

### **3.001 The impacts of solid fuel interventions and electrification on ambient air quality in India.**

Early Career Scientist

Presenting Author:

**Luke Conibear**, EPSRC Centre for Doctoral Training in Bioenergy, University of Leeds, Leeds, LS2 9JT, UK, [pmlac@leeds.ac.uk](mailto:pmlac@leeds.ac.uk)

Co-Authors:

**Edward Butt**, Institute for Climate and Atmospheric Science, School of Earth and Environment, University of Leeds, Leeds, LS2 9JT, UK

**Charlotte Weaver**, EPSRC Centre for Doctoral Training in Bioenergy, University of Leeds, Leeds, LS2 9JT, UK

**Christoph Knote**, Meteorological Institute, LMU Munich, Theresienstr. 37, 80333 Munich, Germany

**Stephen Arnold**, Institute for Climate and Atmospheric Science, School of Earth and Environment, University of Leeds, Leeds, LS2 9JT, UK

**Dominick Spracklen**, Institute for Climate and Atmospheric Science, School of Earth and Environment, University of Leeds, Leeds, LS2 9JT, UK

**Ella Blanquet**, EPSRC Centre for Doctoral Training in Bioenergy, University of Leeds, Leeds, LS2 9JT, UK

Abstract:

Combustion of solid fuels for cooking and heating is widespread across India with large but poorly quantified impacts on ambient air quality. Over the past decade there have been substantial changes in residential energy use across India, due to electrification schemes and implementation of large-scale clean cookstove interventions. We investigate the impacts of changing residential solid fuel combustion over the period 2000 to 2015 on ambient particulate air quality in India. We synthesise information on the location and size of solid fuel interventions, such as the National Biomass Cookstove Initiative. To assess changes in electrification we use data from the National Oceanic and Atmospheric Administration's (NOAA) National Geophysical Data Centre (NGDC) Version 4 Nighttime Lights Time Series from the Defence Meteorological Satellite Program (DMSP) and the Visible Infrared Imaging Radiometer Suite (VIIRS). We also use electrification data from the International Energy Agency (IEA) and The World Bank Group. We assess the impacts of such changes on air quality using the Weather Research and Forecasting Model with Chemistry (WRF-Chem) regional air quality model, remote aerosol monitoring networks, and satellite observations. Our study will inform the potential for electrification and solid fuel interventions to improve ambient air quality and human health.