So far, all the discussion about how to deal with CO2 pollution has assumed that it is a global problem. It undoubtedly is — CO2 emissions anywhere in the world contribute to global climate change. But that assumption typically carries another along with it — that CO2 is *not* a local problem. It turns out that may not be true.

A study just published online in *Environmental Science and Technology* (subscription required for that link; open access pre-publication draft here) concludes that CO2 "domes" that form over cities may cause adverse local health impacts by increasing local temperatures, leading to increases in ozone and particulate pollution.

Here's the abstract:

> Data suggest that domes of high CO2 levels form over cities. Despite our knowledge of these domes for over a decade, no study has contemplated their effects on air pollution or health. In fact, all air pollution regulations worldwide assume arbitrarily that such domes have no local health impact, and carbon policy proposals, such as "cap and trade", implicitly assume that CO2 impacts are the same regardless of where emissions occur. Here, it is found through data-evaluated numerical modeling with telescoping domains from the globe to the U.S., California, and Los Angeles, that local CO2 emissions in isolation may increase local ozone and particulate matter. Although health impacts of such changes are uncertain, they are of concern, and it is estimated that local CO2 emissions may increase premature mortality by 50-100 and 300-1000/yr in California and the U.S., respectively. As such, reducing locally emitted CO2 may reduce local air pollution mortality even if CO2 in adjacent regions is not controlled. If correct, this result contradicts the basis for air pollution regulations worldwide, none of which considers controlling local CO2 based on its local health impacts. It also suggests that a "cap and trade" policy should consider the location of CO2 emissions, as the underlying assumption of the policy is incorrect.