

Global warming's sooty smokescreen revealed=20

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Fred Pearce, Berlin

Smoke is clouding our view of global warming, protecting the planet =
from
perhaps three-quarters of the greenhouse effect. That might sound like =
good

news, but experts say that as the cover diminishes in coming decades, =
we are
in for a dramatic escalation of warming that could be two or even three
times as great as official best guesses.

This was the dramatic conclusion reached last week at a workshop in =
Dahlem,

Berlin, where top atmospheric scientists got together, including Nobel
laureate Paul Crutzen and Swedish meteorologist Bert Bolin, former =
chairman

of the UN's Intergovernmental Panel on Climate Change (IPCC).=20

IPCC scientists have suspected for a decade that aerosols of smoke and =
other

particles from burning rainforest, crop waste and fossil fuels are =
blocking

sunlight and counteracting the warming effect of carbon dioxide =
emissions.

Until now, they reckoned that aerosols reduced greenhouse warming by =
perhaps

a quarter, cutting increases by 0.2 =B0C. So the 0.6 =B0C of warming =
over the

past century would have been 0.8 =B0C without aerosols.

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But the Berlin workshop concluded that the real figure is even higher -
aerosols may have reduced global warming by as much as three-quarters,
cutting increases by 1.8 =B0C. If so, the good news is that aerosols =
have

prevented the world getting almost two degrees warmer than it is now. =

But

the bad news is that the climate system is much more sensitive to =
greenhouse

gases than previously guessed.=20

As those gases are expected to continue accumulating in the atmosphere =
while

aerosols stabilise or fall, that means "dramatic consequences for =
estimates

of future climate change", the scientists agreed in a draft report from =
the

workshop.

Parasol effect=20

Past calculations of the cooling effect of aerosols have been inferred =
from

"missing" global warming predicted by climate models. But direct
measurements reported in Science (vol 300, p 1103) in May by Theodore
Anderson of the University of Washington in Seattle show a much greater
parasol effect. Anderson says climate sensitivity could be larger than
climate models suggest.

The Berlin meeting also heard evidence that past warm eras had higher
temperatures than they ought to, if estimates of the atmospheric =
composition

at the time and greenhouse models are correct. Again this suggests =
greater
sensitivity.=20

"It looks like the warming today may be only about a quarter of what we
would have got without aerosols," Crutzen told New Scientist. "You =
could say

the cooling has done us a big favour. But the health effects of many
aerosols in smog are so great that even in the poor world, they are =
already

cutting emissions." For good reasons, aerosol levels look set to fall.

Moreover, most aerosol emissions only stay in the atmosphere for a few =
days.

Most greenhouse gases remain for a century or longer. So as time goes =
on,

aerosols will protect us less and less from global warming. "They are =
giving

us a false sense of security right now," said Crutzen.

'Sooner, not later'=20

One tentative estimate put warming two or even three times higher than
current middle-range forecasts of 3 to 4 =B0C based on a doubling of
greenhouse gases in the atmosphere, which is likely by late this =
century.=20

That suggests global warming well above the IPCC maximum forecast of =
5.8 =B0C.

Back-of-the-envelope calculations now suggest a "worst case" warming of =
7 to

10 =B0C.=20

Will Steffen of the Swedish Academy of Sciences says the message for =
policy

makers is clear: "We need to get on top of the greenhouse gas emissions
problem sooner rather than later."

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