This comprehensive assessment has been done at the request of 25x25 by the University of Tennessee's Bio-Based Energy Analysis Group.

The study projects how meeting several proposed energy/climate change policy scenarios might impact the U.S. agricultural sector. The policy scenarios that have been analyzed include a cap-and-trade regulatory system and varying treatments of agricultural offsets. The results show impacts on economic returns, climate benefits, feedstock prices, and land use impacts.

**Background**

- The study shows if carbon emissions are regulated solely by EPA as prescribed under a 2007 Supreme Court ruling, net farm income is projected to fall below USDA baseline projections.

- Under a properly constructed cap-and-trade program, net returns for virtually all major crops are positive, up to $13 billion per year. An operationally efficient cap-and-trade program is one that is designed to allow offsets for multiple practices, including
  - reduced soil tillage
  - bioenergy crops
  - methane capture
  - efficient fertilizer application
  - planting perennial grasses or trees on marginal land
  - keeping good farmland in crop production

**Findings**

- An operationally efficient cap-and-trade program that also restricts the removal of crop residues to acceptable, environmentally beneficial levels, offers positive net returns for eight of the nine major crops analyzed.
  - Income from offsets and from market revenues is higher than any potential increase in input cost including energy and fertilizer.
  - At projected carbon prices of up to $27 per metric ton (an estimate provided by EPA), afforestation of cropland will not occur.
  - Major shifts in commodity crop land use does not occur.
  - Demand for bioenergy feedstocks will cause significant shifts to hay and dedicated energy crop acreage from pasture conversion.
  - Crop and beef prices are not disrupted.
  - Biomass feedstock production creates significant direct and indirect reduction in greenhouse gases (GHG), including an accumulated 460 million metric tons more in carbon emission reductions.
• If carbon emissions are regulated by EPA without the benefit of multiple domestic offsets:
  o Net farm income is projected to fall below baseline projections.
  o Sixty million acres of cropland could be converted to forests and grasslands.
  o Agriculture is subjected to higher input costs with no opportunity to be compensated for the GHG reduction services the sector provides.
  o Impacts to beef production are uncertain.

• The scenario that allows multiple offsets, but requires carbon-neutral residues removal (the Multiple Offsets/RCN Scenario)
  o is projected to produce the highest net returns to agriculture and the greatest climate benefits, and offers a comparatively high biomass price;
  o provides nearly $209 billion more in net returns than the USDA Baseline scenario and $364 billion more than the EPA Led scenario.
  o provides an additional 127 metric tons of reduced carbon emissions from 2010 to 2025 when compared with Baseline projections, and even 9 million metric tons more in reductions when measured against projections made for the EPA-Led scenario.

Methodology

• The study assumes that for each scenario, the Renewable Fuels Standard (RFS) established by the Energy Independence and Security Act of 2007 is in play.

• The study used POLYSY, an agricultural policy simulation model of the U.S. agricultural sector, to project the impacts to the agricultural sector from these potential policy scenarios.

The report is available at www.25x25.org.