

Eliciting probabilistic long-term forecasts for the drivers of greenhouse gas emissions in South Africa

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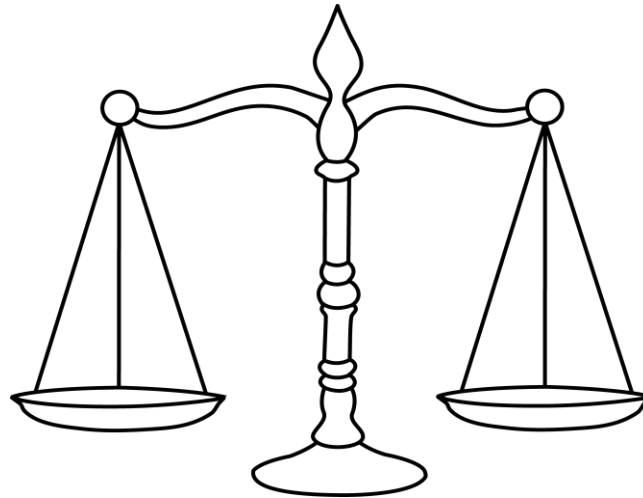
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Joint work with Bruno Merven and Bryce McCall

Energy Research Center, University of Cape Town

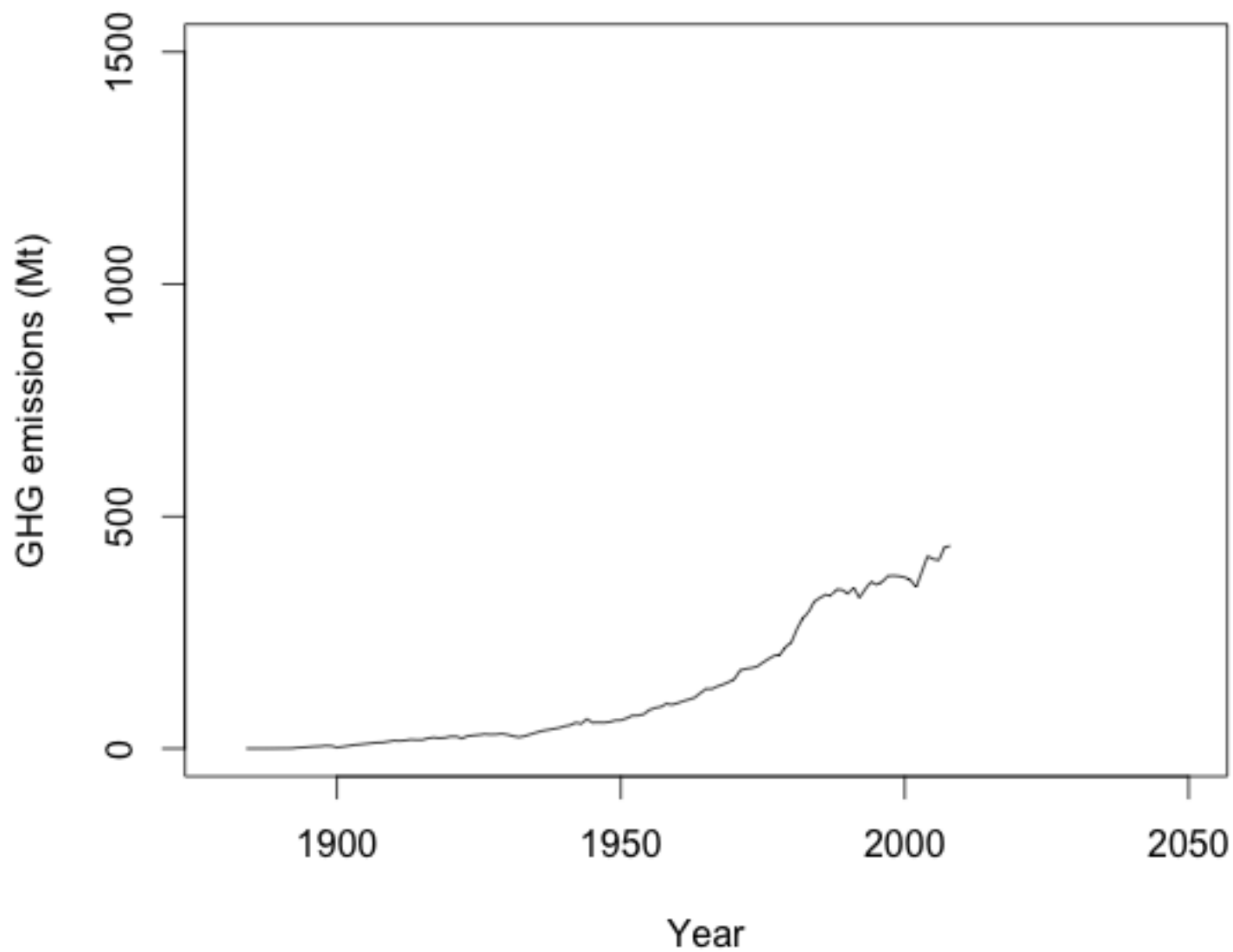


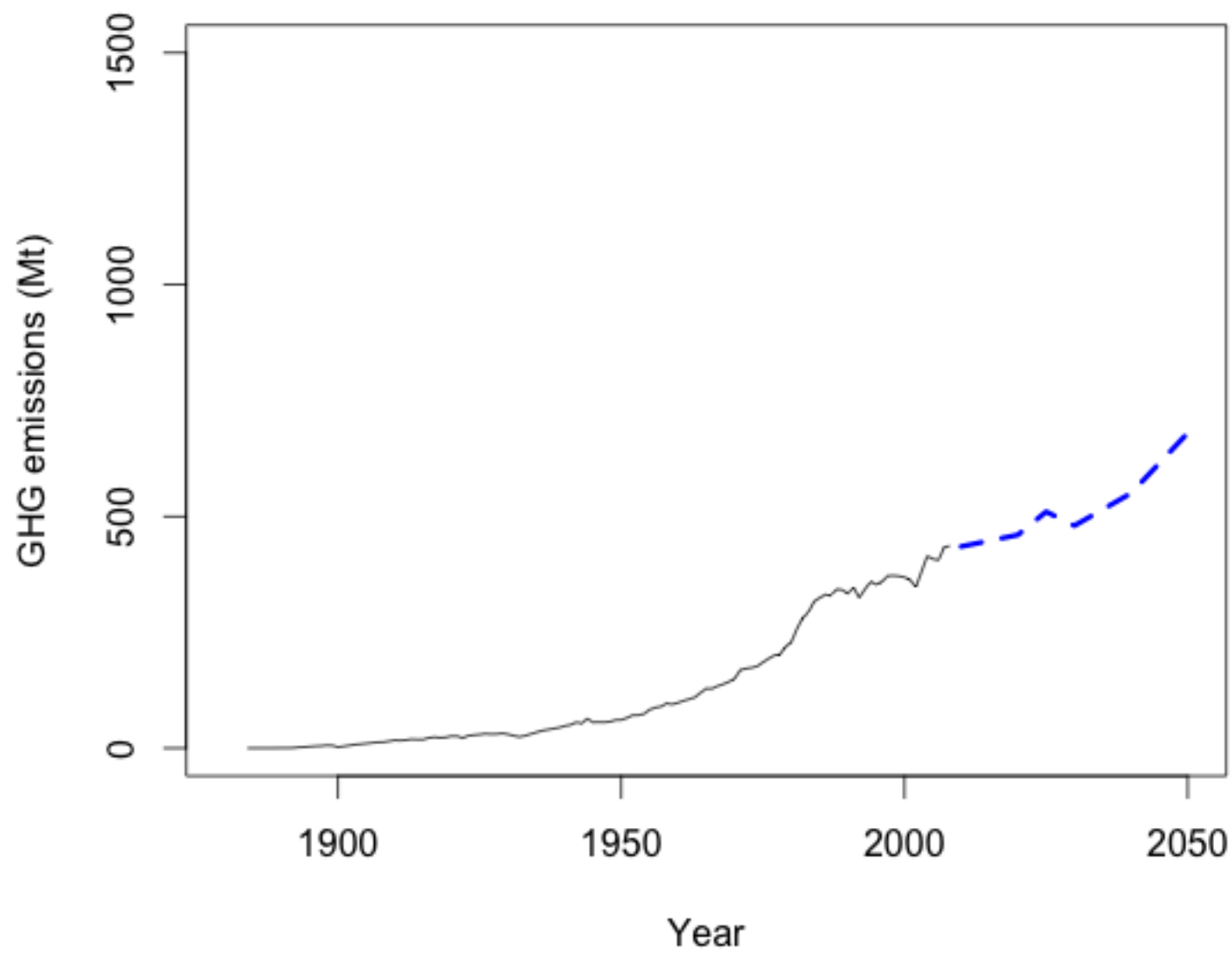
Baseline: what happens under “business as usual”

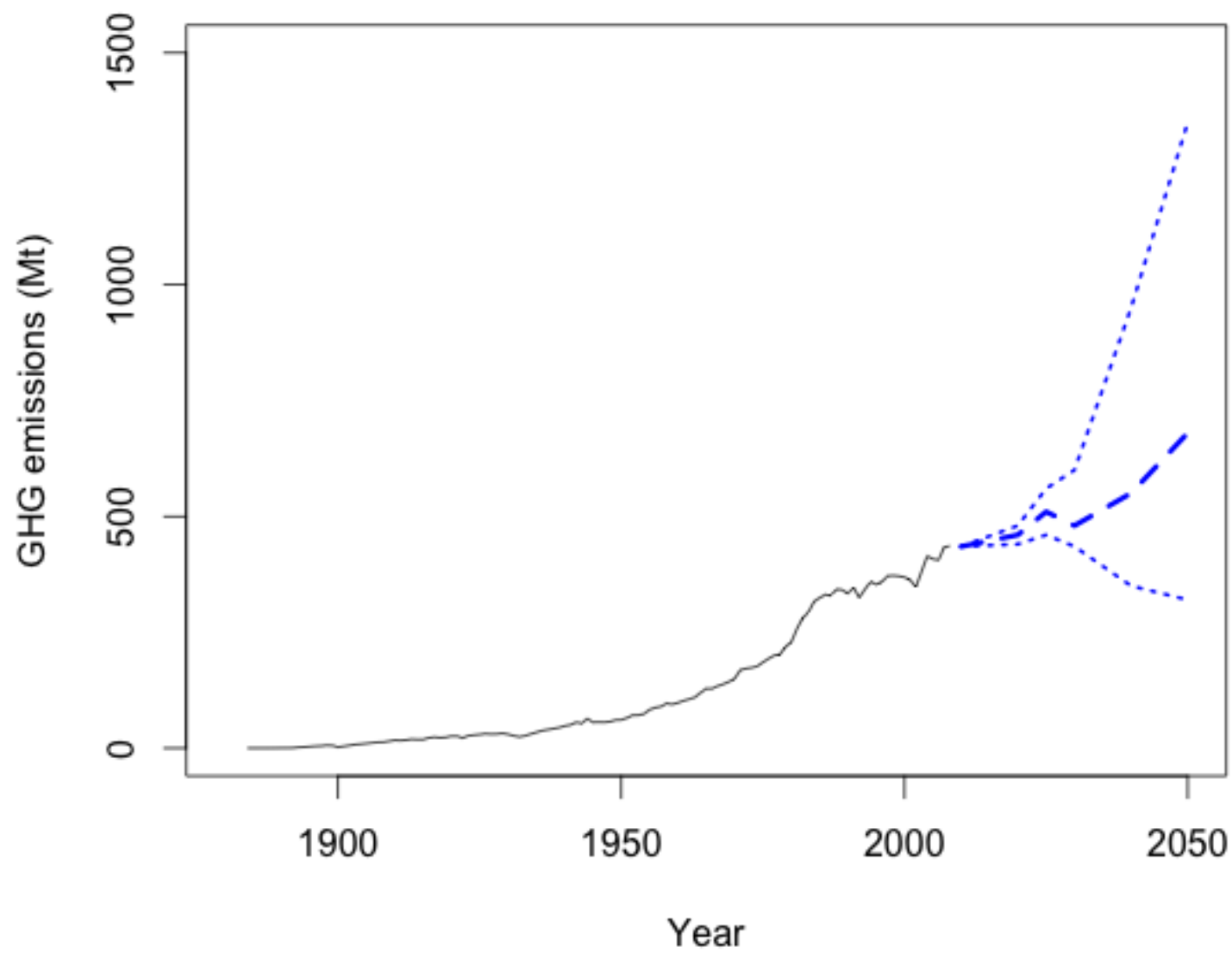


Aim:

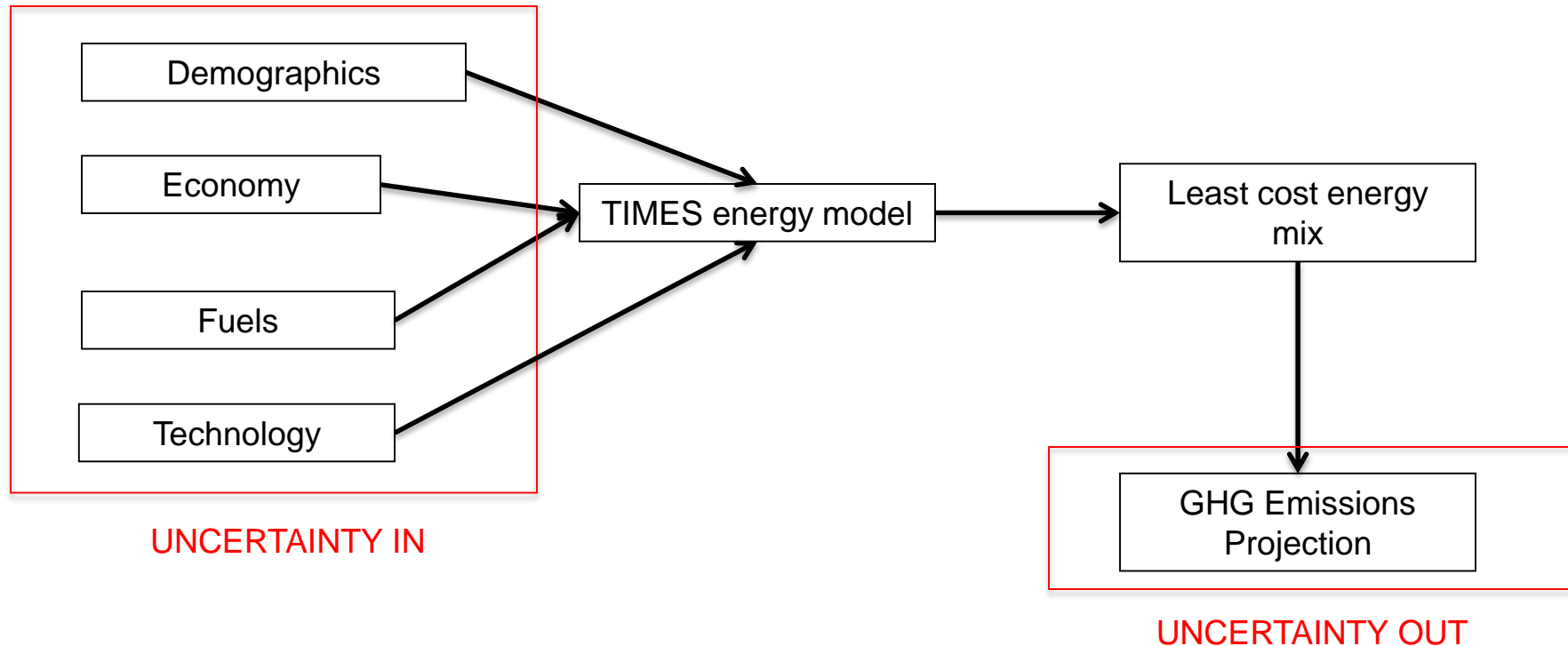
To build a probabilistic baseline forecast of GHG emissions in South Africa to 2050



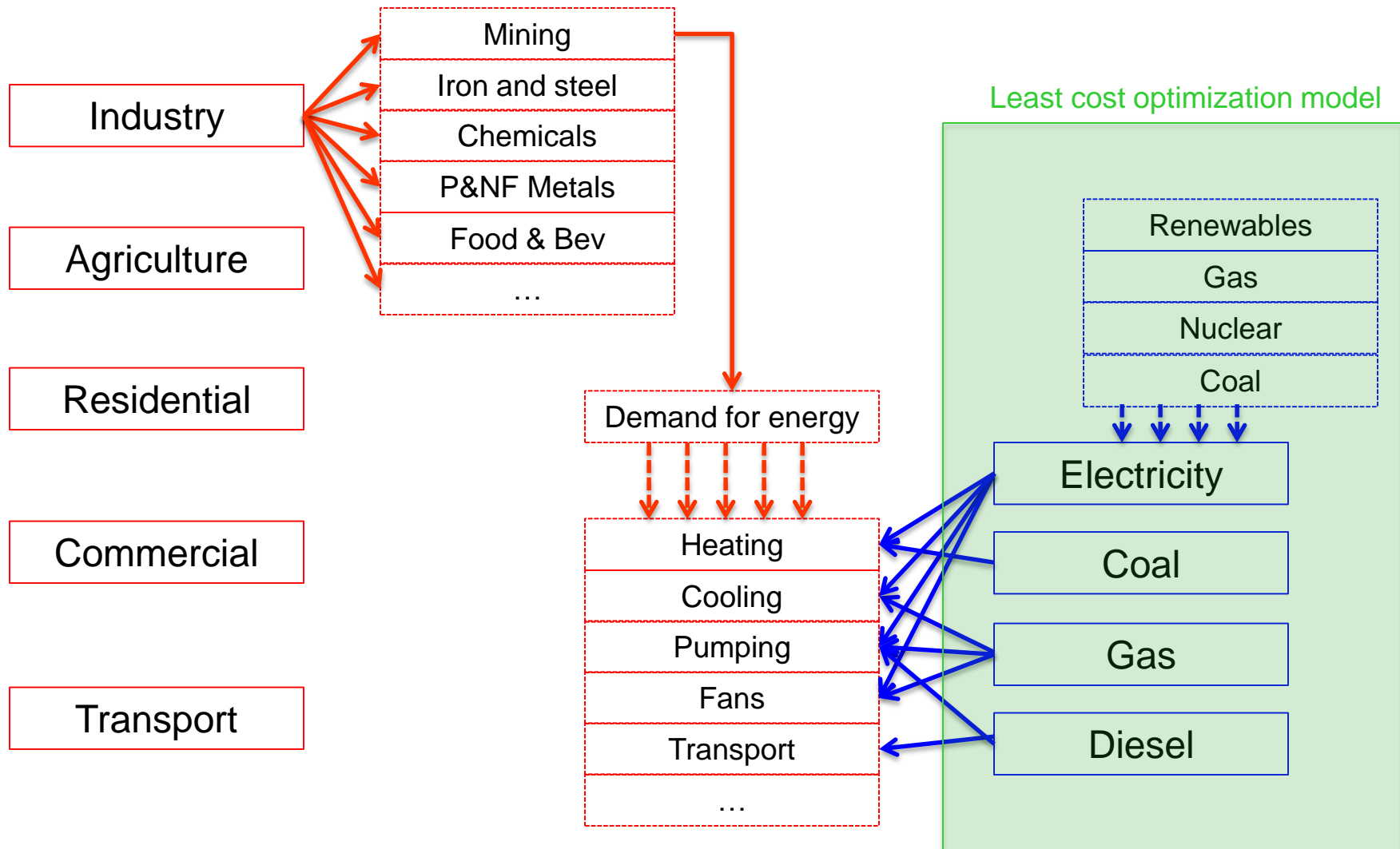




Projecting South African CO₂ emissions



Energy modelling using SATIM



What inputs?



Population growth



GDP growth



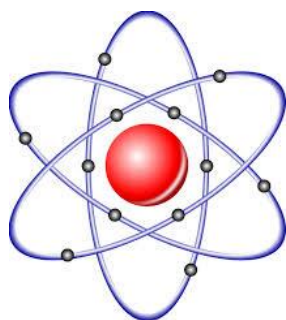
GDP distribution



Coal prices



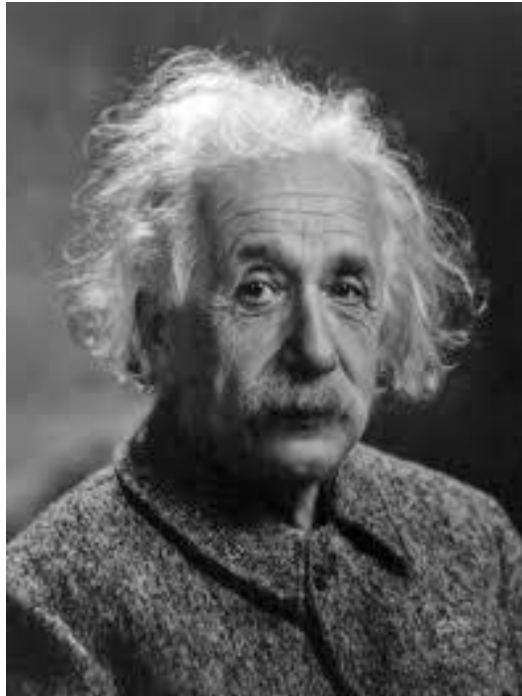
Gas prices



Nuclear costs



Renewables costs



Local expert
assessments



Literature, past
research, models



UN probabilistic projections



2 expert interviews



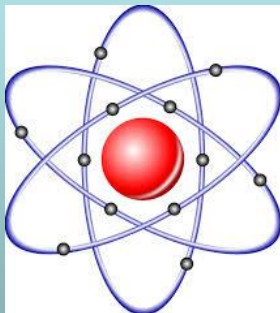
2 expert interviews



4 expert interviews



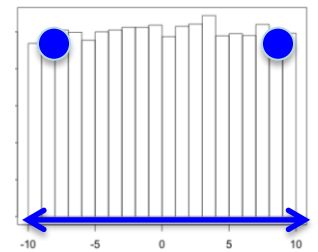
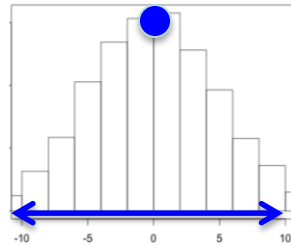
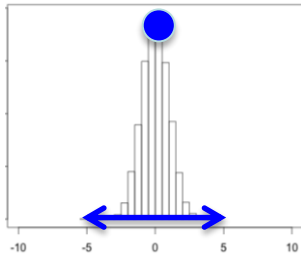
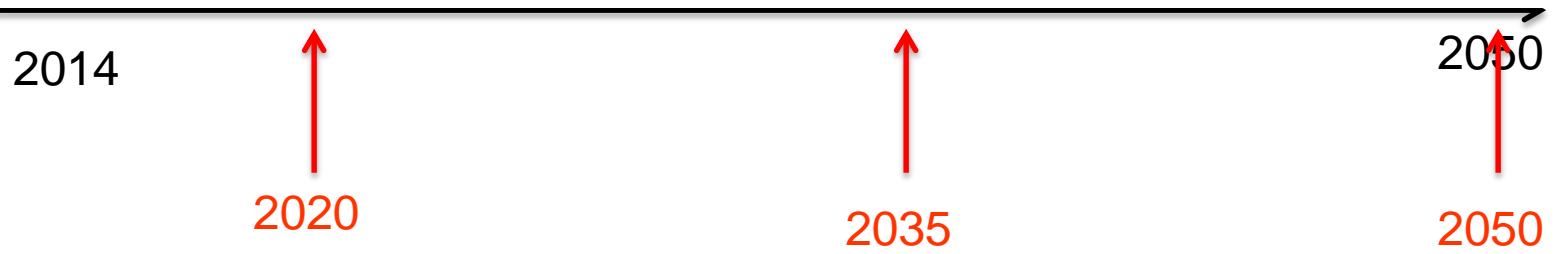
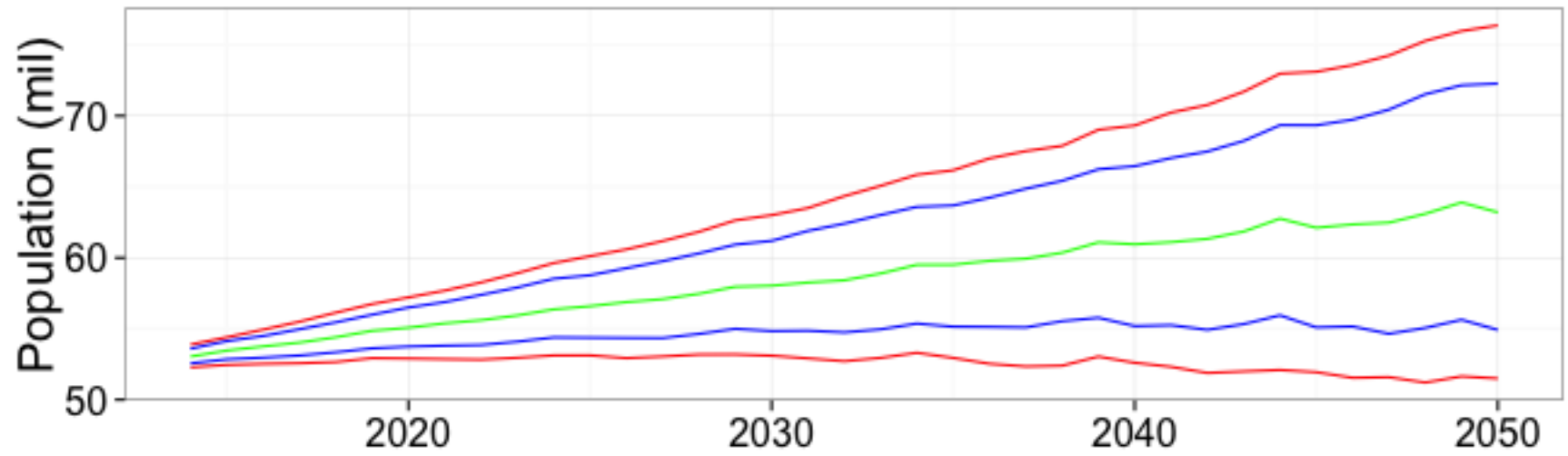
2 expert interviews

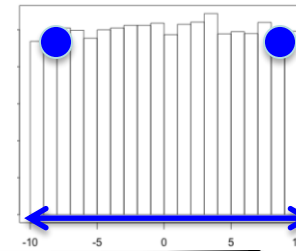
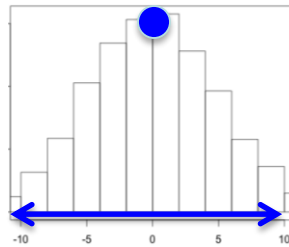
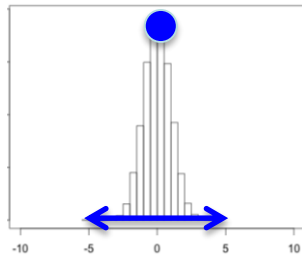


Literature and past work



Literature and past work





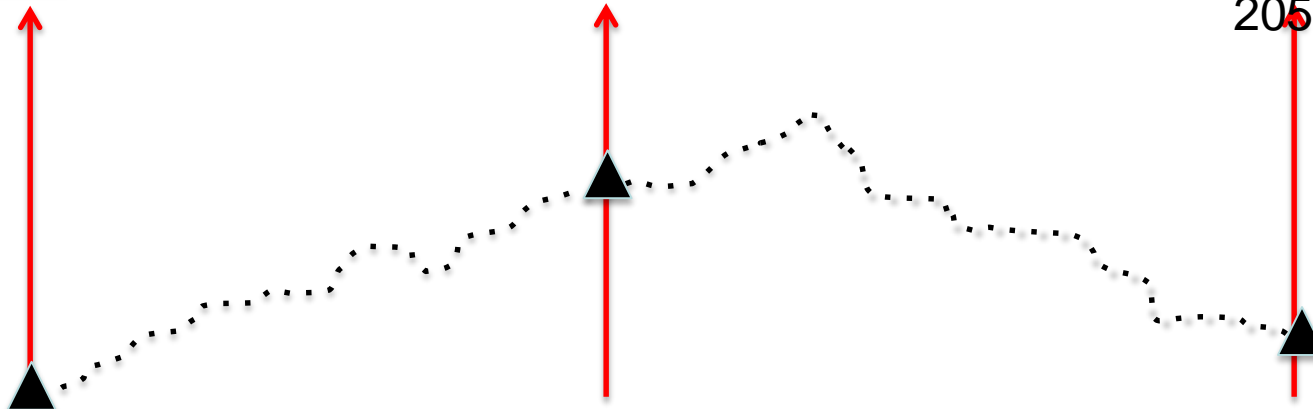
2014

2020

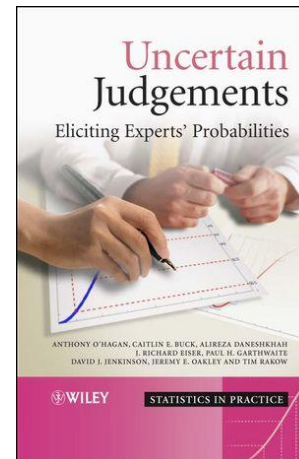
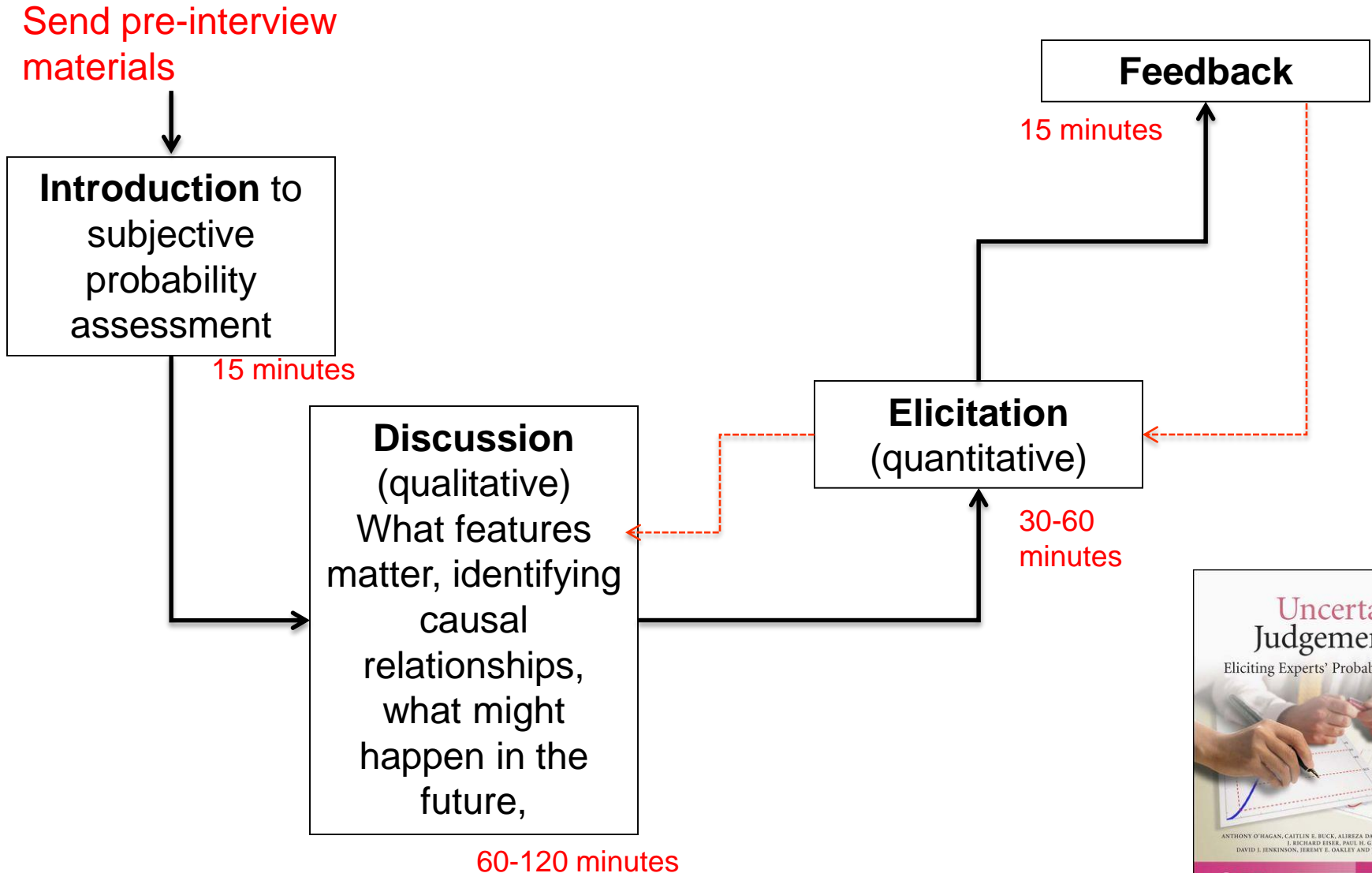
2035

2050

2050

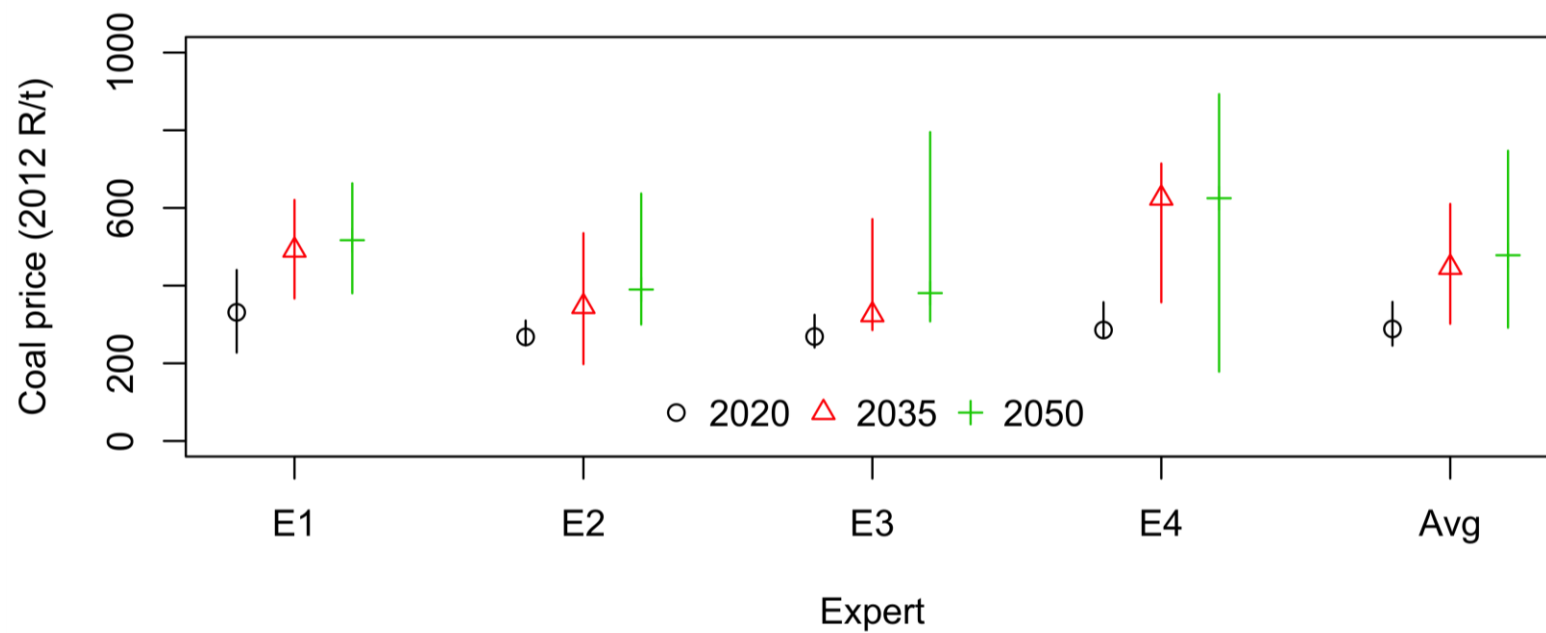
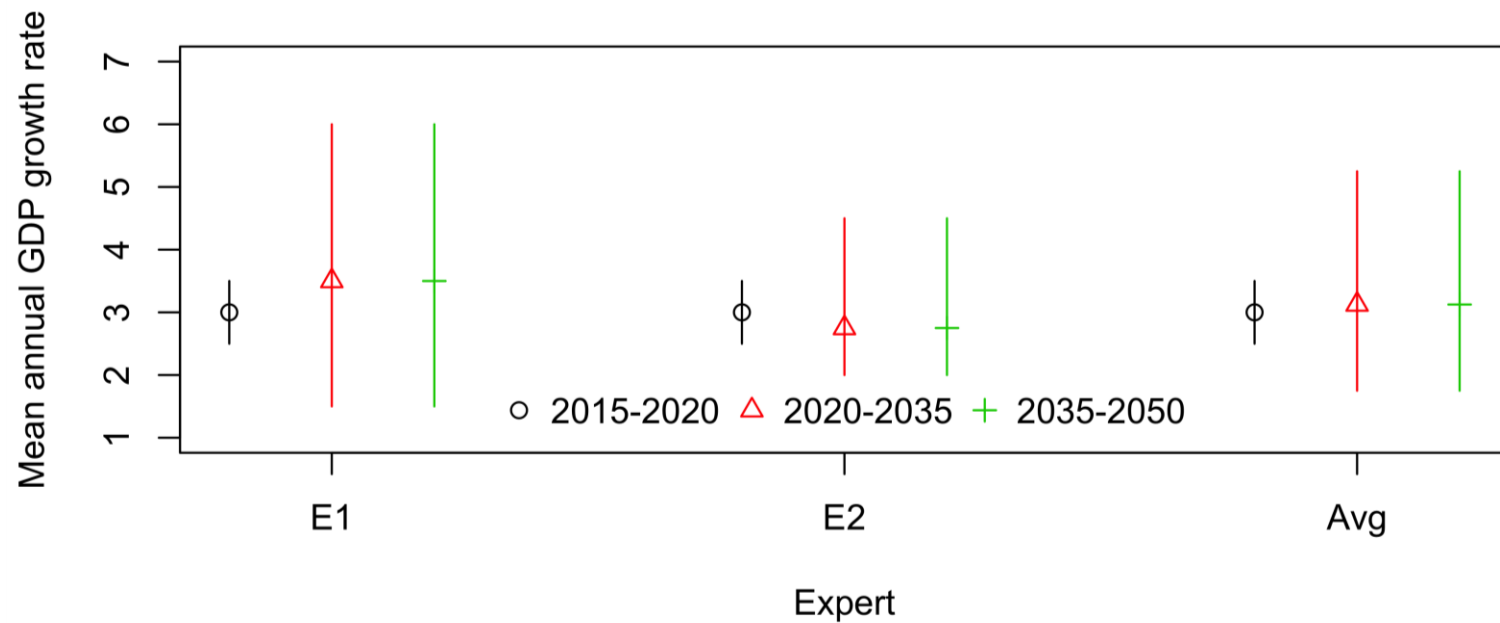


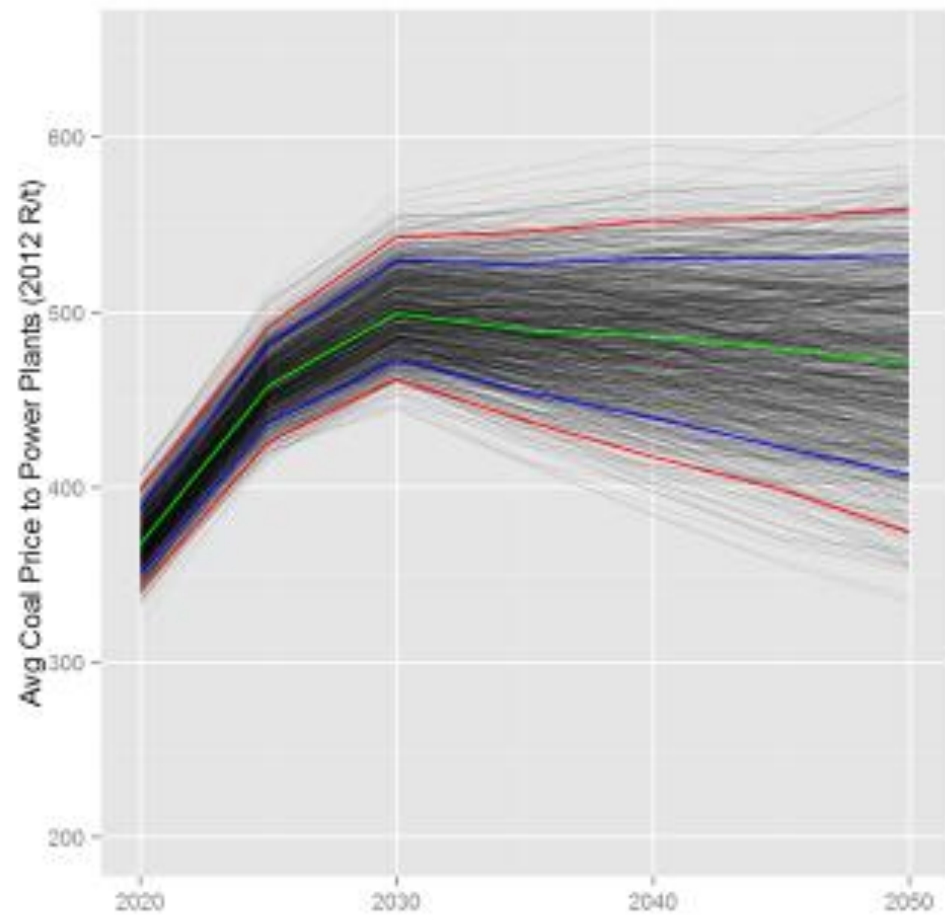
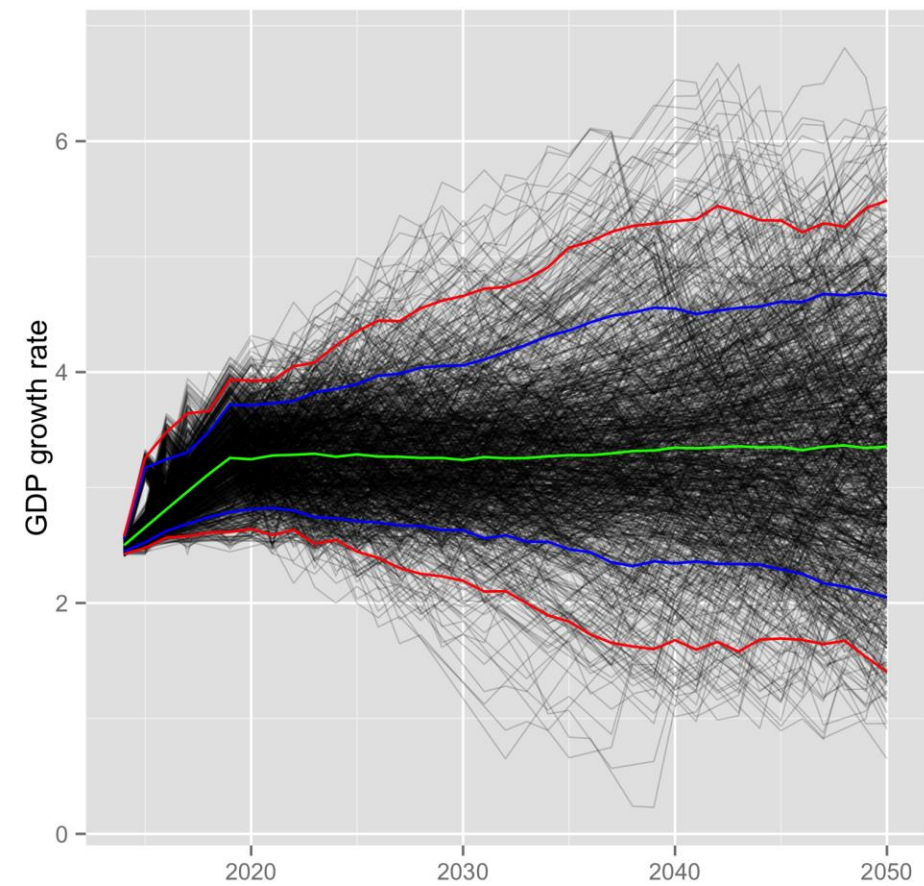
One-on-one Expert Elicitation

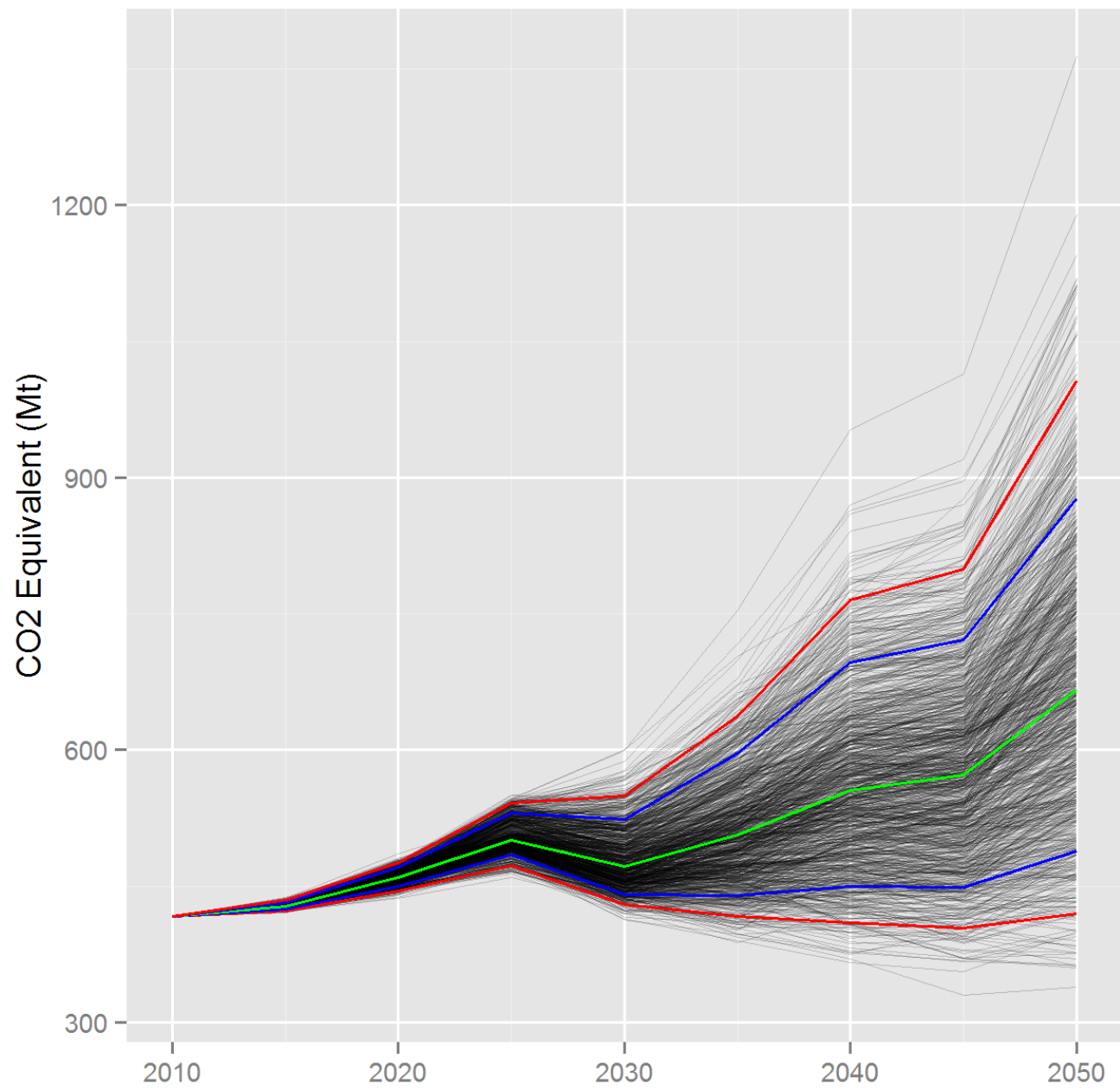


Elicitation protocol

- Establishing rapport with the expert
 - Being comfortable with subjectivity
 - Avoiding motivational and cognitive biases
- Acclimatizing the expert to the elicitation problem
 - Provide background information
 - Discuss broadly
 - Encode assumptions; encourage alternative scenarios and viewpoints
- Eliciting the expert's probability judgments
 - Start with extremes
 - Use easy “prompting” questions if necessary
 - Don't show CDF
- Cross-checking the expert's judgements
 - Formulate questions from derived CDF
 - Check consistency with expert's beliefs
 - Revise where necessary







Long and difficult
“acclimatization” stage

Anchoring

Some basis for
conveying likelihood
information

Extremes?

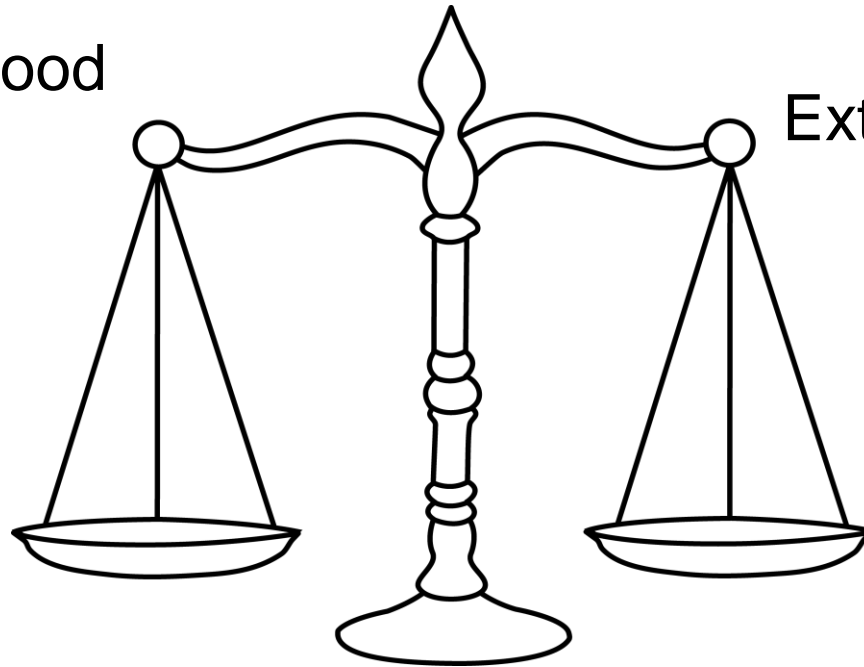
Many additional
outputs

Temporal
relationships?

Relationships
between
inputs?

Transparent,
documented, easily
updated

Most experts
used scenario
thinking
anyway



THANK YOU