



U.S. DEPARTMENT OF
ENERGY

Office of
Science



Pacific Northwest
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Land use perspectives on climate mitigation

Kate Calvin

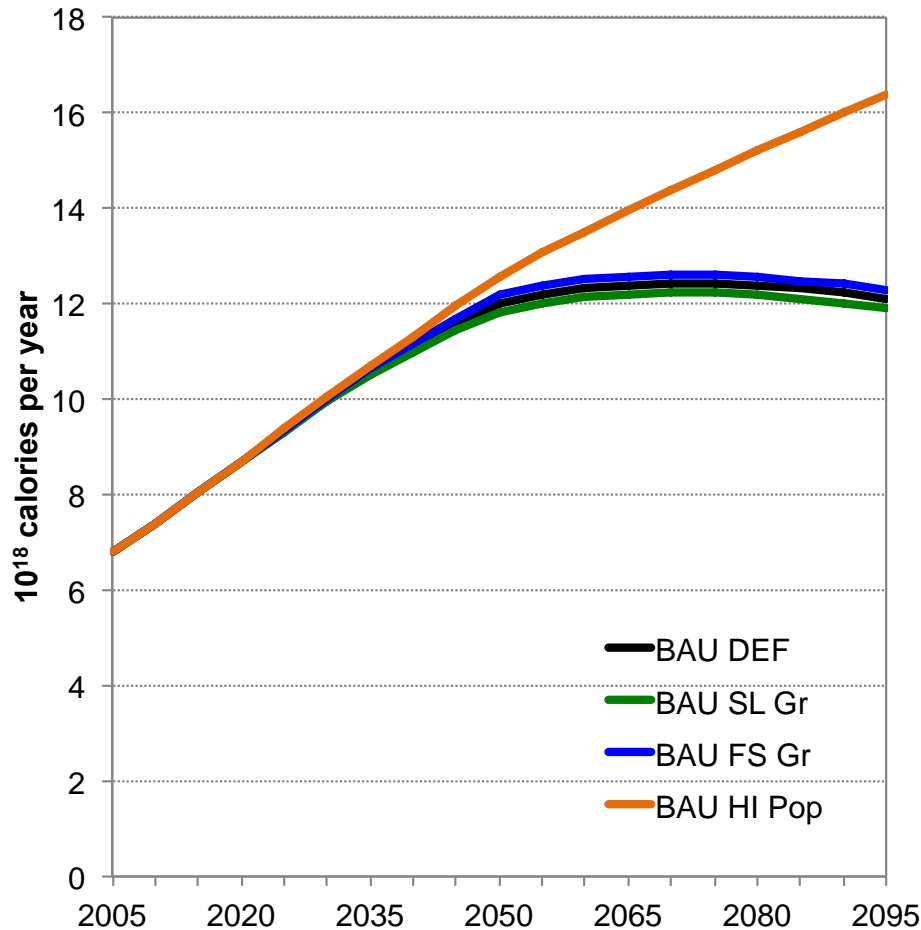
UNFCCC SB38 Bonn Side Event

Bonn, Germany

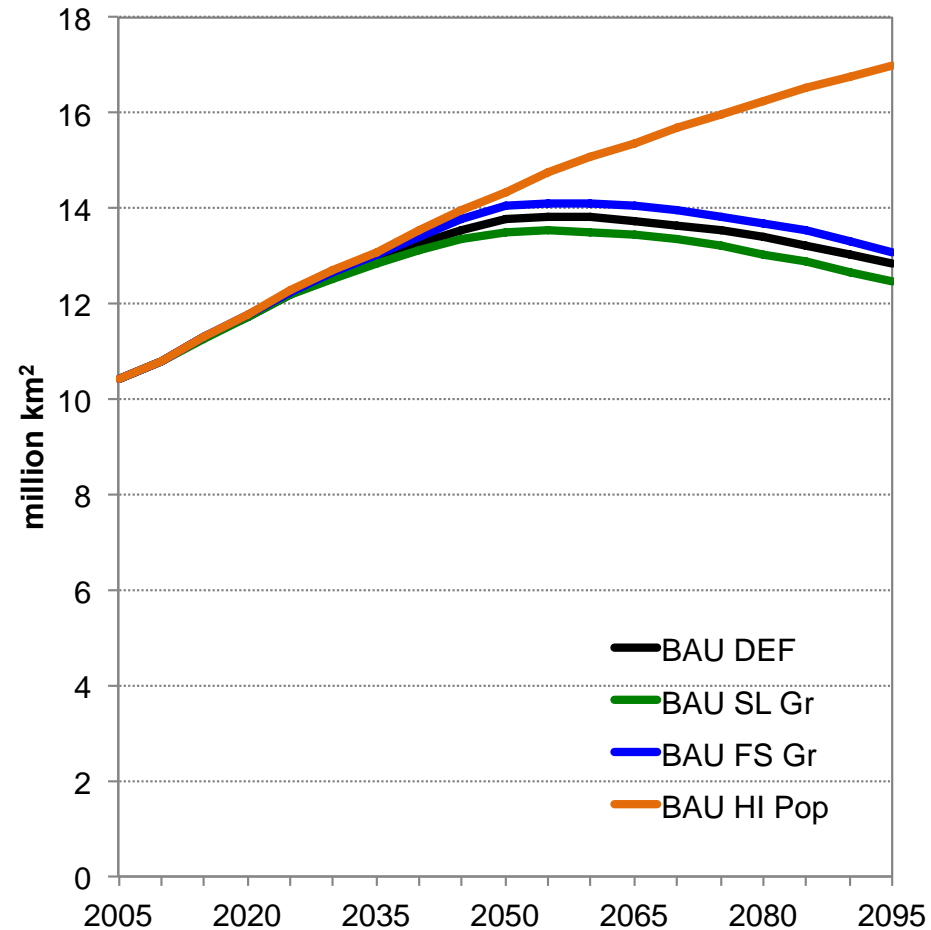
June 13, 2013

Population and GDP per Capita Strongly Influence Food Production and Cropland

Total Food Production



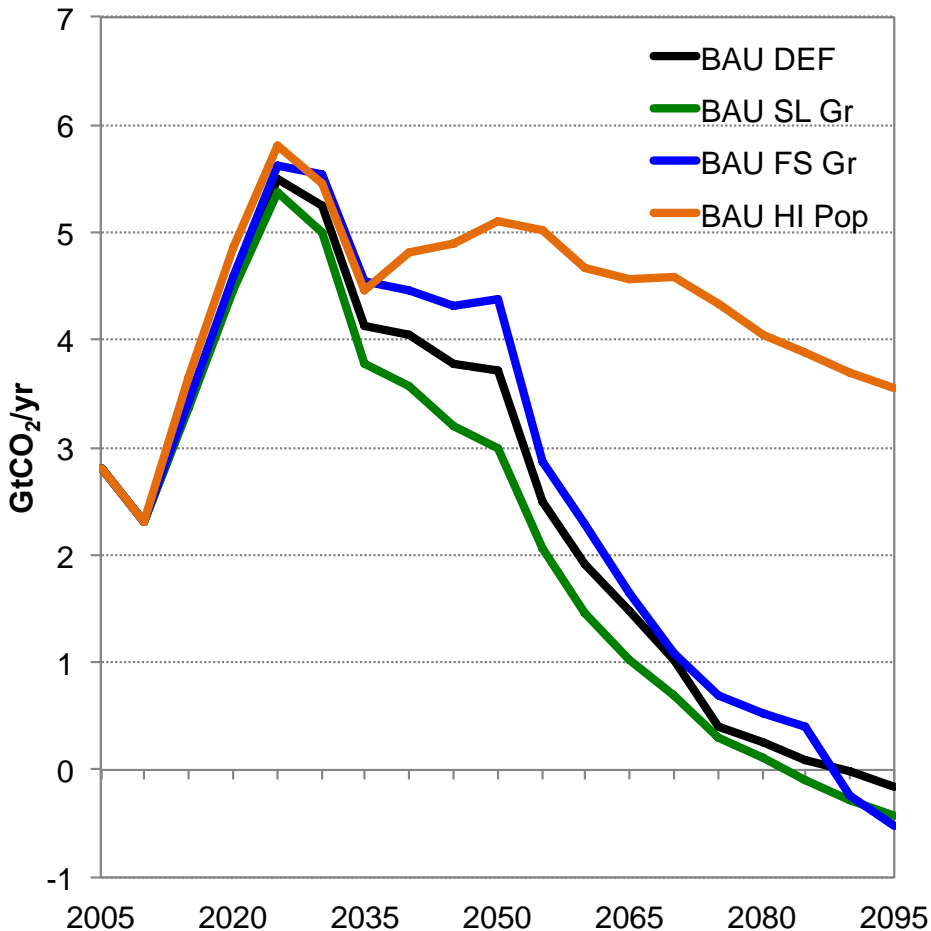
Cropland Area



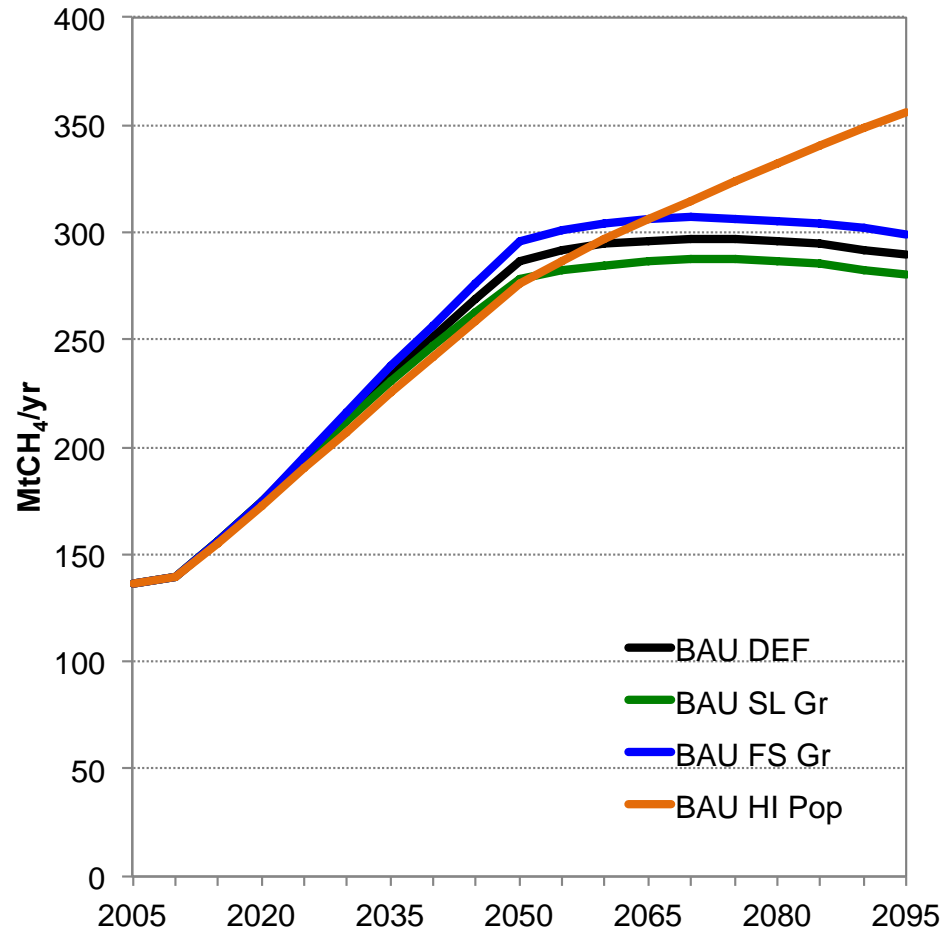
- Wealthier people eat more meat, which requires more land than other food sources.
- Larger populations require more total food production, requiring more cropland.

Differences in Food Production have Implications for Land-Related Emissions

LUC CO₂ Emissions

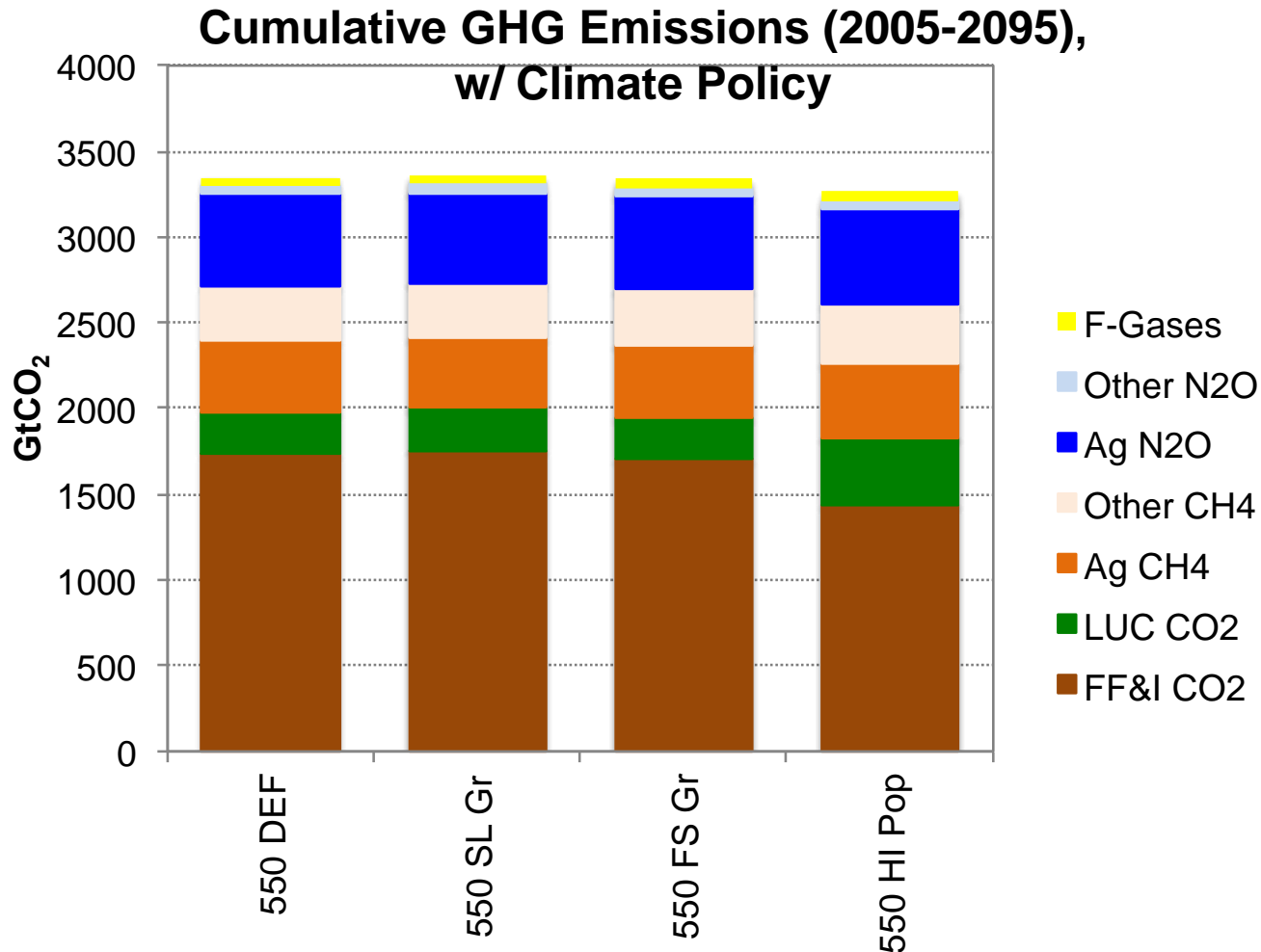


Agricultural CH₄ Emissions



- Scenarios with more cropland have higher LUC CO₂ emissions.
- Scenarios with more meat have higher Agricultural CH₄ emissions.

Increases in Land-Related Emissions are not Easy to Mitigate, Forcing Mitigation to Other Sectors



- The HI Pop scenario has higher Ag CH₄ and LUC CO₂ emissions than other scenarios. More mitigation is required by the energy system to meet climate targets.

▶ Socioeconomics and Land Use:

- Wealthier populations demand more meat and larger populations require more food production, both of which result in increased cropland extent.
- More meat results in higher agricultural CH₄ emissions; more cropland results in higher LUC CO₂ emissions.
- These increases in emissions force more mitigation onto the energy system.



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Thank you!