A UK Emissions Modelling System (UK-EMS)

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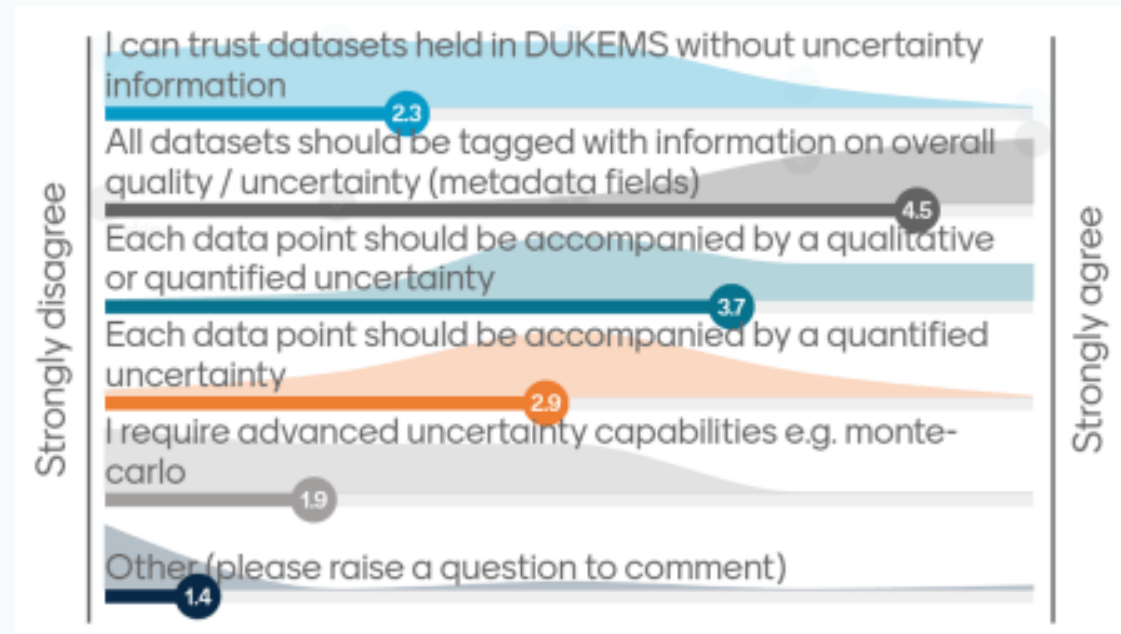
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Overview

- Community driven and co-designed

- Open and accessible system providing access to emissions data and associated calculation methods

- Consistent approach for provision of emissions data across a range of spatial and temporal scales

- Ability to generate model ready data exploring 'what if' scenarios

*The core objectives are the delivery of a **proof-of-concept framework and tools** designed to be operational long term in supporting the atmospheric modelling community by providing a flexible, user-friendly system to deliver **emission input data** for modelling in **a transparent, traceable and reproducible** manner*

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Modelling community helped inform UK-EMS design
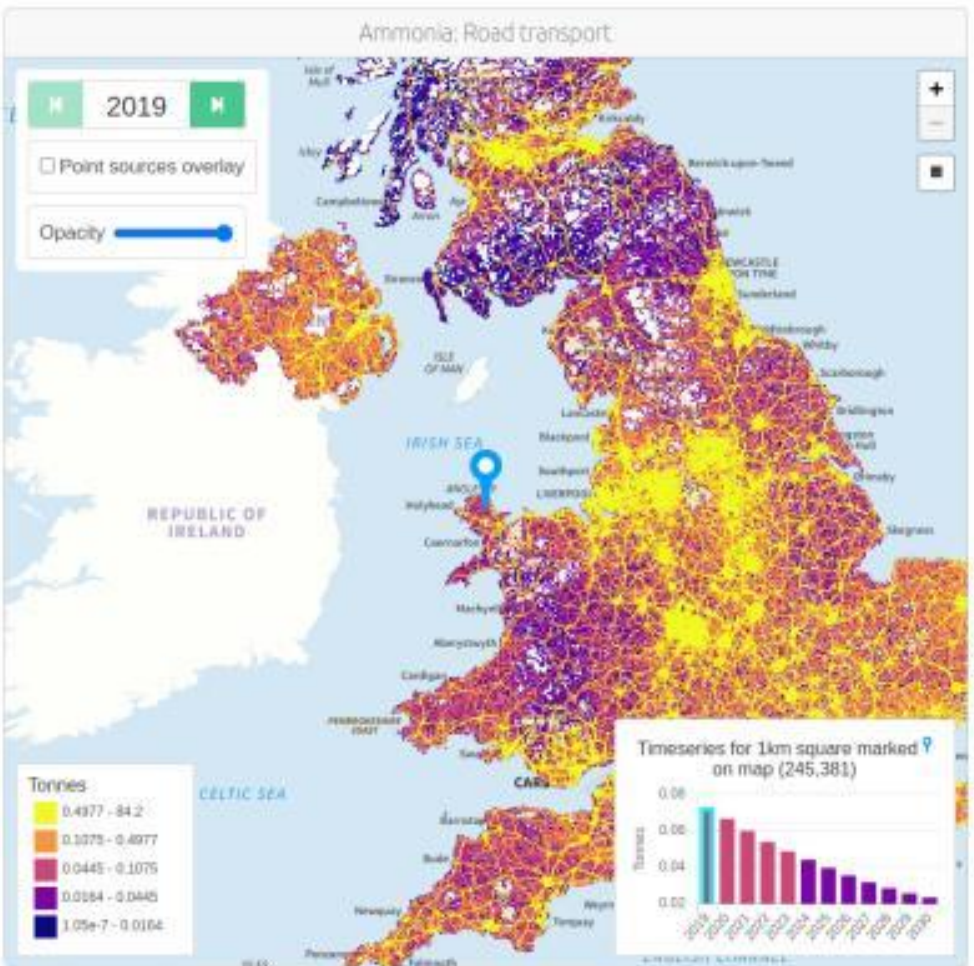
- Many different technical requests:
  - **Upper and lower bands**
  - **Qualitative scores / rankings**
  - **Granular information needed to allow for sensitivity testing**
- BUT – overall appreciation that data **provenance and traceability** should be the priority

"Uncertainty is useful as it indicates how much we can trust the data, but is most useful when considering how the level of uncertainty may propagate through the process of downstream modelling"

UKEMS Infrastructure: DataLabs

NAEI – Emissions scenarios

- Custom build model scenarios from NAEI data

  - E.g. What is the impact of making all petrol cars conventional Euro 2 standard?

  - Utilised latest data on VOC speciation to map to model ready chemical schemes (E.g. CB05).

- Output scenarios provided in model ready format to run through AQ models.

NAEI data on custom grids.
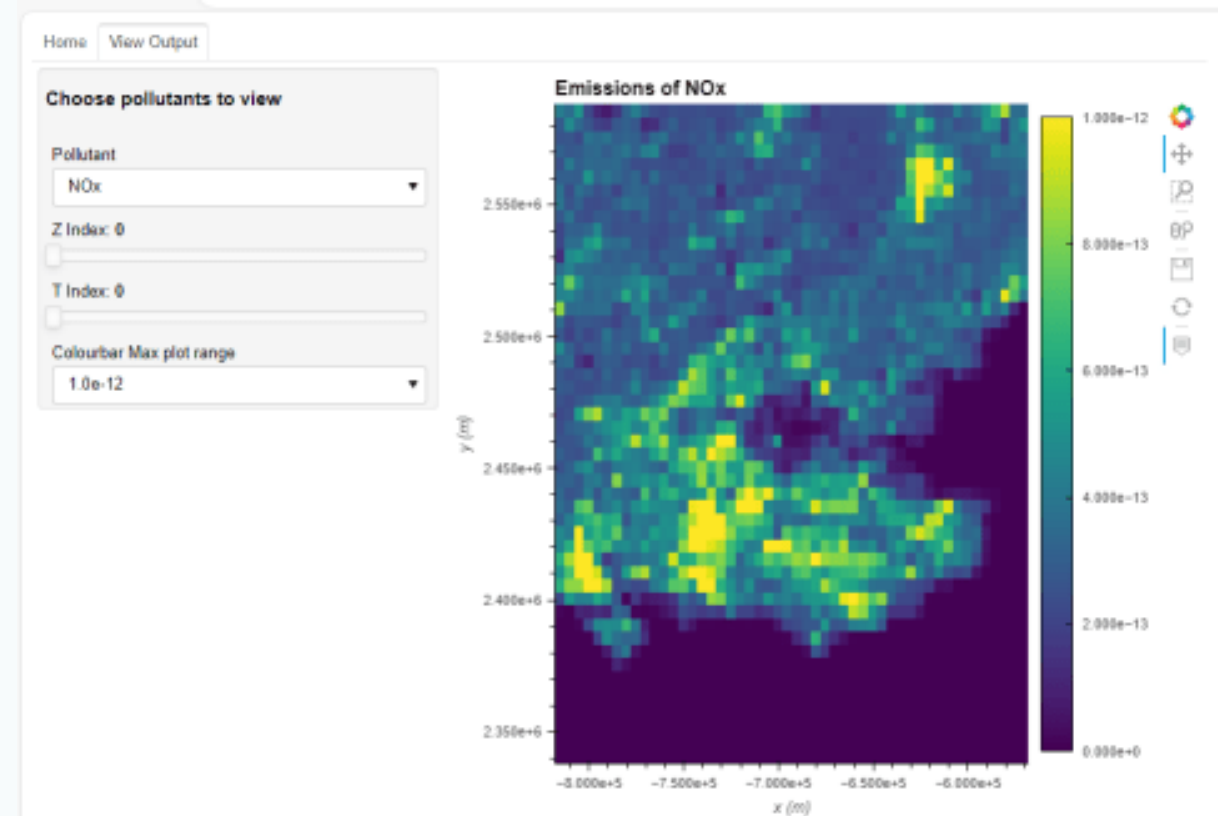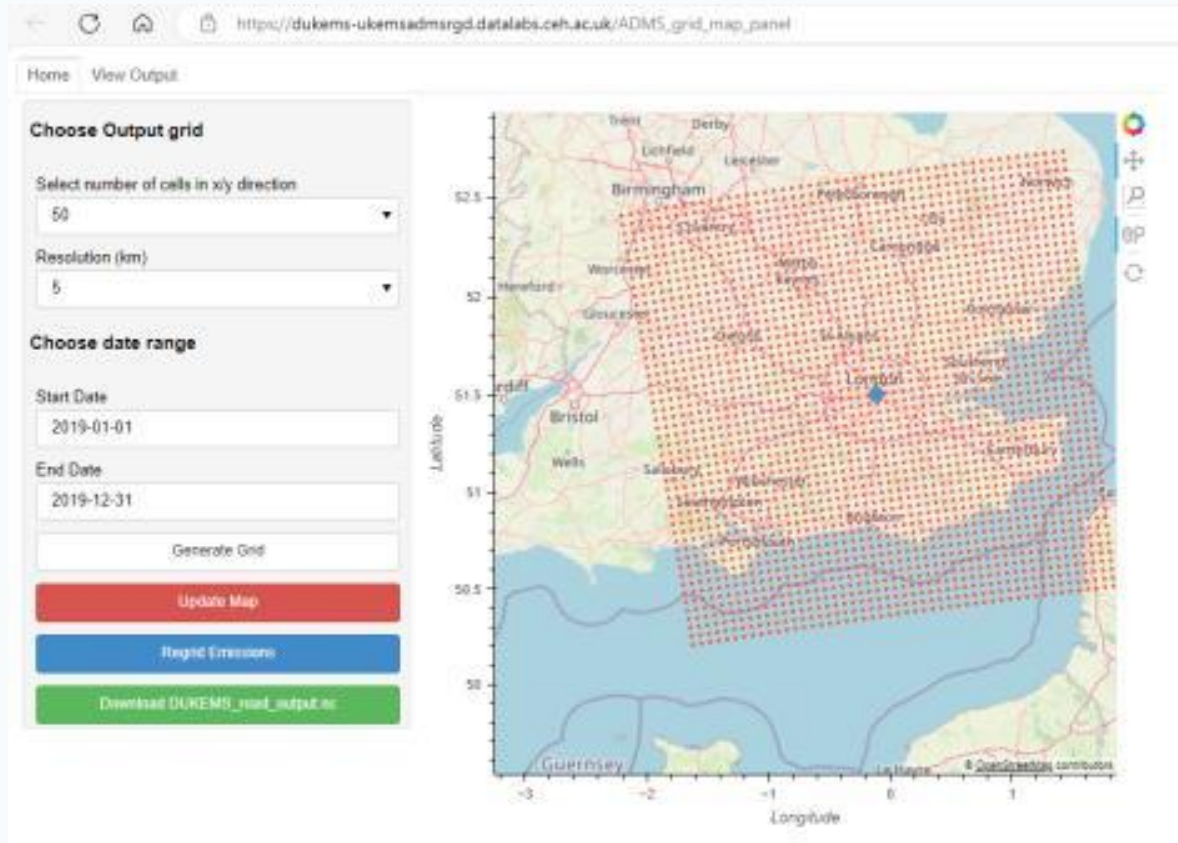
| NAEI 1km BNG* standard grid. | → | Create custom 5km LCC** grid centred on London | → | Regridding tool | → | Model ready netcdf output*** |

*British National Grid (OSGB)
**Lambert conformal conic
***Other outputs could be made available. E.g. csv, JSON, ASCII

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Temporal emission profiles developments

Hour/hour by day of week
Day of week
Month
Day of year

Adjustable

Activity Data

Generalized Additive Models

GAM Temporal Profiles linked to NFR codes

Aggregated sector level profiling

Updateable (standardised)
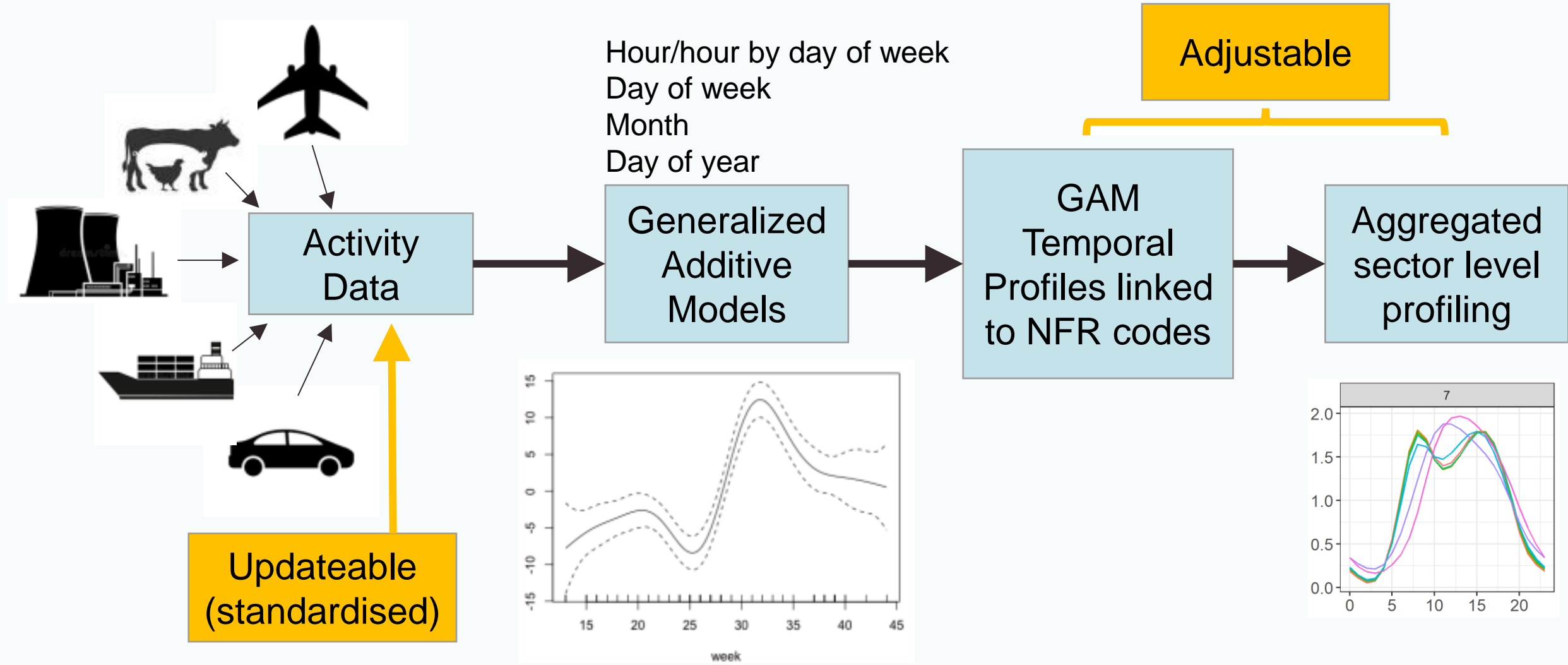
Outlook and next steps

- Proof-of-concept project that demonstrated potential for step change in way modellers and policy makers access emissions data.

- Co-designed with the modeller community to provide a useful framework to ask what-if scenarios from the NAEI

- The UK-EMS has the potential to run in parallel to the NAEI adding support for modellers to obtain model ready data

- As a community driven platform provides a useful forum to gather the collective efforts of modellers to further advance the underlying science

- As a proof-of-concept project fully operational product does not yet exist but could provide some useful tools

- We welcome discussions with relevant policy groups about how we could make UK-EMS viable as an operational tool

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