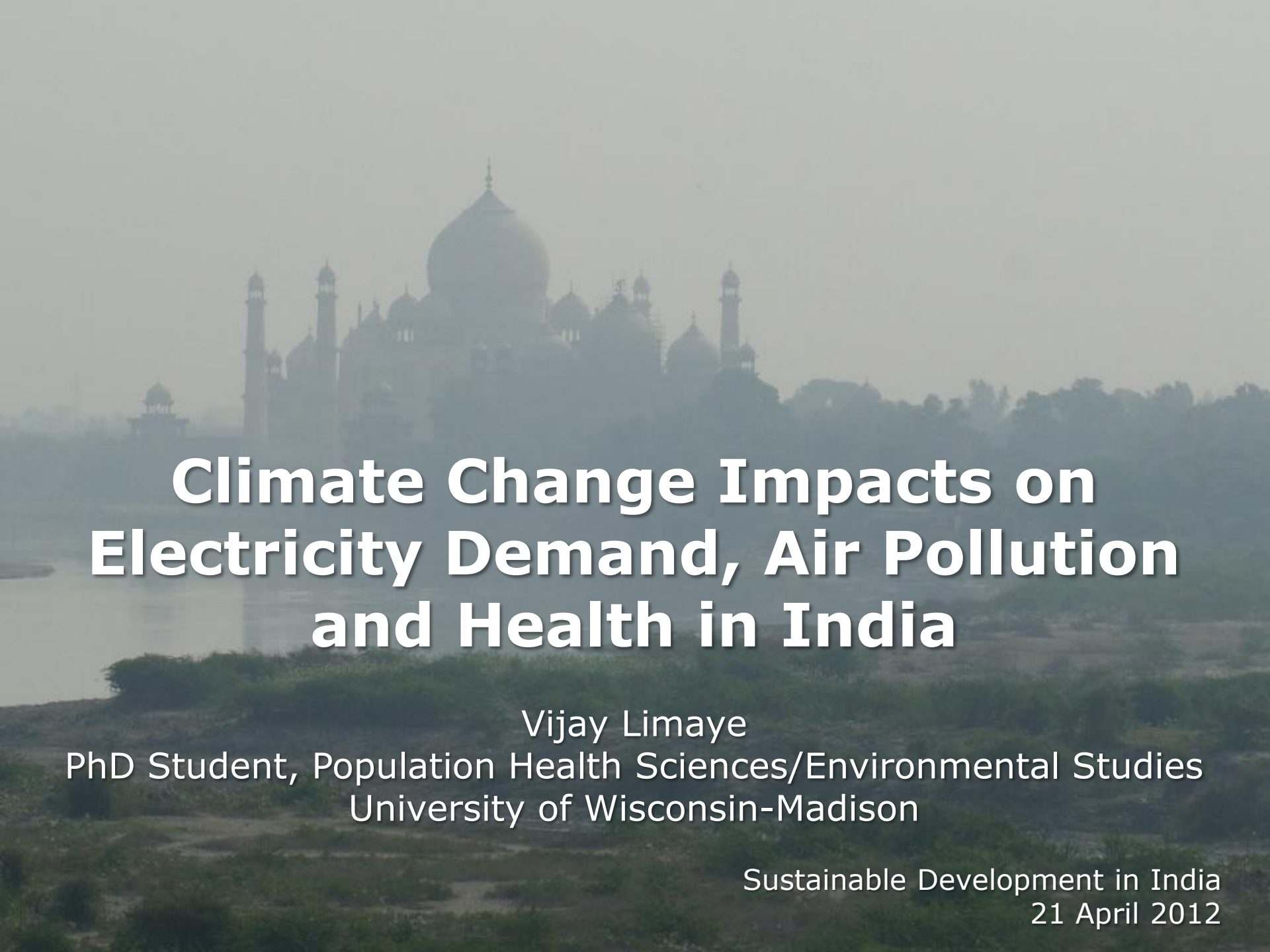


Climate Change Impacts on Electricity Demand, Air Pollution and Health in India

Vijay Limaye
PhD Student, Population Health Sciences/Environmental Studies
University of Wisconsin-Madison

Sustainable Development in India
21 April 2012

India Ink

Notes on the World's Largest Democracy

February 1, 2012, 7:16 AM

India's Air the World's Unhealthiest, Study Says

By HEATHER TIMMONS and MALAVIKA VYAWAHARE

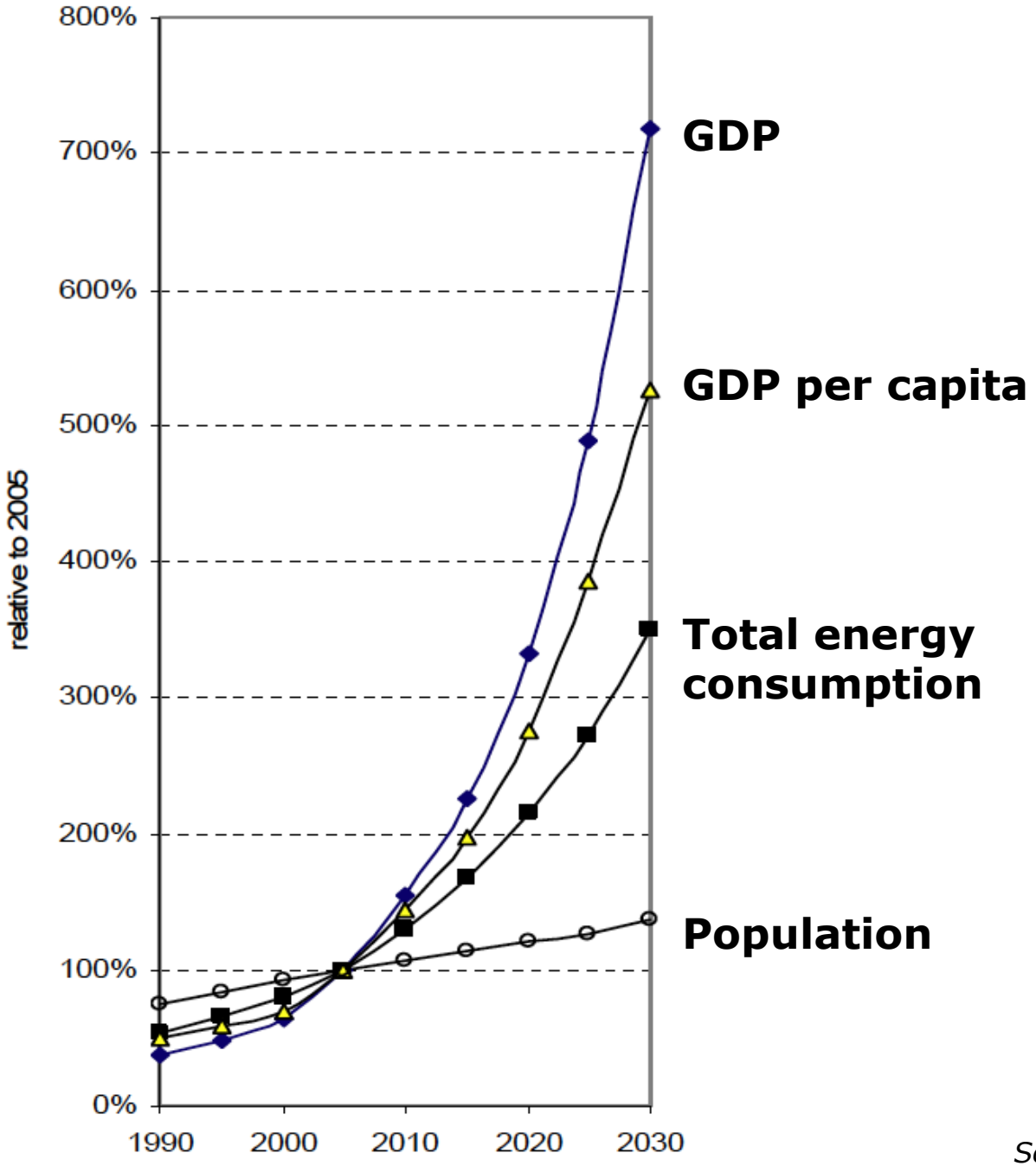
Saurabh Das/Associated Press

New Delhi memorial India Gate, glimpsed through the haze in a December, 2011 photograph.

India has the worst air pollution in the entire world, beating China, Pakistan, Nepal and Bangladesh, according to a study released during this year's World Economic Forum in Davos.

Source: New York Times

Future Trends



Source: IIASA

No Power, No Boom

Prashanth Vishwanathan for The New York Times

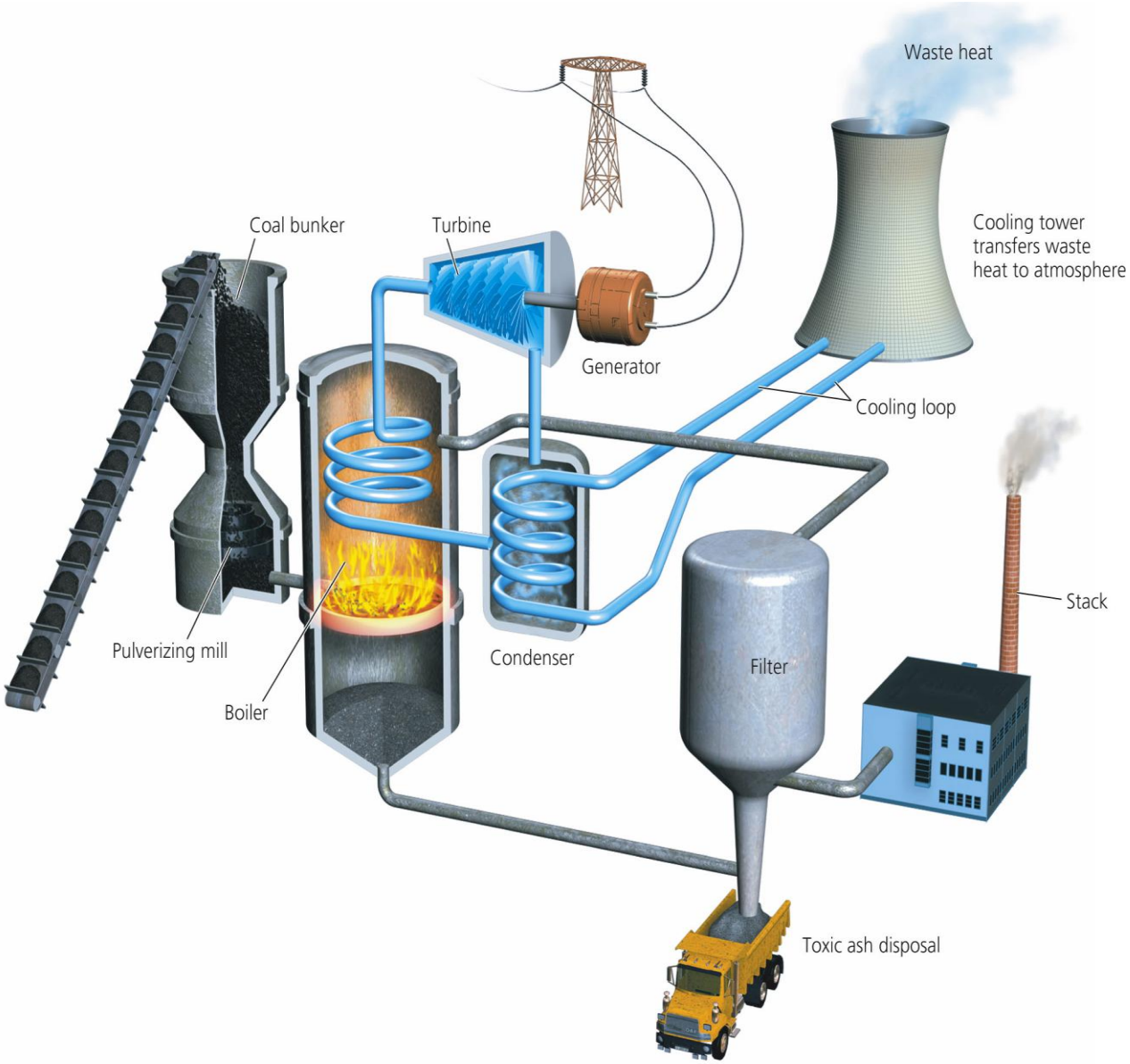
Dust from imported coal rising at the Krishnapatnam port near Nellore, India. Coal is produced at a laggardly rate in India.

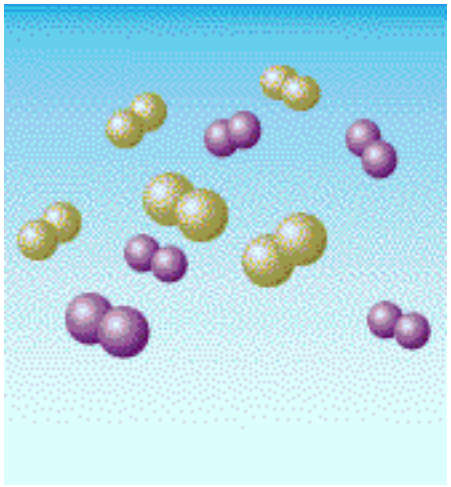
By VIKAS BAJAJ
Published: April 19, 2012

NELLORE, India — India has long struggled to provide enough electricity to light its homes and power its industry around the clock. In recent years, the government and private sector sought to change that by building scores of new power plants.

Source: New York Times

Coal-Fired Power Plants





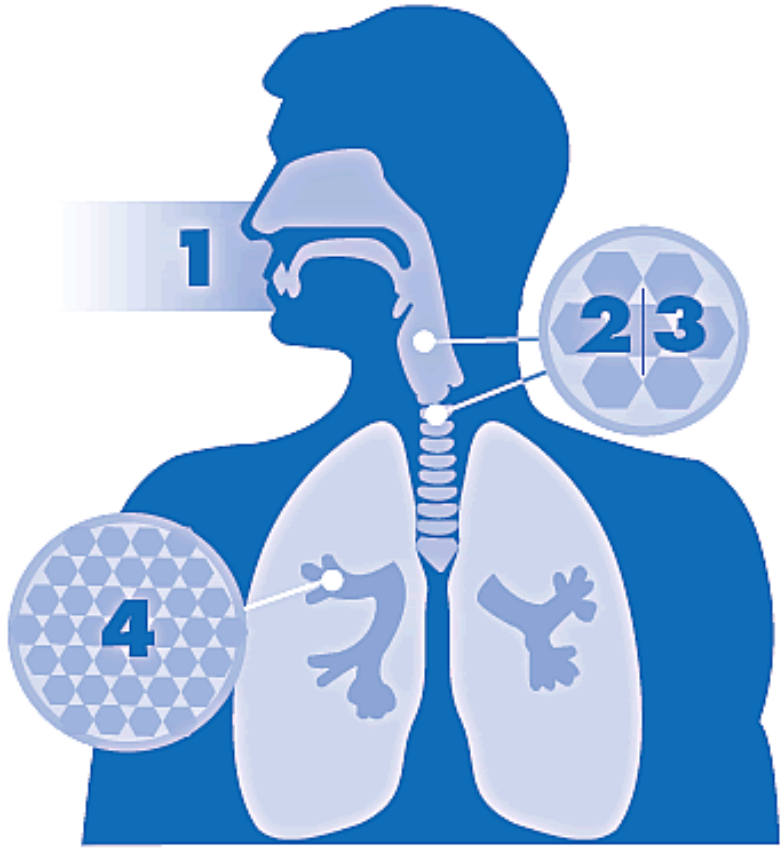
Source: US EIA, Dept. of Energy

Ozone (O_3)

• Ground level ozone (smog) forms when nitrogen oxides (NO_x) and hydrocarbons react in sunlight

• Exposure to ozone is associated with elevated risk of early death, asthma, bronchitis, heart attacks, lung infection

Small Particulates ($PM_{2.5}$)



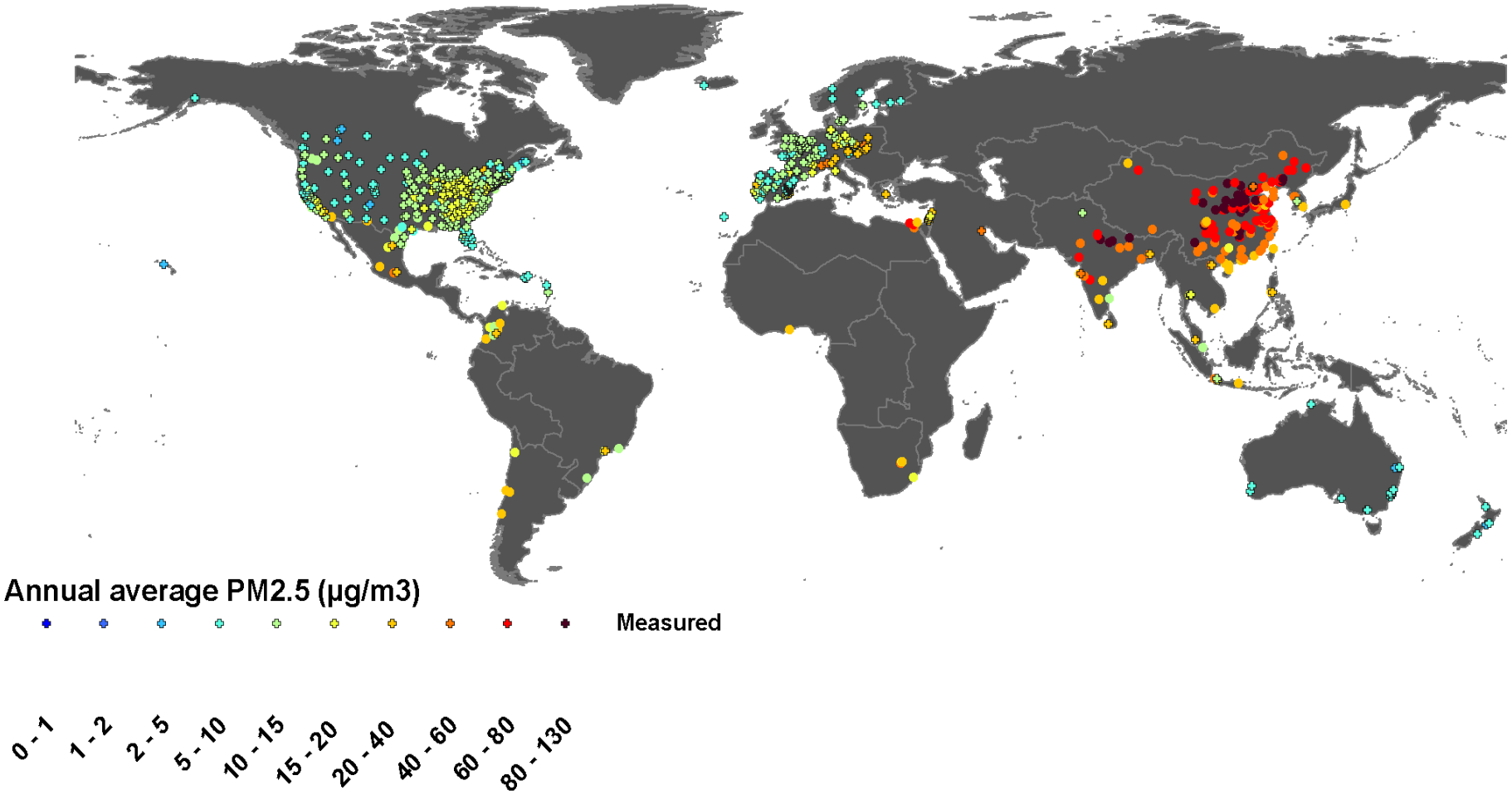
1 Particulate matter enters our respiratory (lung) system through the nose and throat.

2 | 3 The larger particulate matter (PM10) is eliminated through coughing, sneezing and swallowing.

4 PM2.5 can penetrate deep into the lungs. It can travel all the way to the alveoli, causing lung and heart problems, and delivering harmful chemicals to the blood system.

Source: EPA

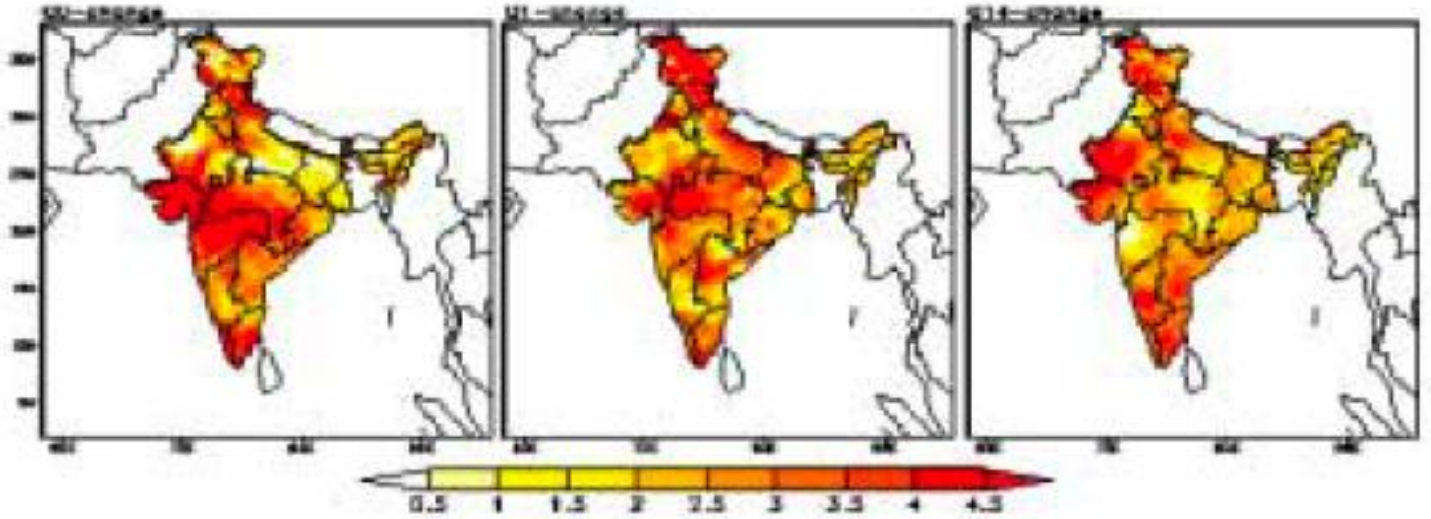
Ambient Air Pollution Monitoring



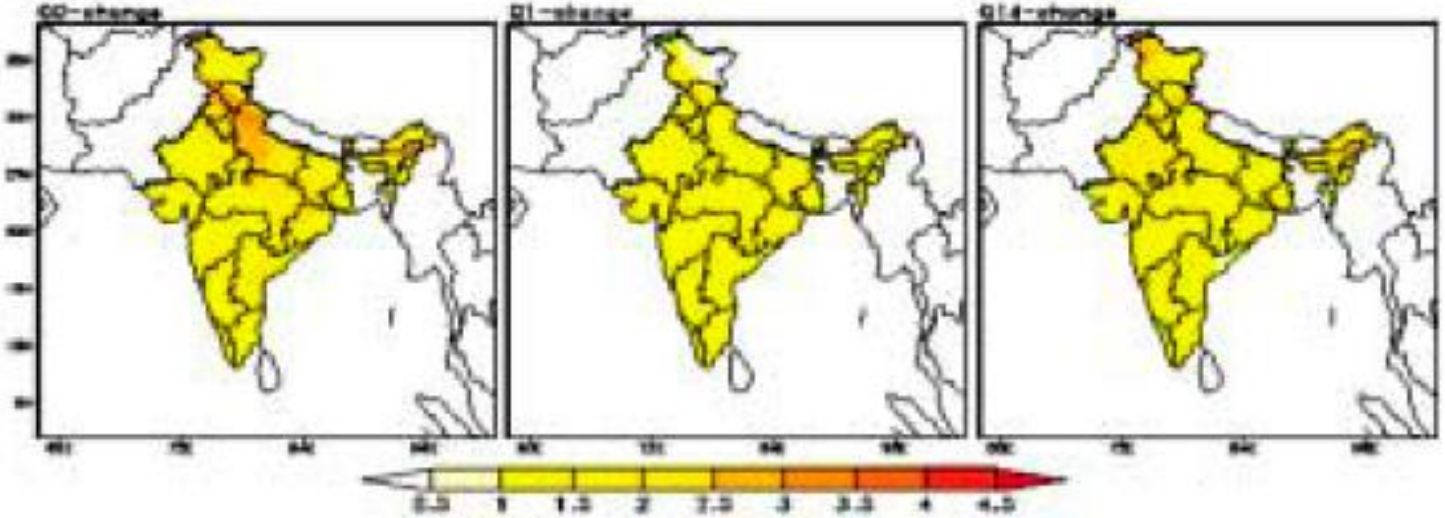
Source: Brauer et al. (2011)

Extremes in temperature

Projected changes in minimum temperatures (1970 to 2030)

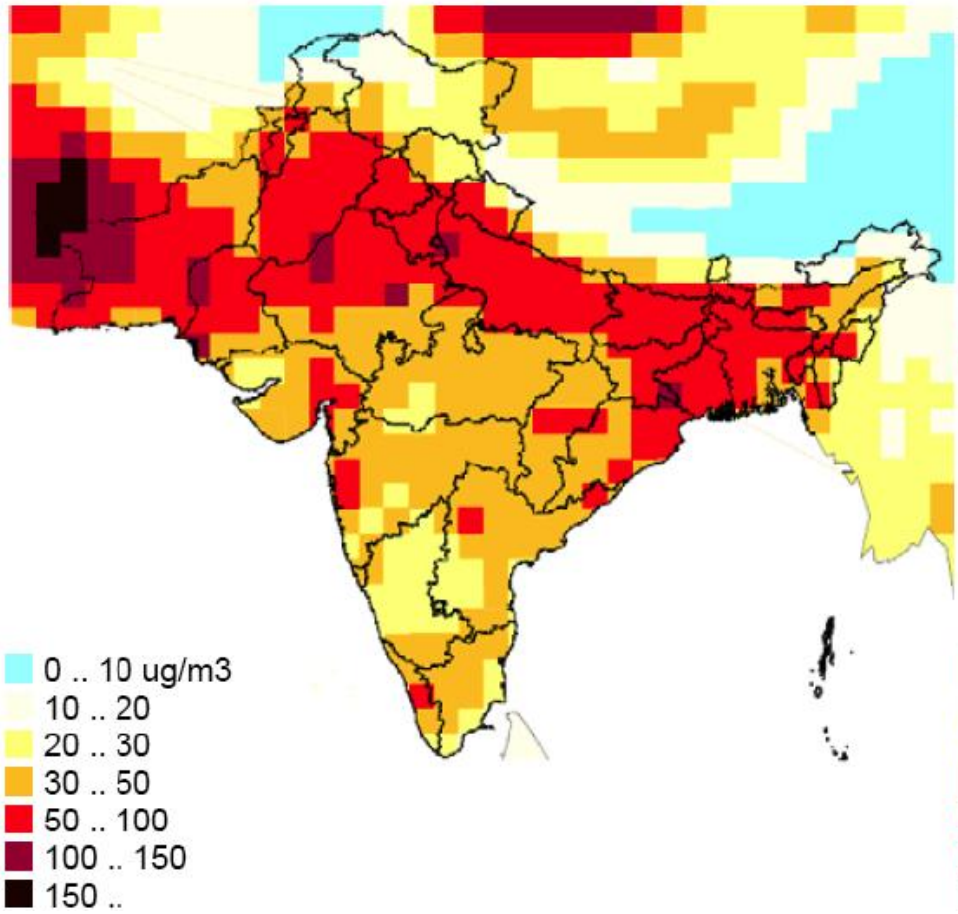


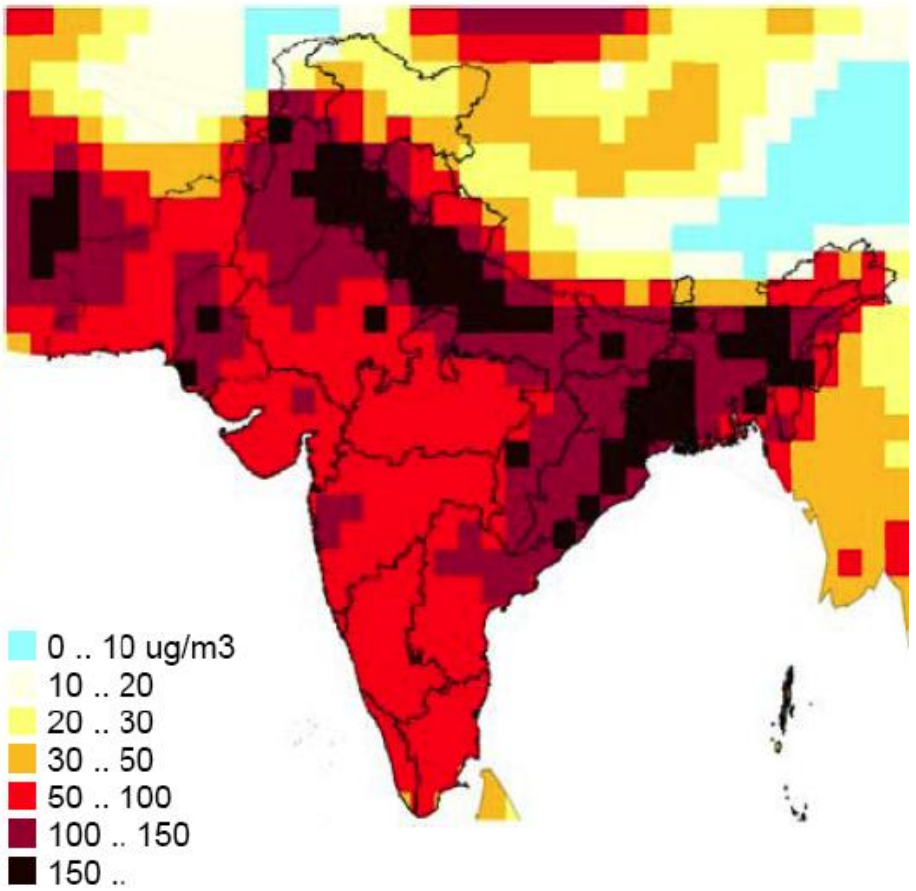
Projected changes in maximum temperatures (1970 to 2030)



Source: Indian Ministry of Environment and Forests (2010)

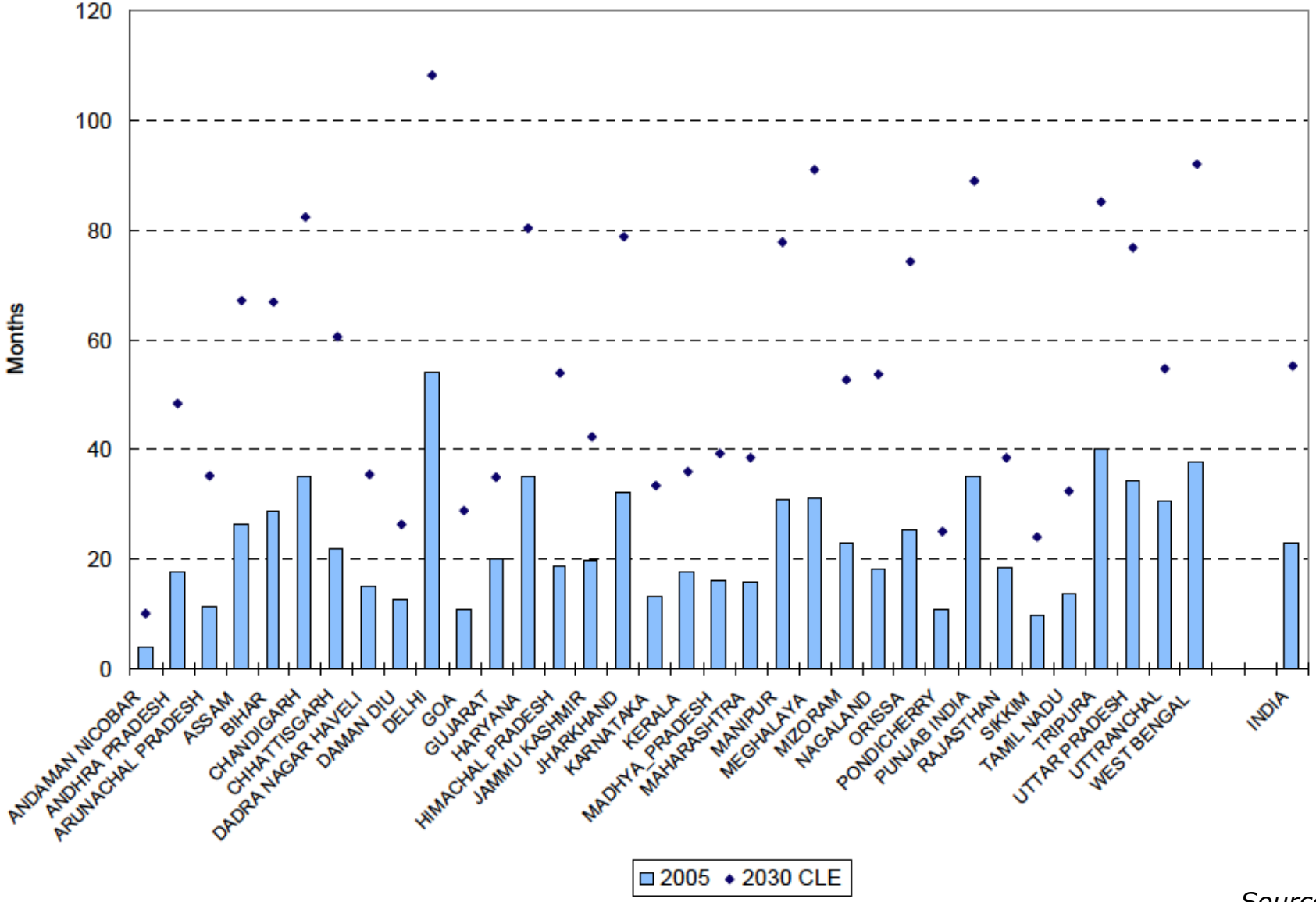
$PM_{2.5}$ in 2005 vs. 2030





Source: IIASA

Health Impacts of $PM_{2.5}$



Source: IIASA

Acknowledgements

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