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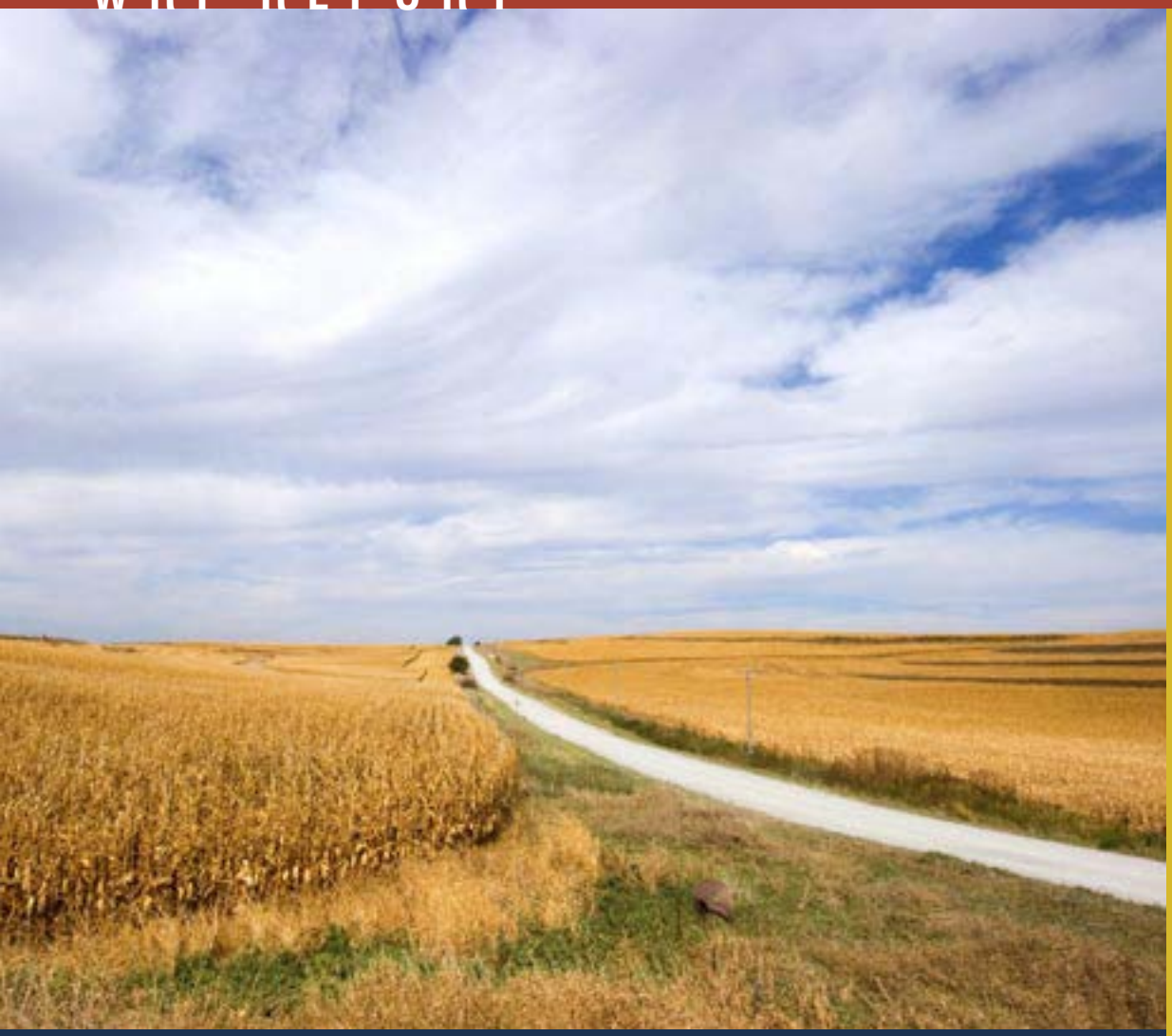
WRI REPORT



ILLINOIS

INDIANA

IOWA

MICHIGAN

MINNESOTA

MISSOURI

OHIO

WISCONSIN

CHARTING THE MIDWEST

An Inventory and Analysis of Greenhouse Gas Emissions in America's Heartland

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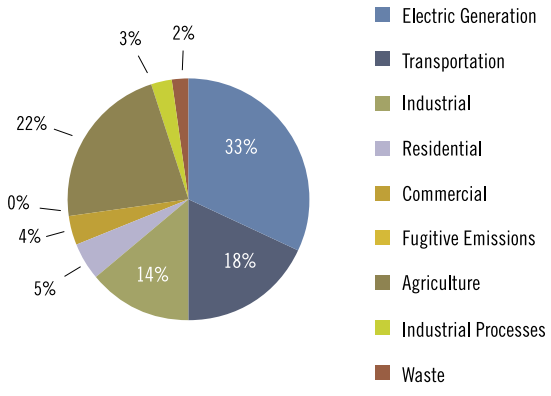
Note

WRI data utilized in this report uniquely provide a common methodological framework for readily comparing GHG emissions across U.S. states. However, it is not the intent of this report to serve as a substitute for emission estimates that might be available from state or local agencies, where complementary or higher-resolution data sets could provide additional information. The data contained in this report may differ from those reported by individual states, but is generally comparable. Disparities in estimates of emissions between WRI and state inventories are likely a result of one or more of the following: data availability, methodologies, and data values, which could include the activity data or emission factors used to calculate GHG emissions in a particular sector.

IOWA

- **In 2003, Iowa GHG emissions totaled 108 $MtCO_2e$, representing 7 percent of Midwest emissions and 2 percent of U.S. emissions.**
- **Iowa's top-emitting sectors include electric generation, agriculture, transportation, and industrial energy use.**
- **Between 1990 and 2003, Iowa had one of the fastest-growing electric generation sectors in the region in terms of emissions, despite having one of the slowest-growing populations in the Midwest.**
- **GHG emissions from agriculture (CH_4 and N_2O) in Iowa account for more than 22 percent, or 24 $MtCO_2e$, of total emissions, the highest contribution from this sector of any state in the Midwest.**

Figure 4.8 | **Iowa GHG Emissions by Economic Sector: 2003**



Source: WRI, CAIT-US (2007).

Iowa is the smallest GHG emitter in the Midwest, and the 23rd largest emitter in the nation in terms of absolute emissions. The state's GHG emissions account for approximately 7 percent of the Midwest's emissions and 2 percent of U.S. emissions. Iowa's emissions profile is significantly more GHG intensive than those of the Midwest and the nation as a whole. Per capita emissions in Iowa (37 metric tons of CO_2e) are 40 percent higher than the Midwest regional per capita emissions value and nearly 60 percent higher than the national average. Iowa's high GHG per capita value is largely due to a relatively low population density and a relatively high density of emissions from agriculture (see Iowa State Spotlight).

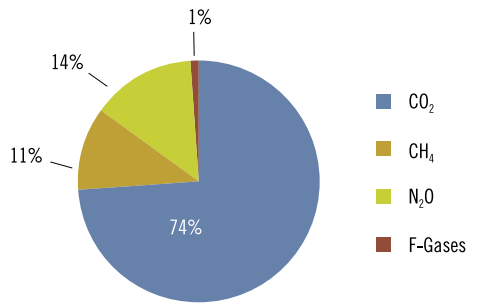
Approximately 65 percent of Iowa's GHG emissions are produced by the major energy sectors: electric generation (33 percent), transportation (18 percent), and industrial energy use (14 percent). The emissions contribution from Iowa's energy sectors is below that of the other seven states in the Midwest. Iowa's unique profile is due to a relatively large contribution from its agricultural sector, which accounts for 22 percent of total emissions (Figure 4.8). Iowa's agricultural focus is additionally borne out in the breakdown of emissions by gas. Emissions of CH_4 and N_2O—the principal emissions byproducts of agriculture—constitute one-quarter of total state emissions, which is twice the total percentage of both the Midwest and the nation as a whole (Figure 4.9). These data suggest the relative importance of both commercial crops and livestock to Iowa's economy, since CH_4 emissions are produced principally by the gastrointestinal processes of cattle and other ruminant animals, and N_2O emissions are byproducts of nitrogen-based fertilizers.

Between 1990 and 2003, Iowa's total GHG emissions grew by 15 percent, comparable to—although slightly above—Midwest and U.S. total emissions growth. Most notably, emissions growth in three energy sectors—electric generation, industrial energy use, commercial

energy use—surpassed the rate of increase for both the Midwest and the nation, although growth in the latter two sectors represents an absolute change of less than 4 $MtCO_2e$ (Table 4.4). Conversely, electric generation emissions grew by over 14 $MtCO_2e$, or 33 percent. This was one of the largest increases (on a percentage basis) observed in the Midwest during this period, despite a slower-than-average rate of growth in population and little change in Iowa's electricity generation fuel mix (WRI, CAIT-US, 2007, from EIA, 2007).

Iowa's population and state GDP steadily increased between 1997 and 2003, although not as rapidly as in the Midwest overall. Nevertheless, Iowa's total annual emissions remained approximately constant. While emissions from electricity generation grew by about 4 $MtCO_2e$ during this period, reductions in emissions from the industrial and agriculture sectors—likely due to improved efficiencies—largely offset these gains. In addition, annual variations in weather and commodity prices can be particularly important drivers of agricultural output. Since nearly one-quarter of Iowa's GHG profile is comprised of agricultural emissions, fluctuations in annual production totals are likely to impose similar variability on the total volume of emissions from agriculture. Therefore, the absence of a trend in this sector may dampen any trend in total emissions.

Figure 4.9 | **Iowa GHG Emissions by Gas: 2003**



Source: WRI, CAIT-US (2007).

Table 4.4 | **Iowa GHG Emissions and Trends by Economic Sector: 1990-2003**

SECTOR	1990 EMISSIONS ($MtCO_2e$)	2003 EMISSIONS ($MtCO_2e$)	1990-2003 EMISSION TRENDS		
			IOWA % CHANGE	MIDWEST % CHANGE	U.S. % CHANGE
Energy Sectors	*65*	*79*	*22*	*14*	*14*
Electric Generation	27	36	33	25	24
Transportation	17	20	17	20	19
Industrial	13	15	13	-11	-3
Residential	5	5	6	8	12
Commercial	3	4	20	9	7
Fugitive Emissions	0	--	--	-40	-35
Agriculture	25	24	-4	-8	0
Industrial Processes*	2	3	0	-5	8
Waste	2	2	7	-21	-9
Total*	***94***	***108***	***15***	***11***	***13***

Source: WRI, CAIT-US (2007).

Notes: Totals exclude emissions from international bunker fuels and land-use change and forestry.

*Due to inconsistencies in industrial processes emissions data prior to 1997, the 1990 emission value for this economic sector has been replaced with the 1997 estimate. Trend calculations for industrial processes reflect the time period 1997 to 2003.

**While the 1990 total emissions value presented here includes industrial processes emissions for 1997 as noted above, calculations of total state, regional, and national emission trends do not include any industrial processes data in order to maintain consistency between 1990 and 2003.

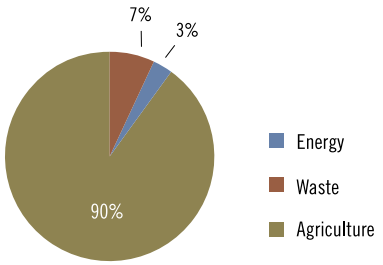
IOWA STATE SPOTLIGHT: AGRICULTURE EMISSIONS

Iowa has long been a leading producer of agricultural products, including corn, soybeans, hogs, and eggs. The agriculture industry plays a significant role in Iowa's economy, accounting for approximately 3 percent of state GDP and generating billions of dollars in revenue annually (BEA, 2007; USDA, 2007).

Agriculture also plays a substantial role in determining Iowa's emissions profile. Iowa's GHG emissions from the agriculture sector are higher than the agriculture emission totals of all other Midwest states (and the second highest nationally), accounting for 24 $MtCO_2e$ in 2003, or 22 percent of total state emissions. Iowa's agricultural emissions are comprised of N_2O emissions (60 percent), primarily resulting from corn cultivation, and CH_4 emissions (40 percent), largely from ruminant livestock. Agricultural emissions of these two high-global-warming-potential gases account for 90 percent of all N_2O and CH_4 emissions in the state (Figure 4.10). Iowa's total N_2O emissions from agriculture are the highest in the country, contributing approximately 14 $MtCO_2e$ in 2003.

Considering that Iowa has both the smallest population and economy in the Midwest, and nearly 90 percent of state land is used for farming (Iowa Agricultural Statistics Bulletin, 2006; WRI, CAIT-US, 2007), it is not surprising that Iowa is a relatively GHG-intensive state. For example, Iowa's agricultural emissions per capita (8 metric tons of CO_2e) is the highest in the Midwest and the fourth highest nationally (WRI, CAIT-US, 2007). (For additional information regarding the agriculture sector and agricultural emissions in the Midwest, see Chapter 3.)

Figure 4.10 | **Iowa N_2O and CH_4 Emissions by Sector: 2003**



Source: WRI, CAIT-US (2007).