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Energy

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Dear Reviewers, dear Associate Editors,

Please find attached our manuscript *"Shrinking together and pulling apart: insights from a gas grid with declining natural gas demand and increasing domestic renewable gas generation by 2040"*, which we would like to submit for publication in your journal *Energy*.

This manuscript deals comprehensively with how Austria's gas grid develops under different decarbonization scenarios of the Austrian and European energy systems, ranging from electrifying most energy services to importing large amounts of renewable methane? In the analysis, we start with a highly spatially resolved representation of the existing Austrian natural gas grid and determine the required gas grid in 2040 to enable gas transits (import and export), the supply of gas demands, and the integration of distributed domestic renewable gas generation. In contrast to most existing studies, our analysis considers both transmission gas pipelines and those of the high-pressure and mid-pressure grid levels. The novelties of our work concern different areas (e.g., a detailed case study demonstrating future developments of natural gas grids, a methodological extension of existing open-source gas grid modeling tools) and address, to the best of our knowledge, for the first time in peer-reviewed literature the aspect of gas grid costs and related end customers tariffs in decarbonized gas grids.

We want to highlight that the work has been carried out through a national project, allowing us a close exchange with relevant stakeholders, energy policy, and decision-makers. Given that, we think that our manuscript fits well with the targeted audience of *Energy's* journal as it provides crucial insights for national energy policy and energy planning to work on decarbonized gas grids and their sustainable transformation.

The manuscript is original; no part of this work has been published before nor is it under consideration for publication in another journal. The authors declare that there are no conflicts of interest regarding the publication of this paper. The paper has been professionally "spell checked" and "grammar checked".

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I am looking forward to your reply and thank you in advance for your consideration.

Yours sincerely,



Sebastian Zwickl-Bernhard