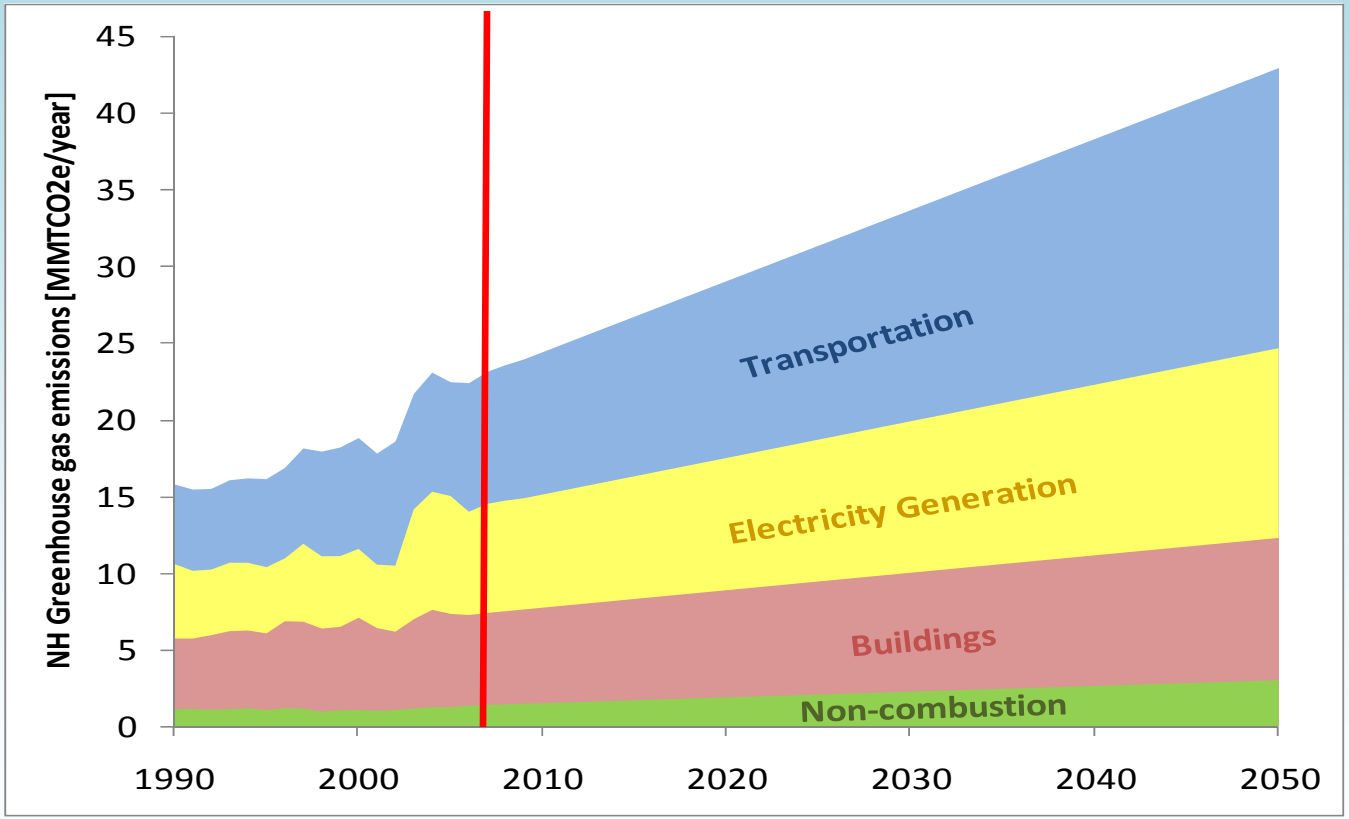
Potential EESE Board GHG Emission Targets for the NH Climate Action Plan

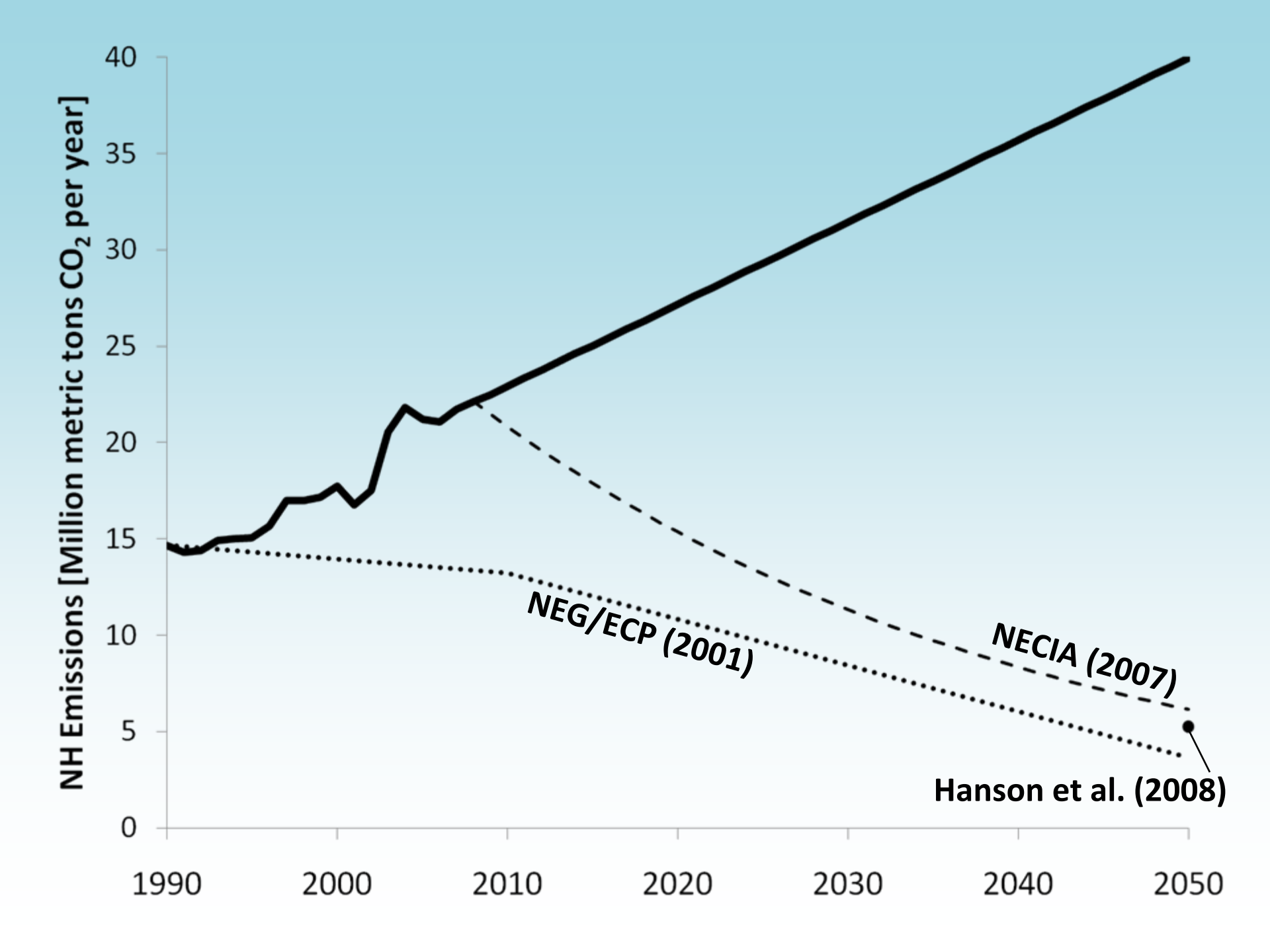
NH EESE Board
Goal Team Sub-Committee

Friday, October 16, 2009

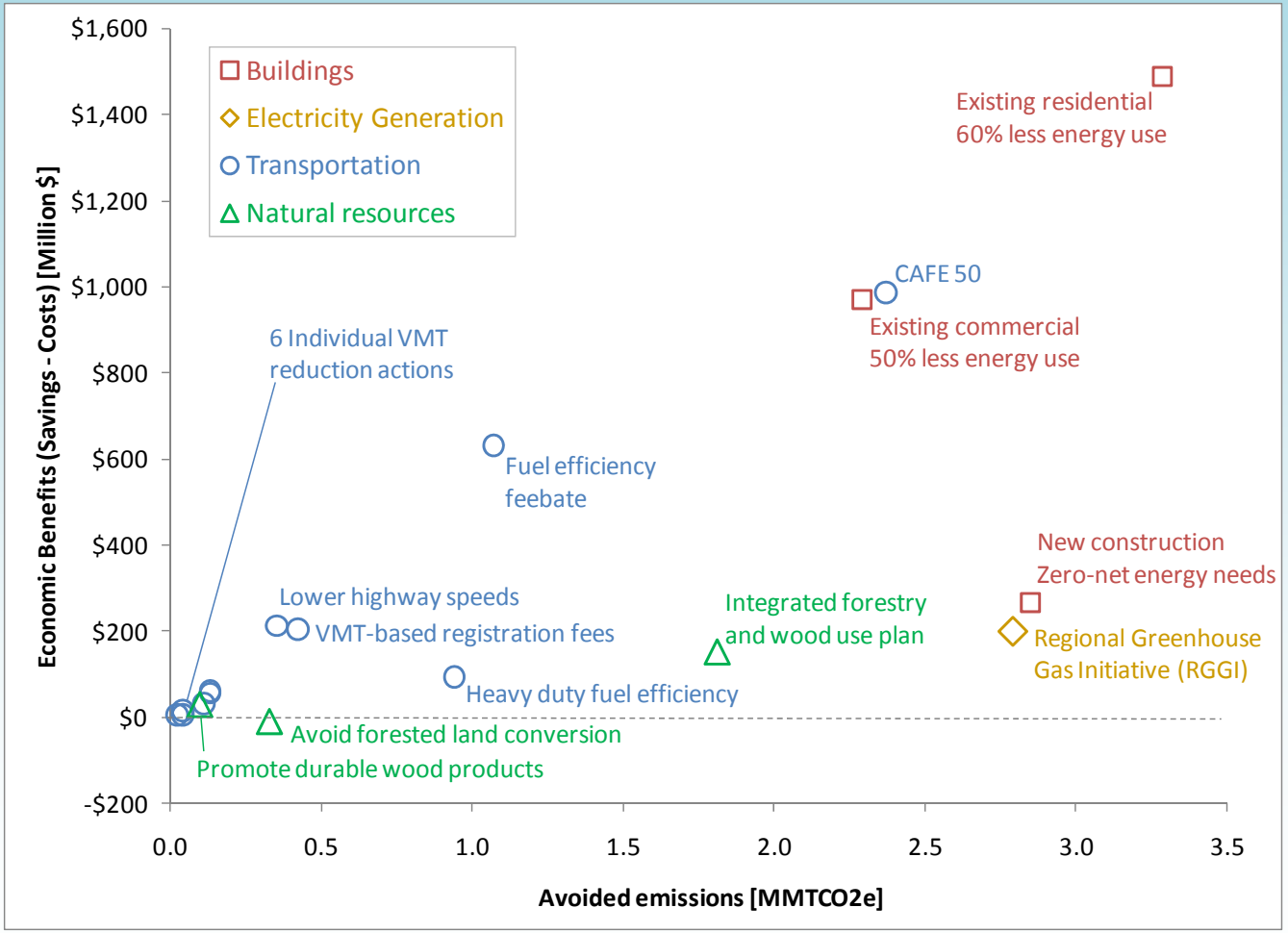
NH Historical and Projected Greenhouse Gas Emissions



Historical data from EPA
Business as Usual (BAU) estimates from CSNE


NH Emissions [Million metric tons CO_2 per year]
40
35
30
25
20
15
10
5
0
1990
2000
2010
2020
2030
2040
2050
NEG/ECP (2001)
NECIA (2007)
Hanson et al. (2008)

Economic Benefits and Avoided Emission Reductions



Analysis conducted by CSNE

Potential Recommended Actions
Building Combination Scenario

1. Building Scenario		Low Scenario	Medium Scenario	High Scenario
RCI 1.1	Maximize Efficiency in New Construction	30% more efficient	70% more efficient	100% more efficient
RCI 1.2	Maximize Energy Efficiency in Existing Residential Buildings	15,000 15% more efficient	15,000 30% more efficient	30,000 60% more efficient
RCI 1.3	Maximize Energy Efficiency in Existing Commercial, Industrial, and Municipal Buildings	15% more efficient	30% more efficient	50% more efficient
EGU 1.1	Establish Revenue Decoupling	Action not individually quantified		
EGU 1.2	Mandate Energy Efficiency Procurement	5% reduction in NH consumption by 2025; maintain percentage to 2050	15% reduction in NH consumption by 2025; maintain percentage to 2050	24% reduction in NH consumption by 2025; maintain percentage to 2050
EGU 1.3	Increase the Use of Combined Heat & Power	5% penetration by 2025; maintain percentage to 2050	15% penetration by 2025; maintain percentage to 2050	25% penetration by 2025; maintain percentage to 2050
RCI 1.4A	Upgrade Building Energy Codes	25%	25%	50%
RCI 1.4B	Increase Building Energy Code Compliance	50%	80%	80%

Potential Recommended Actions
Electric Generation Combination Scenario

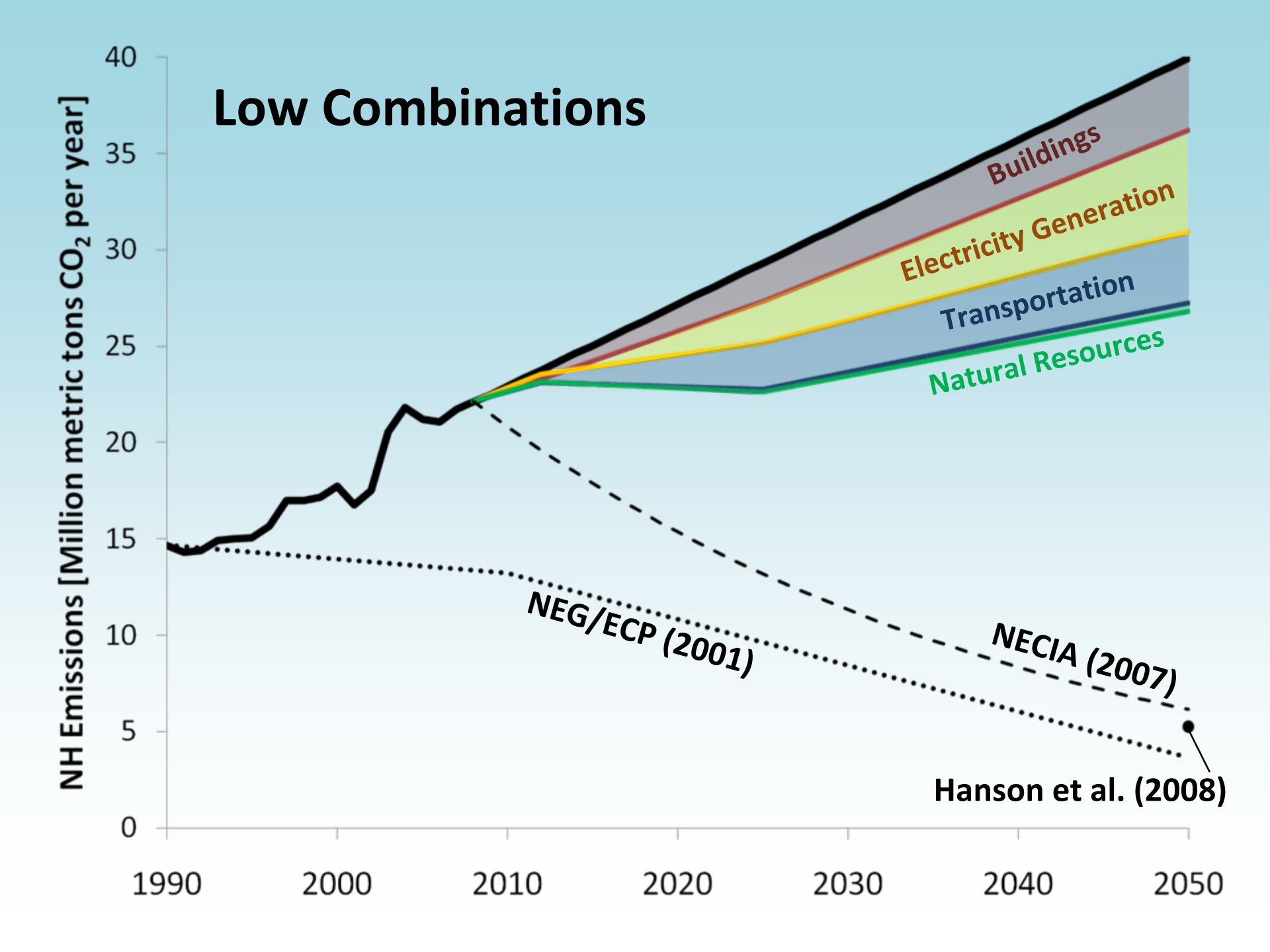
2. Electric Generation Scenario		Low Scenario	Medium Scenario	High Scenario
EGU 2.2	Regional Greenhouse Gas Initiative (RGGI)	NH Allowance + 10% Purchase Scenario	NH Allowance Only Purchase Scenario	NH Allowance -10% Purchase Scenario
EGU 2.1	Promoting Renewable Energy through the Electric Portfolio Standard (RPS)	Quantified as written in Action Plan		
EGU 2.4	Low- and Non-CO_2-Emitting Supply-Side Resources	Action not individually quantified		
AFW 2.4	Encourage the Use of Biogenic Waste Sources for Energy Generation	Analysis underway		

Potential Recommended Actions
Transportation Combination Scenario

3. Transportation Scenario		Low Scenario	Medium Scenario	High Scenario
TLU 1.A.2	Support Fuel Economy Standards for Heavy-Duty Vehicles	Quantified as written in Action Plan		
TLU 1.C.1	Adopt a LCFS	Quantified as written in Action Plan		
TLU 1.C.2	Promote Advanced Technology Vehicles and Supporting Infrastructure	Action not individually quantified		
TLU 1.C.3	Install Retrofits to Address Black Carbon Emissions	25% reduction of BC	50% reduction of BC	85% reduction of BC
TLU 1.D.1	Address Highway Travel Speeds	Enforce speed limit	Reduce speed limit	Reduce speed limit
TLU 1.D.2	Address Vehicle Idling	Quantified as written in Action Plan		
TLU 1.D.3	Improve Traffic Flow	Quantified as written in Action Plan		
TLU 1.A.3	Adopt California Low Emission Vehicle (CALEV) Standards	Quantified as written in Action Plan	Not included in medium scenario	Not included in high scenario
TLU 1.A.1	Support Stricter Corporate Average Fuel Economy Standards	Not included in low scenario	43 MPG	50 MPG
TLU 1.B.1	Create a Point-of-Sale Financial Incentive for Higher Efficiency Vehicles	Not included in low scenario	Feebate of $1000 per 0.01 gallon/mile (new vehicles 22% more fuel efficient)	Feebate of $1000 per 0.01 gallon/mile (new vehicles 22% more fuel efficient)

Potential Recommended Actions
Natural Resource Combination Scenario

4. Natural Resource Scenario		Low Scenario	Medium Scenario	High Scenario
AFW 1.2	Avoid Forest Land Conversion	Quantified as written in Action Plan		
AFW 1.3	Promote Durable Wood Products	Quantified as written in Action Plan		
AFW 2.2	Maximize Availability of Biomass for Electricity and Heating within Sustainable Limits	TBD		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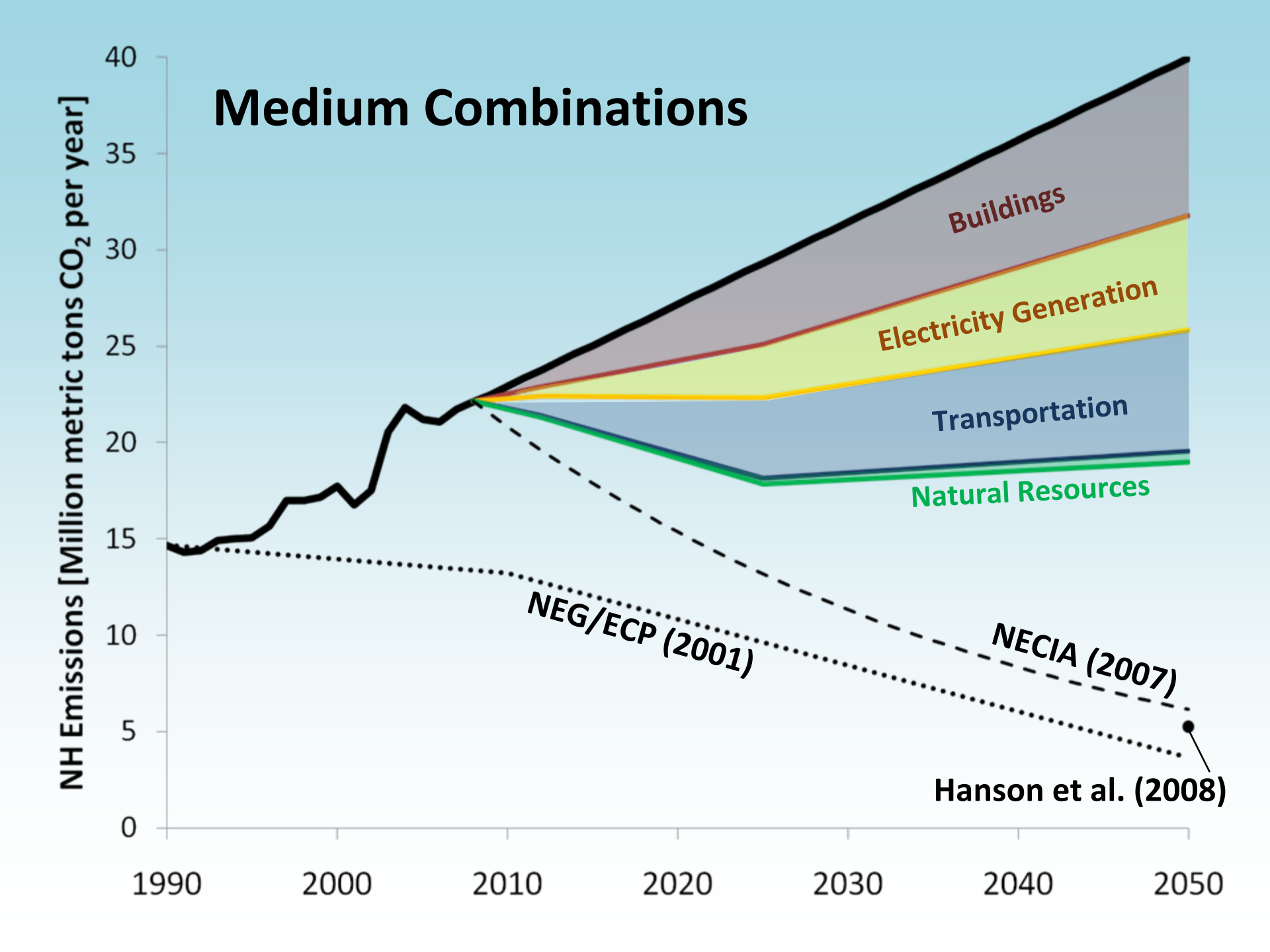
Medium Combinations
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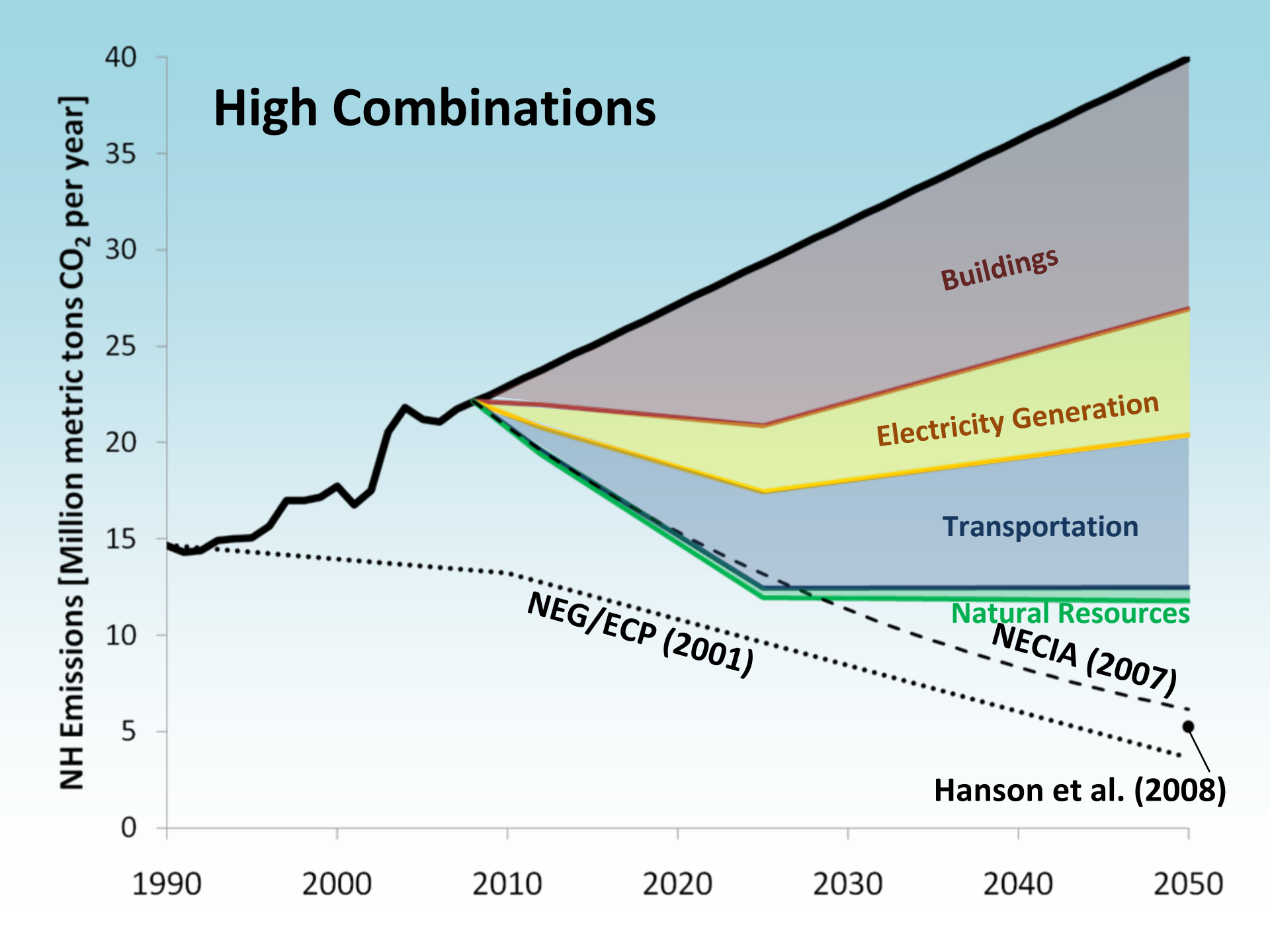
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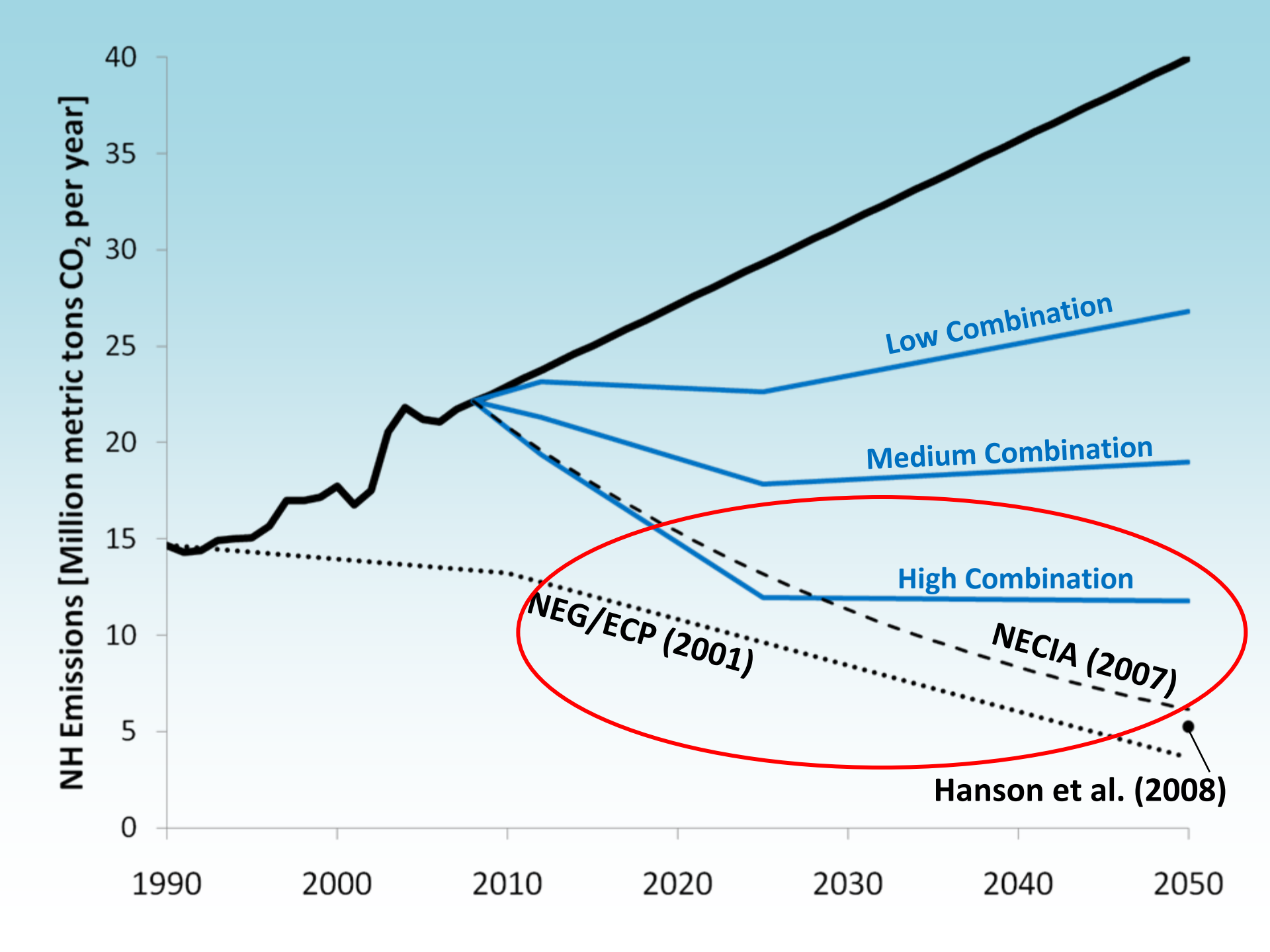
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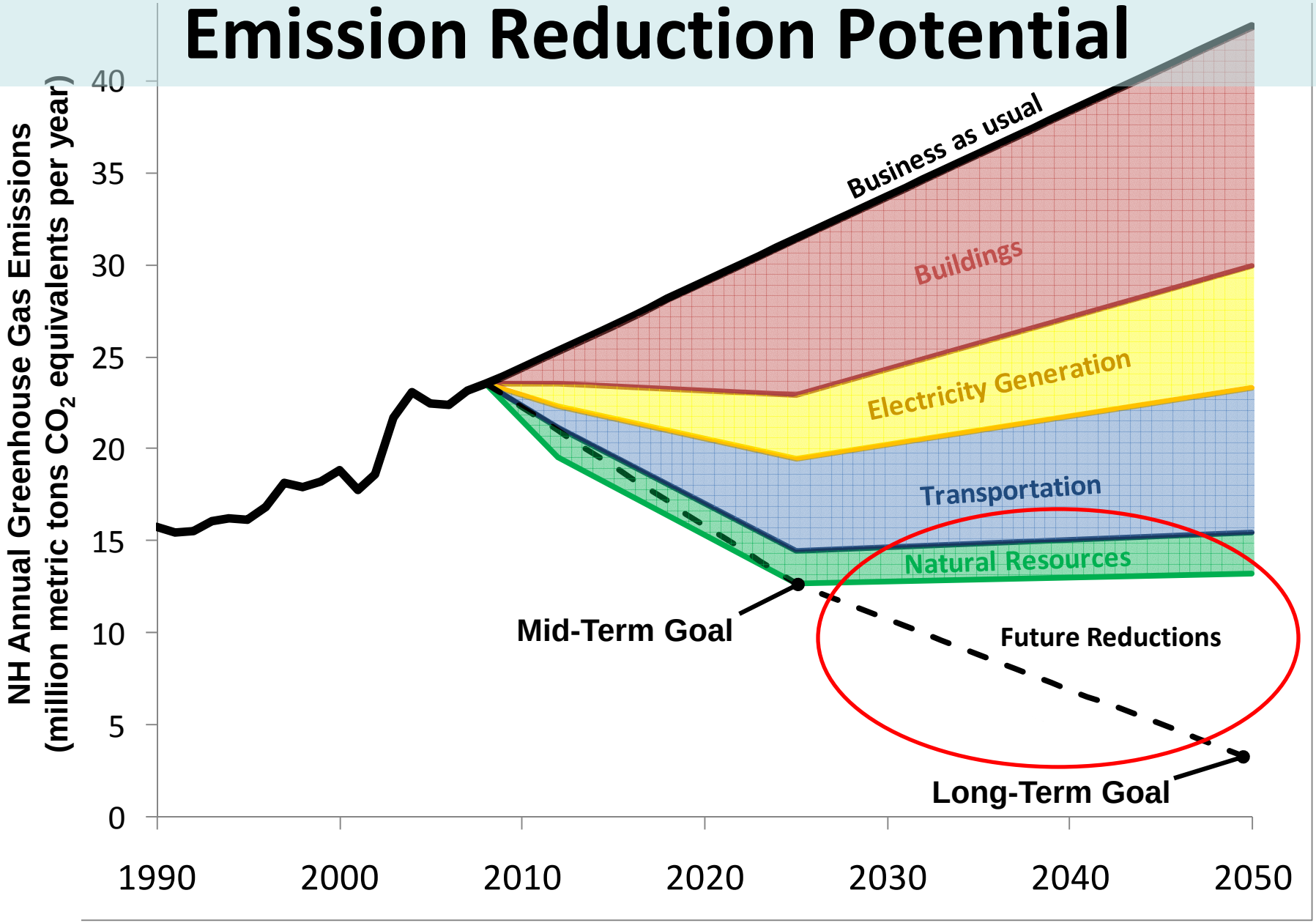
Climate Action Plan
Emission Reduction Potential



Projected Emissions & Interim Targets

Table 2.1 – Projected Emissions Reductions Resulting from the Task Force Recommended Actions

	Emissions [$MMTCO_2e/yr$]	
Year	2025	2050
Total Projected Emissions (BAU)	**31.36**	**42.95**
Projected Emission Reductions from Recommended Actions		
Building Actions	8.43	13.02
Electricity Generation Actions	3.44	6.57
Transportation Actions	5.01	7.91
Natural Resource Actions	1.81	2.25
Total Potential Emission Reductions	**18.69**	**29.75**
Total Projected Emissions for Action Plan	**12.67**	**13.20**
Percent Reduction from BAU	***59.6%***	***69.3%***
Percent Reduction from 1990 Emissions (15.79 $MMTCO_2e$)	***19.7%***	***16.4%***

BAU – Business as Usual

$MMTCO_2e$ – million metric tons CO_2 equivalents

Table 2.2 – Interim Emission Reduction Targets

	Interim Targets				
Year	2012	2015	2018	2021	2024
Annual Emission Targets [$MMTCO_2e$]	21.00	19.08	17.16	15.24	13.32
Percent Change Relative to 1990	33.1% above	20.9% above	8.7% above	3.5% below	15.6% below
Percent Reduction from BAU	10.9%	19.0%	27.2%	35.3%	43.5%

CAP pp. 25

VISION AND GOALS

In the year 2025, New Hampshire is a recognized leader among states in realizing progress toward a clean, sustainable and economically advantageous energy future.

Through public policy initiative, private entrepreneurship, and civic engagement, our state has fully capitalized on cooperative ventures, advanced renewable energy technologies and efficiency to achieve the following major milestones:

1. A 20% reduction in greenhouse gas emissions relative to 1990 levels.
   - Over 25% of all energy consumption (electric, thermal, transportation) derived from renewable and sustainably sourced resources and technologies
   - A 20% reduction of state, county and municipal government expenditures for energy (vs. 2010 expenditures) through investment in renewable energy and energy efficiency

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In the year 2025, New Hampshire is a recognized leader among states in realizing progress toward a clean, sustainable and economically advantageous energy future.

Through public policy initiative, private entrepreneurship, and civic engagement, our state has fully capitalized on cooperative ventures, advanced renewable energy technologies and efficiency to achieve the following major milestones:

2. A robust energy economy that circulates fuel and technology expenditures as much as possible in the New Hampshire economy, and has created clean energy jobs at a rate __% greater than overall job growth since 2010

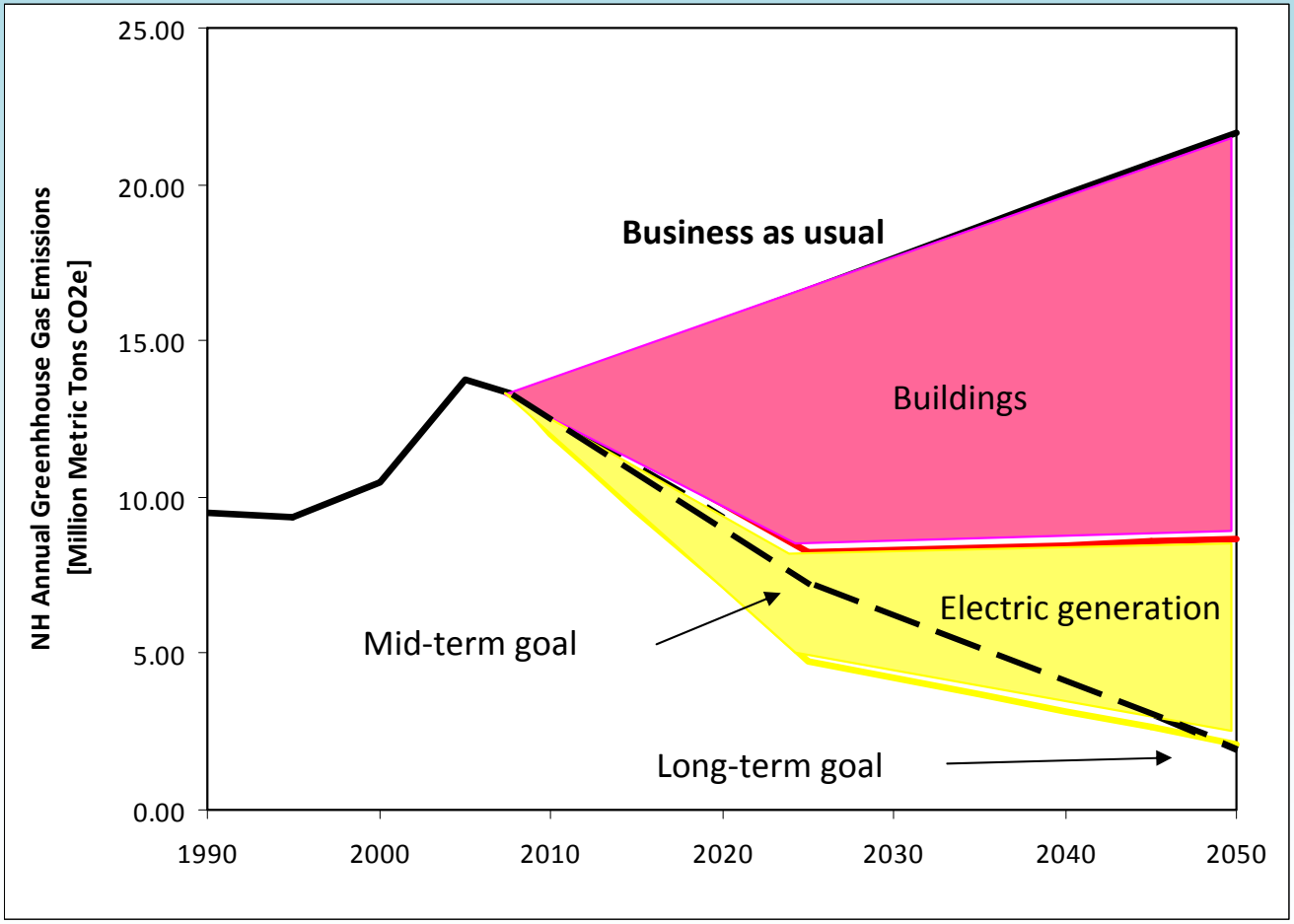
3. A broad and competitive array of energy options to ensure affordability and reliability of energy to citizens in all socio-economic strata

4. Strong central planning, cooperation at all levels of government and with the private sector, and effective utilization of incentives, subsidies, grants, and technical assistance to ensure efficient delivery of services and solutions for residential, commercial and industrial energy consumers

EESE Board GHG Emission Targets

Building and Electric Generation GHG Emissions [MMTCO2e]											
	1990	2008	2010	2012	2015	2020	2025	2035	2040	2045	2050
Business-as-Usual Emissions											
Commercial	1.32	1.41	1.44	1.47	1.51	1.58	1.64	1.78	1.85	1.91	1.98
Industrial	0.83	1.45	1.49	1.53	1.60	1.70	1.81	2.02	2.13	2.24	2.34
Residential	2.47	3.22	3.30	3.38	3.51	3.72	3.92	4.34	4.55	4.75	4.96
Electric Generation	4.85	7.21	7.38	7.63	8.01	8.64	9.26	10.51	11.14	11.77	12.39
Total	9.47	13.29	13.61	14.02	14.62	15.63	16.64	18.65	19.66	20.67	21.67
Potential Emissions CAP											
Buildings Scenario	-	13.29	12.86	12.24	11.31	9.76	8.21	8.39	8.48	8.56	8.65
Electric Power Scenario	-	13.29	12.01	11.05	9.60	7.18	4.77	3.69	3.16	2.62	2.08
Proposed EESE CAP Targets											
20% below 1990 by 2025 (80% below 1990 by 2050)	-	13.29	12.62	11.95	10.94	9.26	7.58	5.30	4.17	3.03	1.89

Climate Action Plan
Emission Reduction – EESE Board



Maximize Efficiency in Buildings

- New residential construction that is 100% more efficient
- Retrofit 30,000/yr existing residential buildings to be 60% more efficient
- Retrofit existing Commercial, Industrial, and Municipal Buildings to be 50% more efficient
- Increase the Use of Combined Heat & Power

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Increase Renewable/Low-CO_2 Emitting Resources

- Implement Regional Greenhouse Gas Initiative (RGGI)
- Promote Renewable Energy through the Electric Portfolio Standard (RPS)
- Increase Renewable Energy and Low-CO_2e Thermal Energy Systems
- Encourage the Use of Biogenic Waste Sources for Energy Generation

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Protect Our Natural Resources to Maintain the Carbon Sequestered

- Maximize Availability of Biomass for Electricity and Heating within Sustainable Limits
- Invest in Forests to Maximize Carbon Storage and to Avoid Net Forest Land Conversion

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Develop Integrated Education, Outreach and Workforce Training

- Energy Efficiency and Conservation in School Curricula
- Develop Residential Energy Efficiency and Conservation Programs
- Create an Energy Efficiency and Sustainable Energy Systems Web Portal
- Increase Energy Efficiency through Building Management Education Programs

NEW HAMPSHIRE DEPARTMENT OF Environmental Services