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**MUNICIPAL ENERGY
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Low Emissions Development Training Series

*Module 3: LEDS Action Planning Startup -
Preliminary Assessment*

The Center for Climate Strategies

Kiev, June 2015



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LEDS Process





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Module 3: Learning Objectives

Create effective planning goals for LEDS objectives

- typically a combination of economy, energy, and environment (3E)

Create a supporting 3E baseline

- with a sector based forecast that includes existing/planned actions

Create database of potential 3E policy options

- build on existing/ planned actions with benchmarks and ratings of potential 3E policy options



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LEDS GOAL SETTING



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**“If you aim at nothing you’re
sure to hit it.”**

Zig Ziglar



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**“Plans are nothing. Planning
is everything.”**

General Dwight. D. Eisenhower



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Goals and Objectives: Approaches

Scope

Coverage of 3E issues

Timing of Goal(s) Selection

Metrics

Methods

Tools

Decision Protocols



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LEDS Goal Areas

GHG reduction potential, carbon intensity

Economic impacts, micro- and macro-scale

Energy security and sustainability

Environment, resource sustainability and efficiency

Equity, fairness for individuals, groups, locations



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Concepts

Multi-Objective Decision Making (MODM)

Self interest, self determination, agency priorities

Linkage to planning/analysis, policy development

Incorporation of synergies and tradeoffs

Expansion through innovation, modernization

Customization and consistency



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Purpose

Scoping of potential goals

Guidance to planning and analysis

Standard setting for policies and programs

Identification of development objectives

Education of key groups and the public

Public awareness on needs and opportunities

Consensus building for agencies, stakeholders



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Prerequisites

Historical and future baselines of activities and outputs (economic, energy, resources, emissions)

Knowledge of drivers of baseline shifts

Benchmarks and policy options from other issues, jurisdictions

Evaluation tools for preferences, tradeoffs, scenarios

Existing studies of baselines, scenarios, impacts

Expert work group collaboration mechanism



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Examples LEDS Related Goal Setting

Intended Nationally-Determined Contributions (INDCs)

Climate Action Plans

Integrated Resource Plans

Rule making

Investment portfolios

Line of business

Product management



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Bottom Line

What are your LEDS startup goals?

Economy

Energy

Environment

Equity



Induced Temperature Trends

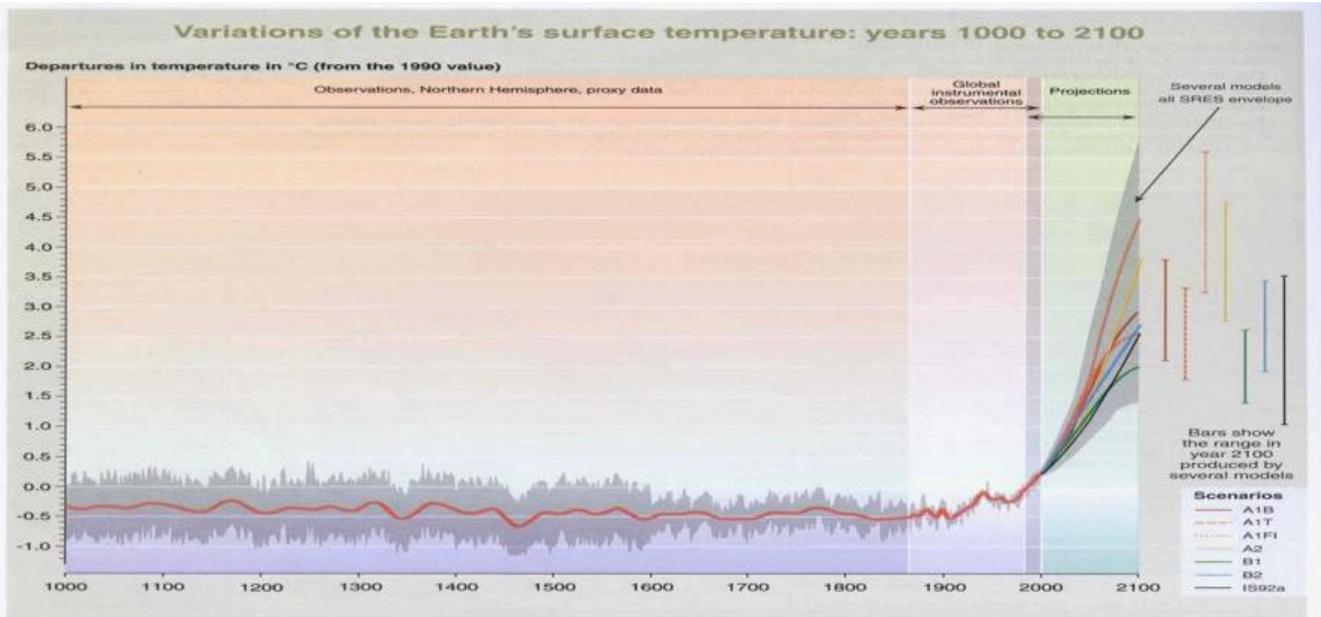


Figure SPM-10b: Variations of the Earth's surface temperature: years 1000 to 2100. From year 1000 to year 1860 variations in average surface temperature of the Northern Hemisphere are shown (corresponding data from the Southern Hemisphere not available) reconstructed from proxy data (tree rings, corals, ice cores, and historical records). The line shows the 50-year average, the grey region the 95% confidence limit in the annual data. From years 1860 to 2000 are shown variations in observations of globally and annually averaged surface temperature from the instrumental record; the line shows the decadal average. From years 2000 to 2100 projections of globally averaged surface temperature are shown for the six illustrative SRES scenarios and IS92a using a model with average climate sensitivity. The grey region marked "several models all SRES envelope" shows the range of results from the full range of 35 SRES scenarios in addition to those from a range of models with different climate sensitivities. The temperature scale is departure from the 1990 value; the scale is different from that used in Figure SPM-2.

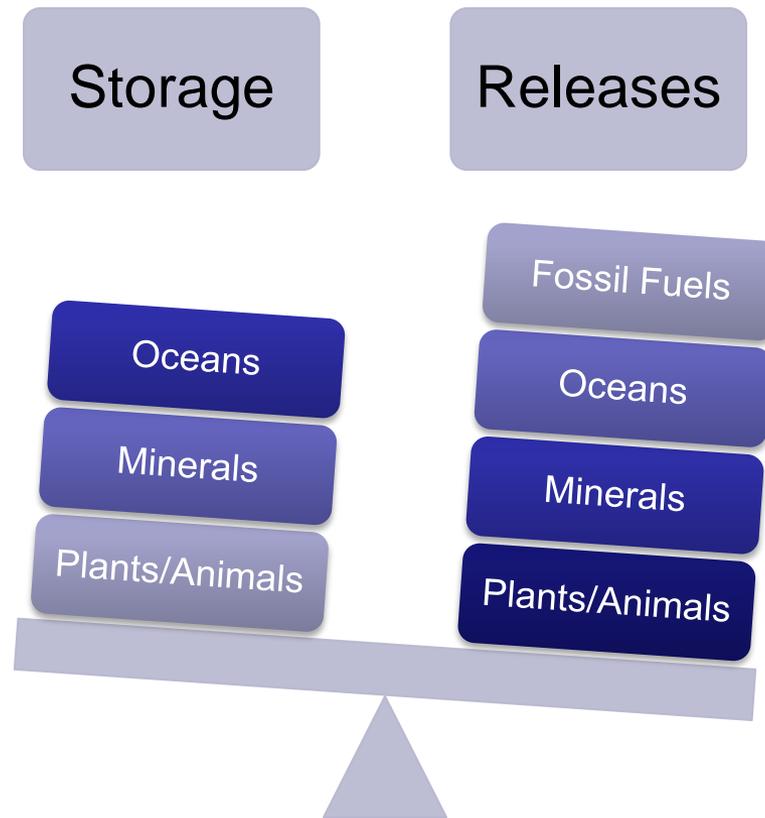
Q9 Figure 9-1b



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GHG Balance

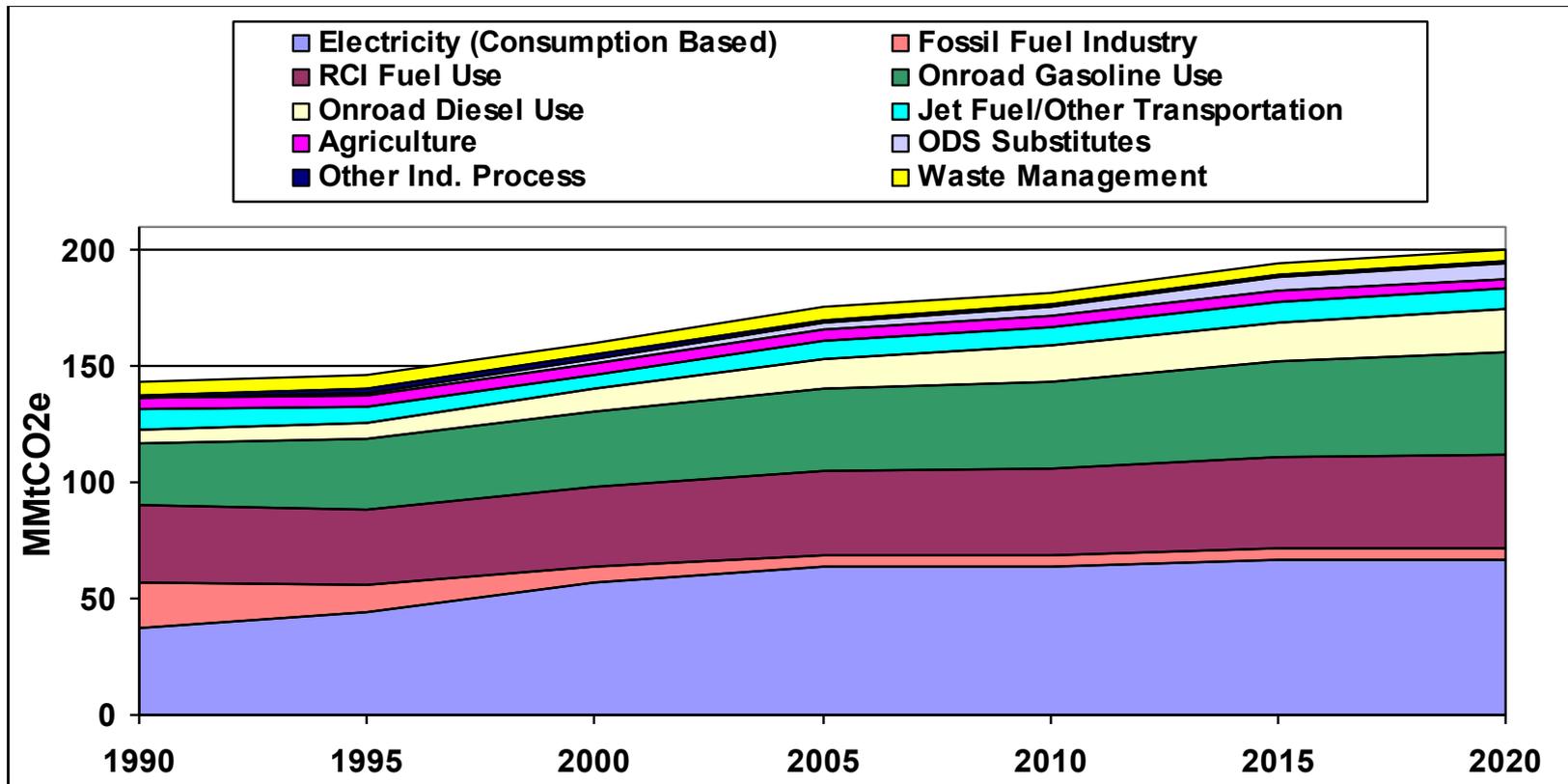




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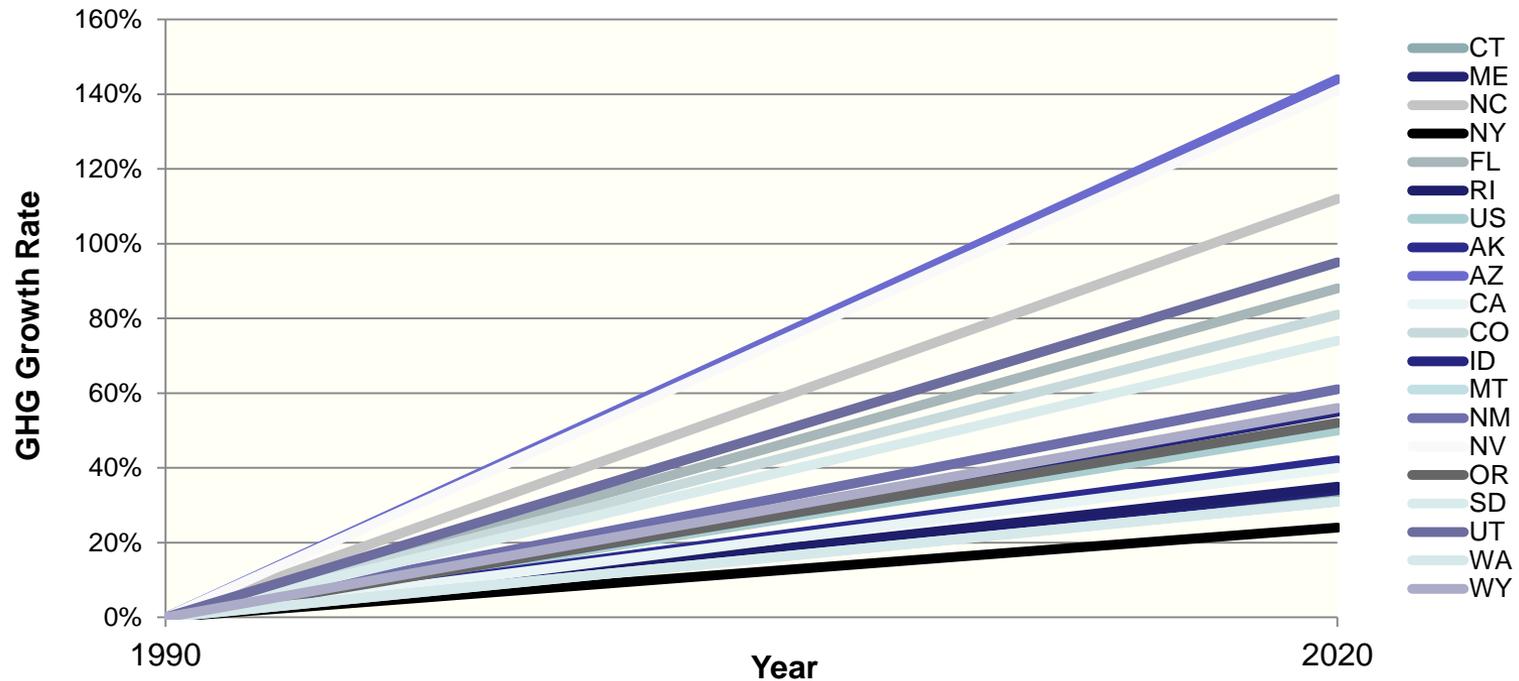
GHG Baseline





US State GHG Growth Rates, 2007

State GHG Emissions Growth 1990-2020
(CCS Analysis, 2007)





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GHG Strategies

HEAT AND POWER

- Renewable and low emitting sources

RESIDENTIAL, COMMERCIAL, INDUSTRIAL, INSTITUTIONAL

- Efficiency, process improvements

TRANSPORTATION AND LAND USE

- Low carbon fuels, vehicle efficiency, community design

AGRICULTURE

- Bio energy, carbon storage, low input farming, feed efficiency

FORESTRY

- Bio energy, carbon storage, land restoration

WASTE

- Source reduction, recycling, energy recovery



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Economic Expansion

Cost effective approaches increase economic efficiency and expansion

Energy savings cut energy costs, stimulate labor investment

Shifts to indigenous vs. imported resources cut job outflows

Actions supported by local supply chains cut job outflows

New investment from outside sources stimulates labor investment at home

Labor intensive activities create more jobs, even if at higher cost (up to a point)



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Economic Transition

Policy Framework, Barrier Removal

Pilots and Demonstrations

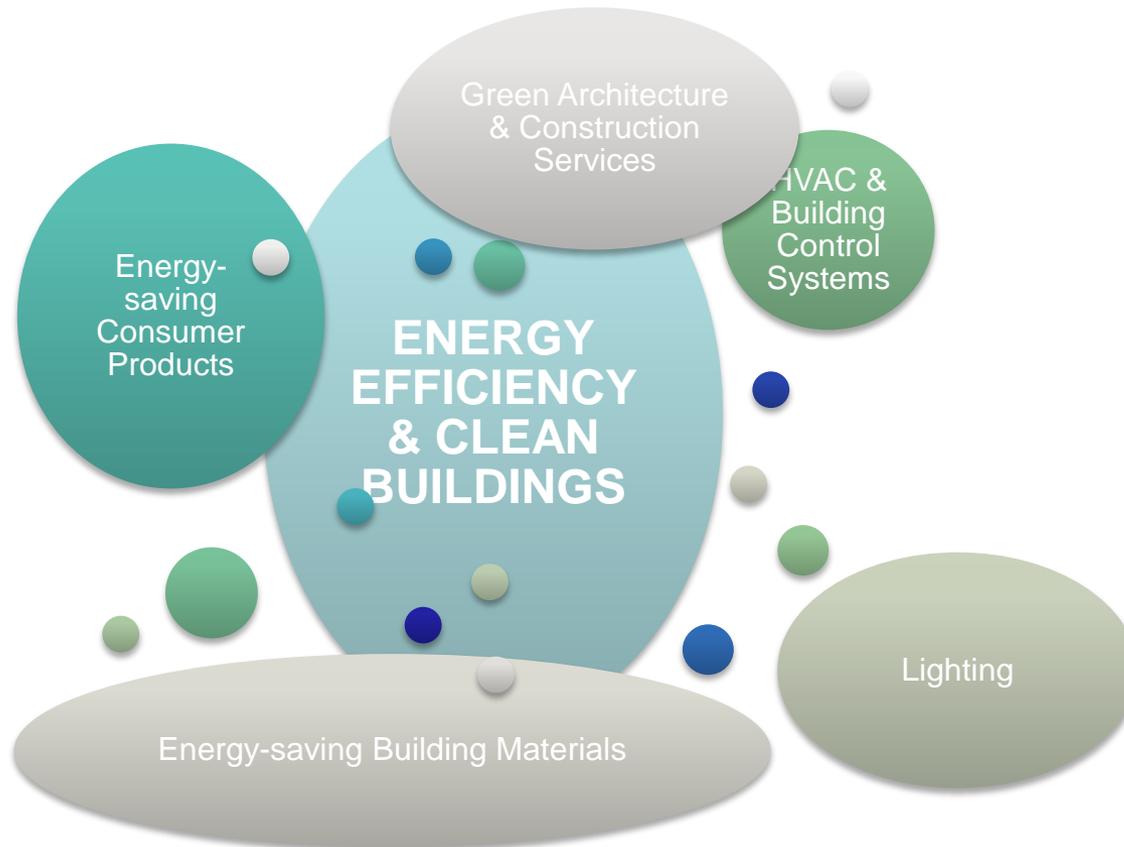
Commercialization and Scale Up

Secondary and Tertiary Production

Sustainability and Exports



New Clean Energy Markets





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Energy Security

Energy Intensity

Fuel Diversity

Electricity
Diversity

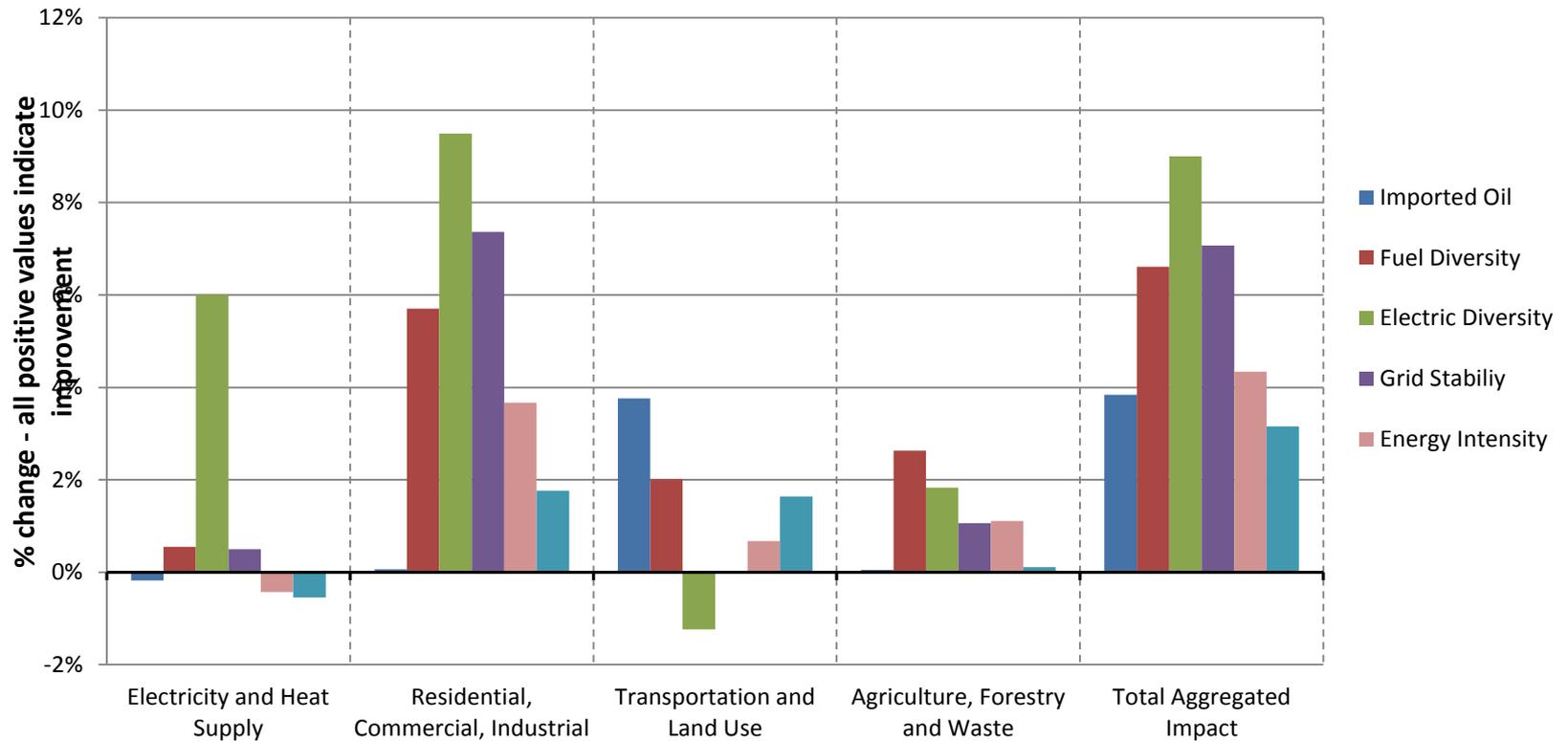
Grid Stability

Access and
Affordability

Import
Reduction



Energy Security Metrics





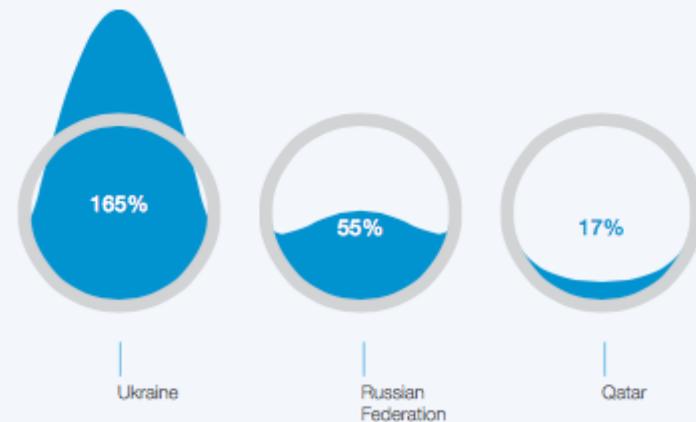
Ukraine Energy Imports

World Economic Forum, 2015

Ukraine's energy intensity is high
(Total primary energy consumption per dollar of GDP, thousand Btu/2005
US Dollars)
Source: IEA 2010



Ukraine is highly dependent on imports
(Total energy consumption as % of domestic production)
Source: IEA 2012

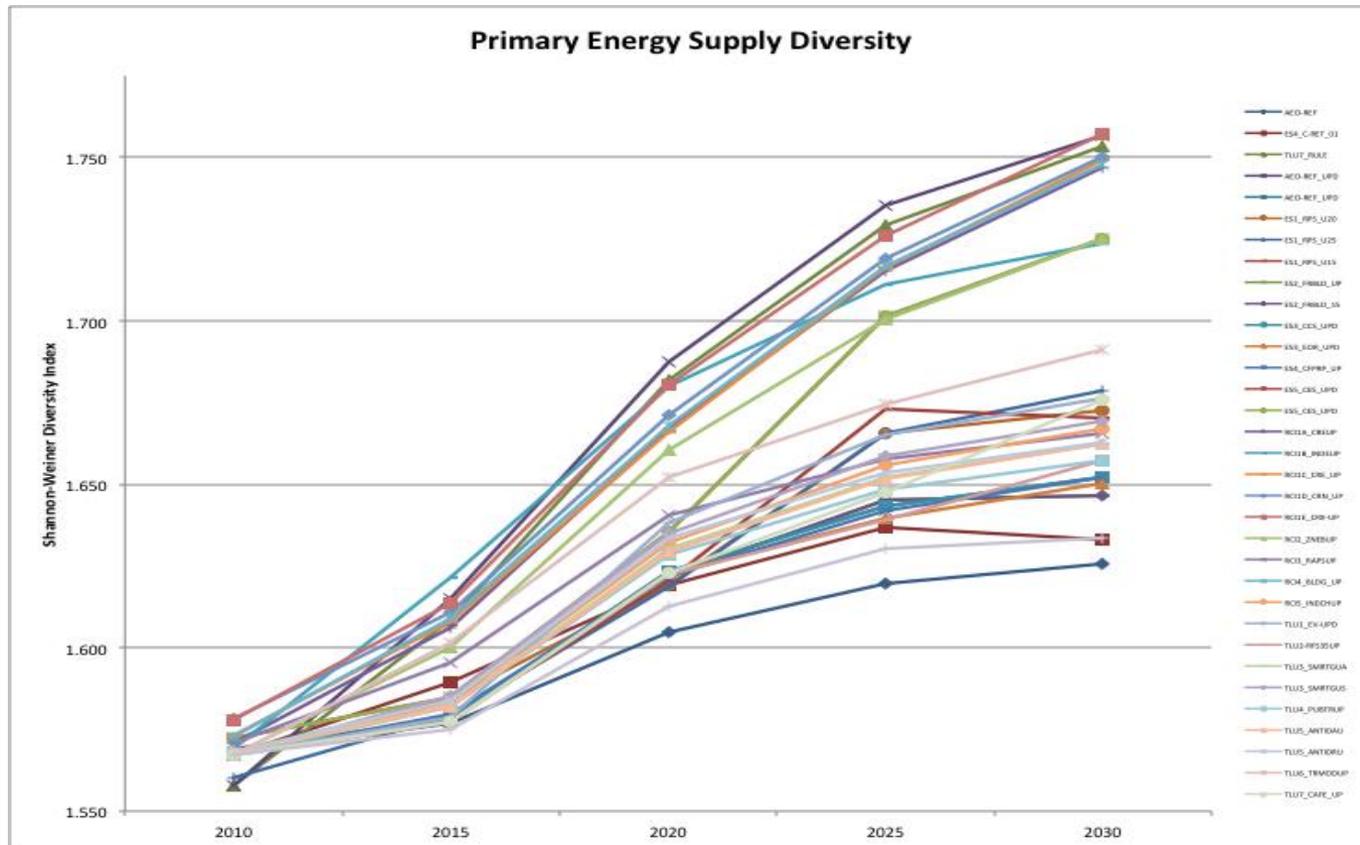




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Energy Security





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Resource Sustainability

Quantity/Scarcity

Quality/Health

Longevity

Resilience

Recovery

Renewability



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Fairness Equity

Wealth
Status

Social
Status

Generational

Business
Size

Special
Populations

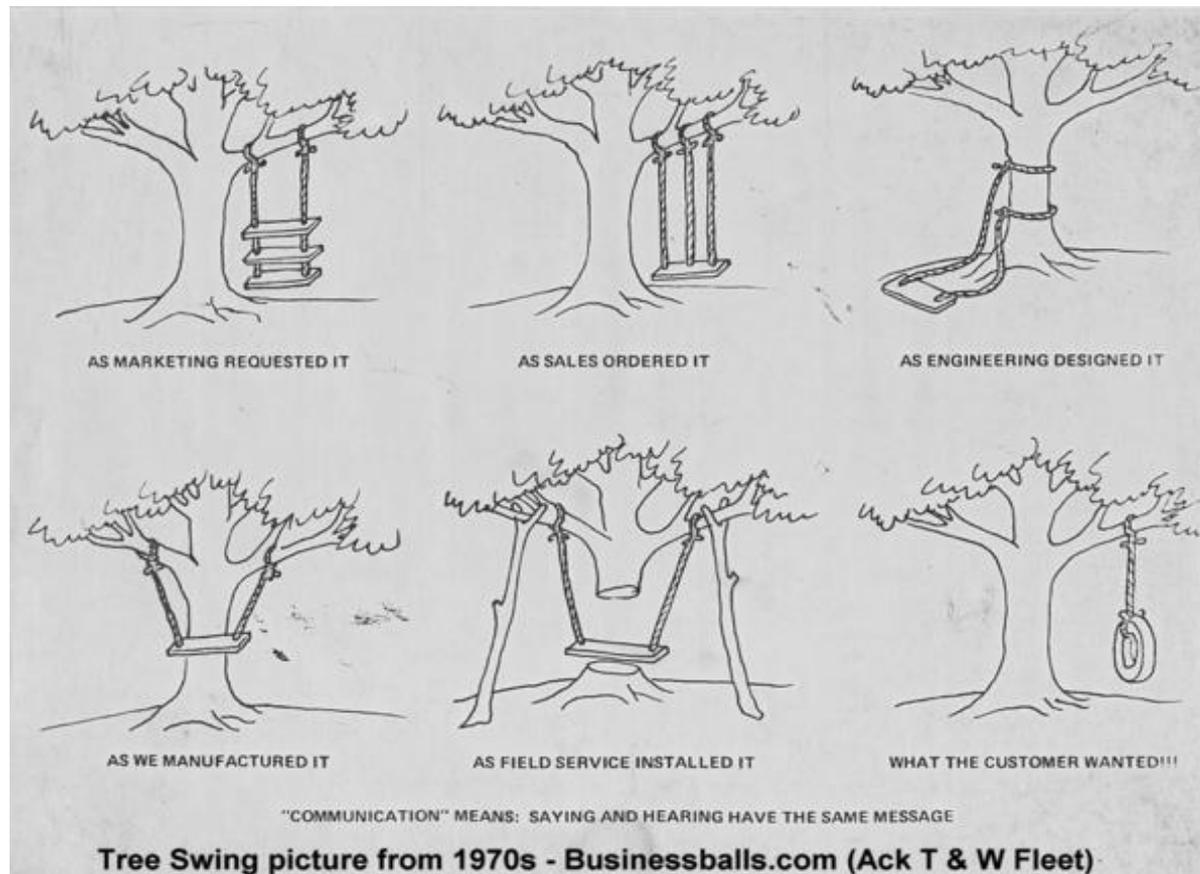
Special
Locations



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Feasibility





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Policy Option Portfolio?

Mechanisms/Sectors	ES	RCI	TLU	AFW	CC
Codes and standards	?	?	?	?	?
Financial & pricing incentives	?	?	?	?	?
Technical & financial assistance	?	?	?	?	?
Voluntary & negotiated agreements	?	?	?	?	?
Information & education	?	?	?	?	?
Disclosure & transparency	?	?	?	?	?
Research & development	?	?	?	?	?
Carbon trading mechanisms	?	?	?	?	?
Carbon taxes & tax shift	?	?	?	?	?
Revenue mechanisms	?	?	?	?	?
Hybrid combinations	?	?	?	?	?



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Goal Setting Questions

Goals
Coverage

Sectors

Levels of government

Metrics

Weighting

Decision
process

Participants

Tools

Time periods

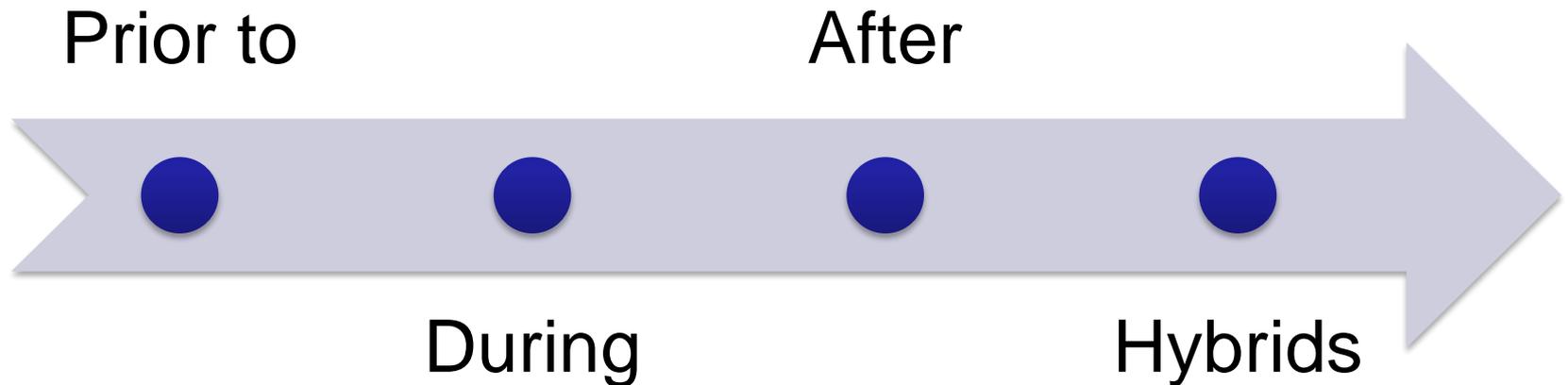
Targets



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Timing versus LEDS Process





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Steps

Chose methods, tools, decision process,
participants

Develop baseline and potential response option
scenarios

Evaluate goal impacts of scenarios, iterate to
finalize agreements

Launch detailed planning process, update goals
as needed



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Goals/Metrics

Economic

- GDP, employment, personal income, market capture, investment capture

Energy and Resources

- Intensity, diversity, imports, affordability, cost, sustainability, market penetration

Emissions

- Tonnages, intensity, health and resource co-benefits

Equity

- Personal income distribution, business size, geographic location



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Methods

Forecasting

Satisficing

Optimization

Feasibility

Backcasting

Visioning

Targeted
Needs

Implied
Actions

Comparisons

Benchmarking

Scaling

External
Standards

Hybrids

Simultaneous

Sequential

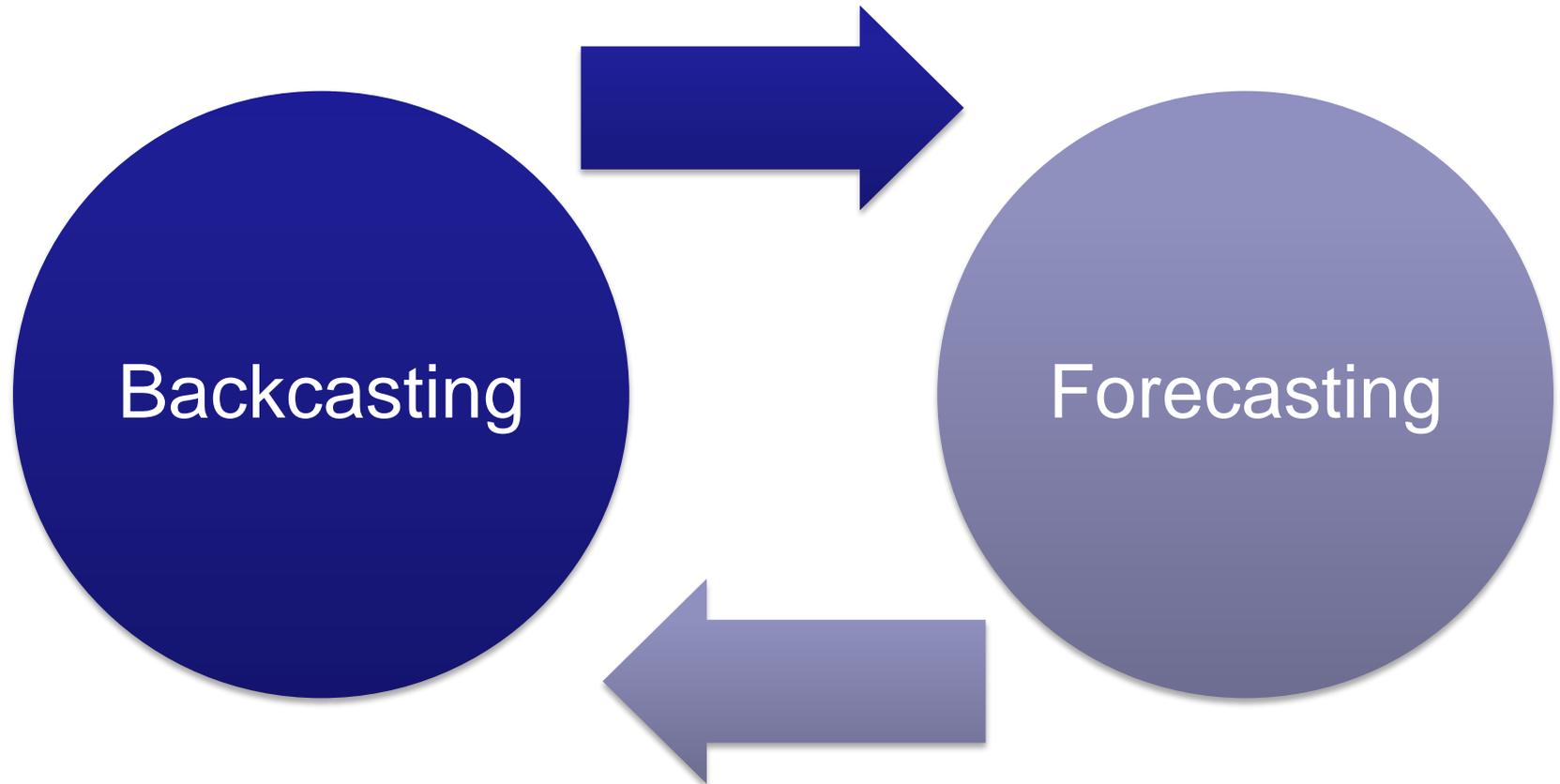
Blended



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Simultaneous Feedback





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Tools

Decision protocols (Stepwise consensus building)

Revealed preference (e.g. Multi Criteria Analysis)

Linked Systems (LEDS Toolkit)

Models (e.g. Times, REMI, CGE)

Databases (e.g. Policies and Measures, Financing)

Visualization



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Uncertainty in Goal Setting

Procedural

Collaboration

Monitoring and updating

Diversification

Hedging

Analytical

Simulation

Sensitivity analysis

Options

Reserves



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Florida Executive Order 07-127

“NOW, THEREFORE, I, CHARLIE CRIST, as Governor of Florida, by virtue of the authority vested in me by Article IV, Section (1)(a) of the Florida Constitution, and all other applicable laws, do hereby promulgate the following Executive Order, to take immediate effect:

Section 1. I hereby establish greenhouse gas emission reduction targets for the State of Florida as follows:

- by 2017, reduce greenhouse gas emissions to 2000 levels;
- by 2025, reduce greenhouse gas emissions to 1990 levels;
- by 2050, reduce greenhouse gas emissions by 80% of 1990 levels.“



Florida Action Plan

Table EX-4. Energy Supply and Demand recommendations summary

Policy No.	Policy Recommendation	GHG Reductions (MMtCO ₂ e)			Net Present Value (See Note 2) 2009–2025 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)	Status of Policy
		2017	2025	Total 2009–2025			
Tier 1							
ESD-5	Promoting Renewable Electricity through Renewable Portfolio Standard (RPS), Incentives and Barrier Removal (20% by 2020)	17	34.5	319	-\$9,274	-\$29	Approved
ESD-6	Nuclear Power	0.0	7.3	49.4	\$1,782	\$36	Approved
ESD-7	Integrated Resource Planning (IRP)	Not to be quantified					Approved
ESD-8	Combined Heat and Power (CHP) Systems	1.8	2.2	26.5	\$126	\$5	Approved
ESD-9	Power Plant Efficiency Improvements	8.4	8.9	111.4	-\$1,541	-\$14	Approved
ESD-11	Landfill Gas-To-Energy (LFGTE)	3.7	8.7	64.7	\$79	\$1	Approved
ESD-12	Demand-Side Management (DSM)/Energy Efficiency Programs, Funds, or Goals for Electricity	13.0	21.8	201.4	-\$8,566	-\$43	Approved
ESD-13a	Energy Efficiency in Existing Residential Buildings	3.4	5.4	50.4	-\$1,432	-\$28	Approved
ESD-14	Improved Building Codes for Energy Efficiency	0.0	4.9	9.9	-\$265	-\$27	Approved
ESD-15	Training and Education for Building Operators and Community Association Managers	Not to be quantified					Approved
ESD-17	Consumer Education Programs	Not to be quantified					Approved
ESD-23	Decoupling	Not to be quantified					Approved
Recent Actions							
	Building Codes for Energy Efficiency (HB 697 and Executive Order 127)	8.0	15.4	136.5	-\$4,082	-\$30	Not applicable
Sector Totals		47.4	93.6	832.8	-\$19,090	-\$23	
Sector Totals After Adjusting for Overlaps (see Note 3)		44.4	106.4	841.3	-\$16,143	-\$19	
Reductions from Recent Actions		8.0	15.4	136.5	-\$4,082	-\$30	
Sector Totals, including recent actions and adjustment for overlaps		52.4	121.8	977.8	-\$20,226	-\$21	



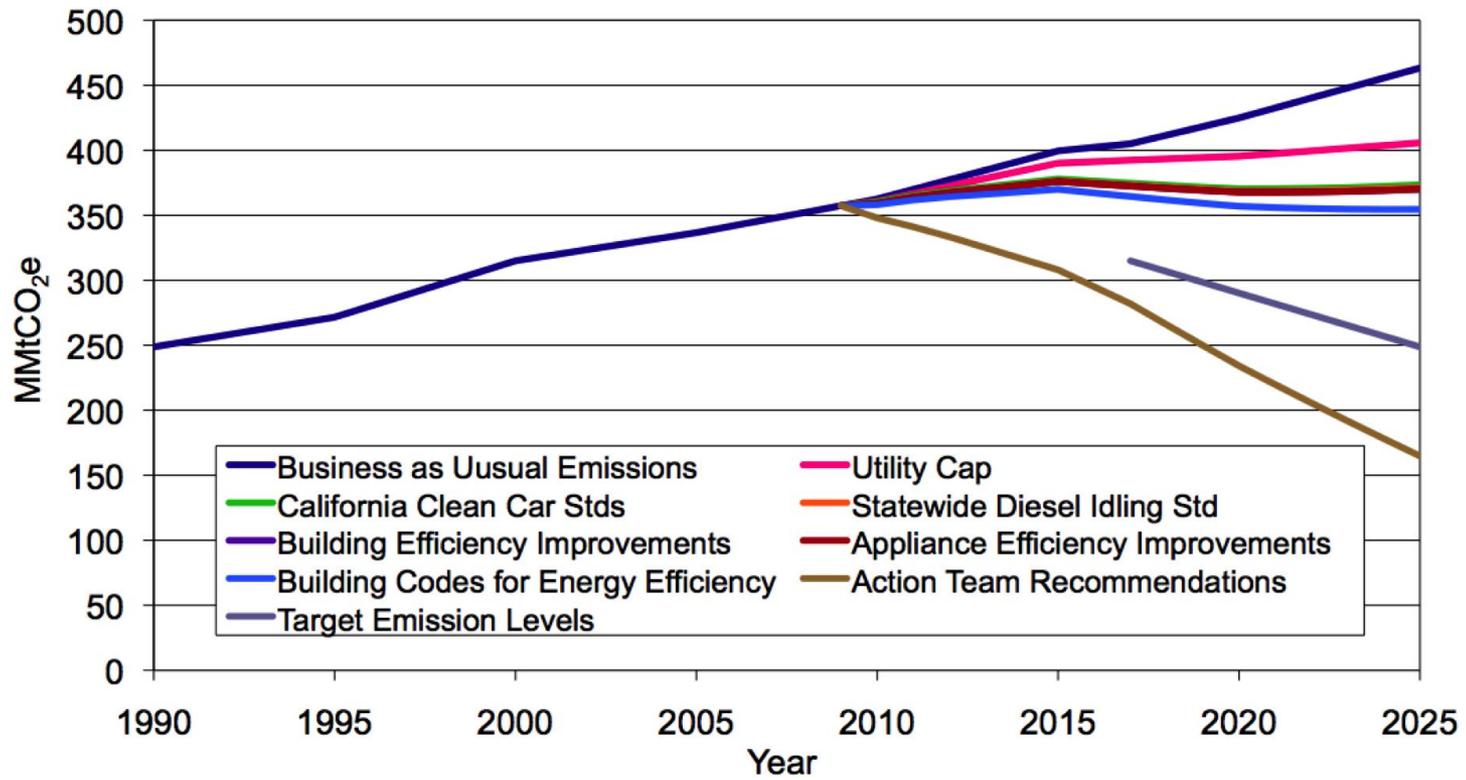
Florida Action Plan

**Table 6. Employment Impacts of the Florida CAP
(thousands)**

Scenario	2010	2015	2020	2025
ESD 5	2.054	8.335	23.370	36.710
ESD 6	0.000	0.000	-3.554	-7.130
ESD 8	-0.681	-3.779	-7.616	-11.590
ESD 9	0.000	1.129	2.980	3.569
ESD 11	0.000	0.077	0.163	0.240
ESD 12	0.158	3.023	6.097	8.666
ESD 13a	0.000	2.554	6.722	10.920
ESD 14	0.298	-0.202	-1.326	-0.301
Subtotal - ESD	1.829	11.137	26.836	41.084
AFW 1	0.075	0.283	0.305	0.308
AFW 2	6.760	18.300	29.450	40.000
AFW 3	0.030	0.113	0.204	0.279
AFW 4	0.000	2.957	9.600	20.470
AFW 5	-0.023	0.034	0.090	0.142
AFW 6	0.428	1.520	3.283	5.153
AFW 7	0.000	17.290	15.460	7.447
AFW 8	0.008	0.072	0.422	0.645
AFW 9	0.273	1.996	4.079	6.440
Subtotal - AFW	7.551	42.566	62.893	80.883
TLU 1	1.112	3.951	7.712	11.290
TLU 2	0.000	0.126	0.265	0.370
TLU 4	-0.140	-1.982	-3.981	-6.701
TLU 8	0.985	0.509	0.945	2.283
Subtotal - TLU	1.958	2.604	4.941	7.242
Summation Total	11.338	56.307	94.670	129.210
Simultaneous Total	11.380	57.720	100.400	148.300



Florida Climate and Energy Goals

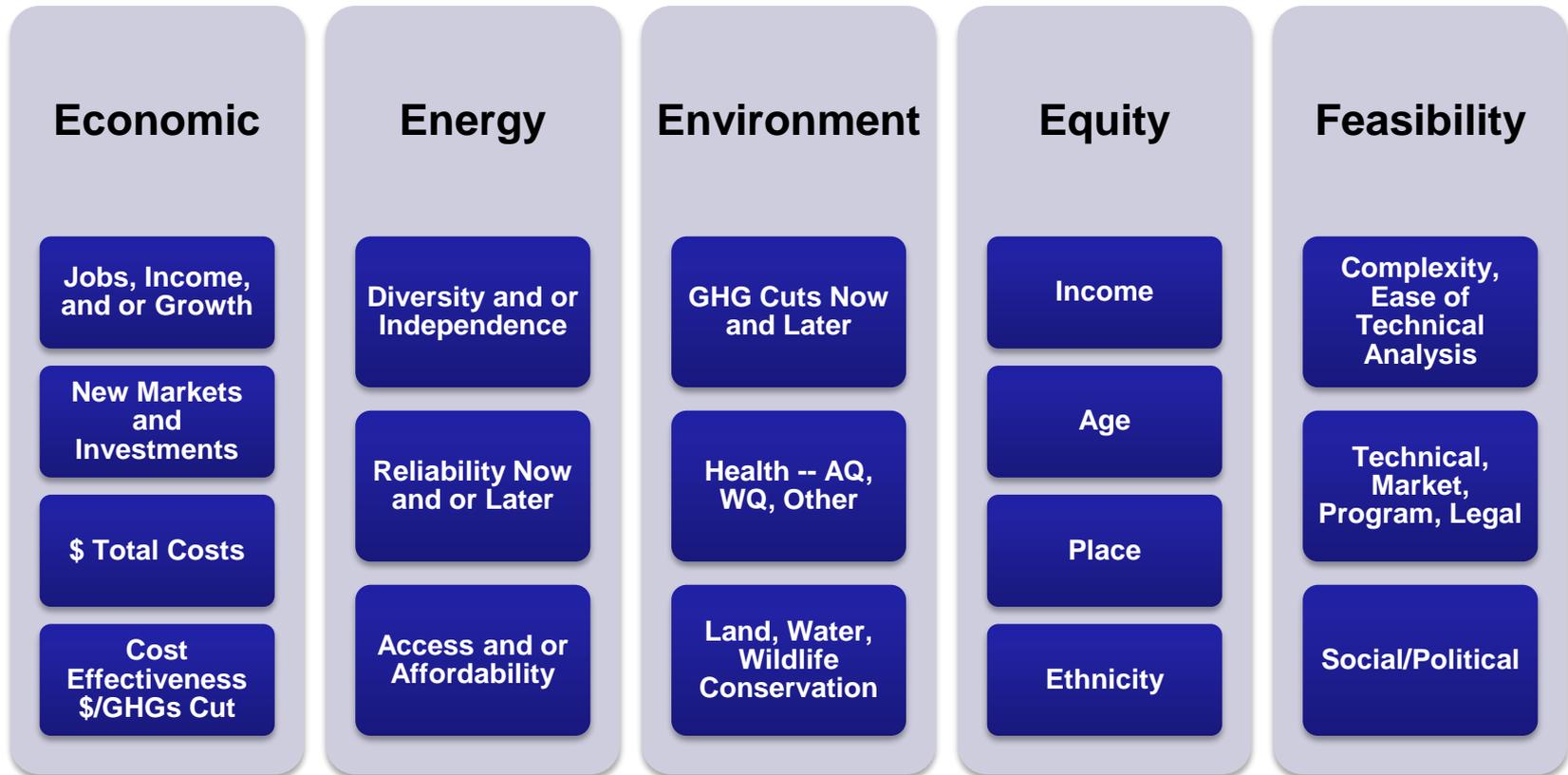




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Minnesota MCA



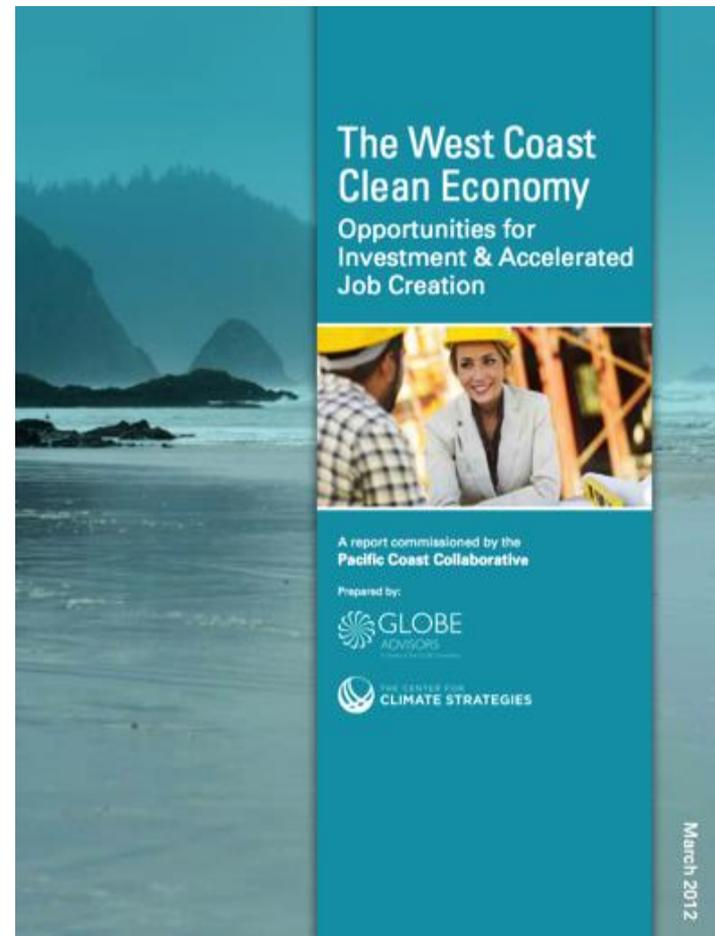


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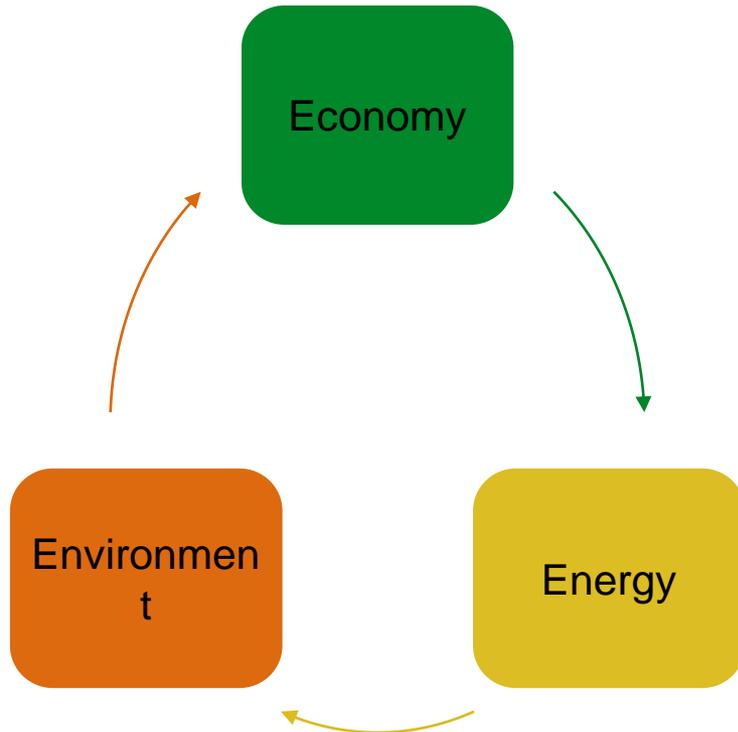
West Coast Clean Economy

- Focused on market and investment capture
- Focused on green market segments
- Policy instruments derived from market, investment needs
- Initial framework
- Multi criteria analysis using expert judgments, benchmarks
- No stakeholders initially
- Cooperative and individual actions menu





West Coast Clean Economy



Clean Energy Goals	Costs Savings per tCO ₂ e	Gross State Product	Jobs (1,000s)	Investment (Billions)	Regional Synergy	Local Health	GHG Reductions
Zero Emission New Buildings							
Green/Energy Efficient Mortgages, property tax incentives, state tax incentives, credit enhanced loan programs							
+	-\$100 to \$100	+	~125	\$7	4	Uncertain	High
Whole Building Retrofits							
On bill financing programs, energy performance contracts, credit enhanced loan programs, property assessment programs, public benefits funds							
+	-\$100 to \$100	+	13 to 26	17	2	+	High
Multistate Financing Policies							
Harmonizing existing state incentives and legal frameworks, Pooled capital loan facilities							
+	-\$100 to \$0	+	> 13	Uncertain	6	+	Medium
Feed-In Tariff/Reverse Auction for Renewables							
Utility customers, voluntary REC contribution/purchase programs							
+	Uncertain	+	Up to 13	\$1.4	5	+	Uncertain
Electricity Transmission and Grid Integration							
Federal backstop guarantees, regional / federal trunk line policies							
+	Not quantified	+	> 26	\$4	7	Uncertain	Not quantified
Electric/Plug In Electric Vehicles							
Utility incentives, vehicle sharing organizations, harmonized incentives, state tax incentives, property tax incentives							
+	-\$100 to \$100	+	> 13	\$14	6	+	High
Low Carbon Fuel Standard (LCFS)							
Tax incentives, procurement requirements, standards							
+	-\$100 to \$100	+	> 13	High	5	+	High



West Coast Clean Economy

The West Coast Clean Economy

Opportunities for Investment & Accelerated Job Creation

The West Coast Clean Economy Report was commissioned by the Pacific Coast Collaborative (PCC) jurisdictions of British Columbia, California, Oregon, and Washington. The report provides a comprehensive analysis of economic growth and job creation potential within these jurisdictions associated with the emerging clean economy. With a collective population in excess of 50 million and a gross domestic product (GDP) of more than \$2.5 trillion USD, the four West Coast jurisdictions constitute the world's sixth largest economy, this West Coast mega-region is a world leader in terms of clean economic growth and job creation.

The report is a forward-looking assessment of what is and what could be as the West Coast region of North America progresses toward a cleaner, lower-carbon economic future. Opportunities abound for these members of the PCC to act cooperatively to maximize the benefits of their shared economies, to minimize the overlap of efforts, and to address shared priorities and challenges. The following is a brief overview of the key findings of this report.

2020 STATISTICAL SNAPSHOT

Potential Net Job Creation: 1.03 Million Full Time Equivalent (FTE) Jobs – a 200% Increase

Total GDP Contribution: Up to \$142.7 Billion USD

Increased Investment: \$147-192 Billion USD

Top Three Clean Job Growth Sectors (Total net new FTE jobs 2010-2020):



A report commissioned by the Pacific Coast Collaborative

Prepared by:



KEY HIGHLIGHTS

- The transition towards a cleaner economy is well underway throughout the West Coast region with a GDP contribution of \$47,000 million USD and 608,452 Full Time Equivalent (FTE) clean jobs in 2010.
- It is estimated that up to 1.03 million net new jobs can be created between 2010 and 2020.
- GDP contributions of up to \$142.7 billion USD and increased investments of between \$147-\$192 billion USD are also possible during this period.
- Five high growth clean economy market opportunity segments exist: Clean Energy Supply, Clean Transportation, Energy Efficiency & Green Building, Environmental Protection & Resource Management, and Knowledge and Support.
- Regional collaboration will allow the leveraging of each jurisdiction's strengths to create a strong, globally competitive market for clean technology products and services.
- Leveling the playing field for clean energy, energy efficiency, and clean transportation solutions, as well as the true costing of carbon, is essential to achieving clean economic prosperity.

BRITISH COLUMBIA

Key Statistics:

Clean Economy GDP (2010)	\$7.4 billion
Clean Economy Jobs (Direct Production) (GLOBE, 2012)	62,359
Investment in Clean Technology (2009-2011) (KPMG, 2011)	CAD \$843 million
VC Disbursement per Capita (2010)	\$47

Top 9 Clean Economy Job Segments:

Segment	# of Jobs
Sustainable Forestry Products	10,805
Public Mass Transit & Rail	9,587
Green Architecture & Construction Services	5,468
Hydropower	5,127
Conservation	5,114
Recycling & Reuse	3,731
Professional Environmental Services	3,705
Green Building Materials	3,242
Waste Management and Treatment	2,821

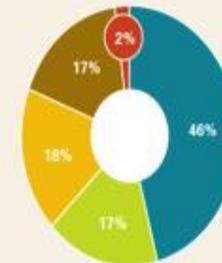


Figure: Direct production jobs in BC's Clean economy sector in 2010.

Strengths & Attributes:

- A well-established and widely dispersed low carbon electricity supply system
- An abundance of underutilized clean energy resources (bioenergy, geothermal, ocean, wind, solar)
- A large natural resource base, including large reserves of natural gas
- 94% of the land in BC is Provincial Crown Land
- The first North American region to put a "price on carbon" through a comprehensive carbon tax, helping to drive innovation and increased efficiency across all sectors of the economy
- Strong and growing clusters of green technology and advanced energy companies with one of the highest ratios of clean technology companies to GDP in Canada
- A widely distributed network of advanced education and skill training institutions
- Innovative clean economy-focused research institutions and facilities such as UBC's Center for Interactive Research on Sustainability (CIRS) and Okanagan College's Green Building Technology Center of Excellence
- A wide array of socially-conscious environmental networks, organizations, and think-tanks



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China, Chongqing LCD

12th
Five
Year
Plan

Co equal goals

Carbon intensity, energy intensity, economic growth

Feasibility analysis with LCD model

Limited "satisficing"

Revealed preference through surveys

Agencies and experts

No stakeholders

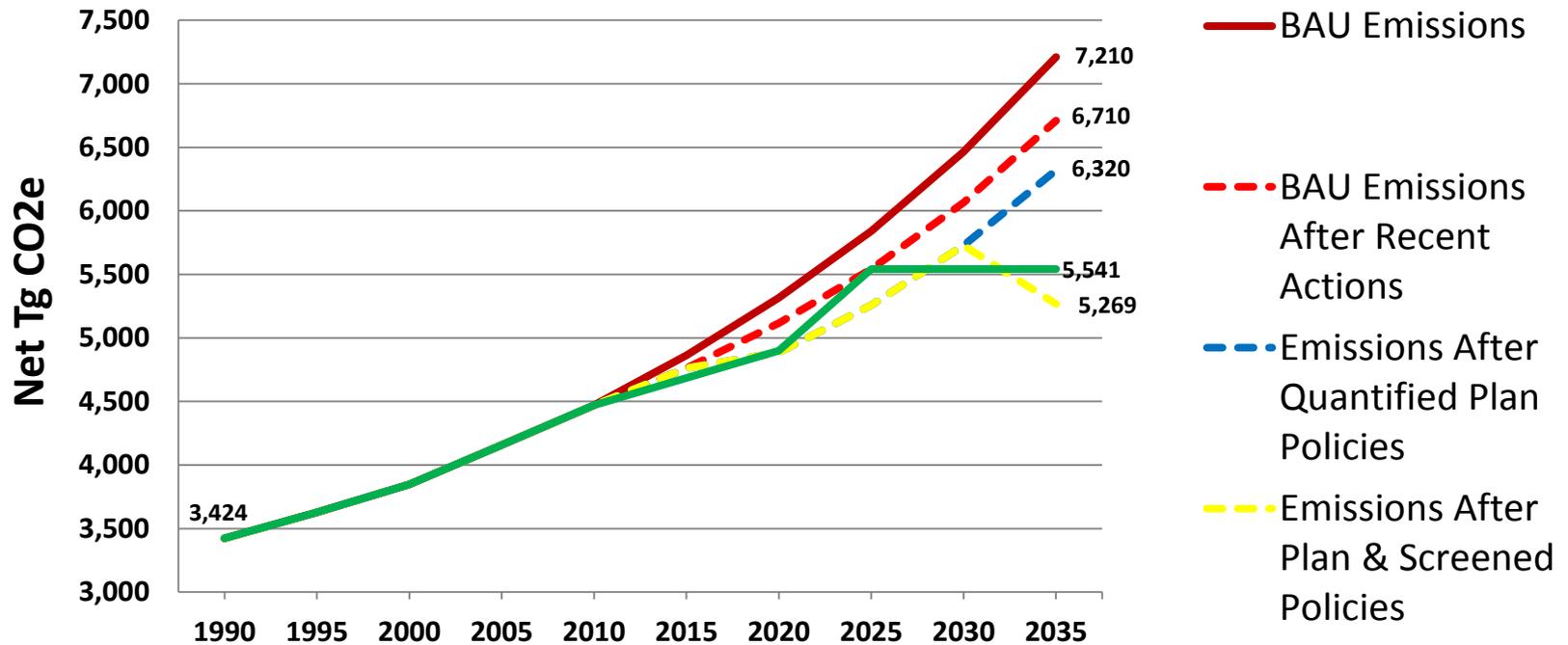


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China, National

GHG Emissions Compared to Plan Target





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Democratic Republic of Congo

Green Growth, Energy Sector

Diversify energy sources to higher share of renewables and value added local supply chains and distribution; Ensure energy security, affordability, reliability; expand ties to sustainable forestry, industry, housing, and other sectors.

Expand current access to electricity from 9 percent to higher; solar Scale Up for street lights and household uses, (hot water, cooking, appliances, appropriate equipment) and schemes to contribute individual solar energy production to grid for payment or balance sheet compensation; Small Hydro and Micro Hydro with 1000 modern villages per year; Wood Stove Efficiency and Charcoal System Evaluation.



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Ukraine INDC

UNFCCC

Primary focus on GHG reduction

Limited technical input, preference seeking

Implied, informal satisficing

Scenario based

Draft for later refinement

Iteration and sensitivity analysis

Agency, expert, and model driven

Rapid



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Transition to LEDS Action Planning

Next Steps

Completion of 3E goal setting

Transition to action planning process

Issue and outcome targeting

Updated baselines by activity, sector

Updated policy options list

Design criteria targeting

Translation to policy screening, design, analysis

Translation to mechanisms



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Survey Exercise

- Outline LEDS Action Plan Startup Plan, Schedule
- Solicit individual, anonymous feedback on key questions, comments on next steps
- Review and discuss
- Facilitate agreements on startup action items



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LEDS BASELINES



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Baseline Development

What we will cover:

- What is a “baseline”?
- How are baselines used in LEDs Planning?
- Greenhouse gases (GHG) and global warming potentials (GWPs).
- Differing GHG accounting frameworks.
- Basic emission estimation methods.
- Data requirements.
- Basic forecasting methods.



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All About Baselines

- Baselines are a series of historic data and forecasted estimates of:
 - Economic activities
 - Energy and resource production and consumption
 - GHG emissions or other environmental metrics
 - Sample drivers of GHG emissions:
 - Materials consumption/waste generation
 - Water consumption/wastewater generation
 - Power generation
 - Industrial production
 - Crop & livestock production, etc.



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Purpose of a GHG Baseline

- Also known as an Inventory & Forecast or “I&F”
- Serves as the primary measurement framework for understanding a jurisdiction’s contribution to global warming and to track progress toward 3E goals
- Shows the source and quantity of GHG emissions
- Indicates the factors contributing to these levels: economic, energy, management
- Provides guidance on mitigation priorities within business as usual (BAU) development patterns
- I&F Design Needs to Fit the Intended Purpose of the Action Planning Process



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Global Warming Potentials (GWPs)

- Climate-Forcing Pollutants
 - GHGs: Seven gases per UNFCCC guidelines:
 - Carbon Dioxide (CO₂),
 - Methane (CH₄),
 - Nitrous Oxide (N₂O),
 - Hydrofluorocarbons (HFCs),
 - Perfluorocarbons (PFCs),
 - Sulfur Hexafluoride (SF₆),
 - Nitrogen Trifluoride (NF₃)
 - Black carbon (BC)
 - A component of particulate matter (PM) with climate warming impacts
 - Has been covered in some North American planning processes; but has not received broad attention in action planning



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Estimating GHG Emissions

- Basic mass emissions formula:

$$\text{EF} \times \text{Activity Data} = \text{Annual Emissions}$$

EF = GHG emission factor (e.g. tCO₂/TJ coal combusted)

Activity Data = annual energy consumption or other indicator (for example, MWh electricity produced; tonne of waste composted; head of livestock)



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Estimating GHG Emissions (continued)

Mass GHG emissions are converted to common units of “carbon dioxide equivalents” (CO₂e) using their global warming potential (GWP):

$$\text{Emissions} = (100 \text{ tCO}_2 * 1) + (1 \text{ tCH}_4 * 21) + (0.01 \text{ tN}_2\text{O} * 310)$$

$$= 100 + 21 + 3.1$$

$$= 124.1 \text{ tCO}_2\text{e}$$

$$1 = \text{SAR GWP CO}_2$$

$$21 = \text{SAR GWP CH}_4$$

$$310 = \text{SAR GWP N}_2\text{O}$$

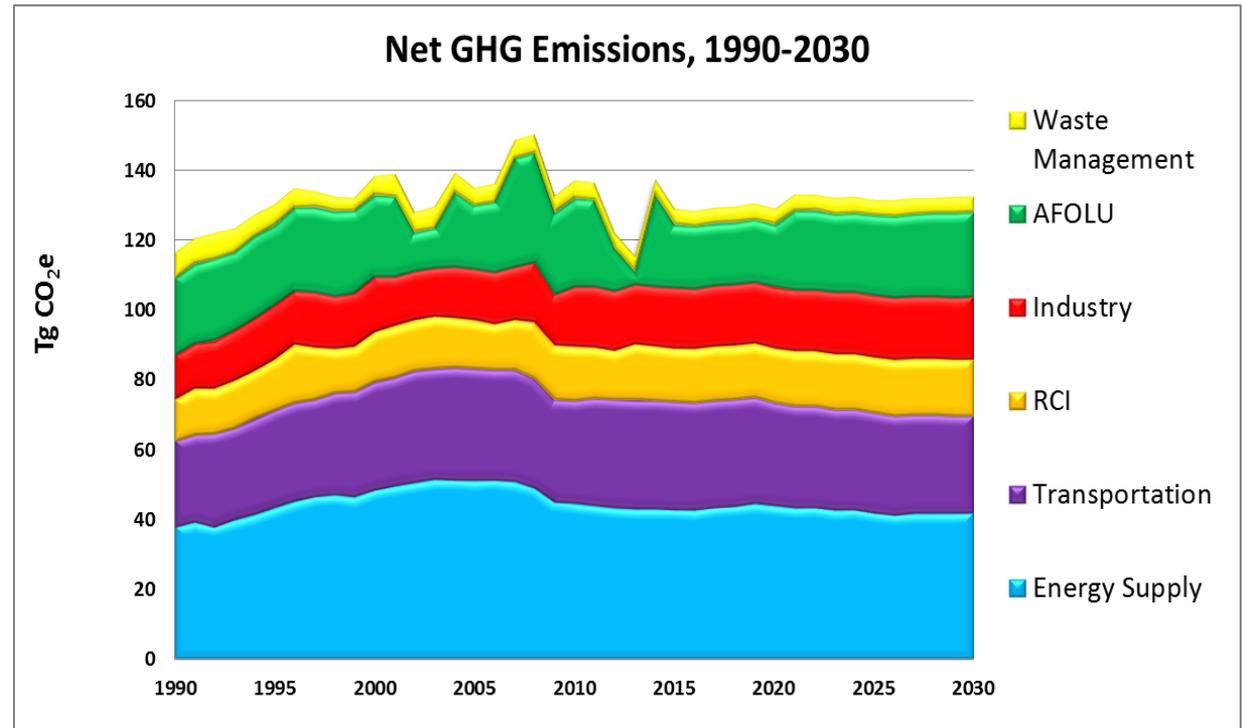


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Subnational GHG Baseline: Minnesota

For LEDS Planning, the GHG baseline is the primary point of reference and measurement toward progress

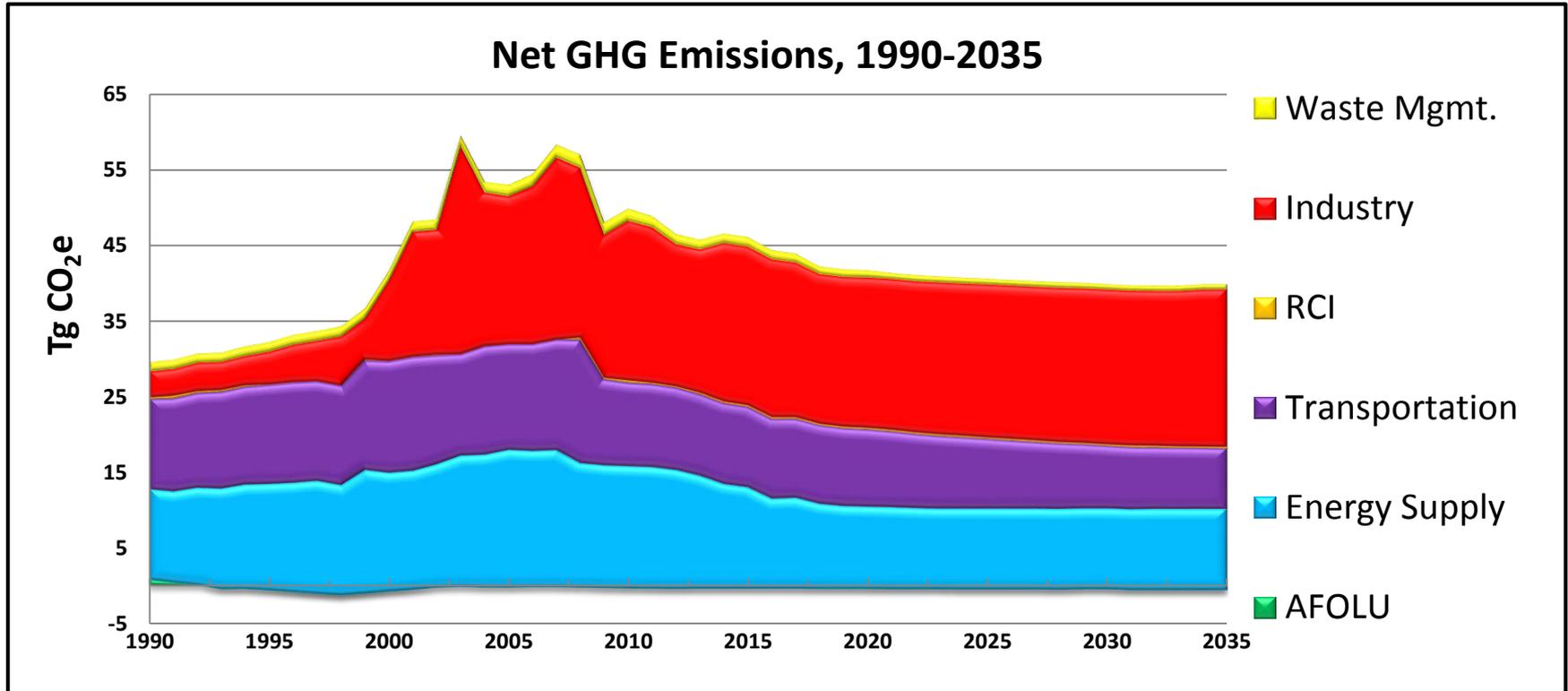




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Subnational GHG Baseline: Puerto Rico



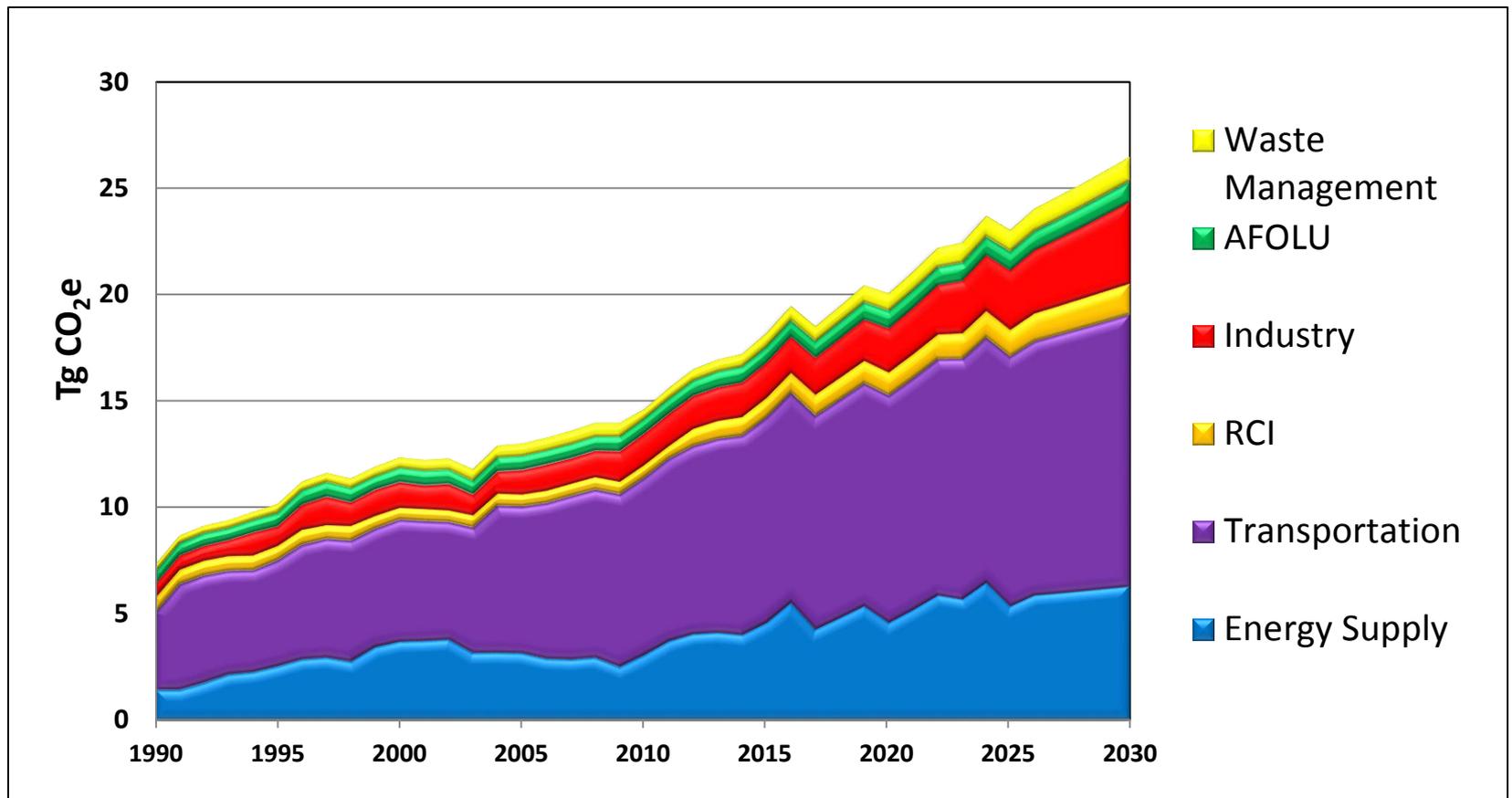
Source: CCS, 2014; GHG Inventory Baseline for Puerto Rico



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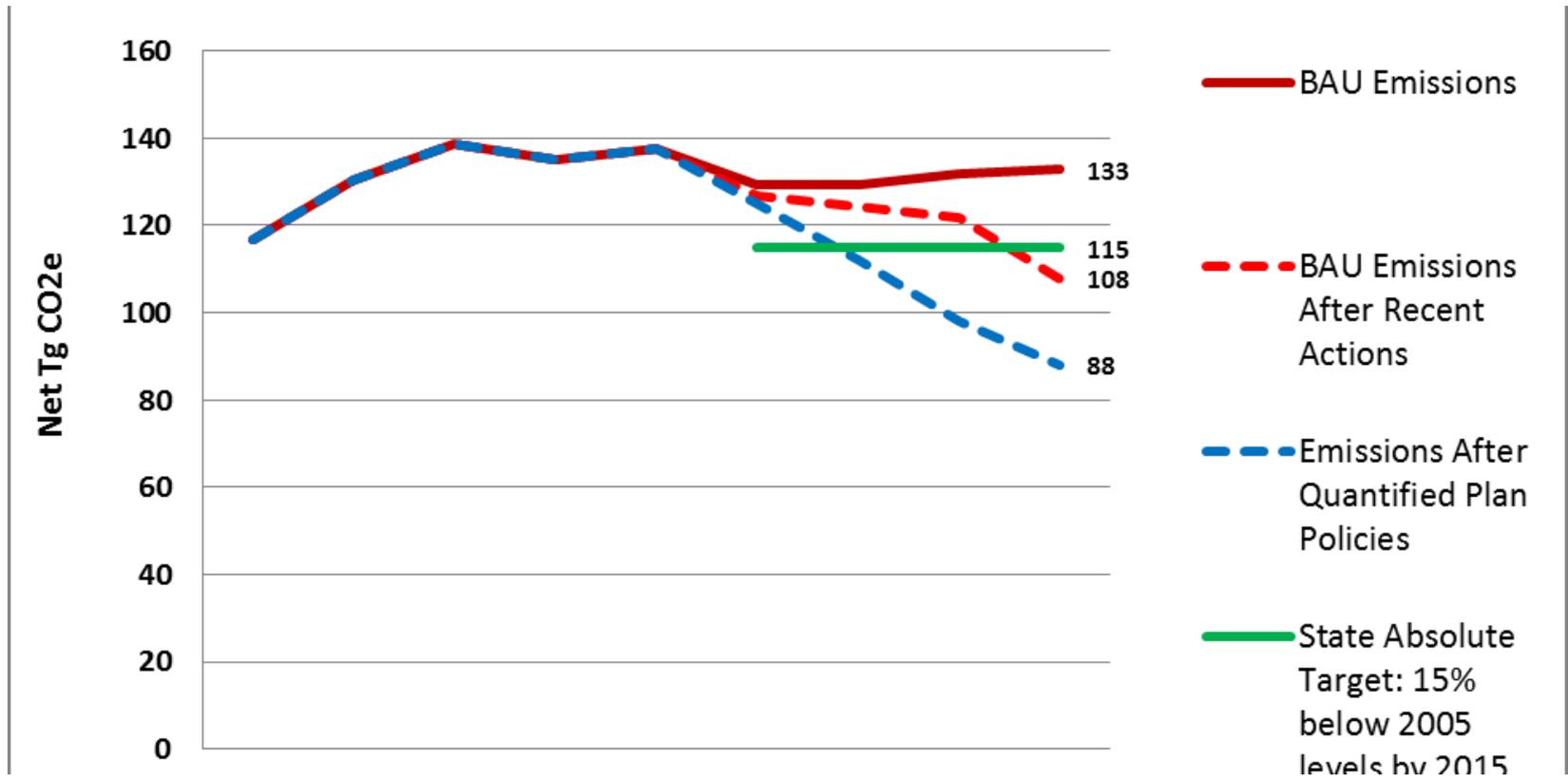
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Baja California, Mexico GHG Baseline



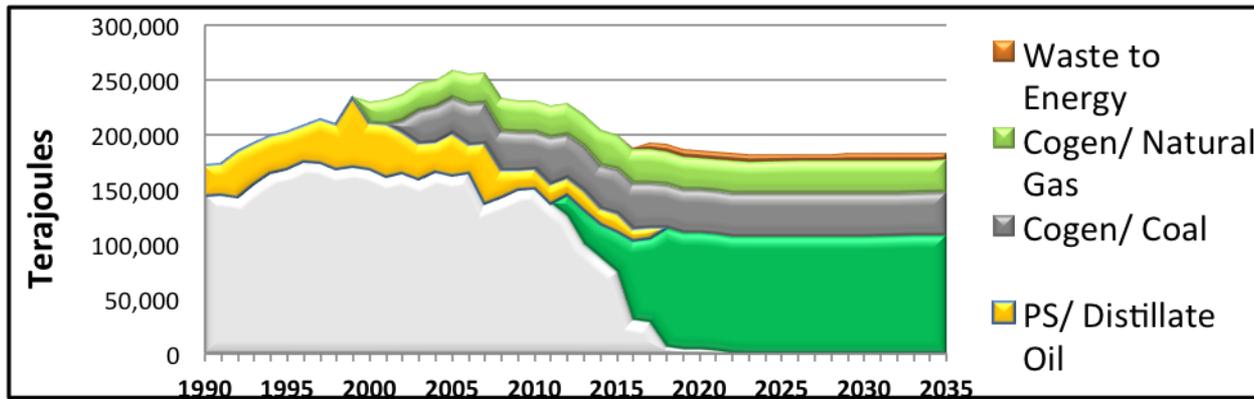


GHG Baselines for LEDS Planning



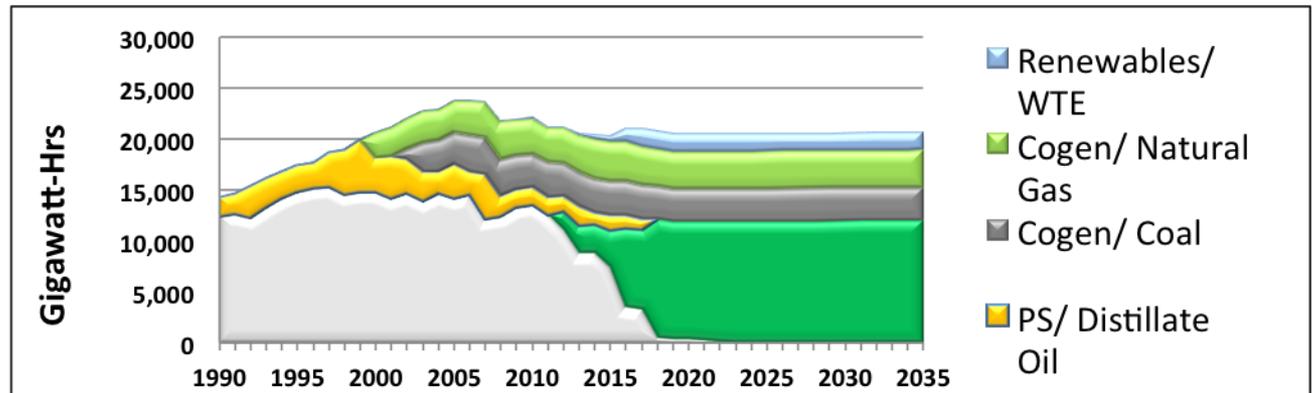


GHG Baselines from Other Baselines



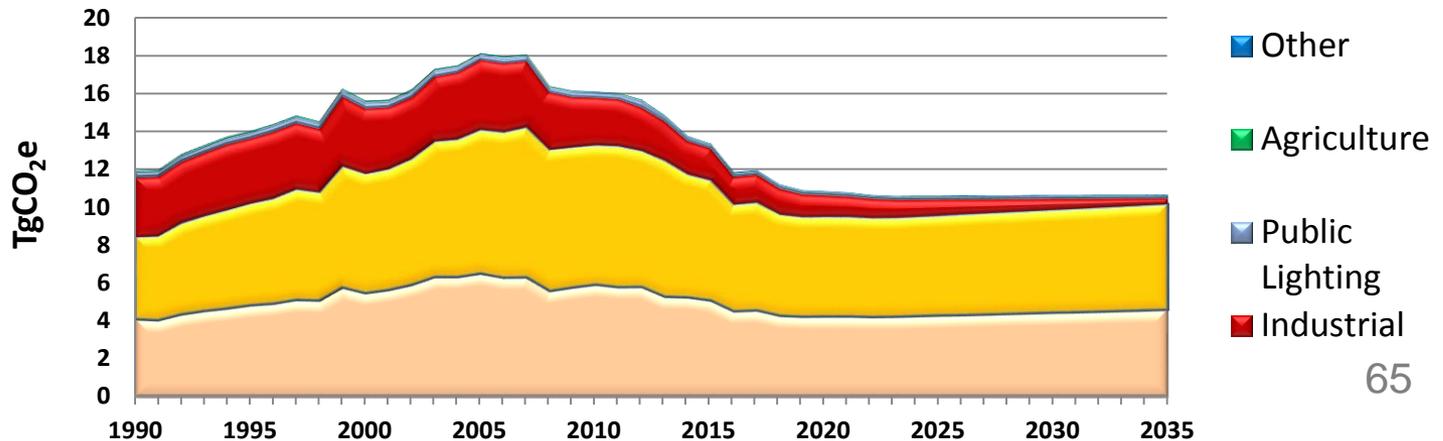
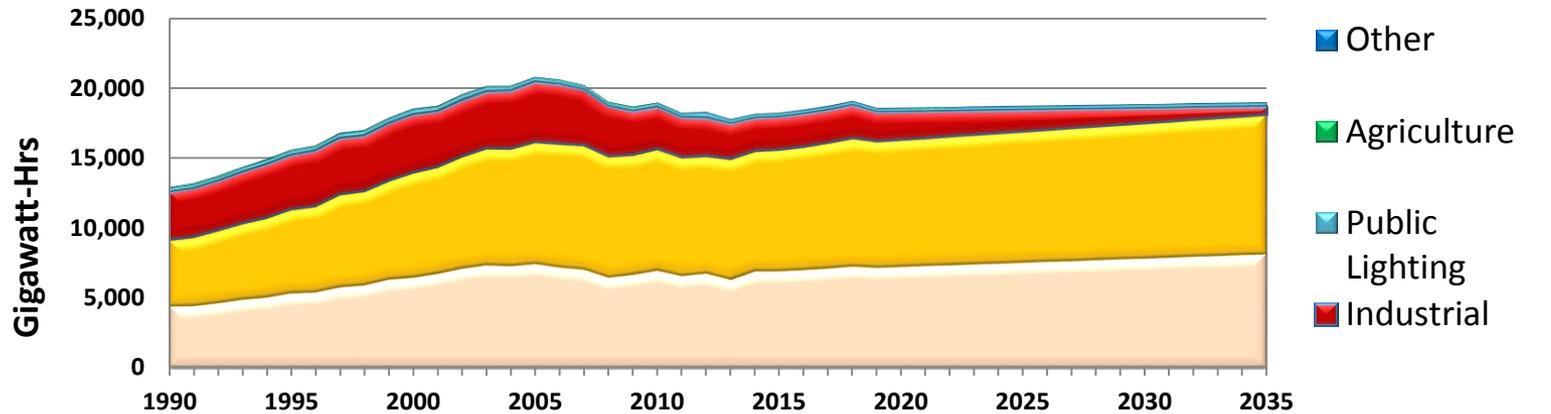
Puerto Rico
Power Supply Sector:
- Primary Energy
- Net Generation

Source:
CCS, 2014;
GHG
Inventory
Baseline for
Puerto Rico





Forecasting Power Demand

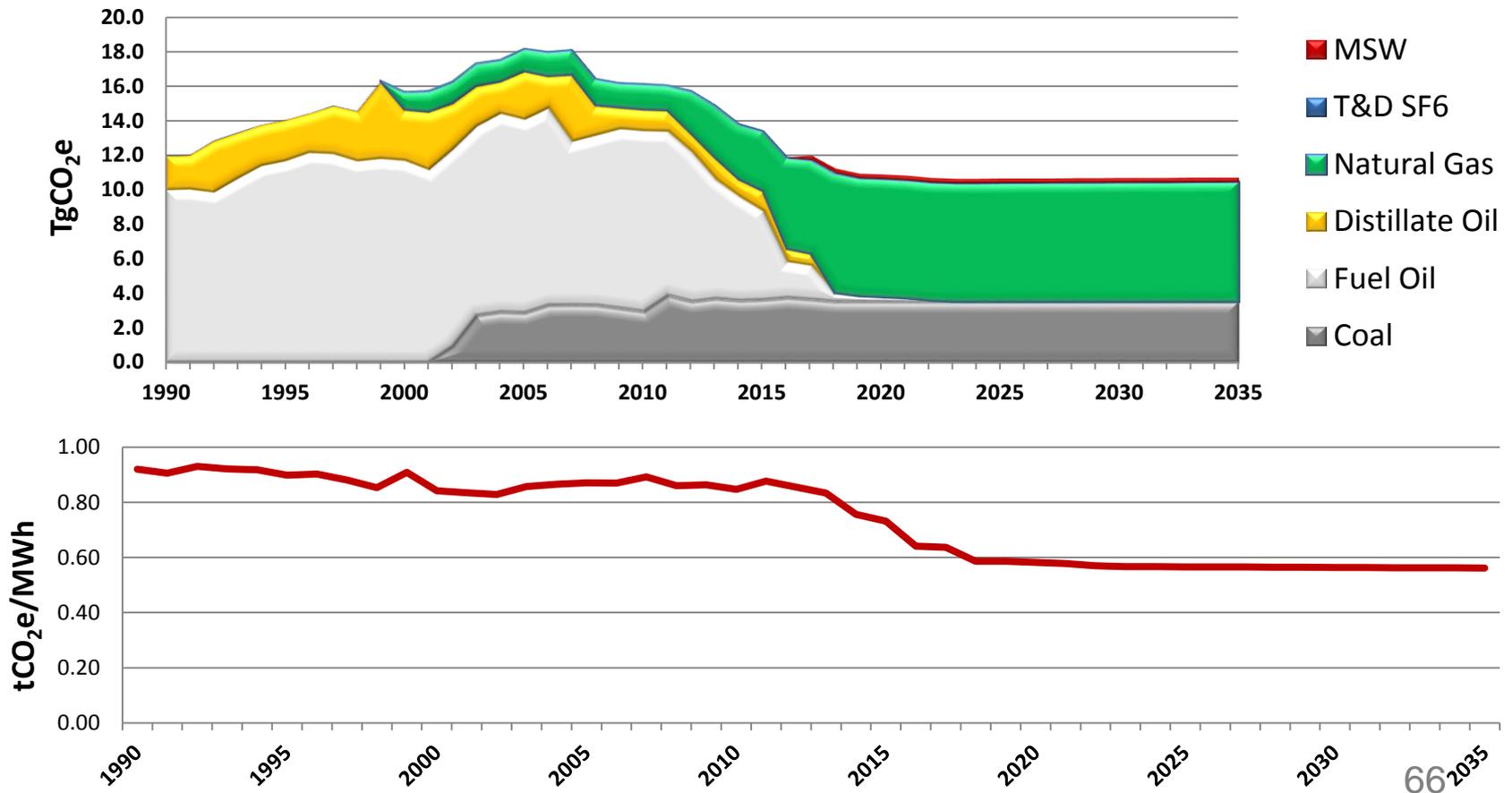




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Forecasting Power Supply

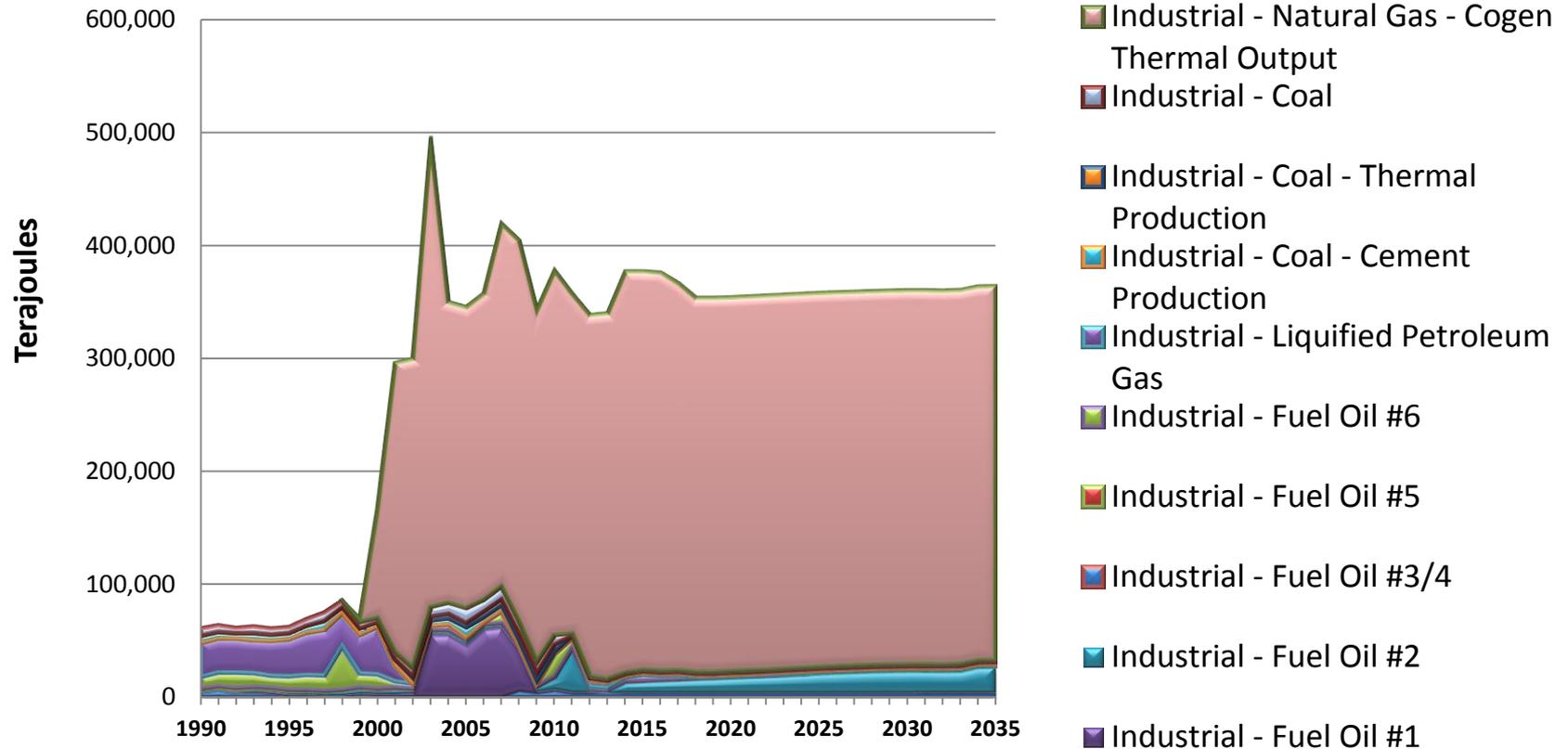




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Puerto RCII Fuel Consumption Baseline



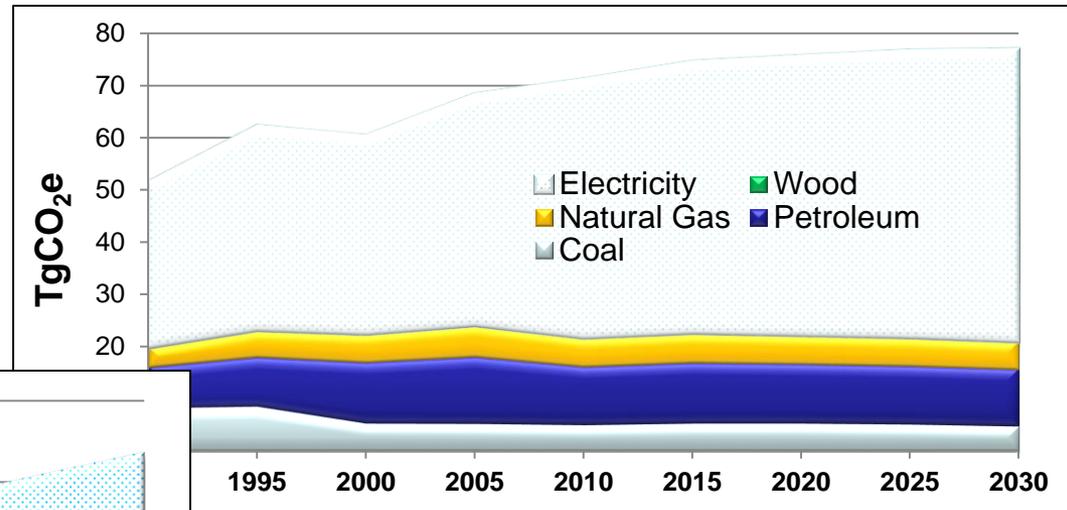
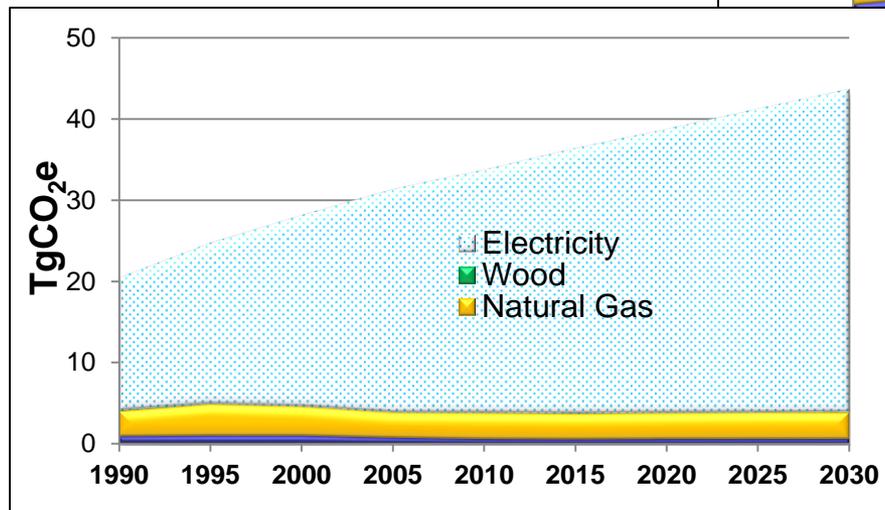


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Kentucky RCII Direct & Indirect Emissions Baseline

Residential Sector



Industrial Sector



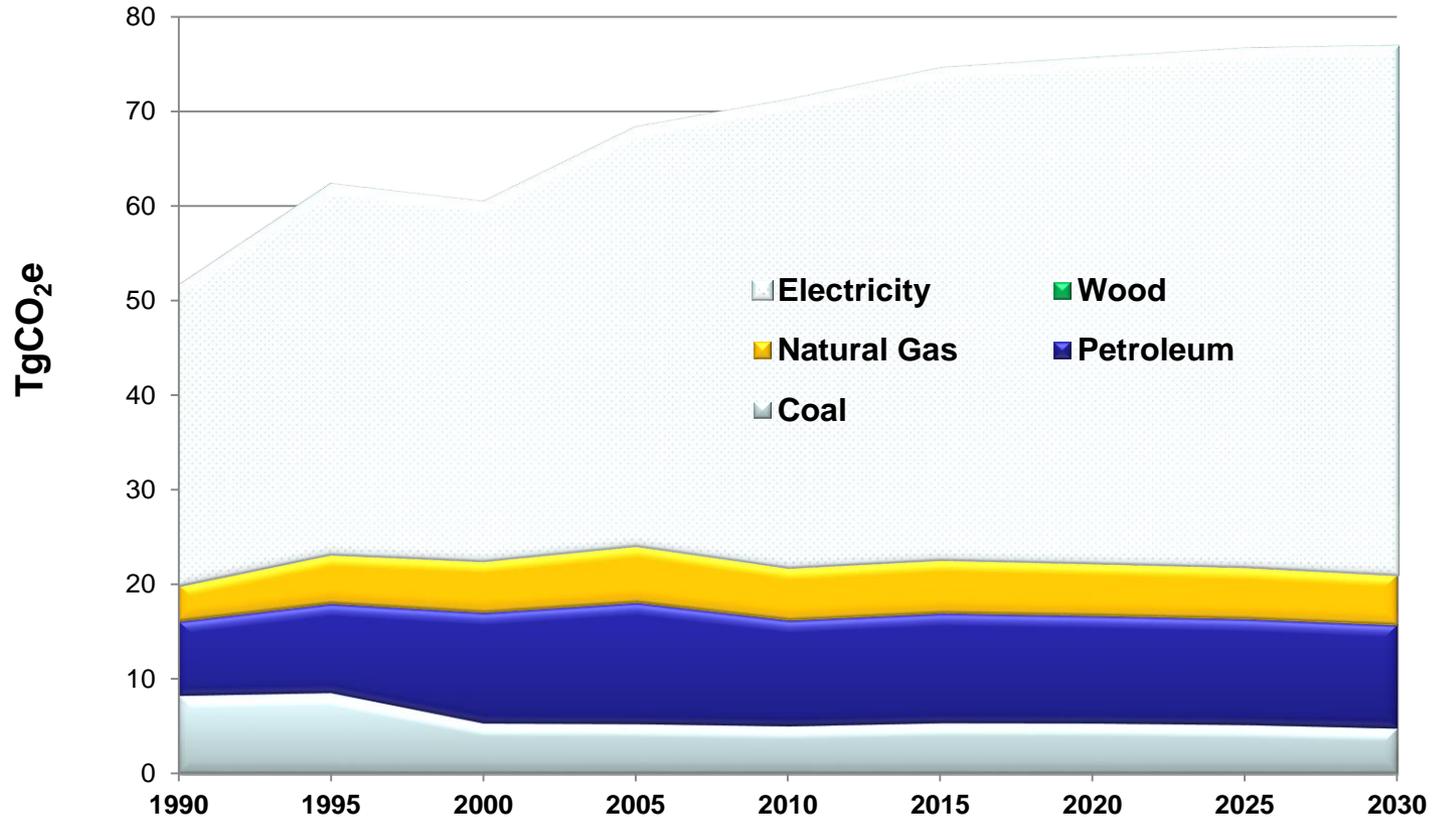
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Kentucky Industrial Direct & Indirect Baseline

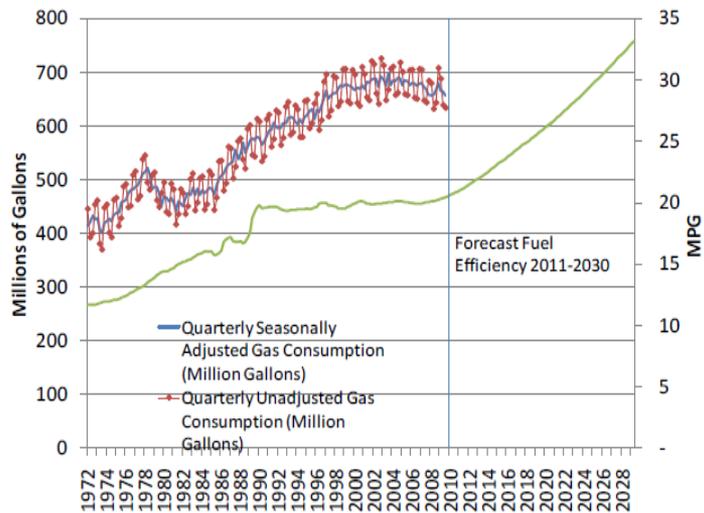
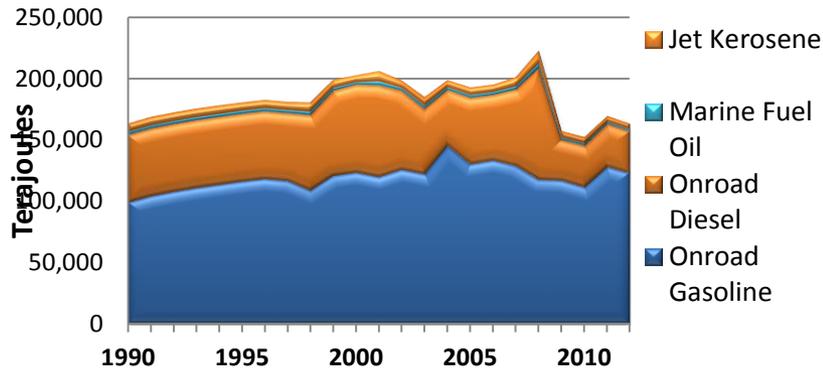
Sources Covered:
All fuel combustion

Emissions from electricity use shown here for context

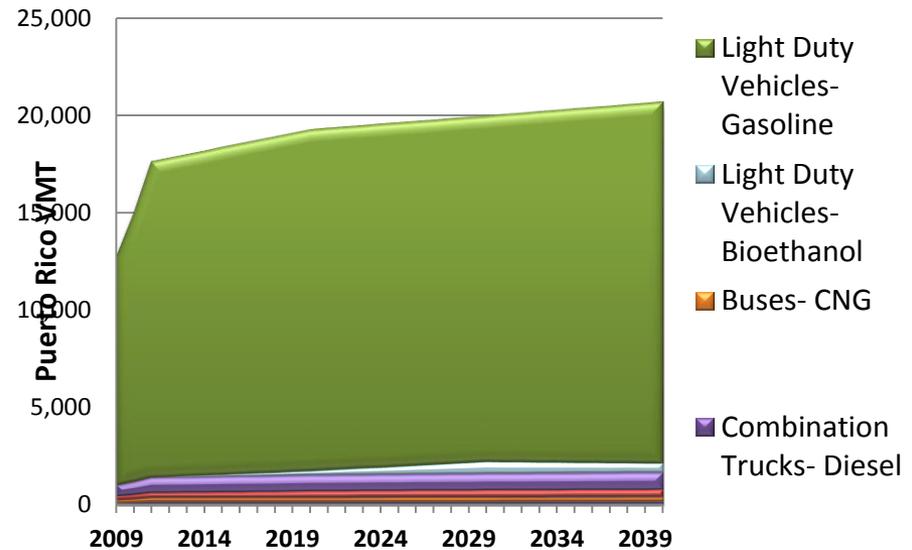




Transportation Baseline



Forecasted Vehicle Activity

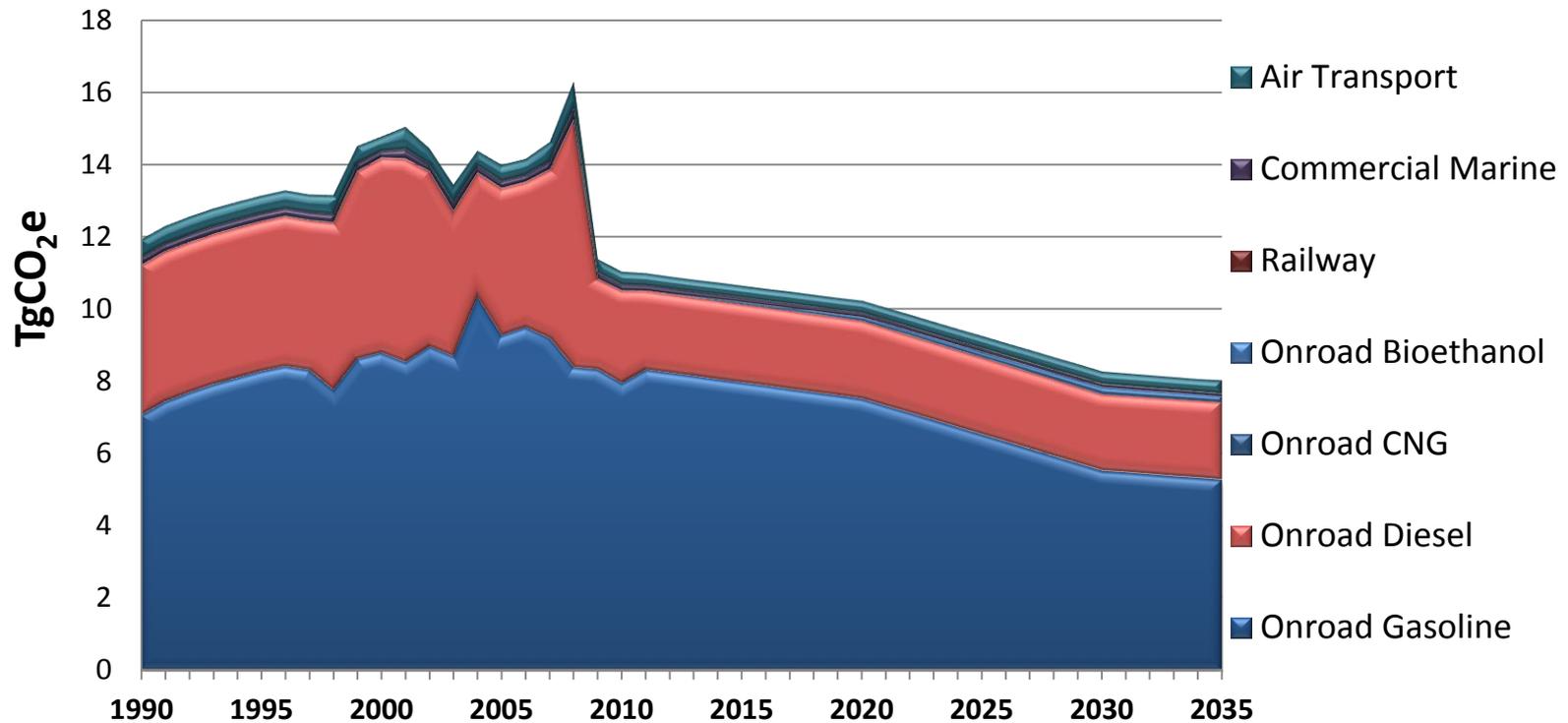




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Puerto Rico Transportation 1990-2035

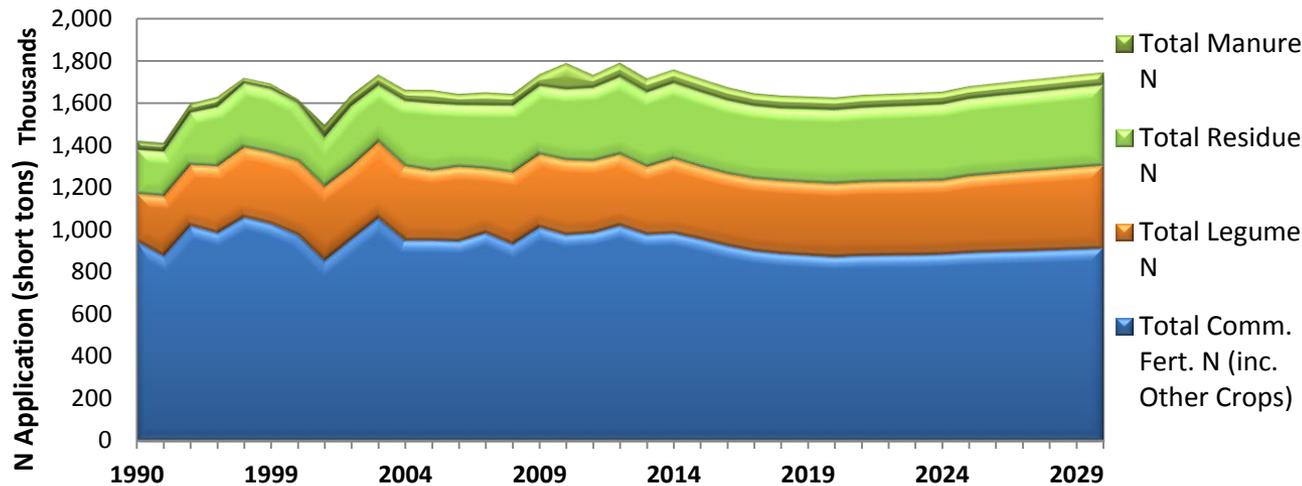
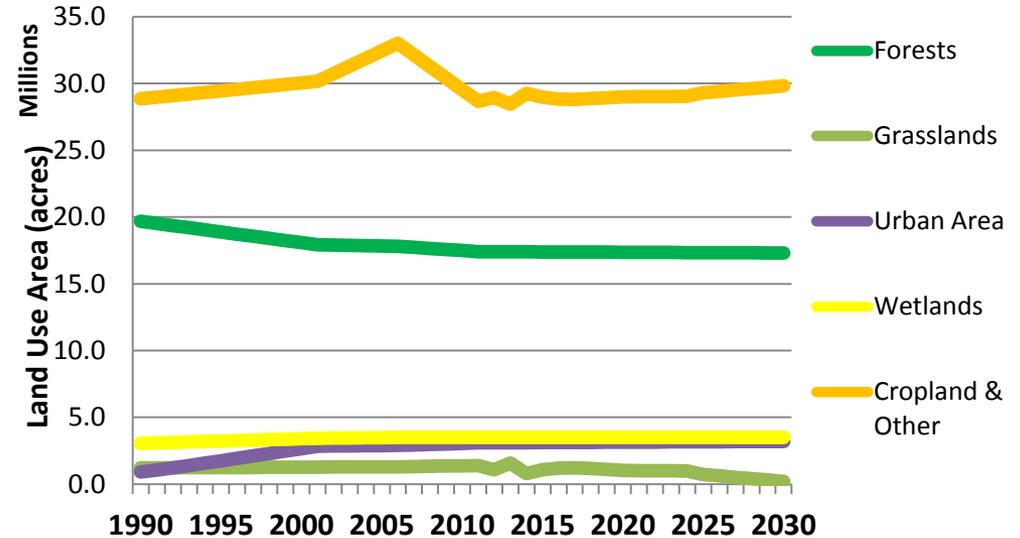




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Non-Energy Baseline Data

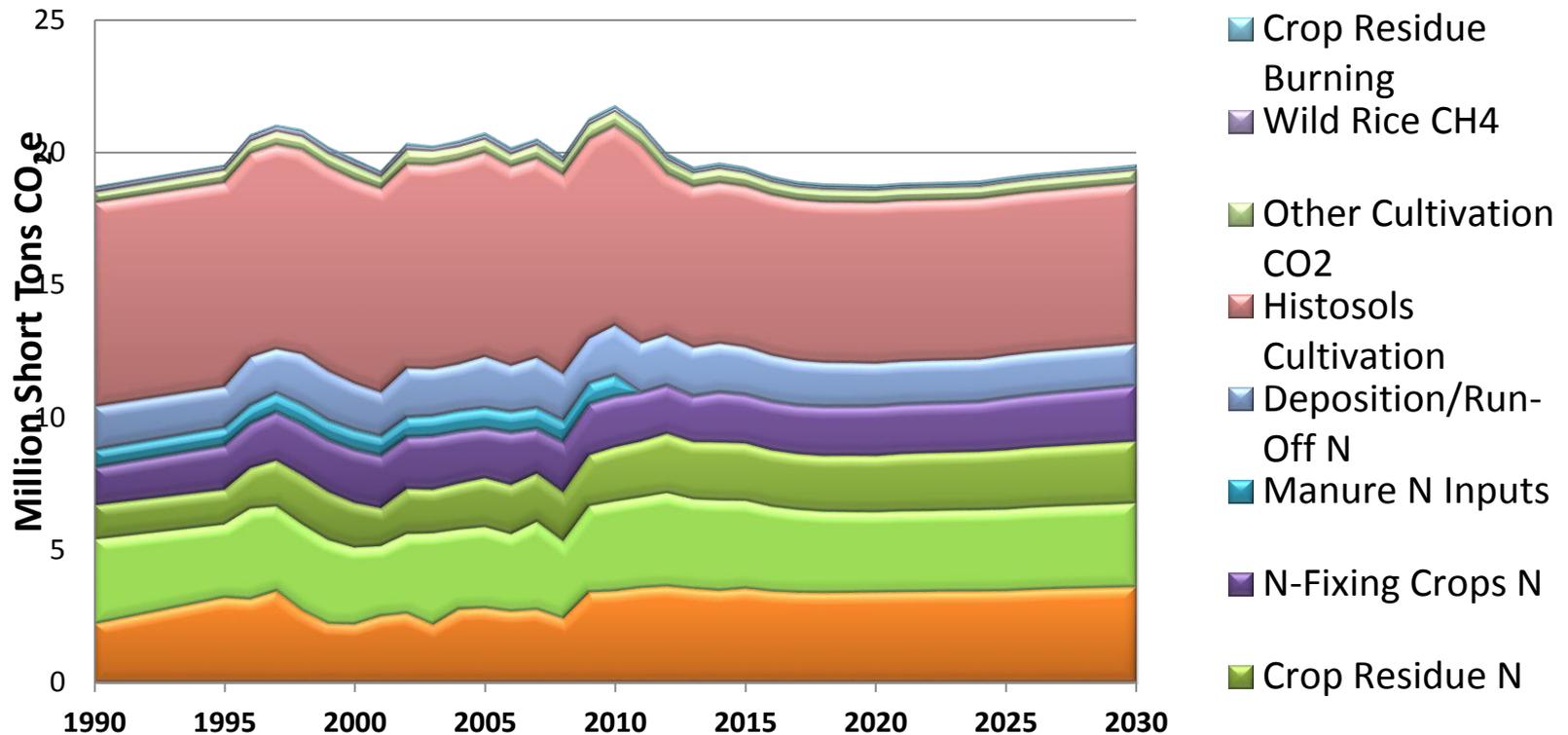




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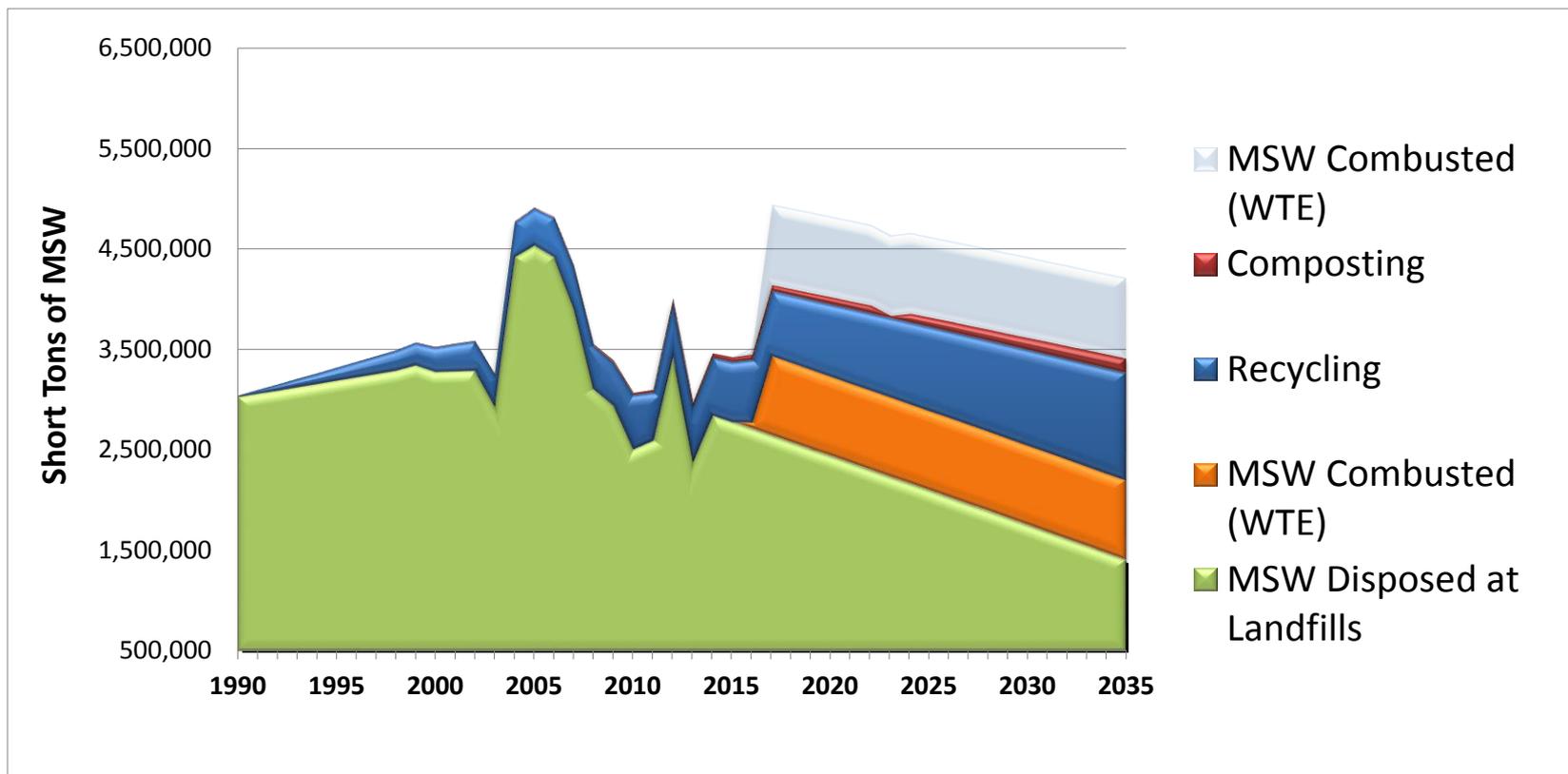
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MN Crop Production Baseline





Puerto Rico Materials, Non-Energy

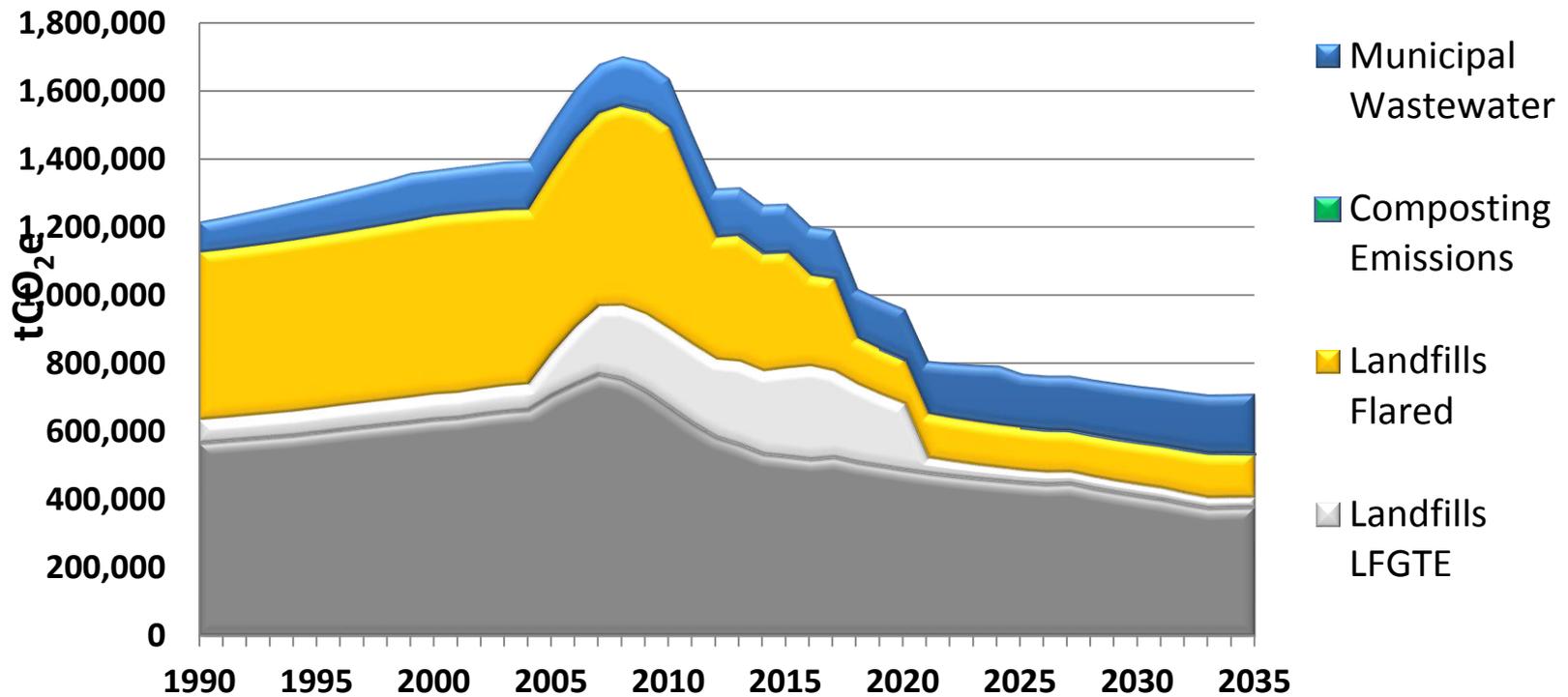




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Puerto Rico Waste Management

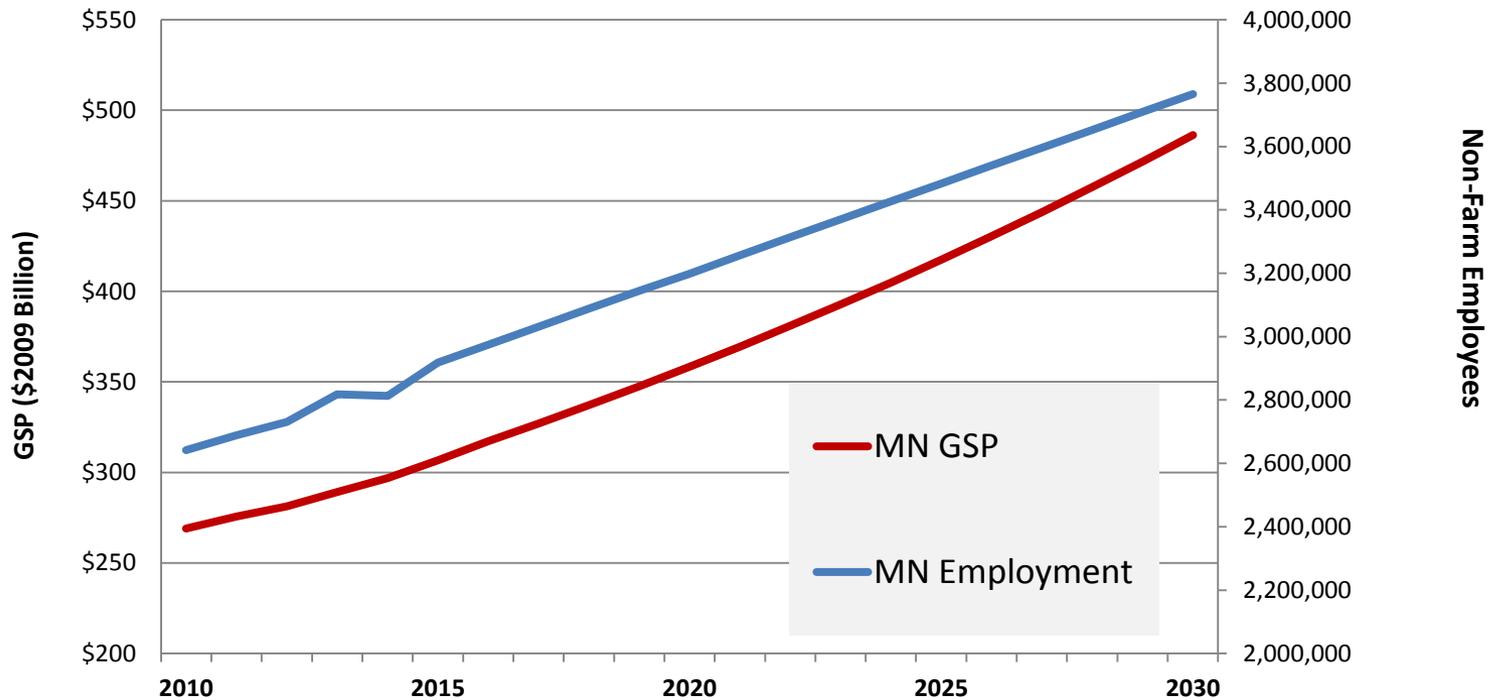




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Additional GHG Baseline Data





Consumption-Based, Energy-Cycle

**GREET Upstream Emission Factor
[Combustion Emission Factor]
(tCO₂e/TJ)**

Fuel Type	GREET Upstream Emission Factor [Combustion Emission Factor] (tCO ₂ e/TJ)		
	Electricity Generation	Residential, Commercial, Industrial	Transportation
Jet Fuel	n/a	n/a	21.4 [71.5]
Coal	4.66 [94.6]	4.66 [94.6]	n/a
Distillate Fuel Oil (No. 2)	20.1 [74.1]	20.1 [74.1]	20.1 [74.1]
Gasoline	n/a	20.3 [69.3]	20.3 [69.3]
Ethanol (U.S. corn)	n/a	43.7 [2.15]	43.7 [2.15]
Natural Gas	4.01 [56.1]	4.01 [56.1]	17.9 [56.1]
Propane/Liquefied Petroleum Gas	n/a	17.3 [63.1]	17.3 [63.1]
Residual Fuel Oil (No. 6)	13.0 [77.4]	13.0 [77.4]	n/a
Wood	6.19 [7.54]	6.19 [7.54]	n/a

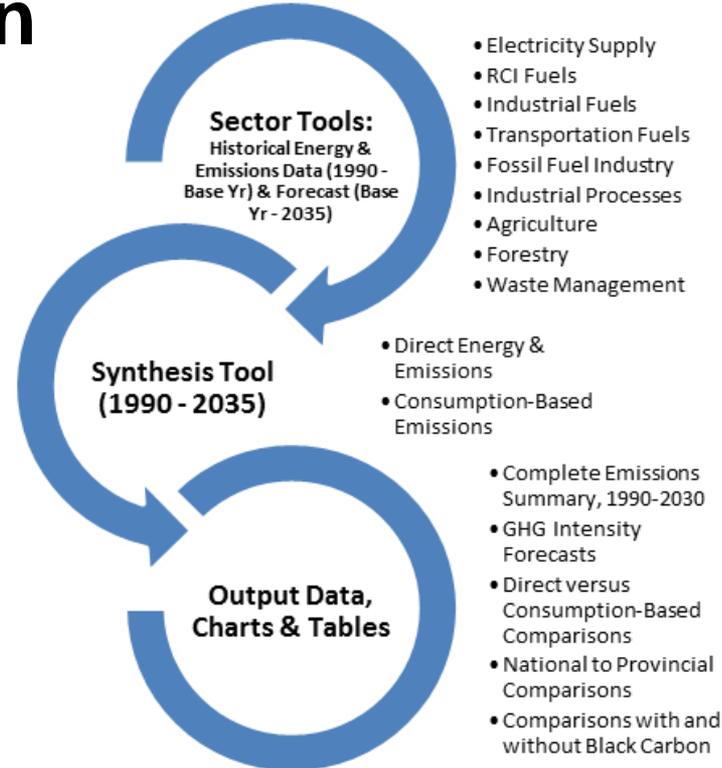


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LEDS Baseline Tools: Linked MS Excel Workbooks & Documentation

*Designed for Sub-
National (Provincial
and Municipal)
Scale LEDS Planning*





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Baseline Monitoring and Updates

Initial Baseline serves as a starting point for continued review and revision during and after a LEDS planning process

A planning-level, sector-based baseline is needed for diagnosis of GHG emissions and appropriate mitigation actions, but is not a baseline for modeling or compliance assessment of individual sources

Key data inputs by sector should be identified for monitoring LEDS Plan implementation progress



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Questions & Answers

- **Baseline Tools Demonstration, Introductory GHG Baseline Development**



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LEDS POLICY OPTION DATABASES



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LEDS Policies and Measures Databases

Topics

Database contents

Database uses

Examples

Steps for use in action planning

Existing frameworks and databases



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Contents

- Complete menu of policies or actions to address 3E planning goals for the LEDS process
 - existing, planned and potential
 - categorized by sector and thematic grouping
 - including cut across sectors (e.g. in a “cross-cutting issues” sector)
- Includes brief description of:
 - how the policy/action addresses one or more 3E needs of the LEDS process
 - implementation mechanisms (“interventions”) required



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Examples

Low Emissions Development Policy Option	Policy Option Description
RENEWABLE ENERGY	
Renewable or Environmental Portfolio Standard	A renewable portfolio standard (RPS) requires utilities to supply a certain, generally fixed percentage of electricity from an eligible renewable energy source(s). In some cases, utilities also meet their portfolio requirements by purchasing renewable energy certificates (RECs) from eligible renewable energy projects. With REC “trading,” it may be beneficial to consider a variety of renewable resources. Similar to an RPS, an environmental portfolio standard (EPS) requires utilities to supply a certain, generally fixed percentage of electricity from both eligible renewable energy source(s) and energy efficiency or other GHG emission-reducing technologies.
Green Power Purchases and Marketing	Green power refers to electricity produced by environmentally benign sources, such as wind, solar, biomass, and hydroelectric generating resources. These programs allow consumers to purchase “green tags” along with their electricity, ensuring that a quantity of electricity equivalent to their purchase contributed to the development and support of renewable resources. Generally voluntary, these programs can be implemented on a statewide or regional basis.



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Uses

Creation of a full range of potential LEDS choices

Identification of gaps in current option sets

Gap filling through innovation

Gap filling through enhancements

Education regarding concepts, needs, potential solutions

Consensus building on policy selection, for example, using Multi Criteria Analysis

Entry point to Policy Option Design



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Steps

Construct initial catalog
from best available
sources

- Categorize by sector, subsector, activity area
- Identify baseline actions (current and planned)
- Develop brief descriptions for each tied to LEDS goals

Provide sector-level
catalogs to technical
work groups (TWGs)

- TWGs review and learn
- TWGs identify and fill gaps as needed
- TWGs provide to full LEDS Advisory Group

LEDS Advisory Group
receives, reviews and
approves

- Learning and exchange across sectors
- Adds missing items as needed
- Prepares for next phase of decision making on draft priorities



P&M Databases

Organization/ Agency	LISTING OF POLICIES & MEASURES DATABASES				
	Title	Description	Geographic Coverage	Sector Coverage	Existing (E), Planned (P)
Center for Climate Strategies	Master Catalog of LEDS Policies and Actions	A catalog of sub-national, GHG-reducing actions and policy options and mechanisms with detailed description and benchmark performance metrics of each option	No country/state specific	All sectors	P
Countries' submissions	National Communications under the UNFCCC	Detailed description of climate change policies and measures adopted by each country. It includes analysis on the GHG emission reduction impacts of these policies	Country Specific	All sectors	E
World Energy Council	Energy Efficiency Policies and Measures	Summary description of energy efficiency policies and measures. No impact analysis/data provided	Global	Energy	E
International Energy Agency (IEA)	Policy and Measures - Addressing Climate Change Database	Summary description of climate change policies and measures. No impact analysis/data provided	IEA Member Countries	All sectors	E+P
IEA	Policy and Measures - Energy Efficiency Database	Summary description of energy efficiency policies and measures. No impact analysis/data provided	IEA Member Countries	All sectors	E+P
IEA	Country review	Summary description of energy related policies and measures. No impact analysis/data provided	IEA Member Countries	Power	E+P
IEA	Building Energy Efficiency Policies Database	Summary description of energy efficiency in buildings related policies and measures. No impact analysis/data provided	IEA Member Countries	Energy efficiency in buildings	E+P
IEA/IRENA	Policy and Measures - Renewable Energy Database	Summary description of renewable energy related policies and measures. No impact analysis/data provided	IEA/IRENA Member Countries	Energy	E



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P&M Databases

Organization/ Agency	LISTING OF POLICIES & MEASURES DATABASES				
	Title	Description	Geographic Coverage	Sector Coverage	Existing (E), Planned (P)
IEA	Country review	Summary description of energy related policies and measures. No impact analysis/data provided	IEA Member Countries	Power	E+P
IEA	Building Energy Efficiency Policies Database	Summary description of energy efficiency in buildings related policies and measures. No impact analysis/data provided	IEA Member Countries	Energy efficiency in buildings	E+P
IEA/IRENA	Policy and Measures - Renewable Energy Database	Summary description of renewable energy related policies and measures. No impact analysis/data provided	IEA/IRENA Member Countries	Energy	E
REN21	REN21 Renewables Interactive Map	Summary description of renewable energy related policies and measures. No impact analysis/data provided	REN21 Member Countries	Energy	E
REN21/REEEP	Reegle Portal	Summary description of renewable energy related policies and measures, and associated energy savings impacts	Global	Energy	E
Ecofys	NAMAs Database	Summary description of adopted NAMAs and associated fragmented impact analysis data	Emerging Economies	All sectors	E



P&M Databases

Organization/ Agency	LISTING OF POLICIES & MEASURES DATABASES				
	Title	Description	Geographic Coverage	Sector Coverage	Existing (E), Planned (P)
OECD	Database on instruments used for environmental policy and natural resources management	Listing of policies and measures, not associated description nor impacts analysis provided	Global	All sectors	E
European Environment Agency (EEA)	EEA database on climate change mitigation policies and measures in Europe (PAM)	Listing of climate change policies and measures, and associated GHG emission reductions impacts	European Union Member States	Vary country by country	E
EEA	Climate and energy country profiles – Key facts and figures for EEA member countries	Summary description of climate change and clean energy policies and measures, and associated energy savings and GHG emission reduction impacts	European Union Member States	All sectors	E + P
Ecofys	EU Climate Policy Tracker	Summary description of climate change policies and measures, and associated GHG emission reduction impacts	European Union Member States	General	E+P
ADEME/EU	MURE (Mesures d'Utilisation Rationnelle de l'Energie)	Summary description of energy efficiency policies and measures, and associated GHG emission reductions impacts.	European Union Member States	Energy Efficiency	E



P&M databases

Organization/ Agency	LISTING OF POLICIES & MEASURES DATABASES				
	Title	Description	Geographic Coverage	Sector Coverage	Existing (E), Planned (P)
U.S. Department of Energy	Database of State Incentives for Renewables & Efficiency (DSIRE)	Summary description of renewable energy related policies and measures. No impact analysis provided	US States	Renewable and Energy Efficiency	E
ACEEE	State and Local Energy Efficiency Policy Database	Summary description of renewable energy related policies and measures. No impact analysis/data provided	US States	Energy Efficiency	E
ESMAP	Energy Efficient Cities Case Studies Database	Summary description of energy efficiency related policies and measures and associated GHG emissions reduction and energy savings impacts	Some countries	Energy Efficiency	E
NREL	NATIONAL RESIDENTIAL EFFICIENCY MEASURES DATABASE	Listing of residential retrofit measures and associated costs for the US industry	No State specific	Energy efficiency in residential buildings	P



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CCS Policy Options Catalogs

available at: www.climatestrategies.us/library/library/view/1100

Master Catalog of Low Carbon Development Policy Options

A catalog of state-level, greenhouse gas (GHG)–reducing actions and policy options prepared by the Center for Climate Strategies (CCS) based on actions undertaken or considered in state-wide climate change action plans by multi-stakeholder groups in a wide cross-section of U.S. states, Mexican states and by other state, local and private participants.

Tables of Policy Options:

Table	Sector Covered
B-1	Energy Supply (ES)
B-2	Residential, Commercial, Industrial (RCI)
B-3	Transportation and Land Use (TLU)
B-4	Agriculture, Forestry and Other Land Use (AFOLU)
B-5	Waste Management (WM)

Important Note: The actions are numbered in this catalog solely for convenience in referencing them. Their numbers do NOT reflect a ranking or prioritization of the actions.



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Policy Options Catalogs

- Review CCS Master Catalog of Policy Options to understand:
 - Sector-level construction of policy catalogs
 - Thematic groupings of policies, sectors, activities
 - Process for identifying baseline actions
 - Process for gap filling through innovation, enhancement



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Thank you for your time and attention!

Questions?

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tpeterson@climatestrategies.us