

**DRAFT**  
**State Agency Climate Policy Working Groups**

In order to move quickly and effectively to implement the Global Warming Solutions Act, a number of working groups are being created to analyze different elements of climate policy. One working group will focus on the details of an economy-wide price on carbon, while all others will focus on sectoral policies that complement this policy.

**Working Group Charge and Deliverables**

Each working group is charged with producing the following deliverables by August 1, 2009:

1. a list of sectoral policies that mitigate GHG emissions and that complement an economy-wide price on carbon
2. a one page summary for each policy covering the points below
3. an appendix with more detailed explanation and links to references

For each sectoral policy identified, each working group will do the following:

1. Explain why the policy is needed if there's an economy-wide price on carbon.
2. Specify key parameters in the policy that the state controls which would influence the resulting outcome.
3. Define metrics by which the policy's success is measured and how that translates into GHG mitigation including:
  - a. How much reduction is feasible by the target dates: 2020, 2030, 2040, 2050
  - b. Cost/ton curve
  - c. Criteria at Chapter 21N Section 5
4. Describe GHG impacts in other sectors, positive or negative, as a result of the policy.
5. Specify factors outside the state's control that affect this policy and explore the implications of a number of scenarios for these factors.
6. Discuss the causal relationship between the policy lever and the desired outcome.
7. Is additional mandatory GHG reporting something needed to make the policy work?
8. Are high global warming gases (list them) an issue with this sector?
9. Is the policy option also an adaptive strategy for climate change?

A brief hypothetical example: An incentive to increase alternative fuel infrastructure:

- Why needed: Market barriers to alternative fuel (AF) infrastructure prevent the adoption of AF vehicles
- Parameters: Size of incentive for alternative fuel infrastructure
- Metrics: Increased market share of alternative fueled vehicles
- Uncertain factors and implications: price of gasoline, expiration of Federal tax credits
- Causal relationship: An incentive for AF infrastructure > Increased infrastructure in areas where there is sufficient density of consumer interest in AF vehicles > Increased utility of AF vehicles for consumers in such areas > Increased rate of consumers (already interested in AF vehicles) purchasing them > Increased infrastructure. The resulting positive feedback loop would allow expansion of market share of AF vehicles, at least among consumers that travel within high-density urban areas. In order to incentivize AF infrastructure in rural areas with low density of AF vehicles, a more significant subsidy would be required. Without AF infrastructure in rural

areas, consumers that travel through rural areas on occasion would be less likely to purchase AF vehicles limiting the overall market penetration.

## **Organizing Framework**

The working groups for sectoral policies related to energy-use are organized into 7 groups (see attached table for background) each of which could be further organized into subgroups as needed before integrating their work:

1. Sustainable transport and development—reducing vehicle-miles traveled (VMT), reducing building space required, etc
2. Materials and waste management—reducing materials usage, recycling, etc
3. Transportation end-use technology efficiency--passenger and freight, road and non-road
4. Buildings end-use technology efficiency--residential and commercial
5. Industrial end-use technology efficiency--manufacturing, water treatment, etc
6. Low-carbon supply--electricity generation both central and distributed, transportation fuels, heating fuels
7. Energy sector sequestration—geologic sequestration at power plants

The workgroups for sectoral policies related to non-energy GHG emissions are:

8. Process emissions (non-energy)—industrial processes, refrigerants, etc
9. Agricultural emissions (non-energy)—tilling, fertilizer, etc
10. Land-use management—afforestation, reforestation, and deforestation (ARD)

The working groups that cut across sectors are:

11. Economy-wide price of carbon
12. Modeling – analytical support for the other working groups.

In addition, there's potential, either now or in the future, for a number of cross-cutting working groups that look across the energy sector from the point of view various entities:

1. State government
2. Local government
3. Large businesses
4. Small businesses
5. Residents

			<b>Drivers</b>				
<b>End-uses</b>	<b>Sector</b>	<b>Sub-sector</b>	<b>Activity (eg passenger- miles, ton- miles, square feet bldg space, etc)</b>	<b>Energy use intensity (BTU of energy per unit of activity)</b>	<b>Fuel carbon intensity (lbs of fuel carbon per BTU of energy)</b>	<b>Carbon fraction released to atmosphere (lbs of carbon emitted per lbs of fuel carbon)</b>	
	<b>Transportation</b>	<b>Passenger</b>	<b>Sustainable transport and development</b> (passenger-miles reduction, commercial building space reduction)		<b>Transportation end-use technology efficiency</b> (feebate, vehicle efficiency standard, incentive to increase passengers per vehicle)	<b>Low-carbon supply</b> (RGGI, RPS, biofuels, low-carbon fuel standard)	<b>Energy-sector sequestration</b> (geologic sequestration at power plants)
		<b>Freight</b>					
	<b>Buildings</b>	<b>Residential</b>			<b>Buildings end-use technology efficiency</b> (building codes, appliance standards, energy efficiency programs)		
		<b>Commercial</b>					
	<b>Industrial</b>		<b>Materials and waste management</b> (reduction in materials, recycling)		<b>Industrial end-use technology efficiency</b> (manufacturing, water treatment, etc)		

The motivation for this table is two fold:

- Energy serves certain societal activities that are intuitively organized into sectors: transportation, buildings, and industrial.
- The relationship between activities and carbon emissions is described by an *identity* commonly used in climate policy planning that breaks down emissions into 4 intuitive drivers:  $\text{Carbon Emissions} = (\text{Activity}) \times (\text{Energy Use} / \text{Activity}) \times (\text{Fuel Carbon Content} / \text{Energy Use}) \times (\text{Carbon Emissions} / \text{Fuel Carbon Content})$

For certain drivers, it helps to treat multiple sectors together. Low-carbon energy supply is helpful to consider together across end-uses and across fuels because of several recent trends: 1) electricity is under consideration as a transportation fuel, 2) biomass is under consideration as a transportation fuel, as a heating fuel, and as an electric generation fuel and needs to be considered consistently across applications, 3) CHP is expected to expand and provides both heat and power, and 4) newer heat pumps offer the potential of using electricity efficiently to heat.

Reducing activity in the transportation and buildings sector--vehicle miles and square feet—while improving the standard of living in Massachusetts involves systemic changes in how we live and work and requires overlapping policy levers such as smart growth, telecommuting, and expanded common spaces.