

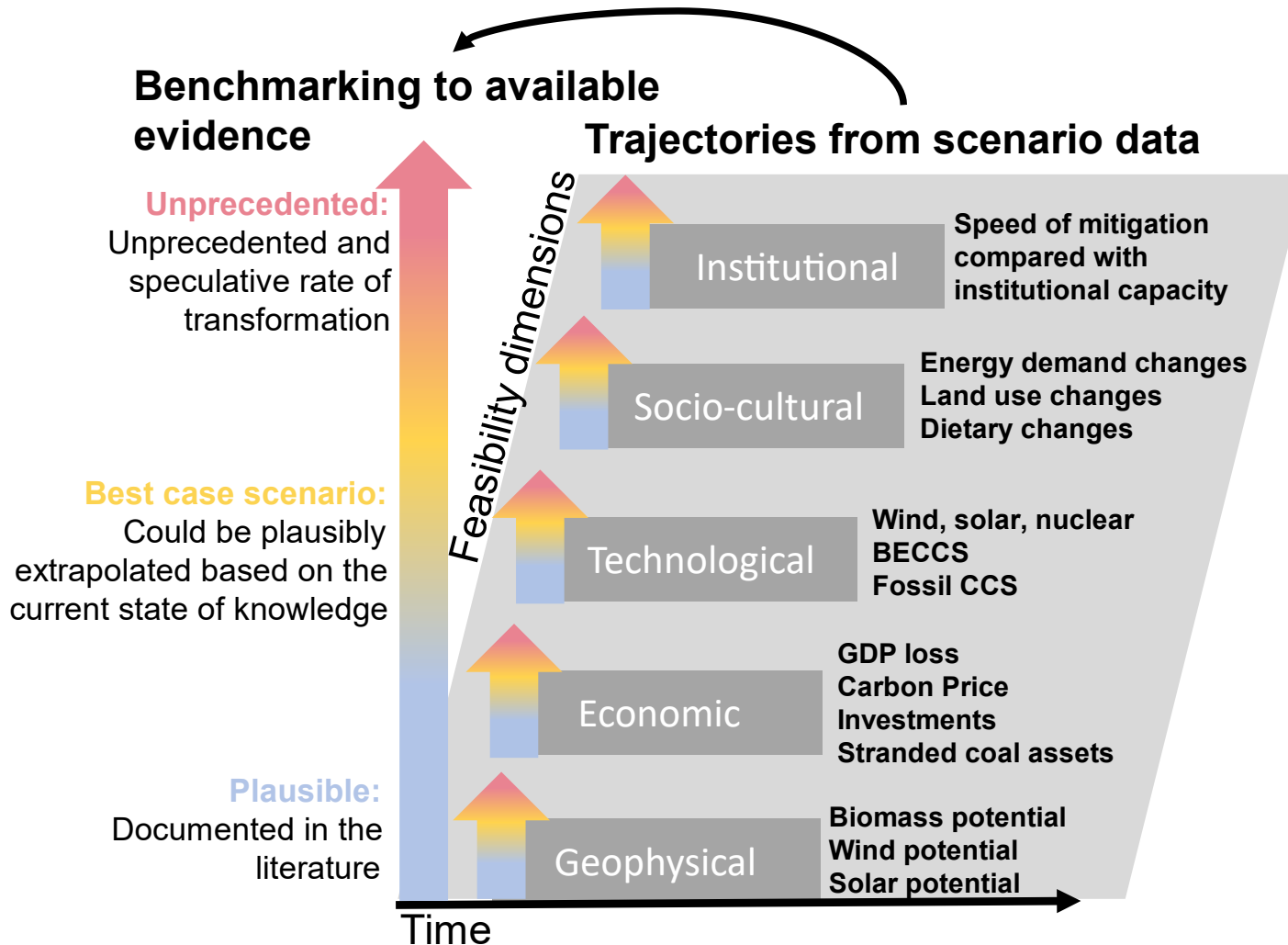
Feasibility of achieving ambitious climate goals?

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Silvia Pianta, Bas van Ruijven

*ENGAGE/NAVIGATE Final Event,
Brussels, 10 October 2023*

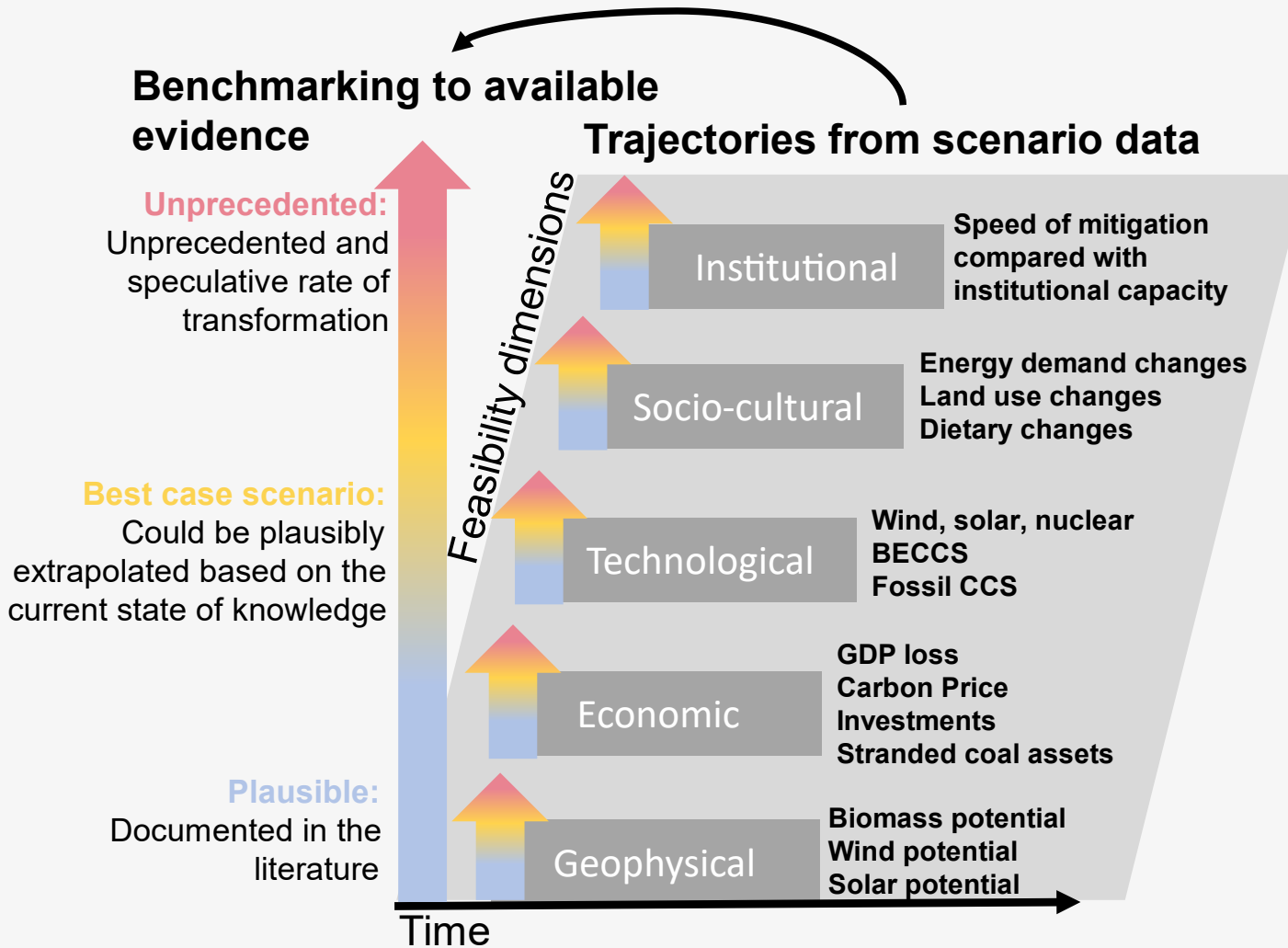
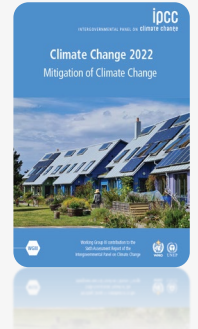


New framework for the evaluation of transition pathways

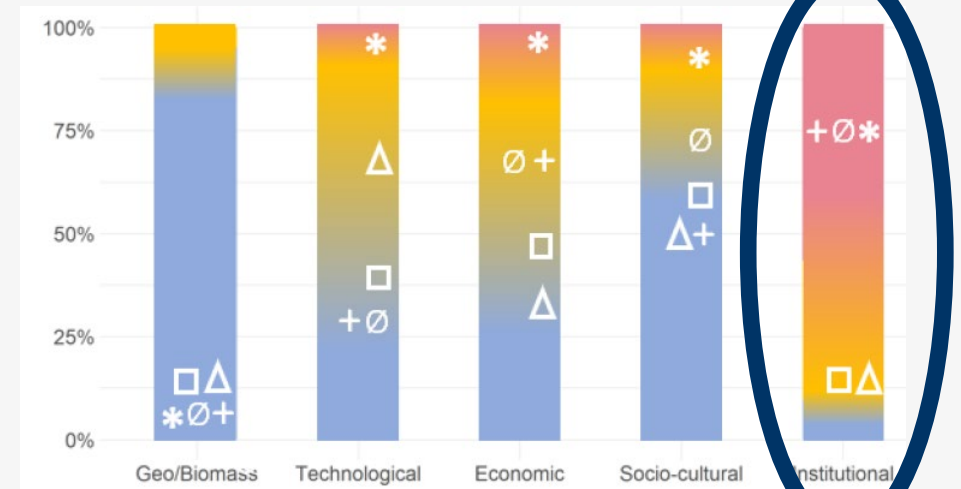


- ✓ Multidimensional framework for systematic scenario evaluation
- ✓ Brings together empirical assessment of transitions with natural science and systems engineering thinking
- ✓ Developed as part of ENGAGE
- ✓ Applied to more than 1000 IPCC scenarios

Key challenges comprise governance and institutional dimension in the developing world

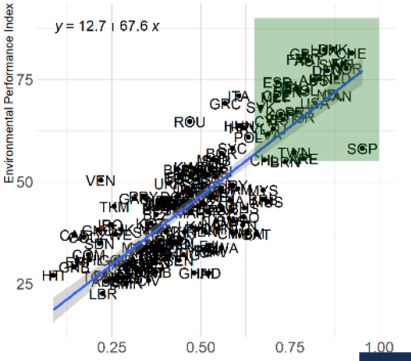


Feasibility evaluation of 1.5C and 2C pathways

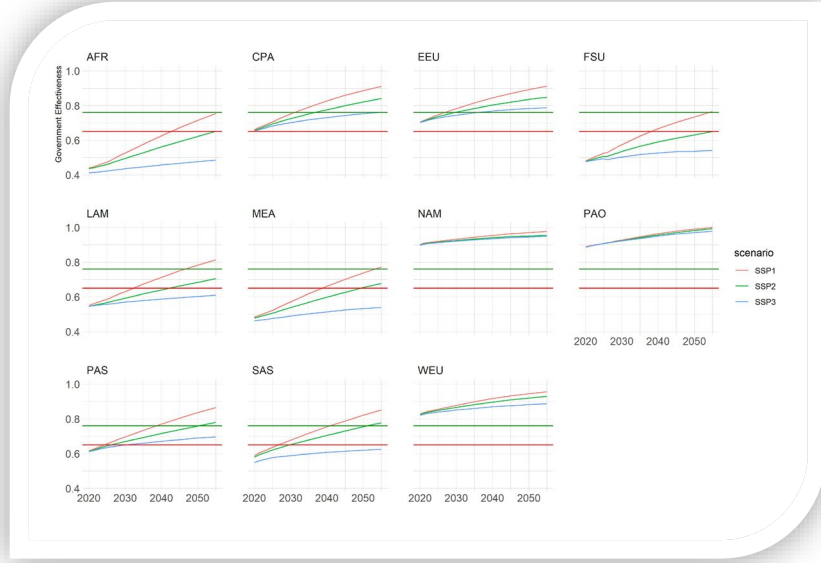


ENGAGE pioneering study incorporating governance and institutional factors into IAMs (Gidden et al, 2023)

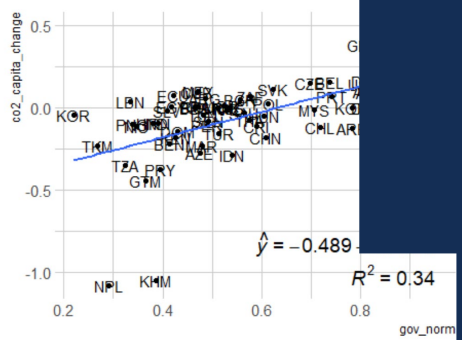
Government Effectiveness



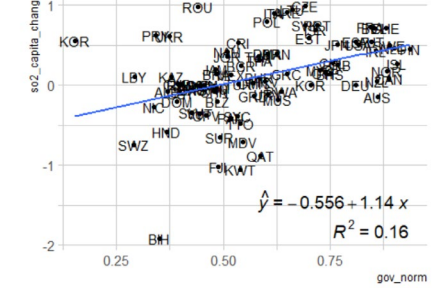
Governance projections along SSPs based on Andrijevic et al. (2020)



CO2 emissions



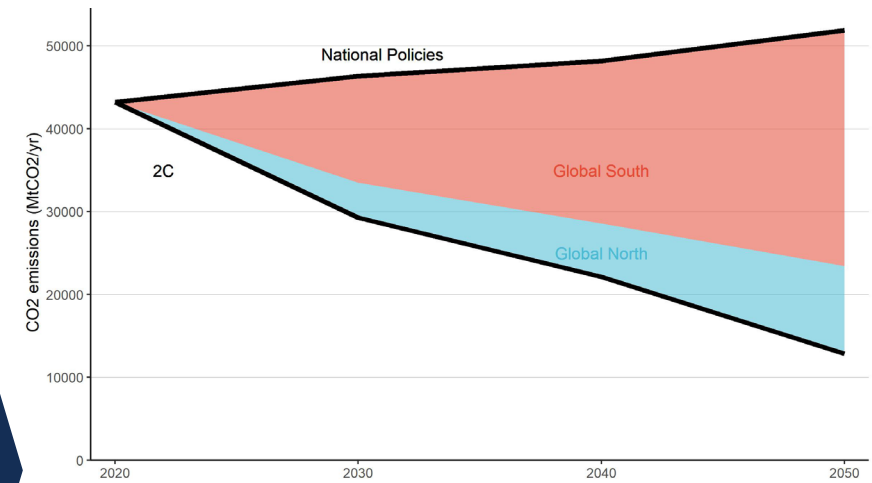
SO2 emissions



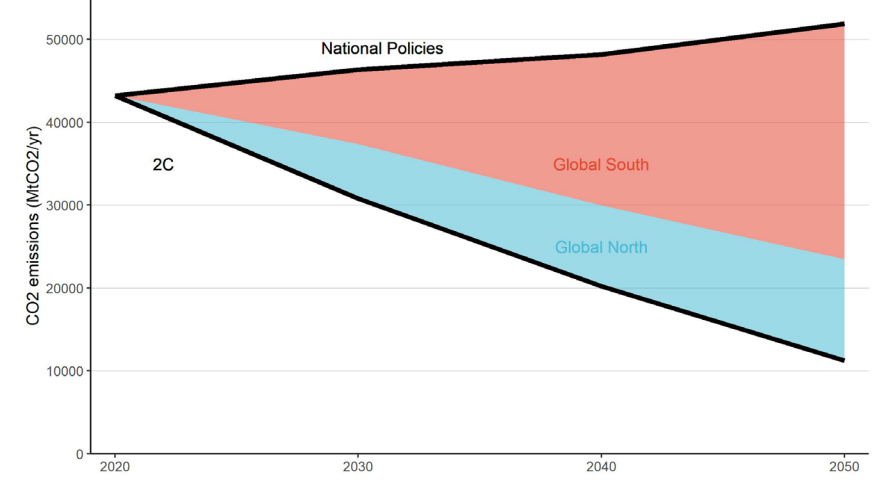
Model Formulation

Governance level	Upper bound on total CO2 emission reductions for a given decade
<0.65	20% (below red)
0.66-0.7	25%
0.71-0.75	40%
0.76	Unconstrained (above green)

Regional Emissions reductions (Gidden, Brutschin et al, 2023)



Global projected emissions reduction under climate mitigation - governance with shares of emissions reductions by region



FEASI-MIP – model comparison for systematic feasibility assessment of 1.5 and 2C warming goals

Feasibility concerns

- ⇒ Technology
- ⇒ Geophysical
- ⇒ Economic
- ⇒ Governance and Institutional



Enablers conditions

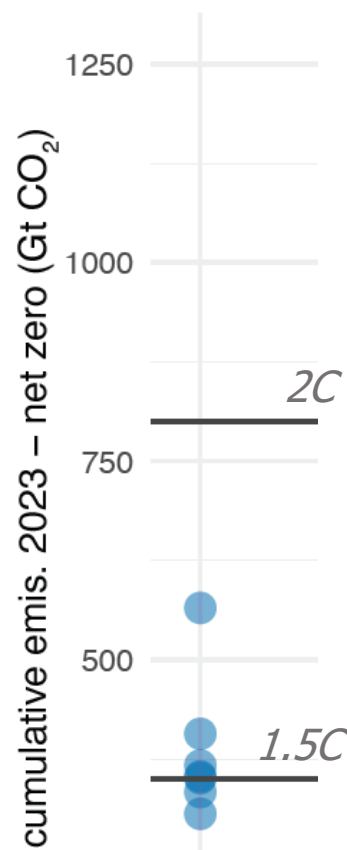
- ⇒ Demand reduction
- ⇒ Electrification



Multiple models (MESSAGE, GEMe3, IMAGE, REMIND, WITCH, POLES, AIM)

Impact of feasibility concerns on limiting the carbon budget (for 1.5°C and 2°C)

- Cost-effective mitigation potential is large and would in theory permit limiting warming to below 1.5C (consistent with IPCC)
- Taking into account feasibility concerns reduces the chances to limit warming to 1.5C considerably
- Enablers (demand and electrification) increases 1.5C chances (~consistent with well below 2C)

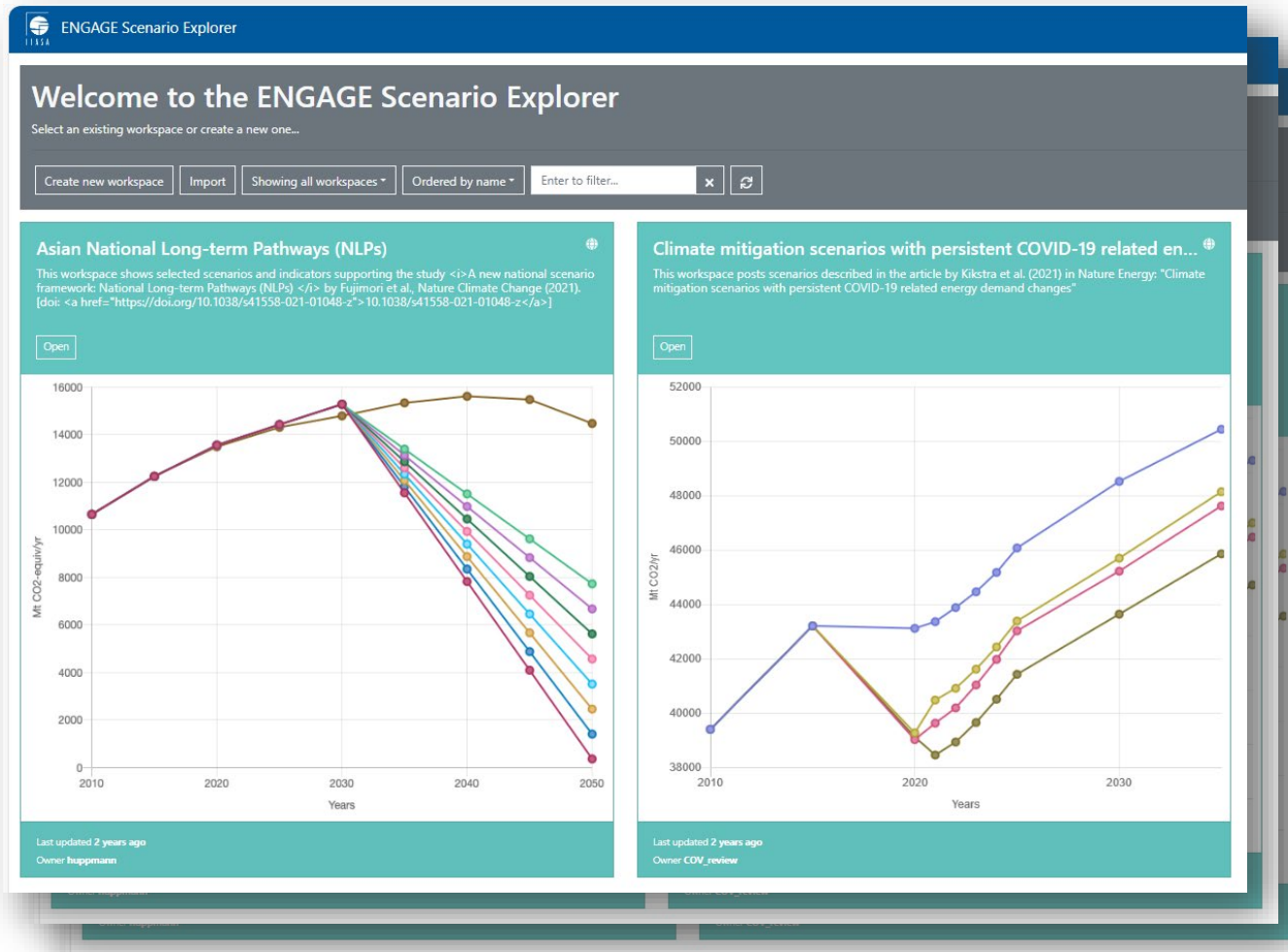


Cost effective



IAMs in the lead on transparency

visit the ENGAGE, NAVIGATE and IPCC explorers



- ✓ IAM community is spearheading the transparency and openness of data efforts
- ✓ MoU with the IPCC
- ✓ ENGAGE, NAVIGATE, IPCC Explorer
- ✓ Majority of IPCC scenarios are from models that are fully open access
- ✓ IAM Chapter in IPCC AR6 (Chp 3) has become the transparency champion
- ✓ IAM community supports other communities with logistics, software and coordination to establish open tools and interactive databases (national, and sectoral - buildings, transport databases of AR6)

<https://data.ene.iiasa.ac.at/engage/#/workspaces>

Thank you very much for your attention!

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ENGAGE SPM



Feasible Futures

www.engage_climate.org



[@ENGAGE_Climate](https://twitter.com/ENGAGE_Climate)

For more information, you can also contact: engage.secretariat@iiasa.ac.at



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