President Trump’s America First Energy Plan

• Keep energy costs low so as to *not* burden the agriculture sector
  - “Less expensive energy will be a big boost to American agriculture…”

• Higher energy costs raise the price of agricultural products, shrink disposable household income, and disproportionately burden the poor
  - The number one challenge to keeping food and other agricultural-related costs low is to withstand the efforts of those who would regulate the emission of carbon dioxide into the atmosphere
A Carbon Tax is a Horrible Idea

• The end game of those who seek to label and classify carbon dioxide as a pollutant is to legislate fossil fuel use into oblivion
  – Attempt to accomplish this by instituting some form of a carbon tax

• A carbon tax is a horrible idea that will only adversely impact America’s agricultural sector

• Any effort to restrict CO2 emissions will raise food prices and jeopardize the future food security of the planet
Relative Price Impact of a $150 per tCO2e Carbon Tax on Emissions from Agriculture on Global Commodity Prices

• Results in higher prices
  – Beef (108%)
  – Pork (27%)
  – Poultry (4%)
  – Milk (49%)
  – Corn (16%)
  – Rapeseed (19%)
  – Rice (65%)
  – Soybean (6%)
  – Wheat (17%)
Percent Increase in the Food Price Index Due to a $150 per tCO2e Carbon Tax

• Results in higher prices
  – Increase for the world as a whole is around 38%
  – 60 to 100% increases in regions with less efficient agricultural production systems (Oceania-OCE, South East Asia-SEA, Sub-Saharan Africa-SSA, South Asia-SAS and Latin America-LAM)
Global Average Loss in Daily Dietary Energy Consumption in Response to a Carbon Tax

- A $190 tCO2e$^{-1}$ tax reduces daily caloric intake by 285 kcal per capita per day (a 9% decrease).

- This decrease adds a 300 million person increase to the global number of chronically undernourished persons across the globe.

Source: Environmental Research Letters 12: 105004
Atmospheric CO$_2$ is Essential for Plant Growth

• Atmospheric CO$_2$ is the basic food of plants
  – It is the primary raw material utilized by plants to construct their tissues

• What impact might rising atmospheric CO$_2$ concentrations have on global agriculture?
  – Can society feed a growing population when estimates indicate that global food production must approximately $double$ its present value just a few short decades from now?
Plant Growth Database

In this section of our website we maintain an ever-expanding archive of the results of peer-reviewed scientific studies that report the growth responses of plants to atmospheric CO2 enrichment. Results are tabulated according to two types of growth response (Dry Weight and Photosynthesis). To begin, click on the response you are interested in below.

- **Dry Weight (Biomass)**
- **Photosynthesis (Net CO2 Exchange Rate)**
Plant Growth Response to a 300 ppm Increase in Atmospheric CO₂

Percent Change in the Combined Production of Wheat, Maize, Rice and Soybean Under Five Different Temperature and CO2 Scenarios

Source: Environmental Research Letters 12: 105004
• Global food production values must increase between 70 and 100 percent between now and the year 2050

• Without the benefits of CO$_2$ on agriculture, world food supply will fall short of world food demand
Observed (1961-2011) and Projected (2012-2050) Monetary Benefit of Rising Atmospheric CO₂ on Global Crop Production

Atmospheric CO$_2$ is Greening the Earth

• The growth-enhancing benefits of atmospheric CO$_2$ are not limited to the agricultural sector

• Observations from all across the globe indicate that the whole of the terrestrial biosphere is reaping incredible benefits from the approximate 40 percent increase in atmospheric CO$_2$ since the beginning of the Industrial Revolution – Global Greening!
Atmospheric CO$_2$ is Greening the Earth

- Evidence of global greening is commonly seen in satellite-derived data

- This greening is occurring despite real and imagined threats to nature
  - A warming climate (since 1980 the Earth has weathered three of the warmest decades in the modern instrumental temperature record)
  - A handful of intense and persistent El Niño events
  - Large-scale deforestation
  - “Unprecedented" forest fires
  - Episodes of persistent, widespread and severe drought
Spatial pattern of relative change of Leaf Area Index (LAI) greening due to CO$_2$ fertilization during 1982 to 2009

Spatial pattern of relative change of Net Primary Production (1961-2010)

Spatial pattern of relative change of Gross Primary Production (1982-2011)

Conclusion

- The agriculture sector and the rest of the terrestrial biosphere have benefited from the productivity increases associated with the modern increase in atmospheric CO$_2$

- These benefits will continue to accrue as long as the air’s CO$_2$ concentration is allowed to continue to rise.

- Any efforts to restrict CO$_2$ emissions will have consequences, including reduced agricultural yields, higher food prices and growing food insecurity that will disproportionately burden the poor.

- Policy leaders should wise up to these facts if they want to avoid the undernourishment and potential starvation of hundreds of millions of persons just a few short decades from now.
Energy, Agriculture and Rising Atmospheric CO2

America First Energy Conference

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