Real-world Evidence that CO$_2$ Emissions and Fossil Energy Enhance the Human Environment

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Some Recent Climate Change News Headlines

**Washington Post**

Planet is entering ‘new climate regime’ with ‘extraordinary’ heat waves intensified by global warming, study says
Heat events like those last summer are predicted to occur two every three years for global warming of 2.7 degrees (1.5 Celsius) and every year ...
1 month ago

**Yale Climate Connections**

How climate change is making hurricanes more dangerous
Major hurricanes are by far the world’s costliest natural weather disasters, in some cases costing well over $100 billion dollars. There’s now ...
1 day ago

**The Conversation US**

Climate change is affecting crop yields and reducing global food supplies
As climate change alters temperature and rainfall patterns, yields of some crops are increasing while others decline. The net result: less food, ...
6 hours ago

**NBCNews.com**

Climate change is devastating Central America, driving migrants to the US border
Ravaged by climate change-driven drought, farmers in rural Honduras and Guatemala live on the edge of hunger, not knowing if the next ...
23 hours ago

**New Atlas**

UN report on global warming warns of "climate apartheid" between ...
The UN has published a new report detailing the dangers of climate change, with a particular focus on how it will shape the issue of poverty in ...
2 weeks ago

**The Guardian**

Sanders and Ocasio-Cortez move to declare climate crisis official emergency
Exclusive: Democrats to introduce resolution in House on Tuesday in recognition of extreme threat from global heating.
1 day ago
The False Narrative of Global Warming

• Rising atmospheric CO$_2$ is presently causing dangerous climate change to the detriment and peril of humanity and the natural world

• Because the combustion of fossil fuels is the principal source behind the CO$_2$ rise, society must abandon all use of fossil energy
  – Activists seek to enforce government and private sector efforts to restrict fossil fuel use via tax, caps or fiat limits on CO$_2$ emissions
The Real Story

- There is no climate catastrophe and CO₂ emissions and fossil energy should be celebrated for enhancing life and improving the standard of living for humanity and the natural world.

- Efforts to restrict CO₂ emissions or limit fossil energy should be avoided:
  - Such actions will most certainly bring about adverse outcomes and unintended consequences that will harm humanity and nature.

Consider the following four key examples of how CO₂ emissions and fossil energy improve human prosperity and benefit the natural world...
Higher CO2 emissions are associated with lower levels of extreme poverty.
The real achievement of increasing life expectancy is in the number of total planetary human life years

1820
• Population = 1.06 billion
• Life expectancy = 29 years
• Total human life years on the planet = 30.7 billion
  (1.06 billion x 29 years)

Today
• Population = 7.38 billion
• Life expectancy = 72 years
• Total human life years on the planet = 527 billion*
  (7.38 billion x 72 years)

* This is a 17-fold increase!
Other Human Benefits from Fossil Energy Use

- Productivity enhancements
- Improvement/expansion of goods and services
- Development of new inventions and innovations
  - Cell phones, air travel, the Internet, CT scans, etc.
  - These products or benefits could not have possibly existed years ago
  - They only exist today thanks to decades of technological and economic progress made possible by fossil energy use

What about fossil energy benefits to nature?
What about fossil energy-related benefits to the natural world?

• Such benefits generally have their origin in, or are linked to, the carbon dioxide concentration of the atmosphere, which has increased during the Modern Era primarily in response to humanity’s combustion of fossil fuels and they include ...
Higher CO₂ Concentrations Increase Plant Productivity

• Atmospheric CO₂ is the basic food of plants
  – It is the primary raw material utilized by plants to construct their tissues

• Plants love CO₂
  – Thousands of laboratory and field experiments have demonstrated that higher atmospheric CO₂ concentrations increase plant productivity and growth
    • The better plants grow, the more food there is available to sustain the entire biosphere
Higher CO₂ Concentrations Increase Plant Productivity

What does this current and future growth-enhancing benefit of atmospheric CO₂ enrichment portend for the biosphere?
Benefits of Atmospheric CO$_2$ Enrichment

Enhanced Agricultural Productivity

- Increasing atmospheric CO$_2$ concentrations have increased past, present and future crop yields
- Without the benefits of CO$_2$ enrichment on agriculture, world food supply could fall short of world food demand by the year 2050
The Positive Externalities of Carbon Dioxide: Estimating the Monetary Benefits of Rising Atmospheric CO₂ on Global Food Production

Elevated Atmospheric CO$_2$ Enhances Plant Water Use Efficiency

- Plant water use efficiency (WUE) is the amount of biomass produced per unit of water lost.

- The result is a reduction in water loss via transpiration, thus increasing plant WUE by as much as 70-100%.
Elevated Atmospheric CO$_2$ Enhances Plant Water Use Efficiency

• Water Use Efficiency Benefits
  – Can produce the same amount of crop yields using less water
  – Less-susceptible to drought
  – Plants will be able to grow and reproduce where it has previously been too dry to exist
  – Win back lands lost previously to desertification
  – Greater vegetative cover can reduce adverse effects of soil erosion
  – Ample real-world evidence of these benefits
Elevated Atmospheric CO$_2$ Ameliorates Environmental Stresses

- Higher levels of atmospheric CO$_2$ reduce the deleterious effects of high soil salinity, high/low air temperature, high/low light intensity, low levels of soil fertility, oxidative stress, pathogen attack, macro and micro nutrient excesses/deficiencies, and the stress of herbivory.

- The percentage growth enhancement produced by an increase in the air’s CO$_2$ content is generally greater under stressful and resource-limited conditions than when growing conditions are ideal.
Increasing Atmospheric CO2 Benefits the Biosphere

Aerial fertilization effect

+ Transpiration-reducing effect
+ Stress-alleviating effect

= A Biospheric Bonanza!
Observations from all across the globe indicate that the whole of the terrestrial biosphere is reaping incredible benefits from the approximate 45 percent increase in atmospheric CO₂ since the beginning of the Industrial Revolution – *Global Greening!*
Concluding Comments

• These benefits to the human environment, which includes both humanity and the natural world, are undeniable
  – Without adequate supplies of low-cost centralized energy, few, if any, of the major technological and innovative advancements of the past two centuries that have enhanced and prolonged human life could have occurred
  – Without the increased CO₂ emissions from fossil fuel use over the past two centuries, Earth's terrestrial biosphere would be nowhere near as vigorous or productive as it is today
Concluding Comments

• It is scientifically and morally indefensible to demonize fossil energy and claim that CO$_2$ emissions are a current threat to human health and welfare

• More, not less, fossil energy is needed to enhance the future human environment
  – This is the critical message that must be shared with scientists, activists, policy makers, educators and the general public
The Institute for the Human Environment

- **www.human-environment.org**
- Non-profit organization advocating for the continued development and improvement of society and the natural environment
- Supports the unfettered use of fossil energy to enhance and protect the human environment
- Seeks to reverse the 2009 EPA Endangerment Finding & restore critical policy balance
• Our message is simple:
  – Atmospheric CO₂ is an aerial *fertilizer*, not an airborne pollutant
  – Fossil energy *enhances* civilization and the human experience, it doesn’t diminish it
  – *More*, not less, fossil energy is needed to enhance and protect the human environment

• Far too many regulations and laws have tilted the scales toward safeguarding the natural environment at the *expense* of humanity and it is time for that to change
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