Many thanks for working on the thorough revisions to this manuscript based on the reviewers' comments. This is clearly a substantial piece of work and will serve as a highly beneficial resource for the atmospheric monitoring community.

I have some minor additional comments that the authors might want to consider in preparing the final manuscript for publication.

- Prinn et al. 2000 should be updated to Prinn et al., 2018 (https://doi.org/10.5194/essd-10-985-2018)
- Page 2 line 25: 'surface emission fluxes' to 'surface fluxes'
- Page 3 line 20: suggest 'For the end-user, the labeling process guarantees high quality observations with full metadata description and traceable data processing.'
- The labelling document at the bottom of page 3 has a poor link. Please can you state exactly the title of the document, rather than just 'labelling document' – this will help find the document should that link be lost at some point. A better link would be fantastic if possible, or a higher tier website that is more likely to maintain this document at some point in the future. This might also be the case elsewhere e.g. bottom of page 5
- Page 5 line 9: '14C values', should this be '$\Delta^{14}CO_2$ values'?
- Page 5 line 26: rather, 'due to poor performance'
- 'Indeed, the mole fraction assigned by the CAL-FCL are given in extremely dry conditions as well as the target measured directly at the end of the calibration sequence in the field.' I think the following might be better if I understand correctly: 'Indeed, the mole fraction assigned by the CAL-FCL, as well as the target measured directly at the end of the calibration sequence in the field, are given in extremely dry conditions.'
- Page 8 line 27. Is there any reason 10 years is recommended? At least some reason to recommend this would be good
- Page 8 line 32: 'If the instrument has NOT..'?
- Page 9 line 27: Worth listing all the issue if not too long.
- Page 10 line 19: I couldn't quite make sense of '(15 times four cylinders and all cycles taken into account, here four).'
- Page 11: Spell our ECMWF and state model data comparison.
- Page 16/17. There are a lot of different dimensions/models of Nafion – is there any more detail as to what the 'polytube' Nafion is?
- Page 17 line 4: what needs to be 'well controlled'?
- Figure 4 – can you just mention what reason could be for white space (e.g. instrument doesn't measure something, or down for maintenance)?
- Figure captions 16, 17 and 18 refer to Figure 13. Is this correct? I don't think it makes sense. Please double check that all Table and Figure references are correct throughout.

Fantastic job. Thanks to the ICOS team for their continuing hard work!