Maine GHG Baselines & Methods
The Center for Clean Air Policy
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Baselines & Targets

General Sources, Methods, Assumptions

- All Sector Baseline combines individual sectors for Maine (not the region)
- Initial baselines provide a starting place for analysis and planning
- Forecasts are numerical estimates based on key methods, data sources, and assumptions

Targets

- Maine Legislature’s target: 1990 levels of greenhouse gases (GHG’s) by 2010, 10% below 1990 levels by 2020
- Note: Maine targets are statewide and not sector based; sectoral target lines are provided for illustration only
Maine GHG Baseline & Target

Maine's All Sector GHG Emissions

- **Baseline Emissions**
- **Target Emissions Level**
Sector GHG Baselines
Inventory & Baselines

- Initial baselines created by linking inventory results with growth forecasts for each sector

Inventory Assumptions

- **Energy Information Administration (EIA) State Energy Report Constitutes Bulk of Inventory Data**
- **Technical Notes on EIA Data:**
  [http://www.eia.doe.gov/emeu/states/_price_multistate.html#pr_technotes](http://www.eia.doe.gov/emeu/states/_price_multistate.html#pr_technotes)
Baseline Assumptions

- Initial Baseline (Growth) Assumptions
  - EIA Annual Energy Outlook 2003 (AEO 2003) 140 page assumptions document:
  - AEO 2003 projections used for Transportation and RCI sectors
    - AEO uses National Emissions Modeling System (NEMS) for energy based estimates (CO2)
- Other data sources listed within individual sectors
Agriculture & Forestry

GHG Emissions from Maine's Agriculture & Forestry Sector

Baseline Emissions
Target Emissions Level
Agriculture & Forestry
Agriculture & Forestry

Sources for initial baseline

- US Environmental Protection Agency (EPA) GHG Emissions Inventory tool
- US Department of Agriculture (USDA) Forest Service provided information on Forest Cover and land use

Methods for initial baseline

- Initially use default EPA data, projected linearly
Agriculture

- Key initial baseline assumptions
  - No change in land use or land cover trends from 1990-2000 period
  - No significant change in technology
  - No new federal policies
  - No change in management practices
  - No change in productivity from climate impacts
Forestry

Key initial baseline assumptions

- **Land use and land cover (species, age class) trends from 1990-2000 do not change**
  - Forests do not recover from storm and disease damages during 1990’s; rates of storm and disease damage remain constant

- **Land ownership and land management practices do not change from the 1990’s**

- **Wood products use and their long term carbon storage rates do not change from 1990’s**

- **No change in productivity from climate change**
Transportation

GHG Emissions from Maine's Transportation Sector

- Baseline Emissions
- Target Emissions Level

x-axis: 1990 to 2020
y-axis: MMT CO2E
Transportation

Sources for initial baseline

- **U.S. Department of Energy’s (DOE) EIA data**
  - State Energy Data Reports—fuel use (fuel sales with adjustments)
  - Federal Highway Administration Statistics Series
  - VMT levels and breakdowns

- **Maine Department of Transportation (DOT) reports**
  - VMT forecasts, VMT growth projections

- **EPA GHG Inventory Tool**
Transportation

- Methods for initial baseline
  - **For CO2:**
    - Use Maine-specific fuel use data for year 2000 (from EIA’s State Data Reports) as starting point
    - Apply Northeast annual fuel use growth rates (from EIA’s AEO 2003) to estimate for 2000 – 2020
  - **For N2O and CH4:**
    - Use EPA Inventory tool to estimate emissions for mobile sources
Transportation

Key initial baseline assumptions:

- Fuel use: NE Regional fuel use is similar to Maine
- Vehicle Miles Traveled (VMT): ME VMT rates similar to NE regional rates
- State fuel use and fuel sales are consistent
  - ME drivers do not buy significant amounts of fuel in other states that is used for in state driving
- Technology: ME light-duty vehicle fleet efficiency is similar to NE region (vehicle type & fuel use)
- Black Carbon not included
Electricity & Waste

GHG Emissions from Maine's Electricity & Waste Sector

- Baseline Emissions
- Target Emissions Level

MMTCO2E
Electricity & Waste

- Sources for initial baseline
  - EIA Electric Power Annual for years 2004-2010
  - Clear Skies Initiative (CSI) results from the Integrated Planning Model (IPM) by ICF Consulting for years 2010-2020

- Methods for initial baseline
  - Electric Power Annual data projected to CSI results to year 2010, then CSI projections used to 2020
    - Regional modeling results applied to Maine
Electricity & Waste

- Key initial baseline assumptions
  - No new federal legislation on electric utilities prior to 2010; CSI assumed thereafter
  - EIA gas price forecasts; lower than market at present
  - EIA renewable energy supply/demand forecasts - regional, no new policy
  - EIA economic growth forecasts are regional
  - Nuclear plants in the power pool are relicensed but not uprated
  - EIA demand response function in response to price changes
Residential, Comm’l, Industrial

GHG Emissions from Maine’s RCI Sector

Baseline Emissions
Target Emissions Level
Residential, Comm’l, Industrial
Residential, Comm’l, Industrial

- Emissions included in Inventory (1990-2000) and Baseline (2000-2020)
  - CO2 from fuel consumption, Methane from oil & natural gas systems
  - High GWP gases from ODS substitutes & industrial processes

- Inventory Sources (1990-2000)
  - EIA State Energy Reports, EPA Electric Power Annual
  - EPA GHG Inventory Tool

- Baseline Sources (2000-2020)
  - EIA Annual Energy Outlook (AEO) 2003
  - EPA Forecast High Global Warming Potential (GWP) Gases
Residential, Comm’l, Industrial

- Methods for initial inventory and baselines
  - **CO2 Emissions from Fuel Consumption**
    - Inventory: EIA State Data Reports for fuel use estimates, apply EPA emission factors
    - Baseline: Grow fuel use based on EIA’s AEO2003 report by applying regional growth rate, apply EPA emission factors
  - **Methane Emissions from Natural Gas and Oil Systems**
    - Inventory: EPA GHG Inventory Tool for estimates
    - Baseline: Assume historical growth rate
  - **High GWP Gas Emissions**
    - Inventory: EPA GHG Inventory Tool for estimates
    - Baseline: Grow Industrial Process Gases emissions using High GWP Gas Report
Residential, Comm’l, Industrial

Key initial baseline assumptions:

- EIA regional energy demand and economic growth forecasts, which accounts for
  - Delivered price of energy
  - Availability of renewable energy
  - Changes in efficiency of energy use due to advanced technology
  - No new federal programs or spending

- The share of high GWP gases in ME compared to the US remains constant (at 2000 ratio) over time

- Black Carbon not included