

Interactive comment on “Dynamic projection of anthropogenic emissions in China: methodology and 2015–2050 emission pathways under a range of socioeconomic, climate policy, and pollution control scenarios” by Dan Tong et al.

Anonymous Referee #1

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This work aims to develop a dynamic projection model connecting SSP-RCP scenarios with local policies and representing dynamic emission changes under local policies for China, so as to explore China's future anthropogenic emission pathways. I think this work is of great importance since that most of China's local emission-control policies and technologies have not been well incorporated in global emission scenarios yet, which may introduce great uncertainties in climate and socioeconomic assessment. This work can substantially fill such gaps. Generally, this manuscript is well-written and well-structured, and fits the scope of this journal. Here are some issues that are

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suggested to be addressed for further improving this work.

In Section 3.1, five SSP-RCP combinations were chosen, please briefly discuss the reasons and designs for the combination options, like choosing SSP3-60 and SSP4-70 rather than SSP3-70 and SSP4-60.

Since the GCAM-China energy outputs were harmonized by multiplying a balance ratio to eliminate the discrepancy between MEIC and GCAM-China models in the base year. I am concerned about the spatial heterogeneity for the balance ratio during 2010-2015. Could a similar harmonization method be applied for the gap in the base year for CMIP6 and DPEC?

Minor comments:

Page2, Line 53: 'is still higher than'

Page2, Line 58: 'benefits substantial reductions', improper use of verb 'benefit'

Page3, Line 74-75: 'These scenarios describe future emission 75 changes based on a set of scenarios', better to differentiate the 'scenarios' in expression

Page3, Line 78: simplify 'do not consider' to 'neglect'?

Page3, Line 80-81: unclear expression 'The absence of public emissions data products makes further use difficult in climate and chemical transport models.'

Page3, Line 82-83: confusing expression 'that connects global scenarios considering local policies and representing dynamic emission changes with local policies and technology deployment', rewrite as 'a comprehensive scenario set connecting SSP-RCP scenarios with local policies and representing dynamic emission changes under local policies'?

Page4, Line 96-98: please rephrase this sentence to make it clear

Page5, Line 145; Page13, Line 376-377, 394; Page15, Line 449-452: 'Therefore, we

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used. . .', better to keep consistency in tense (past tense for methodology)

Page8, Line 219: 'A technology-based emission projection model', remove 's'

Page11, Line 315: 'GCAM-China'

Page12, Line 340 and 349; Page13, Line 391; Page18, Line 542: please pay attention to tense for the clauses of 'we assumed that', 'we found that'

Page15, Line 435: try to use proper pronoun to make sentence brief

Page18, Line 419: 'is required to be up to'

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