

GHG Reduction Strategies for Connecticut



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Connecticut SIPRAC Meeting

Hartford, CT

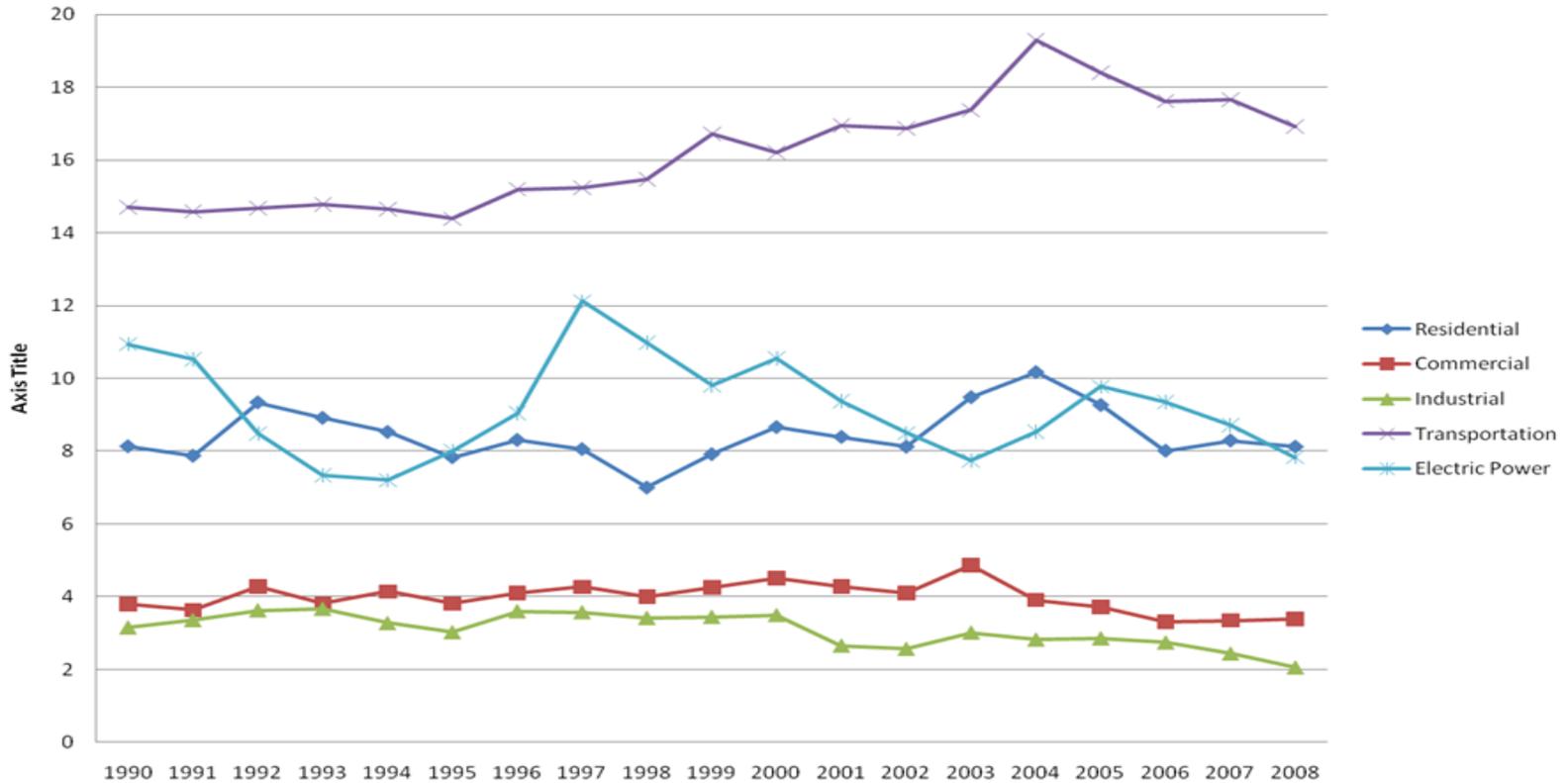
May 12, 2011

Process

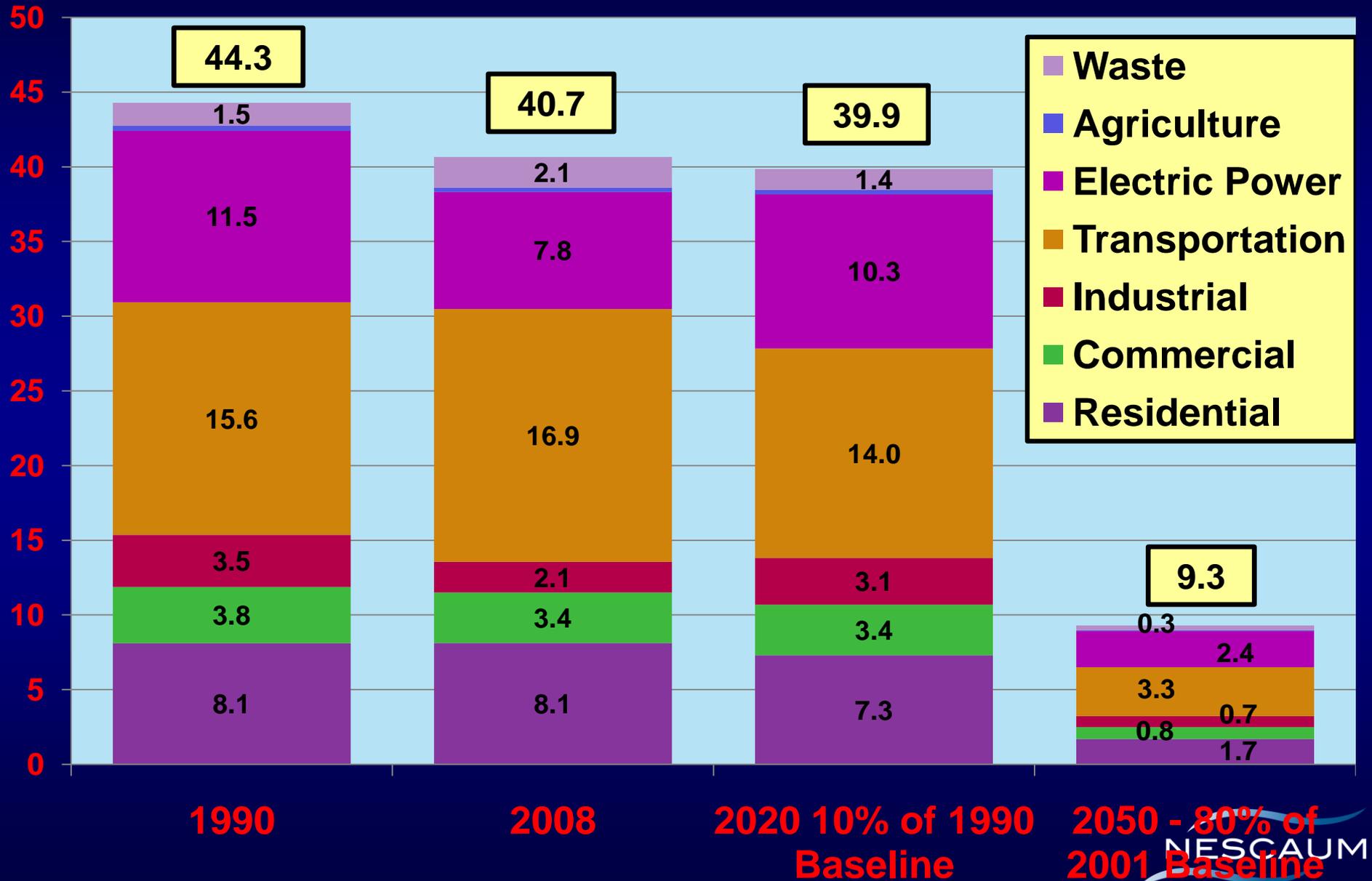
- CT DEP working to implement GWSA through an open and transparent stakeholder driven process
- NESCAUM supporting CT DEP to focus, prioritize, and assess the many good GHG candidate strategies identified by stakeholders to date.
- Several key strategies prioritized based on a preliminary screening analysis of GHG reduction potential and economic opportunities for CT
- A refined analysis will hone preliminary work and incorporate new data and methods to develop recommended strategies to achieve target of **6-7 Million Metric Tons (MMT) CO₂e** by 2020 and an *additional 30 MMT* by 2050

GHG Emission Trends

Connecticut
CO2 from Fossil Fuel Combustion by Sector
1990 - 2008



CT's GHG Emissions & Reduction Targets



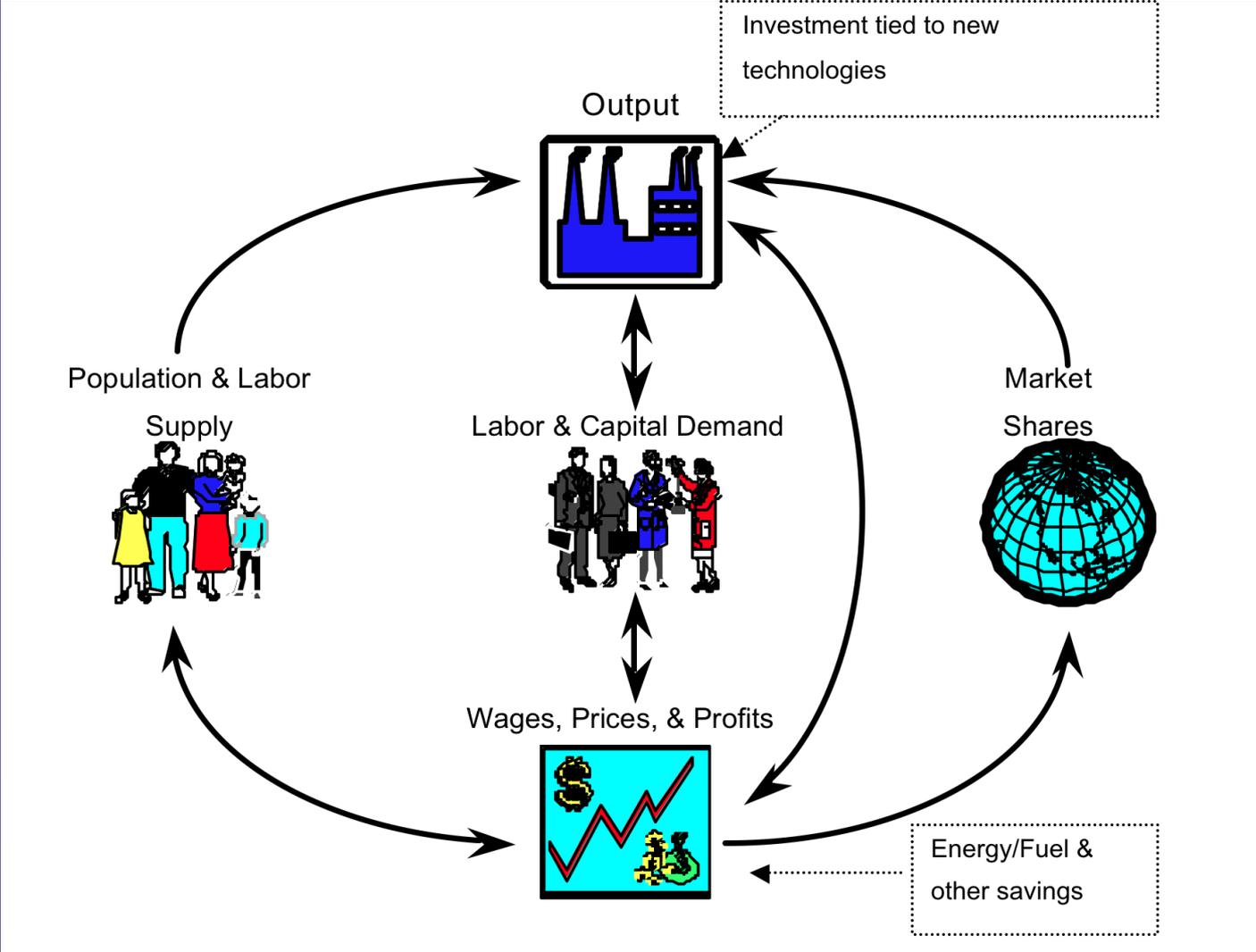
Roadmap I: Preliminary Work

- NESCAUM's December 2010 Report: *Connecticut Greenhouse Gas Emissions: Mitigation Options Overview and Reduction Estimates*
- Preliminary Economic Linkage Analysis by EDRG
- CT Integrated Resource Plan (IRP)

Roadmap II: Refined Analysis of CT GHG Strategies

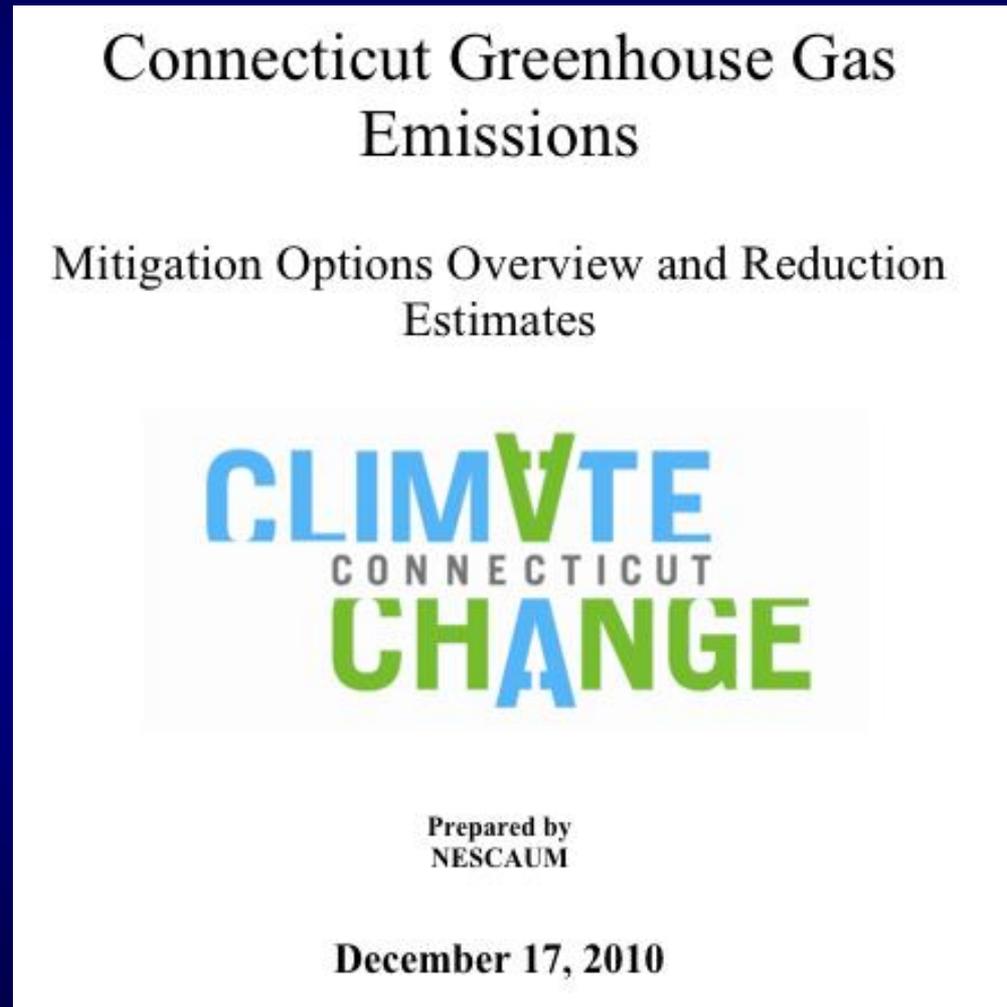
- Methodology and data ‘white paper’
- 2010-2050 wedges-style GHG analysis and program definition
- Synthesize program costs, IRP data, and ‘CT clean tech’ industry data into input data for REMI
- Macroeconomic analysis

REMI Background



Preliminary Work: GHG Report

- December report reviews 21 strategies
- Focus was 2020 GHG reduction potential



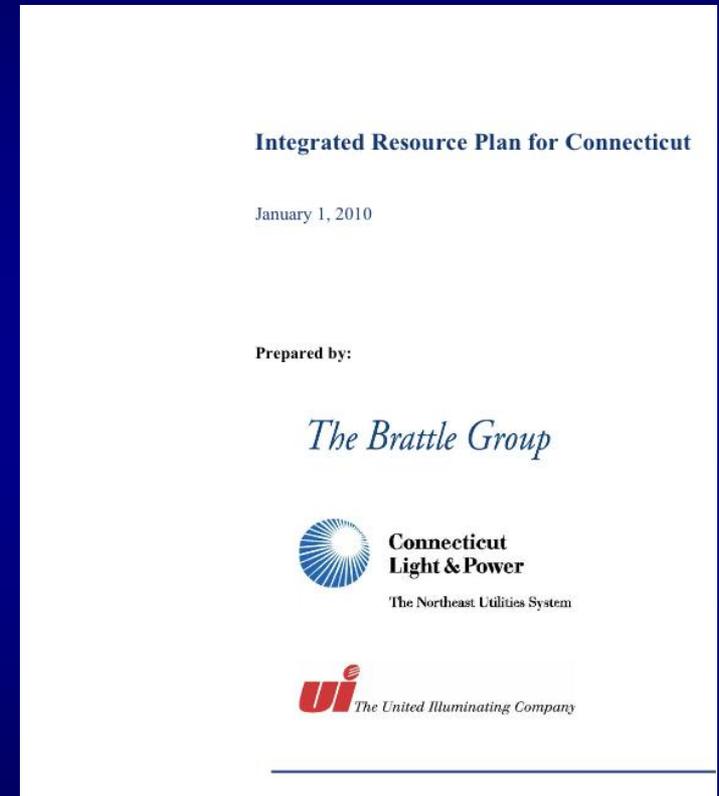
Preliminary Work: Econ. Linkage

- Legislative mandate to consider economic opportunities for CT
- Two metrics consider potential for in-state business development and impact of per-dollar spending changes

DESCRIPTION	Potential ECONOMIC
bc Implement solid waste mgmt plan	effect on CT business cost (indeterminant), + competitively non-compet
bc Forest ecosys mgmt practices	- then +
n Carbon SEQSTRN	- then +
n Smart Grwth	- then +
n VMT Reduc	- then +
bc LCFS RPS	- then +
bc RGI	- then +
n weathztn municipal district heating	- then +
bc 2008 EE_funding levels	- then +
bc EE potential Top	- then +
bc (arra funded) heat pumps	- then +
bc Bldg Code	- then +
bc Cleaner Dies	- then +
bc Appliances	- then +
bc LEV	- then +
bc (arra funded) LEV	- then +
bc - NU pilot smart meter	- then +
n smart meter	- then +
bc Implement solid waste mgmt plan	- then +
bc Forest ecosys mgmt practices	- then +
n Carbon SEQSTRN	- then +
bc LCFS	- then +
n LEV	- then +
bc LEV	- then +
bc CO2 PerMile Cleaner Vehicles	- then +

Preliminary Work: IRP

- 2010 analysis by Brattle Group, CT Light & Power, and UI
- Evaluates power system reliability, environmental and economic metrics
- Provides sound analytic basis for assessing power sector opportunities for GHG reductions



Preliminary Prioritized Strategies

1	2	3	4	5	6
Strategy	Actual 2020 reduction potential (Mt) (1 decade)	2050 GHG reduction potential (3 decades)	In-state economic opportunity (relative rank)	Spending change impact on value added (relative rank)	Combined rank (see note for explanation of numerical rank)
Smart Growth	0.65	high	4	1	5.2
VMT Reduction/Public Transit	0.08	high	5	2	5.9
RPS	2.6	high	7	4	6.1
CASE District Heating	8.1*	high	10	12	7.2
RGGI II	0.35	high	8	5	7.3
Building Codes	N/A	high	14	7	8.1
LCFS	3.3	high	6	17	8.9
Energy Efficiency (Top 20 R/C/I)	8.5	medium	12	10	9.8
Solid Waste Management Plan	1.6	medium	1	14	10.0
Double 2008 EE funding (Elc, Oil, Gas)	1.5	medium	11	6	10.6
High GWP gases	1.5	medium	2	15	10.6
Residential Weatherization	1.4	medium	9	9	10.8
Carbon Sequestration	0.0046	medium	3	16	11.5
LEV GHG Standard	3.7	high	17	18	11.8
Appliance Standards	3	medium	16	8	11.9
Heat Pump initiative	2.3	low	13	11	14.7
Speed Limits	0.7	low	20	3	14.9
LD Feebate	2.9	medium	18	19	15.1
Clean Diesels	0.0005	low	15	N/A	15.7
Smart Meters	0.34	low	19	13	17.3
CO2 Performance Standard	0	low	21	21	19.9

Grouped Strategies

1. Transportation Planning (public transit, smart growth, LCFS, LEV & freight)
2. Power Sector (RPS & RGGI +/-II)
3. Buildings (energy efficiency, building codes & district heating)
4. Waste management sector
5. High GWP gases
6. Land use change and forestry

Next step is to assess feasibility of implementation!

Refined Analysis “Roadmap”

- Methodology and data ‘white paper’
- 2010-2050 wedges-style GHG analysis and program definition
- Synthesize program costs, IRP data, and ‘CT clean tech’ industry data into REMI input data
- Macroeconomic analysis

Methodology and Data

- Since NESCAUM 2010 report, NY, MA, and NJ have each released an analysis of state-specific GHG strategies
- White paper to review analytical approach for refining and extending GHG reduction potential analysis for 6 grouped strategies
- Propose data sets and methods to be used for each technical approach

2010-2050 Wedges Analysis

- Consideration of both 2020 targets and 2050 targets
- Long-term reduction estimates inherently subject to high level of uncertainty
 - Possible approach to formally address uncertainty is a Monte Carlo style analysis
- Program investments will inform macroeconomic analysis

REMI Synthesis and Analysis

- Macroeconomic assessment will draw on cost estimates from wedges analysis, power sector information from IRP, and estimates of new, related CT business opportunities
- EDRG will utilize NESCAUM 12-state REMI model

Products

- CT DEP expects to make recommendations for GHG reduction programs to achieve Global Warming Solutions Act targets with consideration of economic opportunities for the state

Schedule

- White paper on proposed data and methods to be posted on ctclimatechange.com website by late June
- CT and NESCAUM will provide two to three weeks for public input
- Detailed wedges analysis and program definition to follow

Areas for Comment

- Need for large-scale strategies to achieve 2050 targets.
- Strategies that are most appropriate for the 2020 to 2050 timeframe.
- Suggestions on innovative, market-based approaches and data sources
 - Class II RPS-tying increased recycling rates to RECs.
 - Other data sources used by stakeholders