Greenhouse Gas Projection Tool for States

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EPA's State & Local Climate Change Program (SLCCP)

- Began in 1990
- Mission: to build capacity in the states
- Products: States Workbook for calculating GHG emissions at the state level; States Guidance for developing action plans
- Support: provided technical support to states in the development of their inventories and action plans
- Results: 40 states and Puerto Rico have developed inventories for 1990; 30 states have completed action plans

Rationale for Inventory Support

- Help states develop targeted action plans; inventory emissions and target reductions from major sources
- Share EPA's extensive inventory experience
  - Development of the National Inventory
  - Contributing to the Good Practice Guidance
- Help states overcome monetary, knowledge, and data constraints
- Facilitate comparisons across states by providing standardized inventory methodologies

States Need More than Guidance

- Inventories are resource-intensive
  - Collect data
  - Identify appropriate emission factors/methods
  - Set up calculation spreadsheets
  - QA/QC results
- Inventories for multiple years necessary to maximize usefulness
  - Emission trends are necessary for projecting emissions, identifying mitigation activities, and setting targets
- Guidance was updated as methods were improved, but states couldn’t keep pace with the changes

Beyond Guidance…the State Inventory Tool

- Allows users to input state-specific activity data and emission factors
  - Suggests potential data sources
  - Provides default data for situations where state data is not available and/or where national data may be preferable
- Automates calculations based on input data
- Includes 10 sector modules and 1 synthesis module
- Calculates emissions for 1990-2000
  - Additional years are currently being added

Taking the Inventory to the Next Level

- After completing the tool/implementing the guidance, states have estimates of GHG emissions by gas and sector from 1990-2000

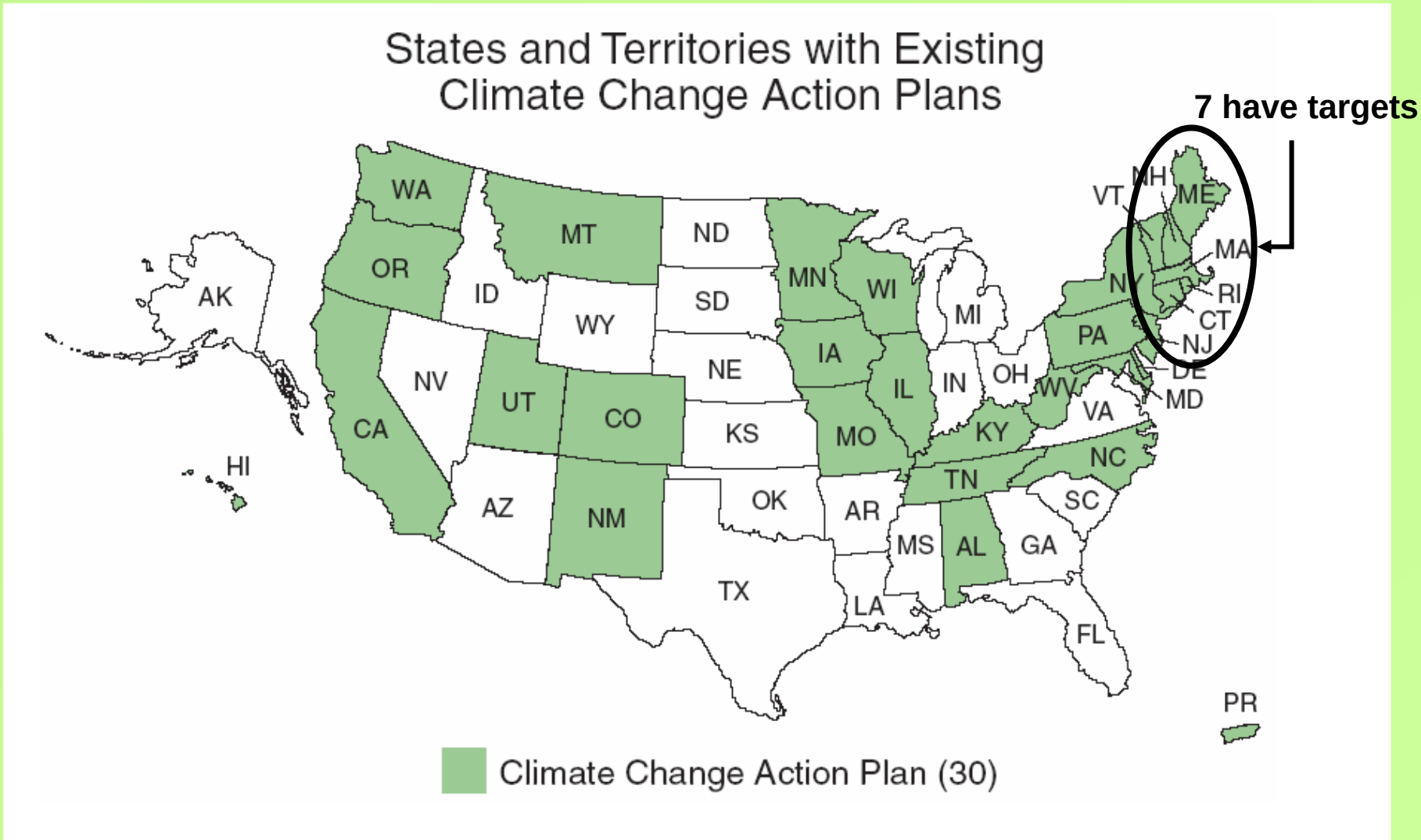
So Then What???

- What will state emissions be in 2010 or 2020?
- Will the distribution of emissions by source or by gas be different in the future than it is today?
- Where should the state concentrate its mitigation efforts to maximize reductions?

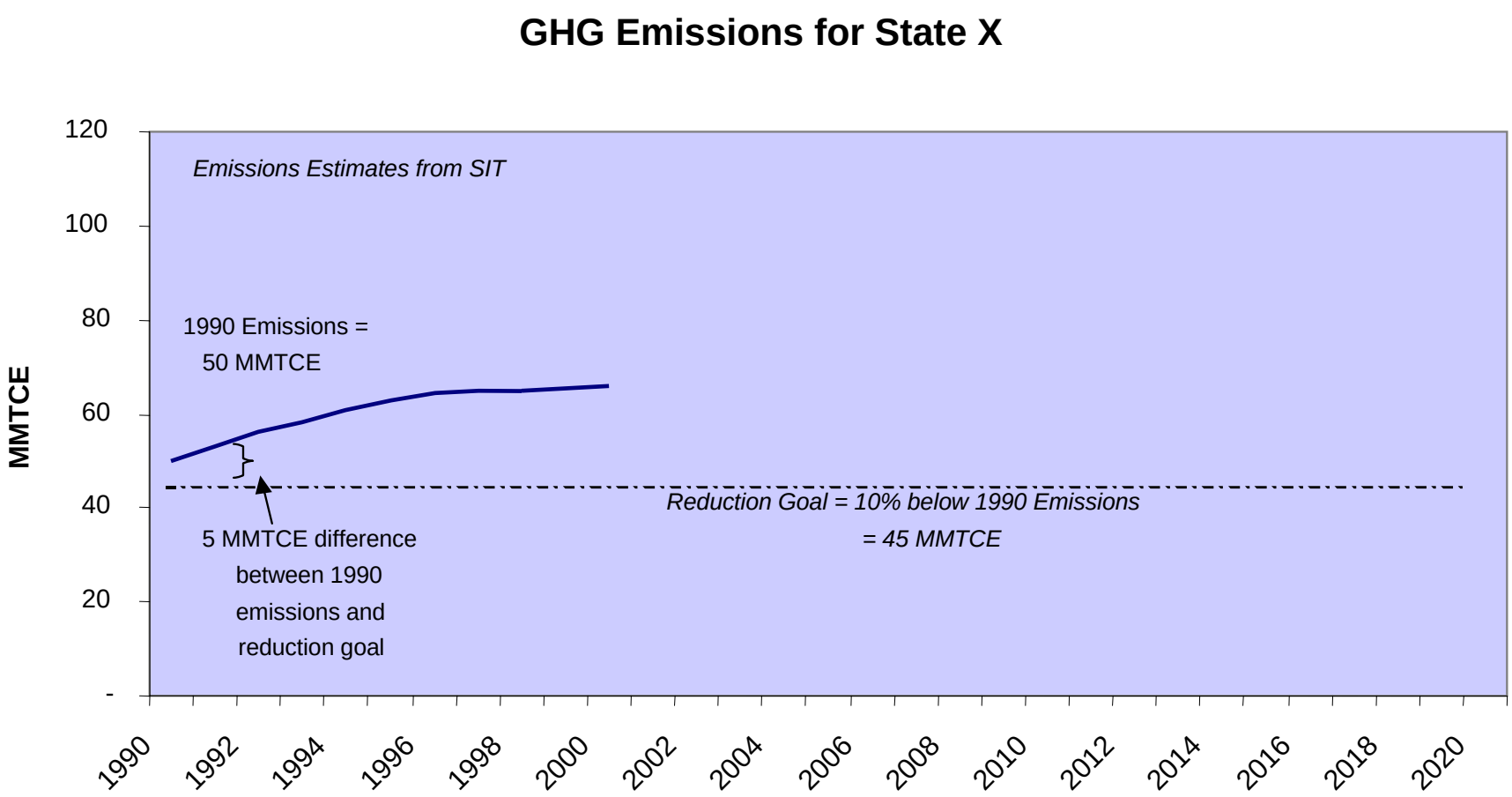
State Climate Change Action Plans

- Brainstorm activities to reduce emissions
- Coordinate across various state agencies to find areas for cooperation and emission reduction opportunities (energy, environment, waste)
- Quantify GHG emission reduction potential of specific activities
- Quantify costs per ton of reduction
- Some states choose to set targets

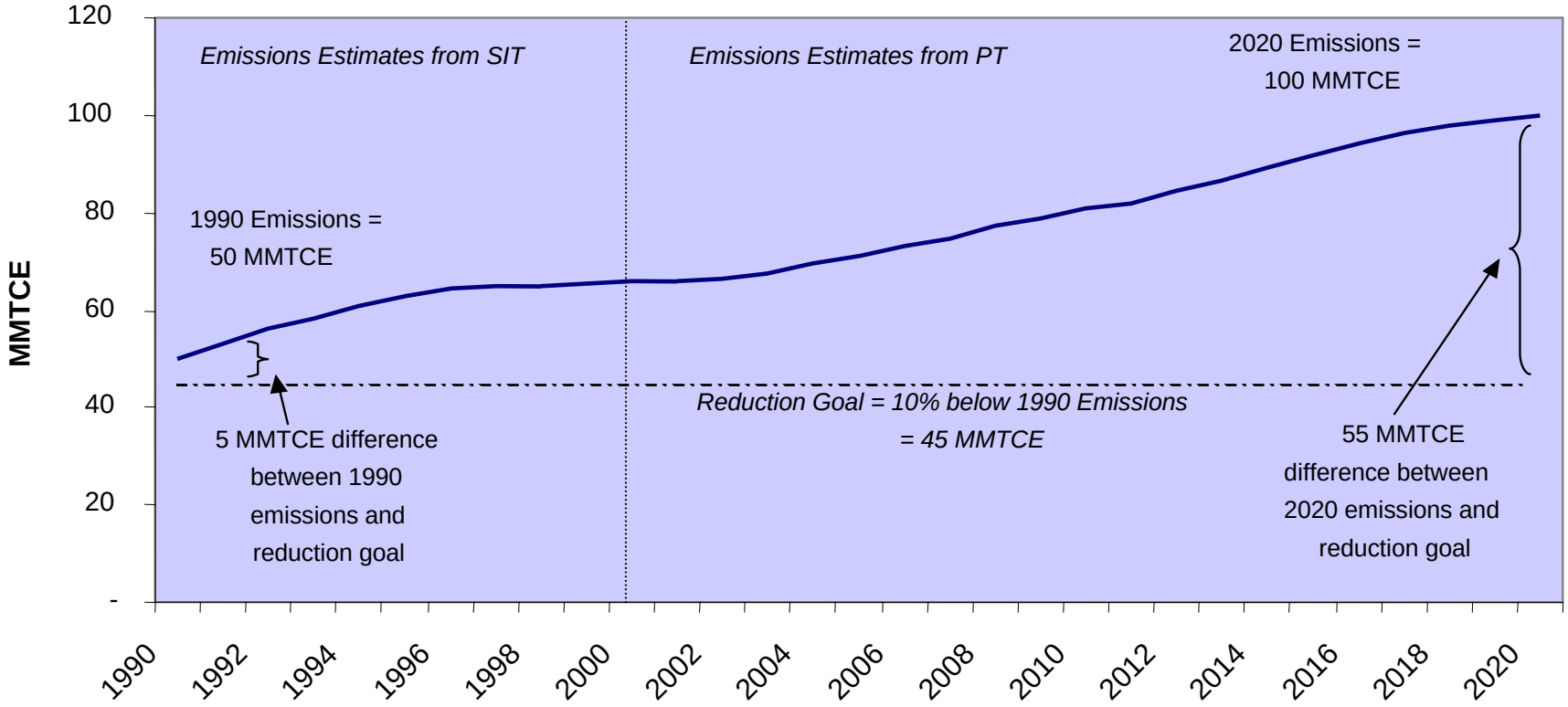
State Action Plans



Setting a Target Means Something Different in 2000



Setting a Target Means Something Different in 2000 than it Does in 2020



To the Rescue! The State Projection Tool

- Project emissions by gas and by sector through 2020
- Be compatible with, but not dependent on, the State Inventory Tool
  - Allow states to build on their estimates from the State Inventory Tool
  - Enable users who have not completed the State Inventory Tool to project emissions
- Include default state activity data and emission factors, but allow states to override this information
- Create a user-friendly framework

State Projection Tool Design

- Single Excel® module estimates emissions for all economic sectors
- Users may import historical emissions data from each sector module of the State Inventory Tool
- Other users may use default historical emission estimates
  - Simpler methods compared than those in SIT
  - Default historical emission estimates used to establish trends
  - SIT should be used to develop detailed inventories of historical emissions

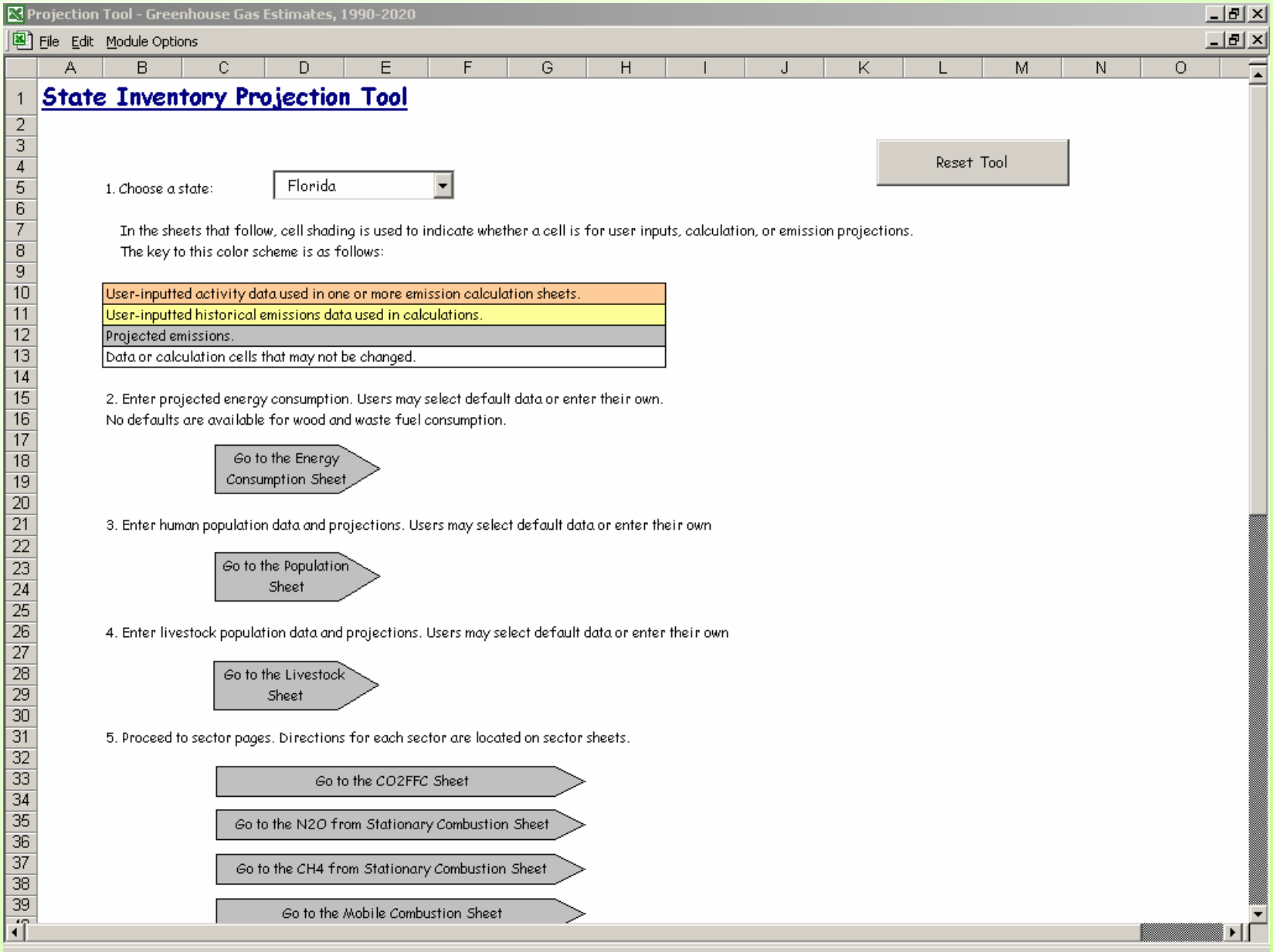
Using the Projection Tool

- Open the Control Sheet
- Select a state
- Use the navigation arrows to access the energy consumption, population, and livestock sheets
- Once each of these sheets is completed, return to the Control Sheet to continue on to the next step

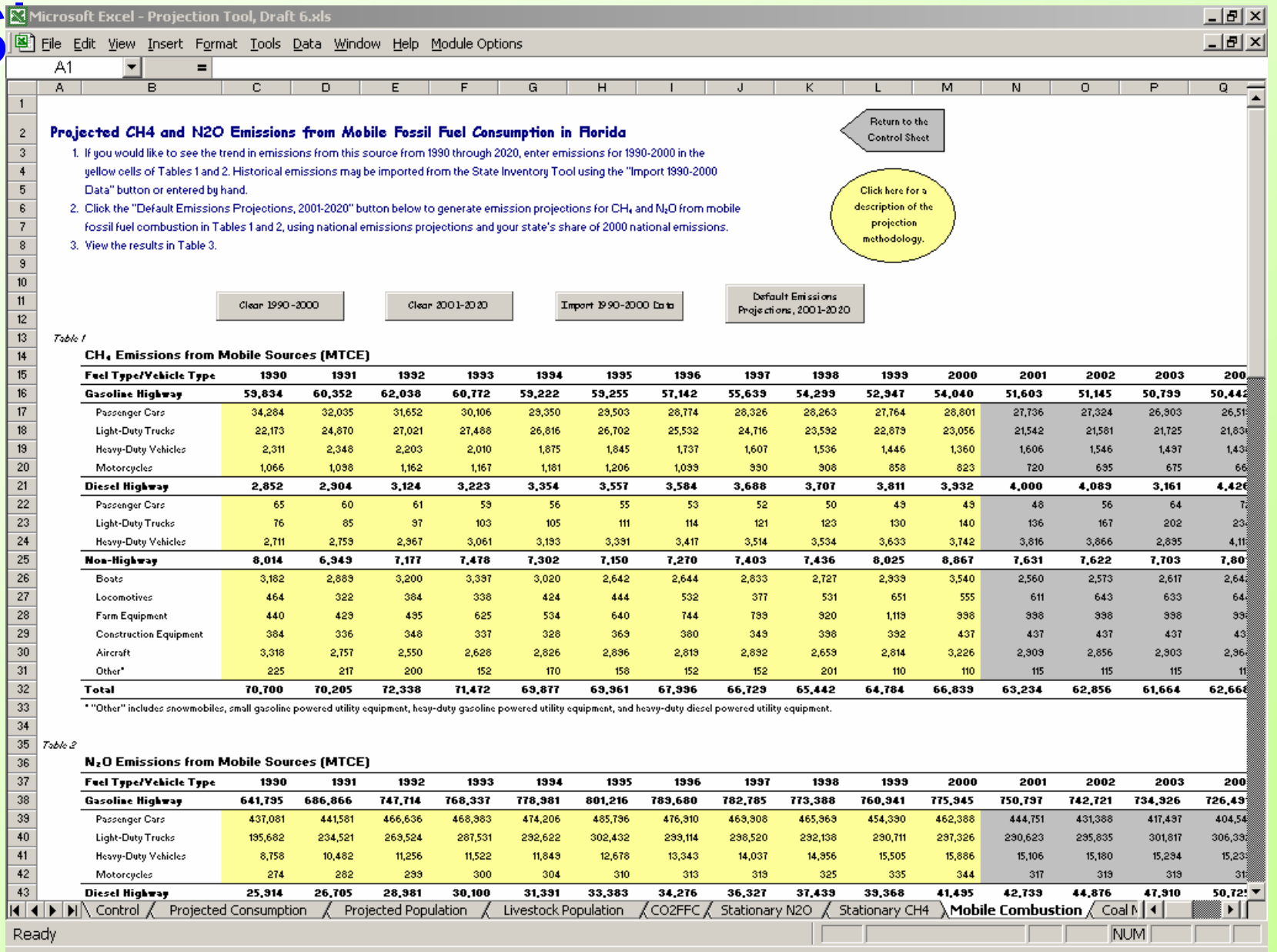
Using the Projection Tool (cont'd)

- Go to each of the 14 sector pages and enter data
  - Historical Data: import data from the State Inventory Tool, manually add data, or select defaults.
  - Projected Data: use default projections, project data based on historical data, or manually add projected data
- Once data has been entered for all sectors:
  - Return to Control Sheet
  - Select units
  - View emission results by sector
  - View emission results by gas

Projection Tool Control Sheet



Mobile Combustion: Calculation S



Emissions Summary by Gas

Microsoft Excel - Projection Tool, Draft 6.xls

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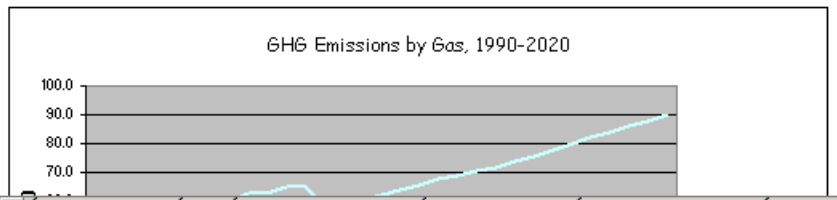
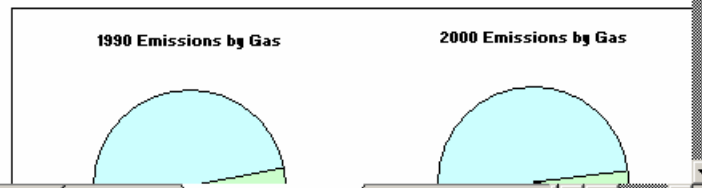
A1 = ="Summary of Projected GHG Emissions by Gas in "&SelectedState

Summary of Projected GHG Emissions by Gas in Florida

Return to the Control Sheet | Go to the Summary by Sector

MMTCE	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CO_2	50.789	50.314	51.304	52.732	55.198	56.221	57.862	59.404	62.860	62.864	65.081	65.443	58.687	59.325	60.307
CO_2 from Fossil Fuel Combustion	50.644	50.179	51.732	52.548	54.480	55.471	57.064	58.680	62.117	62.085	64.263	64.419	57.584	58.141	59.643
Industrial Processes	0.039	0.037	0.038	0.040	0.544	0.576	0.611	0.580	0.604	0.628	0.659	0.849	0.925	1.000	1.076
Waste Combustion	0.106	0.097	0.134	0.144	0.174	0.175	0.187	0.144	0.139	0.151	0.159	0.174	0.179	0.183	0.188
CH_4	4.034	4.123	4.119	4.141	4.121	4.173	3.946	3.797	3.715	3.808	3.862	3.870	3.920	3.982	4.047
Stationary Combustion	0.056	0.060	0.063	0.066	0.067	0.069	0.073	0.064	0.061	0.062	0.062	0.023	0.017	0.017	0.017
Mobile Combustion	0.071	0.070	0.072	0.071	0.070	0.070	0.068	0.067	0.065	0.065	0.067	0.063	0.063	0.062	0.063
Coal Mining	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas and Oil Systems	0.512	0.518	0.524	0.542	0.535	0.528	0.532	0.516	0.513	0.438	0.488	0.503	0.517	0.531	0.545
Enteric Fermentation	0.700	0.708	0.710	0.710	0.727	0.747	0.639	0.688	0.657	0.641	0.642	0.593	0.590	0.586	0.585
Manure Management	0.169	0.169	0.167	0.171	0.180	0.176	0.165	0.177	0.186	0.178	0.180	0.198	0.188	0.186	0.185
Rice Cultivation	0.017	0.030	0.033	0.033	0.033	0.033	0.031	0.027	0.028	0.030	0.024	0.029	0.029	0.030	0.030
Burning of Agricultural Crop Waste	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Waste	2.336	2.389	2.368	2.363	2.321	2.359	2.185	2.061	2.003	2.131	2.184	2.244	2.302	2.355	2.402
Wastewater	0.171	0.176	0.179	0.182	0.185	0.188	0.191	0.195	0.198	0.200	0.212	0.207	0.210	0.213	0.216
N_2O	2.413	2.467	2.561	2.613	2.679	2.709	2.683	2.662	2.608	2.568	2.611	2.567	2.529	2.523	2.518
Stationary Combustion	0.142	0.151	0.157	0.161	0.162	0.162	0.174	0.173	0.172	0.167	0.168	0.114	0.095	0.096	0.098
Mobile Combustion	0.726	0.762	0.826	0.851	0.863	0.886	0.877	0.874	0.864	0.856	0.882	0.846	0.840	0.836	0.832
Industrial Processes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manure Management	0.169	0.169	0.167	0.171	0.180	0.176	0.165	0.177	0.186	0.178	0.180	0.198	0.188	0.186	0.185
Agricultural Soil Management	1.164	1.167	1.180	1.192	1.220	1.230	1.204	1.180	1.123	1.095	1.093	1.121	1.113	1.106	1.098
Burning of Agricultural Crop Waste	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Waste Combustion	0.020	0.018	0.026	0.028	0.036	0.038	0.040	0.031	0.030	0.032	0.034	0.038	0.039	0.041	0.042
Wastewater	0.192	0.200	0.205	0.208	0.217	0.217	0.222	0.227	0.232	0.240	0.253	0.248	0.253	0.257	0.262
HFC, PFC, and SF_6	0.471	0.488	0.464	0.577	0.600	0.734	0.863	0.957	1.002	1.030	1.136	1.262	1.400	1.645	1.886
Industrial Processes	0.471	0.488	0.464	0.577	0.600	0.734	0.863	0.957	1.002	1.030	1.136	1.262	1.400	1.645	1.886
Total Emissions	**57.71**	**57.99**	**59.05**	**60.06**	**62.60**	**63.84**	**65.36**	**66.82**	**70.18**	**70.27**	**72.69**	**73.14**	**66.54**	**67.48**	**69.36**





State Landfills | WIP | Waste Calculations | Flaring & LFGTE | Waste Combustion | WasteResults | Wastewater | Summary by Gas | Summary by Sector

Ready NUM

Emissions Summary by Sector

Microsoft Excel - Projection Tool, Draft 6.xls

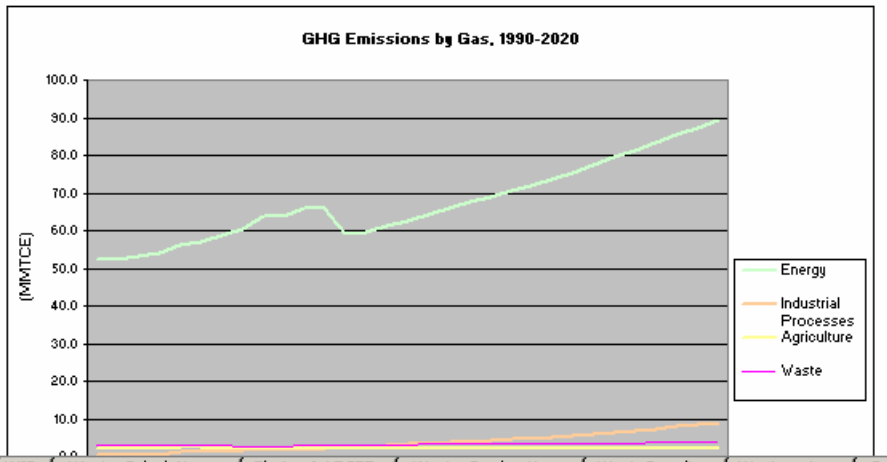
File Edit View Insert Format Tools Data Window Help Module Options

A1 = ="Summary of Projected GHG Emissions by Sector in "&SelectedState

Summary of Projected GHG Emissions by Sector in Florida

Return to the Control Sheet | Go to the Summary by Gas

MMTCE	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	20
Energy	52.2	52.3	53.4	54.2	56.2	57.2	58.8	60.4	63.8	63.7	65.9	66.0	58.1	59.7	61.2	62
CO2 from Fossil Fuel Combustion	50.6	50.8	51.7	52.5	54.5	55.5	57.1	58.7	62.1	62.1	64.3	64.4	57.6	58.1	59.6	61
Stationary Combustion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0
Mobile Combustion	0.8	0.8	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0
Coal Mining	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Gas and Oil Systems	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0
Industrial Processes	0.5	0.5	0.5	0.6	1.1	1.3	1.5	1.5	1.6	1.7	1.8	2.1	2.3	2.6	3.0	3
Agriculture	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2
Enteric Fermentation	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0
Manure Management	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0
Rice Cultivation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Agricultural Soil Management	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1
Burning of Agricultural Crop Waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Waste	2.8	2.9	2.9	2.9	2.9	3.0	2.8	2.7	2.6	2.8	2.8	2.9	3.0	3.0	3.1	3
Municipal Solid Waste	2.5	2.5	2.5	2.5	2.5	2.6	2.4	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.6	2
Wastewater	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0
Total	**57.7**	**58.0**	**59.0**	**60.1**	**62.6**	**63.8**	**65.4**	**66.8**	**70.2**	**70.3**	**72.7**	**73.1**	**66.5**	**67.5**	**69.4**	**71**



WIP | Waste Calculations | Flaring & LFGTE | Waste Combustion | WasteResults | Wastewater | Summary by Gas | Summary by Sector | Methodology

Ready NUM

Next Steps in Development

- Regularly update the tool as methodology, activity data, and emission factors are revised
- Create “patches” for tool as updates occur
  - Users can install the updates themselves, instead of reinstalling the entire tool

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