

# Impact of a transition to electric vehicles on air quality within Australia

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# Background

- Road transport is responsible for about 15% of Australia's GHG emissions
- Electric vehicles touted as an emerging technology that can cut these emissions at the same time as substantially improve air quality
- Many 'what ifs' giving a wide range of scenarios depending on:
  - Type of vehicle: pure electric or hybrid
  - Hydrogen fuel cells, i.e. not a battery
  - Mixed scenarios, e.g. EVs and increased ride sharing
  - Renewable energy

# Aims

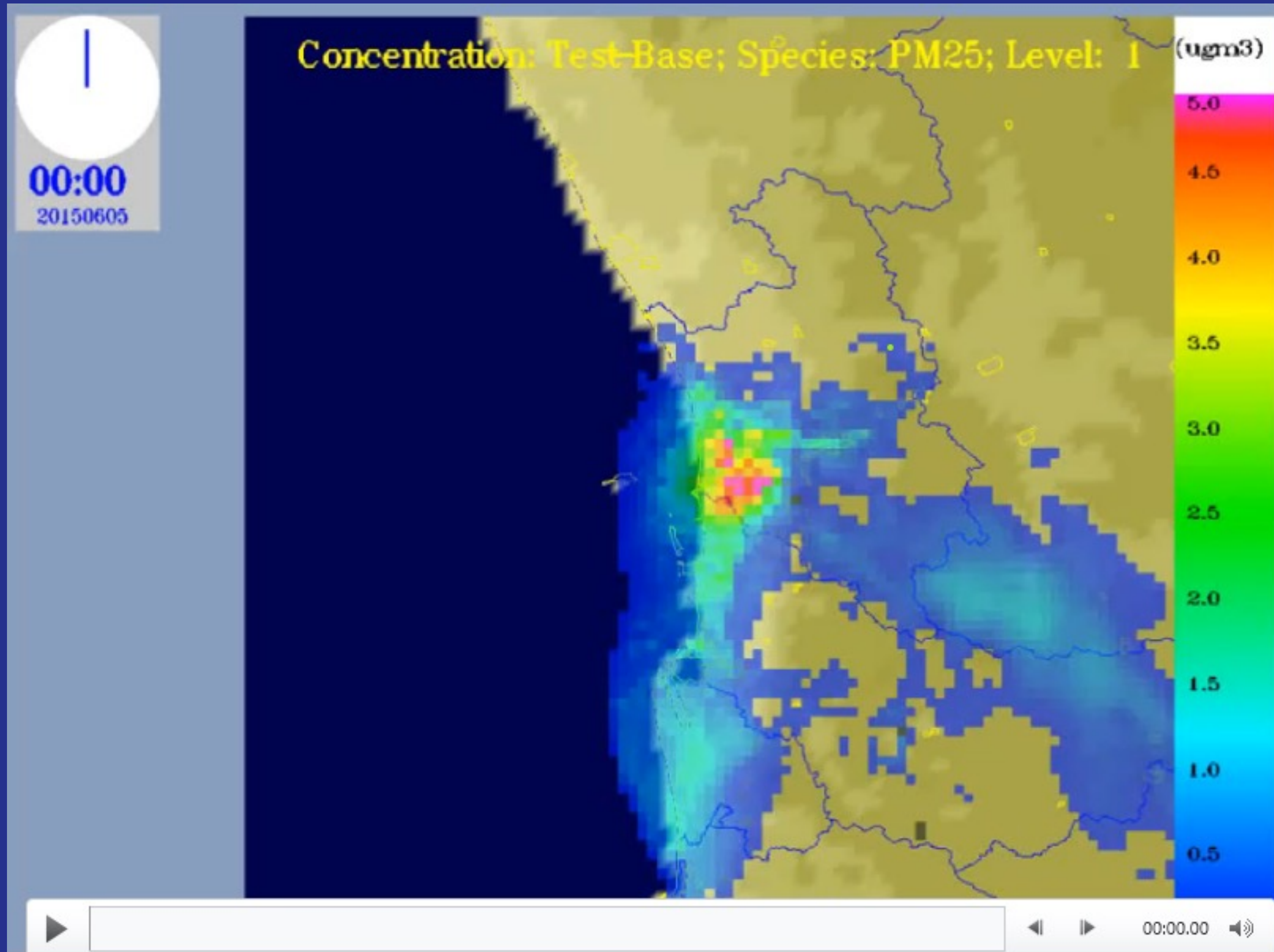
To investigate what impact EVs will have on air quality and health in Australia

- Potential for EVs from a population health perspective
- Inter and intra-city comparisons of health burden
- Disaggregated by:
  - tailpipe emissions (petrol versus diesel)
  - evaporative emissions, i.e. VOCs
  - non-exhaust pm
- What about source of energy to electrify vehicle fleet
- Future scenario modelling using case study – Perth

# Methods

- City scale simulation studies
- Health Impact Assessment
- Chemical transport model (CTM)

# CTM simulation for Perth – PM2.5



# Currently working on

- Health burden/Potential of EVs in Australian context
- Intra-urban health impacts
- Exploring use cases of CTM
- Particulates: size, number, and composition

## Challenges

- time intensive, e.g. one week to generate a simulation year
- computational expensive
- highly complex
- not accessible

# Developing an emulator

- Emulator approximates the CTM under different assumptions
- Faster and less computationally intensive than CTM
- More accessible to end users
- Allows exploring different scenarios more easily



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