

# Regionalized modeling of CO<sub>2</sub> removal pathways in the USA and China

CAS- Climate: SRS-- U.S.-China: A Comparative Analysis of the Regional Dynamics Influencing Decarbonization Pathways –  
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# Social context

- **Regional differences matter!**
- In many (most?) countries, localities have considerable say over local activities (federalism: de facto and de jure)
- Localities get little gain from action on global problems
- Since resources are mobile, local actions on global problems are constrained
  
- [Feasibility] If localities perceive limited gains, they will not support climate action
- [Fairness] Climate policies will affect different local economies very differently

# Social impact

- Better understanding of how (and why) localities respond to climate policies
- Modeling sub-national region incentives for policies that diverge from least-cost abatement pathways
- Better models of net economic burdens facilitate burden sharing that encourages cooperation among localities, across governance layers
- Decarbonization studied alongside other regional priorities such as economic development, social equity, sustainable resource use, and regional environmental quality

# Convergence Research Approach

Two approaches to modeling regional effects:

Global IAMs (we use GCAM) ← reduced form, partial eqm

Computable General Eqm (CGE) models ← structural, behavioral

IAMs have advantages in:

Industry detail (bottom up), accounting for resource stocks

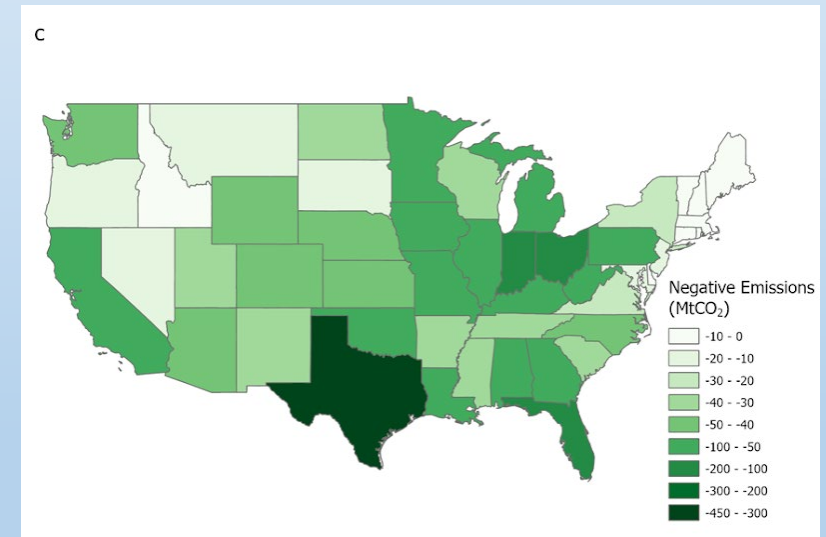
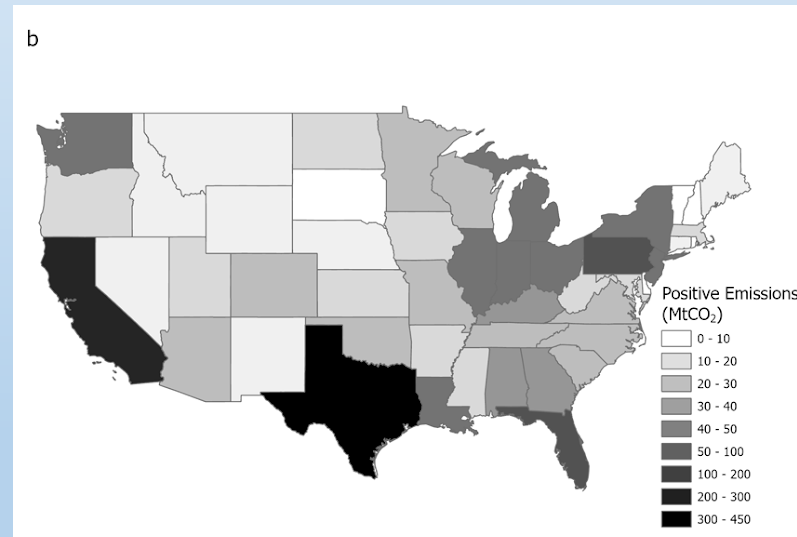
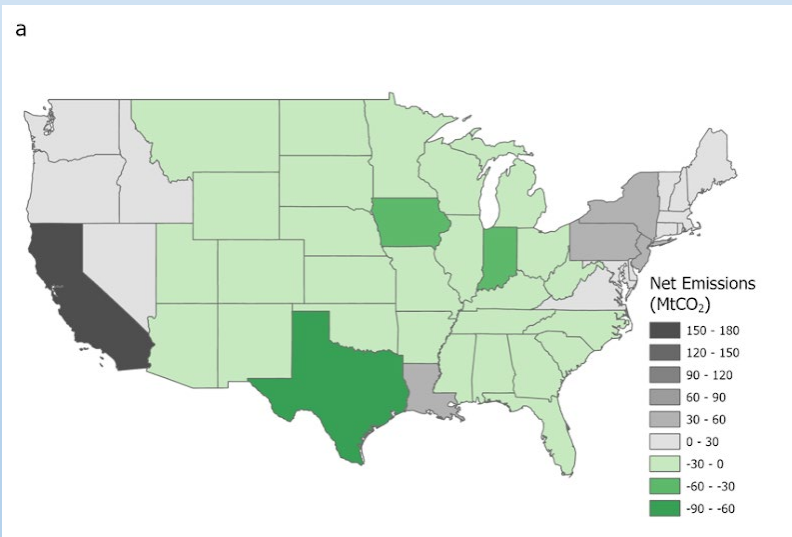
CGE advantages:

Social accounting (value-added sectors), net econ effects by group  
(say urban versus rural communities)

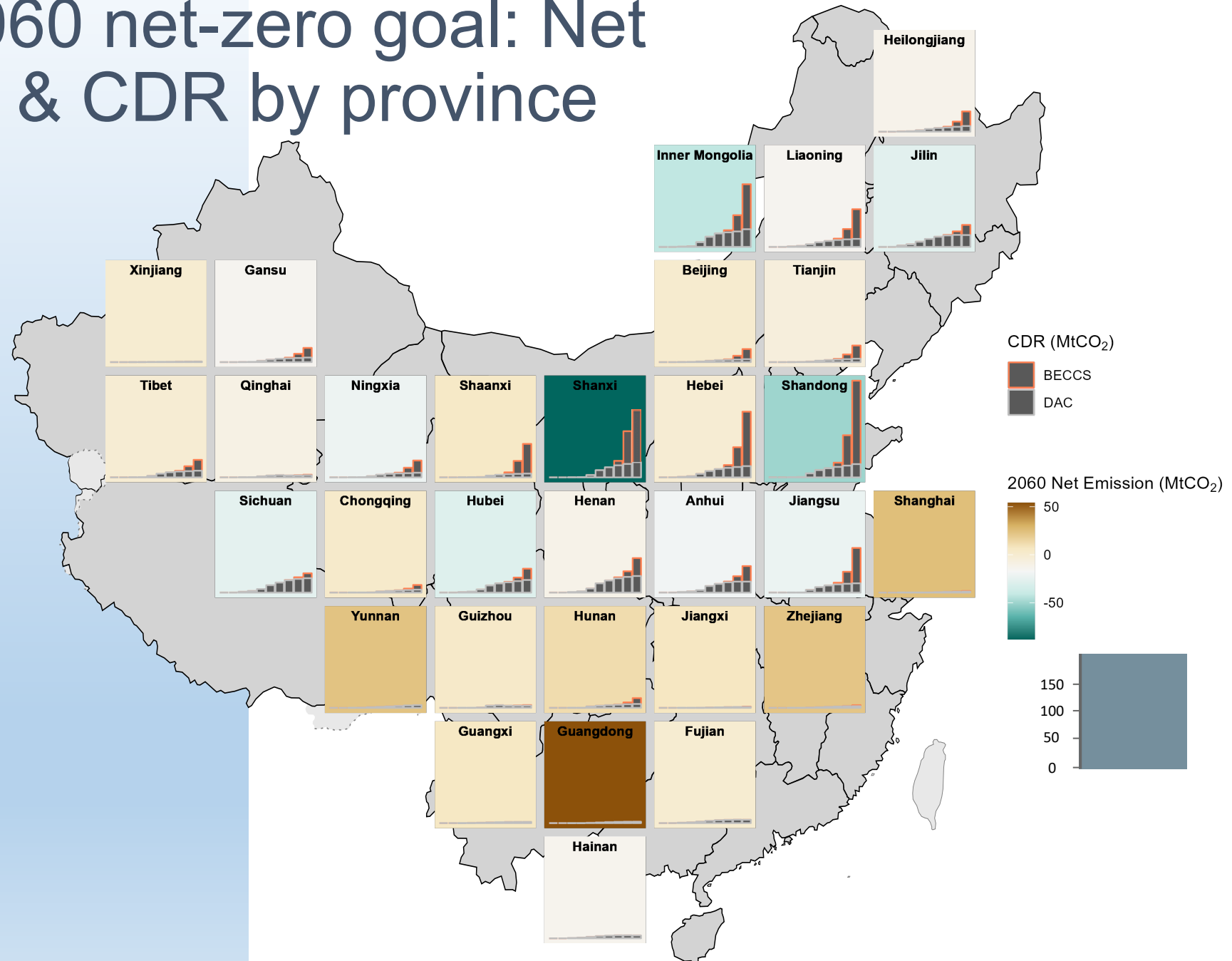
**(soft) Linking these can combine advantages**

# State-by-state 2050 emissions: national net-zero CO<sub>2</sub> emissions scenario

Net (a), gross positive (b), and gross negative (c). NETs include BECCS, DACCS, and land-use change.



# China's 2060 net-zero goal: Net Emissions & CDR by province



**Thank you**

**All comments welcome!**

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