RISEP Process – Illuminating Choices

The result of the modeling exercise will be a comparison of the key parameters associated with energy security, cost-effectiveness, and sustainability.

Scenario	Security		Cost-Effectiveness			Sustainability	
Metric *(units)*	Diversity of power generation and fuels *(max % of dominant fuel source)*	Stability, Reliability, Resiliency Indicators *(frequency of outages in mdbf)*	Total Energy Expenditure *($Millions)*	Average Cost of Electricity *($/kWh)*	In-State Jobs Created *(thousands)*	GHG Reductions (2035 % below 1990 levels)	Air Quality Indicators (PPM)
Scenario 1: Prioritize Security	50%	365	$800	$0.16	6.3	40%	0.0010
Scenario 2: Prioritize Sustainability	80%	100	$900	$0.28	10.8	75%	0.0001
Scenario 3: Prioritize Cost Effectiveness	80%	175	$630	$0.13	4.5	25%	0.0030

ILLUSTRATIVE

Source: NAVIGANT & RISEP, June 2013

Rhode Island State Energy Plan

Statewide Planning Council

Thursday, August 8, 2013

Supplemental Slides

Results of the modeling exercise demonstrate the tradeoffs between scenarios in the electric sector.

	Metric	Units	BAU	Scenario 1: Prioritize Security	Scenario 2: Prioritize Economics	Scenario 3: Prioritize Sustainability
Secure	Diversity of Fuels Used to Meet In-State Demand	Dominant fuel source in 2035 (%)	87%	50%	87%	85%
	Grid Tied Storage	MW in 2035	0	200	0	150
	Stability, Reliability, Resiliency	+/-	N/A	+++	-	+
Economic	Average Annual Electric Energy Expenditures*	$2012 Millions	902	1,119	934	1,090
	Average Cost of Electricity*	$2012/MWh (Wholesale)	$59.76	$59.81	$59.74	$59.43
	Average Price Volatility of LMPs	Index in 2035 (Relative to BAU)	1	0.926	0.999	0.961
	Economic Activity (Total In-State Expenditures*)	$2012 Millions	21,959	22,365	22,296	23,383
	In-State Employment Impact* (Relative to BAU)	Job Years	N/A	3,444	20	1,170
Sustainable	GHG Reductions (RI Load Served)	% below 2013 levels in 2035	23%	35%	23%	56%
	NOx & SO2 (RI)	% below 2013 levels in 2035	14%	57%	14%	14%
	Land Use Conversion	Acres	408	2,072	426	651

- Averages and totals are across the analysis period spanning 2013-2035
- Wholesale costs only consider marginal cost to meet load, system costs include all electric system infrastructure expenditures

NAVIGANT ENERGY

Results of the modeling exercise demonstrate the tradeoffs between scenarios in the thermal sector.

	Metric	Units	BAU	Scenario 1: Prioritize Security	Scenario 2: Prioritize Economics	Scenario 3: Prioritize Sustainability
Secure	Diversity of Fuels Used to Meet In-State Demand	Dominant fuel source in 2035 (%)	67%	62%	74%	63%
	Thermal Storage (ETS)	MW in 2035	0	1,067	0	217
	Stability, Reliability, Resiliency	+/-	n/a	+++	+	++
Economic	Average Annual Thermal Energy Expenditures*	$2012 Millions	$1,126	$1,148	$1,062	$1,092
	Average Cost of Energy*	$2012/MMBTU	$18.07	$18.67	$17.43	$17.74
	Average Price Volatility of Fuels	Index in 2035 (Relative to BAU)	1.000	0.961	0.976	0.963
	Economic Activity (Total In-State Expenditures*)	$2012 Millions	$0	$1,917	($1,616)	$1,063
	In-State Employment Impact* (Relative to BAU)	Job Years	0	1,275	(1,534)	538
Sustainable	GHG Reductions (RI Load Served)	% below 2013 levels in 2035	8%	25%	8%	34%
	NOx & SO2 (RI)	% below 2013 levels in 2035	19%	80%	41%	80%

* Averages and totals are across the analysis period spanning 2013-2035

NAVIGANT ENERGY

Results of the modeling exercise demonstrate the tradeoffs between scenarios in the transportation sector.

	Metric	Units	BAU	Scenario 1: Prioritize Security	Scenario 2: Prioritize Economics	Scenario 3: Prioritize Sustainability
Secure	Diversity of Fuels Used to Meet In-State Demand	Dominant fuel source in 2035 (%)	56%	32%	34%	39%
	Grid Tied Storage (EV Battery)	MW in 2035	137	1277	1277	6292
	Stability, Reliability, Resiliency	+/-		+++	+	+++
Economic	Average Annual Transportation Fuel Expenditures*	$2012 Millions	$1,696	$1,098	$1,096	$1,132
	Average Cost of Fuels*	$2012/MMBTU	$29.87	$29.75	$29.45	$30.22
	Average Price Volatility of Transportation Fuels	Index in 2035 (Relative to BAU)	1.000	1.013	1.018	0.999
	Economic Activity* (Total In-State Expenditures)	$2012 Millions	$0	$4,187	$2,194	($9,179)
	In-State Employment Impact* (Relative to BAU)	Job Years	0	528	(317)	(5,454)
Sustainable	GHG Reductions (RI Load Served)	% below 2013 levels in 2035	11%	54%	52%	56%
	NOx & SO2 (RI)	% below 2013 levels in 2035	19%	52%	51%	65%

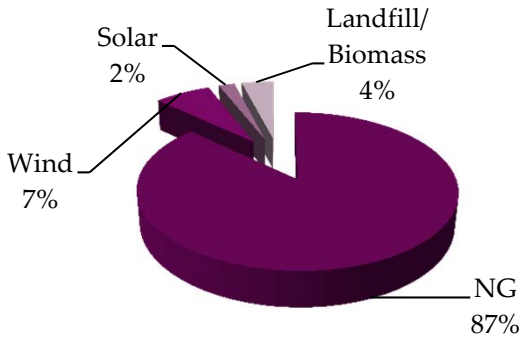
* Averages and totals are across the analysis period spanning 2013-2035

NAVIGANT ENERGY

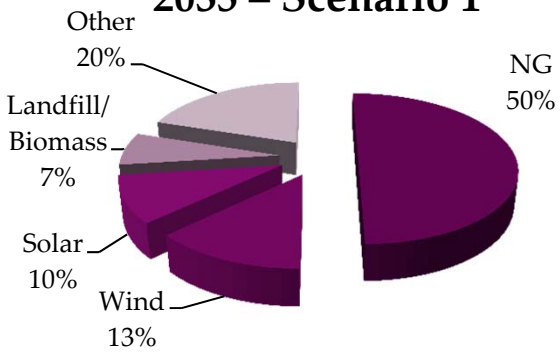
In Scenario 1, Natural Gas is constrained to meet only 50 % of electric demand (87% in the BAU case), Renewables take over 8% of the thermal energy market, and AFVs reach 34% of the market.

Electric Sector

2035 – BAU

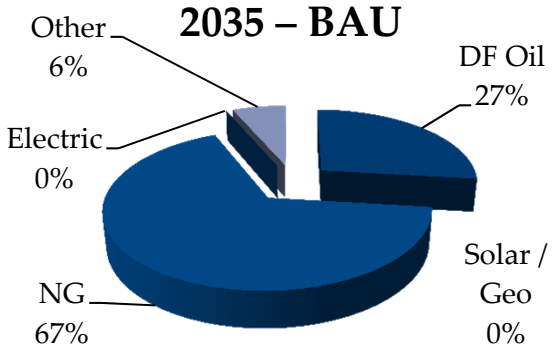


2035 – Scenario 1

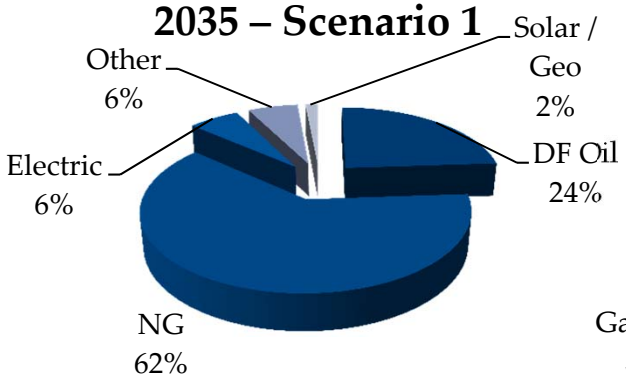


Thermal Sector

2035 – BAU

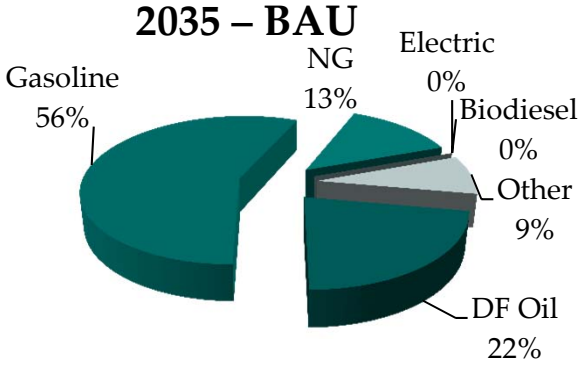


2035 – Scenario 1

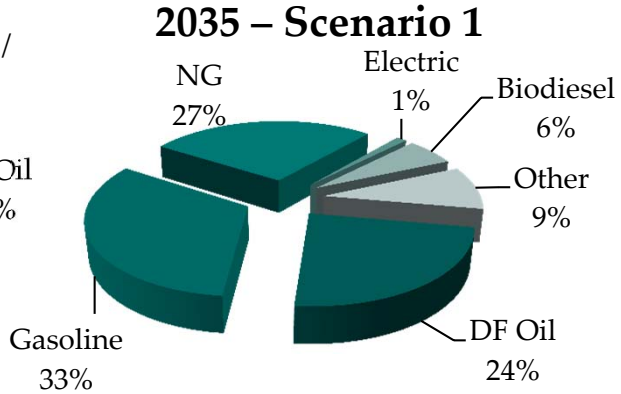


Transportation Sector

2035 – BAU



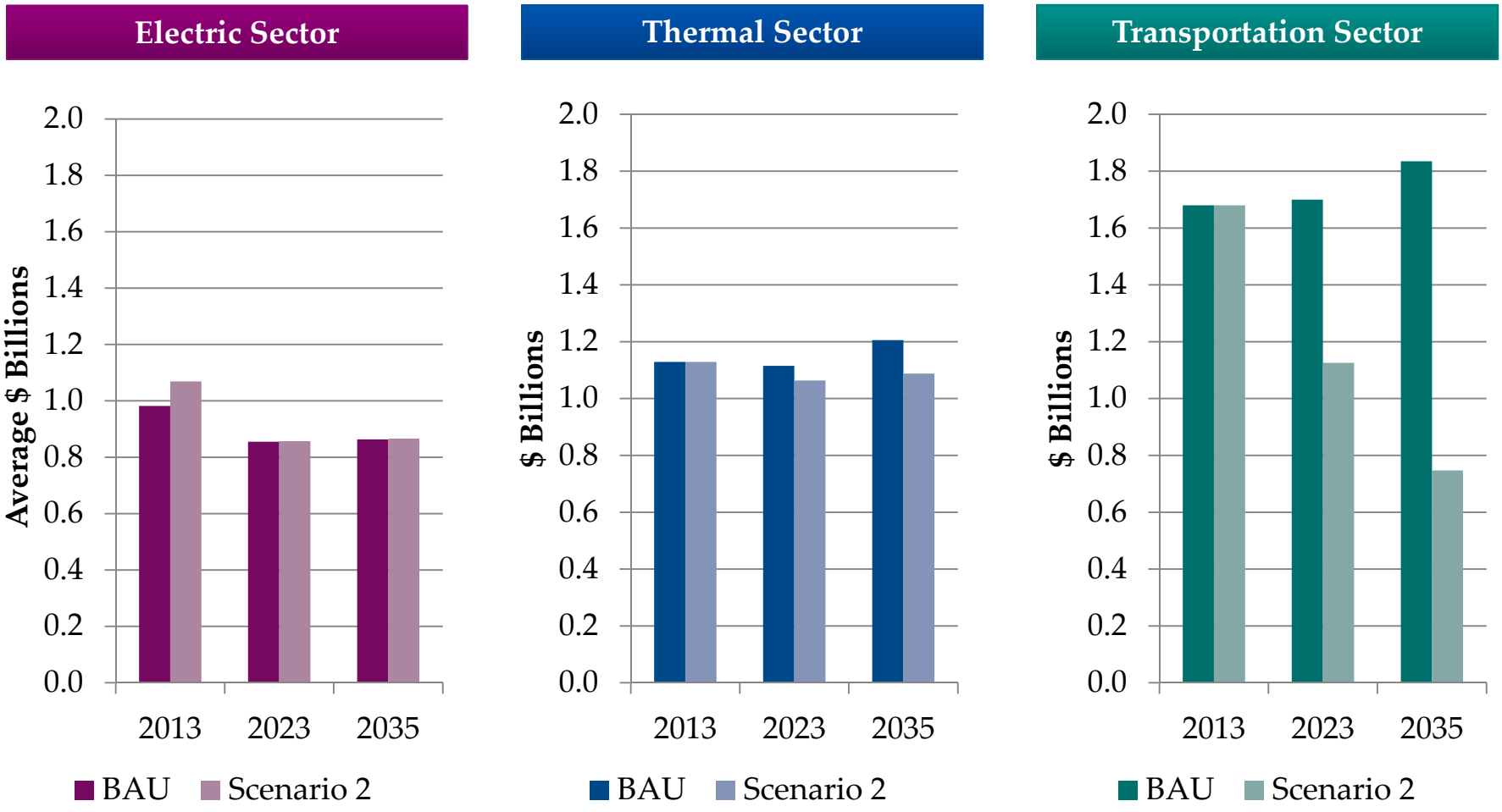
2035 – Scenario 1



*Electric Sector 'Other' includes: large-scale hydro, nuclear, and oil
**Thermal Sector 'Other' includes: gasoline, kerosene, propane and residual fuel oil.
***Transportation Sector 'Other' includes: ethanol E85, jet fuel, propane and residual fuel oil.

NAVIGANT
ENERGY

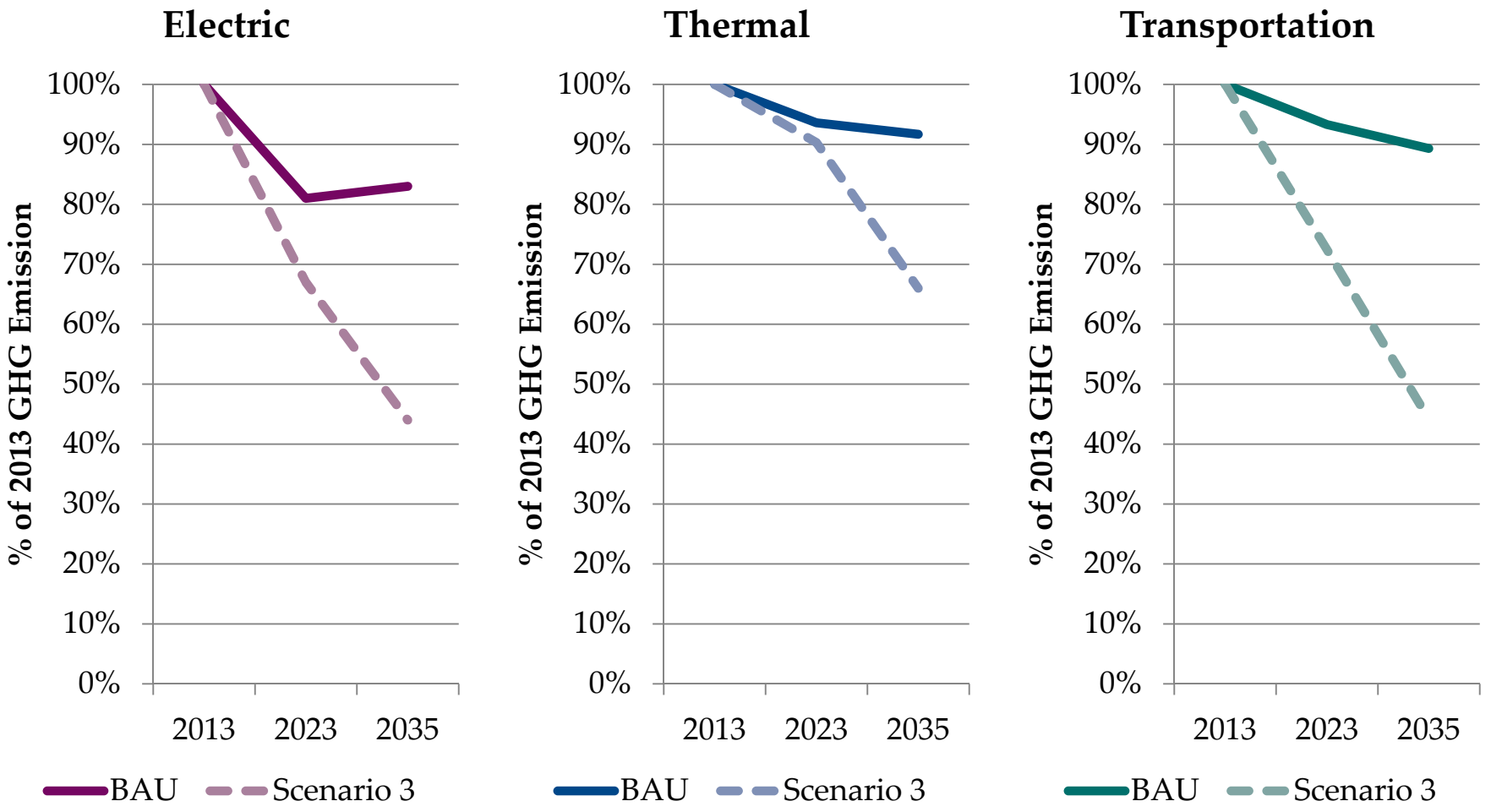
In Scenario 2, total electric expenditures increase slightly to keep pace with increased RPS and increased electrification, whereas thermal and transportation fuel expenditures drop to 90% and 41% of the BAU, respectively.



* Electric sector figures are averages across the periods 2013 – 2020, 2021 – 2028, and 2029 – 2035 to eliminate spikes from single year infrastructure investments.

NAVIGANT
ENERGY

In Scenario 3, GHG emissions drop by 56%, 34%, and 56% below 2013 levels of the BAU case in 2035, across the three sectors respectively.



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