Energy scenarios

clean cooking access may stall under slow post-pandemic recovery and ambitious climate mitigation without explicit focus

(100 characters including spaces)

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August 2021

Without additional support policies, clean cooking could become unaffordable for about 470 million people by 2030 if a post-pandemic recovery is slow, and about 200 million people by 2030 under ambitious climate mitigation action. Acceleration of clean cooking transitions by tapping into pandemic recovery and climate funds to target the poorest people and regions globally is urgently needed.

The policy problem (120-150 words)

At the current rate, the SDG7 target of universal access to clean cooking services by 2030 is unachievable and may remain unattainable for some countries even by 2050. This can also hinder progress on other SDGs including those on health, gender, inequality, climate, and land. Financial strain following the COVID-19 pandemic is pushing people further down the energy ladder and deepening inequities. Emerging evidence also suggests that exposure to household air pollution from dirty cooking can exacerbate public health issues. Understanding how access to clean cooking may change under alternative future scenarios is important to inform strategies for achieving health and climate goals. While there are several climate mitigation scenarios in literature, it is not clear how the world might develop in the absence of climate policy and how climate change mitigation might interact with clean cooking access goals. As a result, decision makers don't have clear guidance on integrated climate mitigation, development, and clean cooking access policy.

The findings (120-150 words)

We explore clean cooking access until 2050 under alternative future scenarios of socioeconomic and demographic change, COVID-19 recovery, and ambitious climate mitigation. We find the population share with access to clean cooking improves in all scenarios relative to today, but the target of universal access by 2030 is not reached even in our most optimistic growth and low inequality scenario. About 470 million more people could be pushed into cooking fuel poverty by 2030, exacerbating global inequities, in a slow pandemic recovery scenario that accounts for 2020 and 2021 GDP estimates and assumes a twenty-year recovery period relative to a pessimistic growth scenario that assumes no pandemic shock. We find populations in sub-Saharan Africa, developing Asia and Latin America are the worst affected. Cooking poverty strongly correlates with income poverty, particularly in sub-Saharan Africa. Ambitious climate mitigation, without additional policies and financial support, could also make clean cooking unaffordable for about 200 million people by 2030. A transition to clean cooking can reduce future demand for cooking energy, specifically in regions with heavy biomass reliance currently.

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The study (120-150 words)

We apply existing models of household cooking choice and demand to assess future transitions worldwide. We account for multiple fuel use (fuel stacking), population heterogeneity, inter and intra-regional income distributions, and affordability of clean cooking options. In the models, we use data from nationally representative household surveys of select countries for global coverage. We then simulate behavior, preferences and choices of individual households representing entire distributions of household characteristics and income into the future, by region, to analyze access to clean cooking, and subsequent changes in final cooking energy demand until 2050 under alternative scenarios. We assess how cooking fuel transitions vary by income and urban or rural location across scenarios. We also identify populations most vulnerable to falling into cooking poverty following a slow pandemic recovery or fuel price changes under ambitious climate mitigation policy.

Messages for Policy (4-5 bullets, each less than 200 characters including spaces)

- The world is off track with SDG7. A slow pandemic recovery and ambitious climate mitigation may slowdown efforts to extend clean cooking access and make universal access by 2030 more challenging.
- Populations in sub-Saharan Africa, developing Asia and Latin America (the regions with the biggest access gaps today) are most vulnerable to being unable to transition to clean cooking in the future.
- There is an urgent need to prioritize commitments, investments and coordinated policies to make clean cooking more accessible and affordable in the poorest regions and for the poorest populations.
- Transitioning away from solid biomass cooking can reduce growth in future cooking energy demand, with subsequent air quality, climate, and health benefits.
- Pledges to COVID-19 recovery funds, international climate finance, and the value of losses suffered by those lacking access, all dwarf estimates of universal clean cooking access investment needs.

Source research

Pachauri, S., Poblete-Cazenave, M., Aktas, A. Gidden M. Access to clean cooking services in energy and emission scenarios after COVID-19. Nat Energy (2021). https://doi.org/

Further Reading

Energy Sector Management Assistance Program (ESMAP). *The State of Access to Modern Energy Cooking Services*. (2020). http://documents.worldbank.org/curated/en/937141600195758792/The-State-of-Access-to-Modern-Energy-Cooking-Services **A global assessment of recent progress, the current state of access to clean cooking services, and valuation of losses suffered by those lacking access.**

Dagnachew, A. G., Hof, A. F., Lucas, P. L. & van Vuuren, D. P. Scenario analysis for promoting clean cooking in Sub-Saharan Africa: Costs and benefits. *Energy* **192**, 562 116641. (2020). https://doi.org/10.1016/j.energy.2019.116641 **Scenario analysis of clean cooking transitions in sub-Saharan Africa with a quantification of potential costs and benefits.**

Bensch, G., Jeuland, M., Peters, P. Efficient biomass cooking in Africa for climate change mitigation and development. *One Earth*, **4** (6), (2021) https://doi.org/10.1016/j.oneear.2021.05.015 **Potential of fuel-efficient biomass stoves in contributing to clean cooking and climate mitigation in sub-Saharan Africa.**

Cameron C., Pachauri S., Rao N.D., et al. Policy trade-offs between climate mitigation and clean cook-stove access in South Asia. *Nat. Energy* **1**, 15010 (2016). https://doi.org/10.1038/nenergy.2015.10 **Assessment for South Asia of the distributional implications of ambitious climate mitigation policy for clean cooking access in the region**.

Das I, Lewis JJ, Ludolph R, Bertram M, Adair-Rohani H, Jeuland M. The benefits of action to reduce household air pollution (BAR-HAP) model: A new decision support tool. *PLoS ONE* **16**(1): e0245729. (2021)

https://doi.org/10.1371/journal.pone.0245729 **A new decision-support model aimed at guiding planning of policy interventions to accelerate transitions towards cleaner cooking fuels and technologies accounting for a wide range of costs and benefits**.

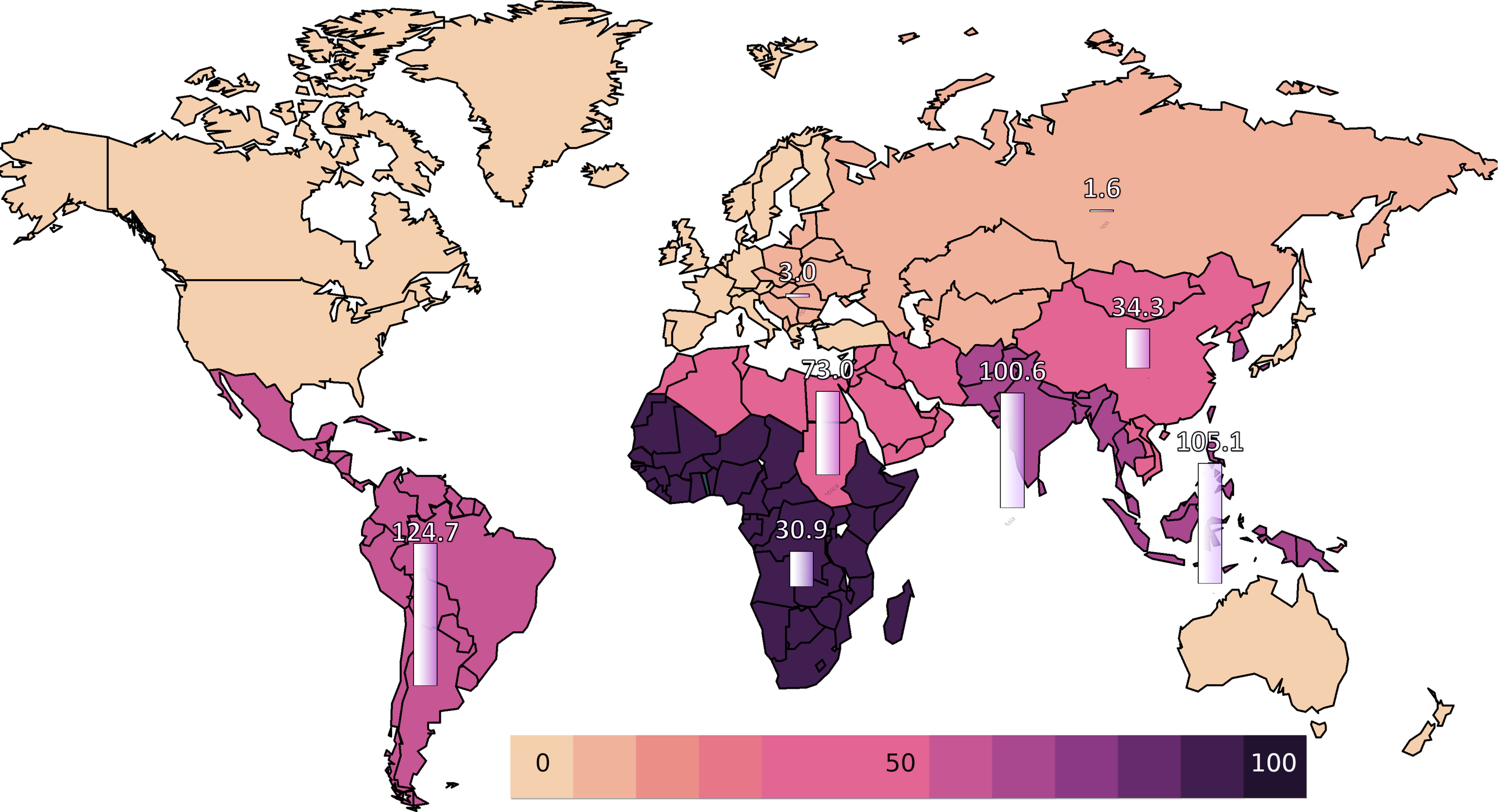
Figure Caption: Percentage of cooking poor populations by model regions under the Shared Socioeconomic Pathway 3 (SSP3), a pessimistic reference growth scenario, with bars depicting additional cooking poor in millions under the slow COVID-19 pandemic recovery (COVID) scenario relative to SSP3. Regions depicted are Sub-Saharan Africa (AFR), South Asia (SAS), Middle East and North Africa (MEA), Latin America and the Caribbean (LAM), Other Pacific Asia (PAS), Centrally Planned Asia and China (CPA), Former Soviet Union (FSU), North America (NAM), Central and Eastern Europe (EEU), and Western Europe (WEU).

Acknowledgments

M.P.-C. received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 821124 (NAVIGATE). This work was partially funded by the contributions of the National Member Organizations of IIASA.

Competing interests

The authors declare no competing interests.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34.3
73.0
100.6
105.1
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30.9
0
50
100