



**Advanced Model Development and Validation for the  
Improved Analysis of Costs and Impacts of Mitigation Policies**

# Climate Policy and Sustainable Development

Keywan Riahi (IIASA and TU Graz), Narasimha Rao (IIASA), Gunner Luderer (PIK), Shonali Pachauri (IIASA), Oliver Fricko (IIASA), Volker Krey (IIASA)

**ADVANCE Final Conference**  
Brussels, 24 October 2016



This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 308329.



# SUSTAINABLE DEVELOPMENT GOALS



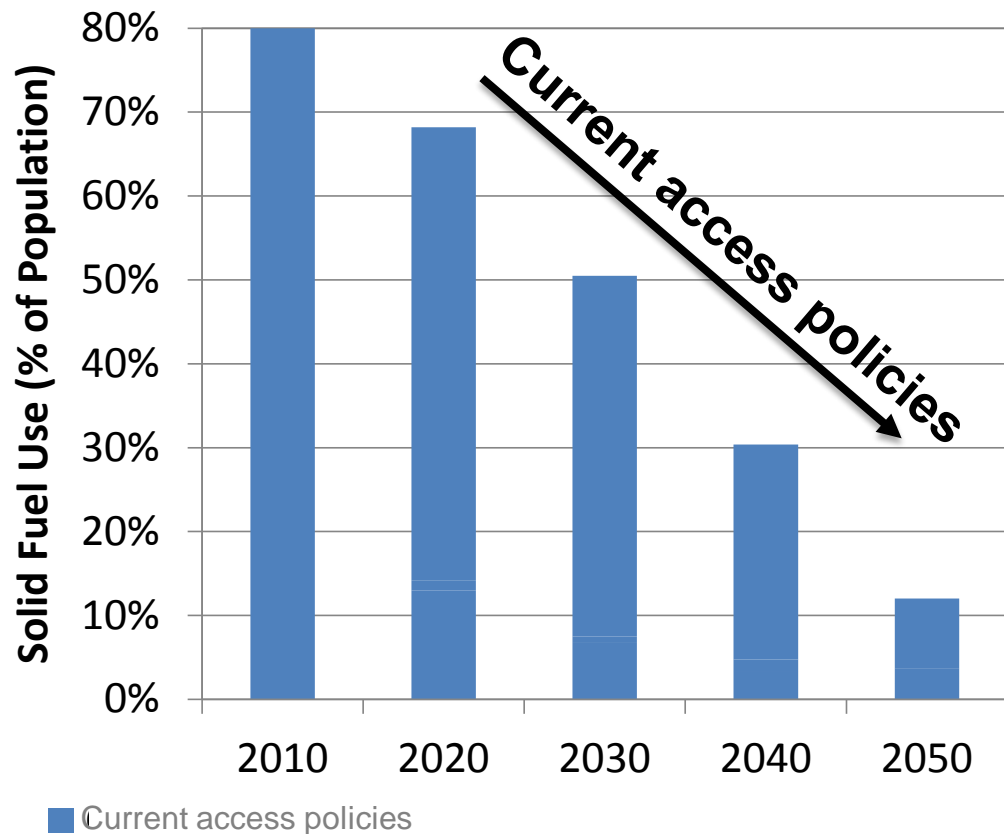


# SUSTAINABLE DEVELOPMENT GOALS



# Most developing countries have an ambitious agenda to reach energy poverty goal

## South Asia

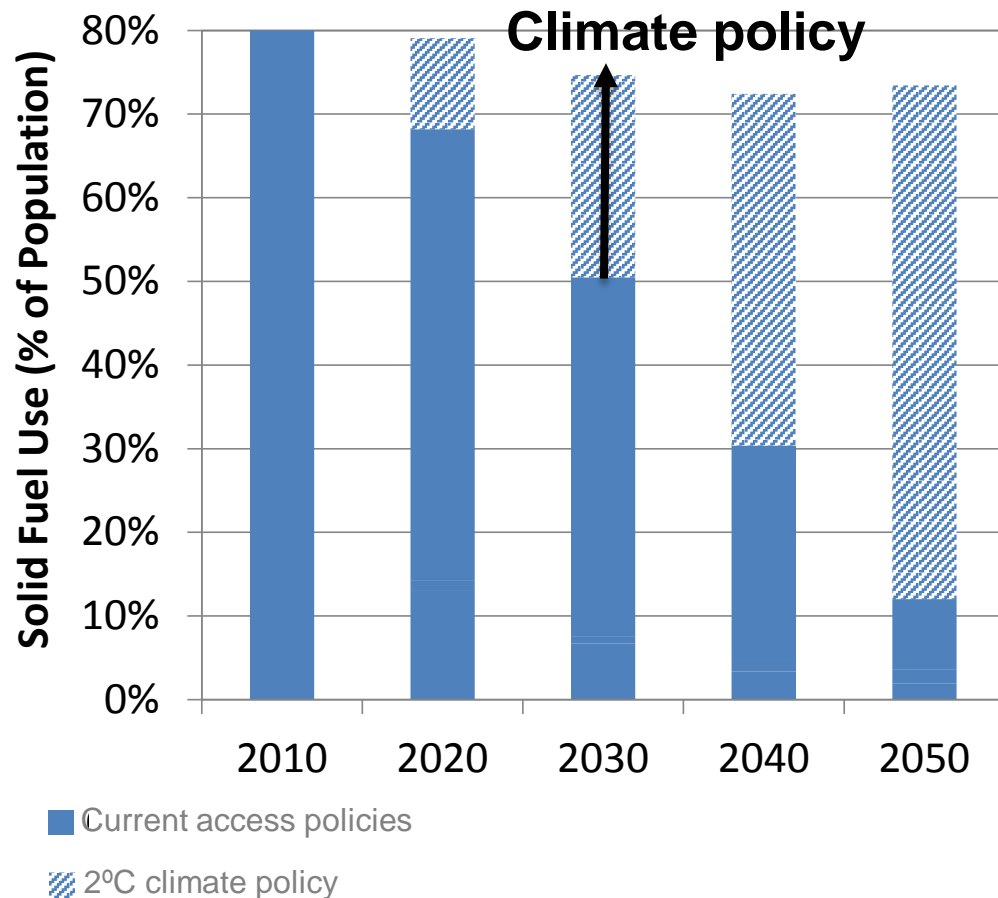


- More than 1 billion people are today without access to clean cooking in South Asia (SA)
- ~1.2 million premature deaths in 2015
- Current policies will lead to significant improvements for clean cooking access
- Today's financing (3.5 billion \$/year) is NOT sufficient to achieve universal clean cooking by 2030



# “Single-minded climate policy” may lead to significant trade-offs for energy access in South Asia

South Asia



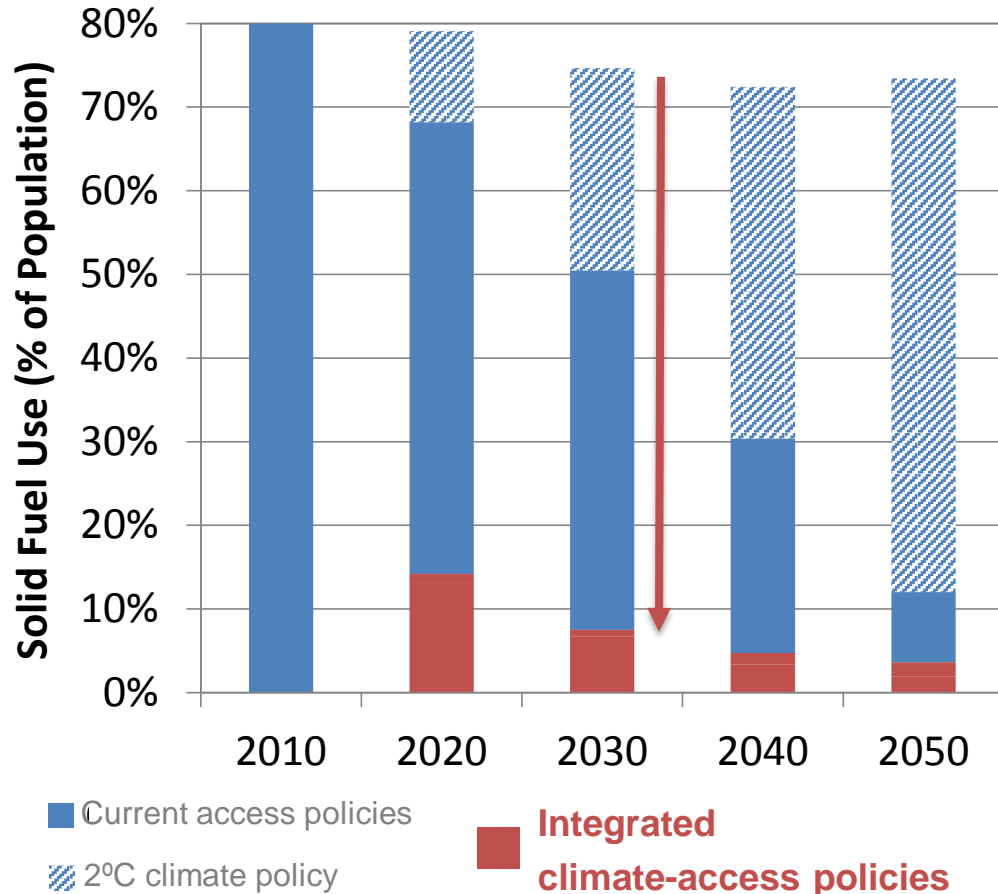
- Adverse side-effect of “single minded” climate policy may lead to **0.5 million additional premature deaths** in 2030 and increase further to mid century



Cameron et al., 2016, Nature Energy

# Integrated climate-access policies may save >1.5 million lives each year to 2030

South Asia

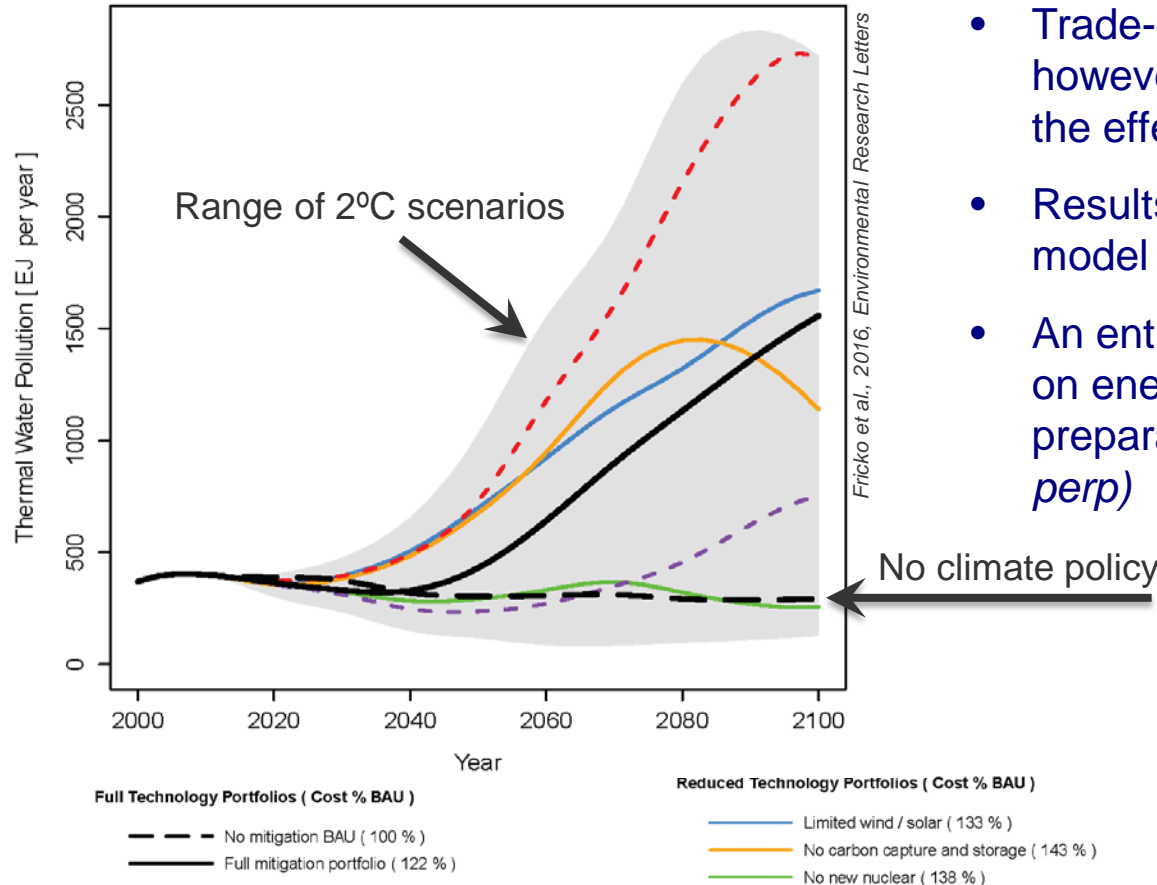


- Climate policy design with complementary measures need to shield the poor
- Increase of costs for reaching energy access objectives of about 45% - compensation necessary by either redistribution of carbon revenues or shielding the poor
- Major health benefits in the order of **1.5 mill. saved lives each year to 2030**
- Fossil-fuel subsidy need to be seen in a completely new light (→ **J. Jewell in the afternoon**)



Cameron et al., 2016, Nature Energy

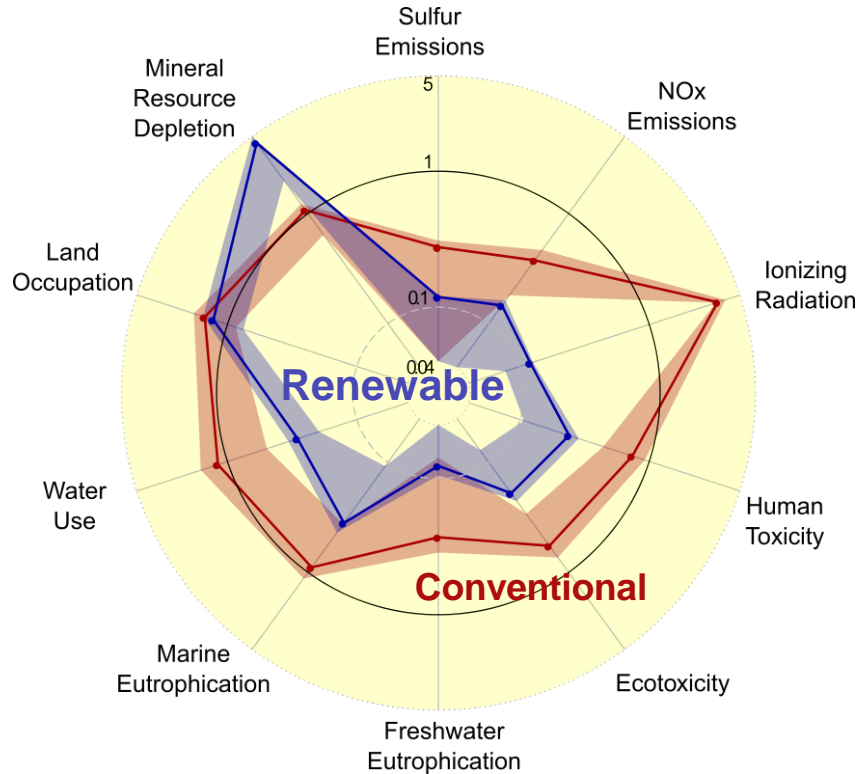
# Some unexpected trade-offs: Impacts of climate change mitigation policy on thermal water pollution (energy-related)



- Trade-offs may be significant, however, adaptation can reduce the effect.
- Results from the IIASA-MESSAGE model
- An entire inter-model comparison on energy-water nexus under preparation (*Mouratiadou et al., in prep*)



# Major co-benefits of wind and solar across multiple indicators



- Assessment of environmental footprints based on novel LCA-IAM approaches
- Multiple benefits of rapid renewable deployment (solar PV, wind)
- RE Trade-offs primarily with respect to mineral demand (however, little knowledge about scarcity of resources)





**Thank you!**

This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 308329