

GLOBAL POWER SECTOR TRANSFORMATION

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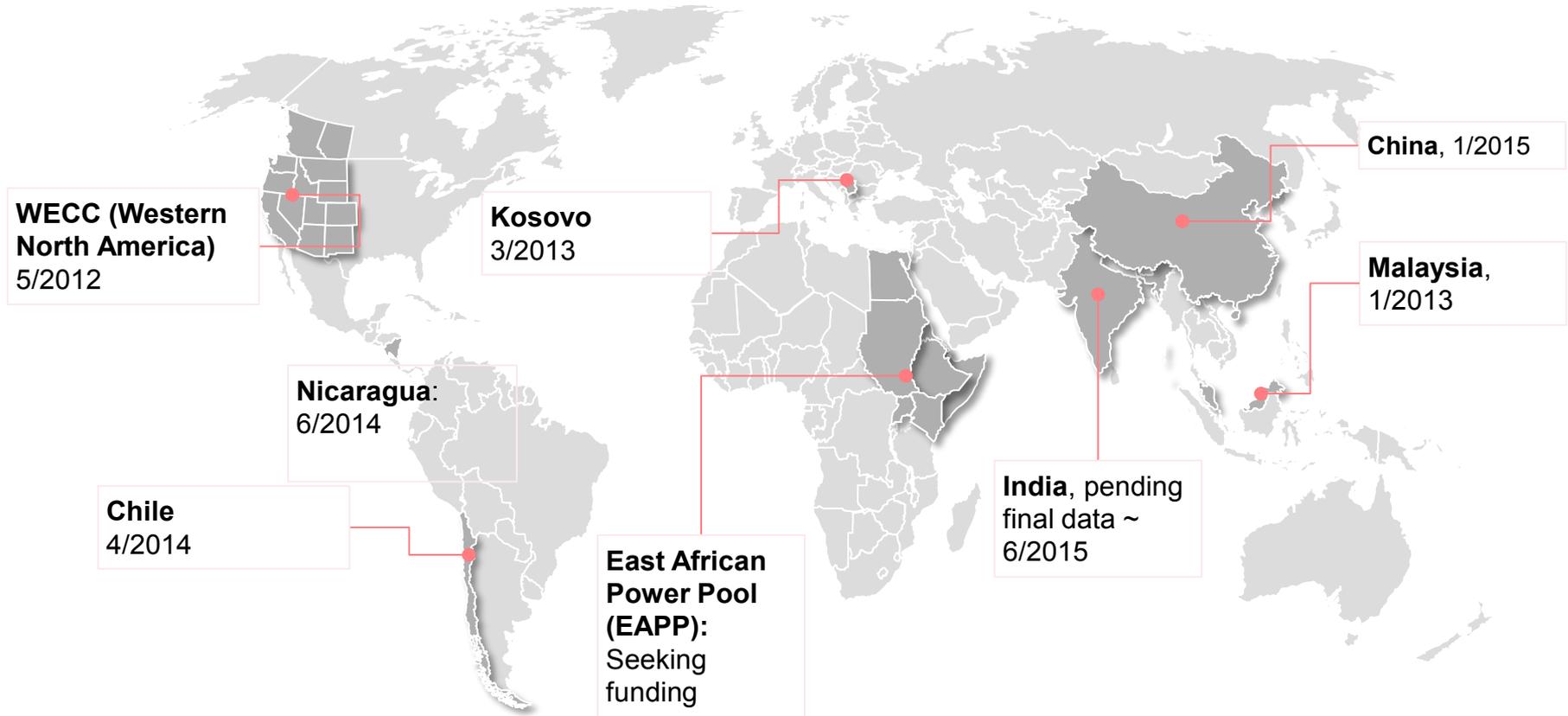
ENERGY AND RESOURCES GROUP &

**RENEWABLE AND APPROPRIATE ENERGY
LABORATORY (RAEL)**

UNIVERSITY OF CALIFORNIA-BERKELEY

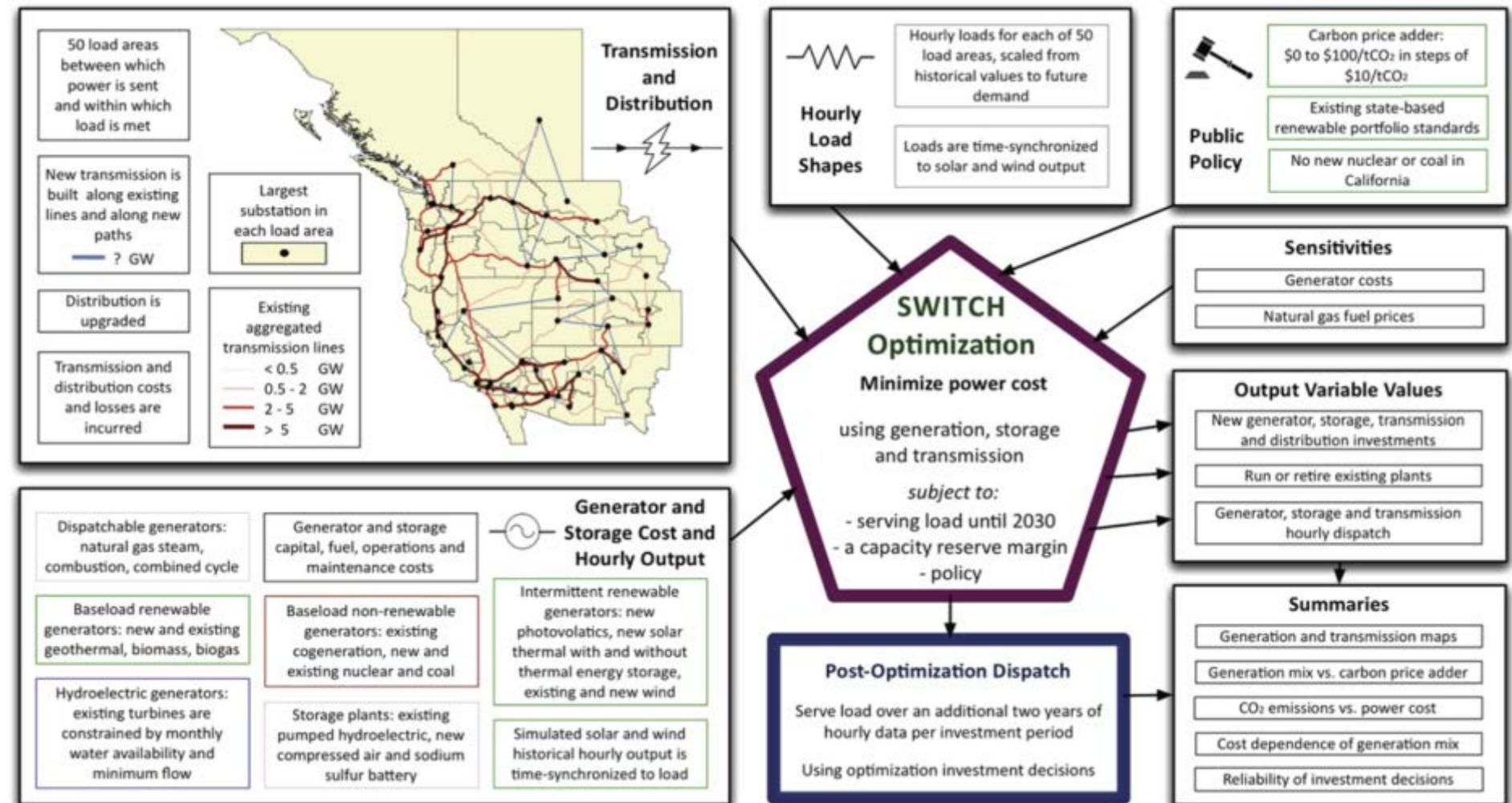
1. NEED FOR OPEN SOURCE MODELS, AND MODEL INTERCOMPARISON

Energy System Modeling Efforts in the Renewable and Appropriate Energy Laboratory, UC Berkeley



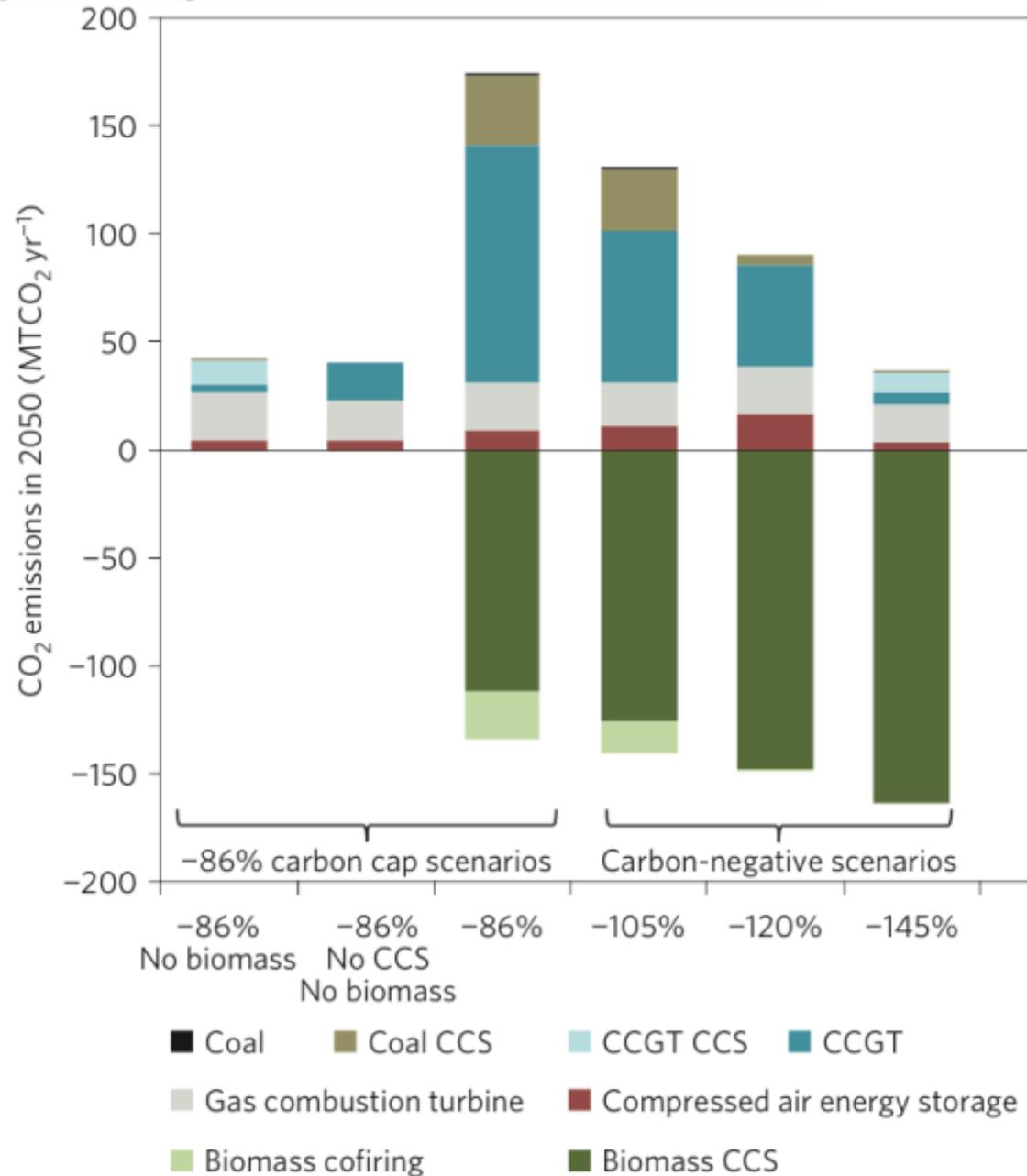
<http://rael.berkeley.edu/switch>

High-resolution modeling of the western North American power system demonstrates low-cost and low-carbon futures

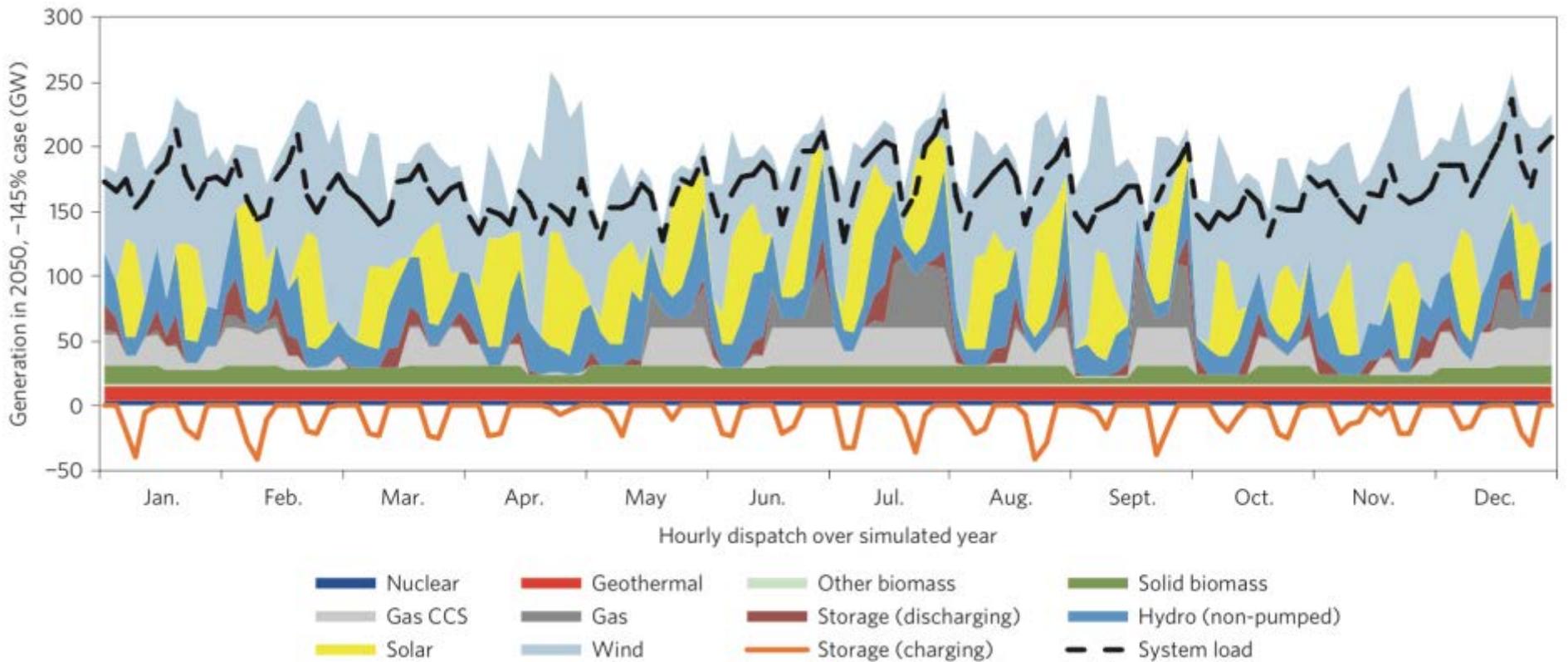


**2. “DEEP
DECARBONIZATION”
STRETCHES THE
BOUNDARIES OF BOTH
MODELS AND THE
IMAGINATION**

Biomass enables the transition to a carbon-negative power system across western North America

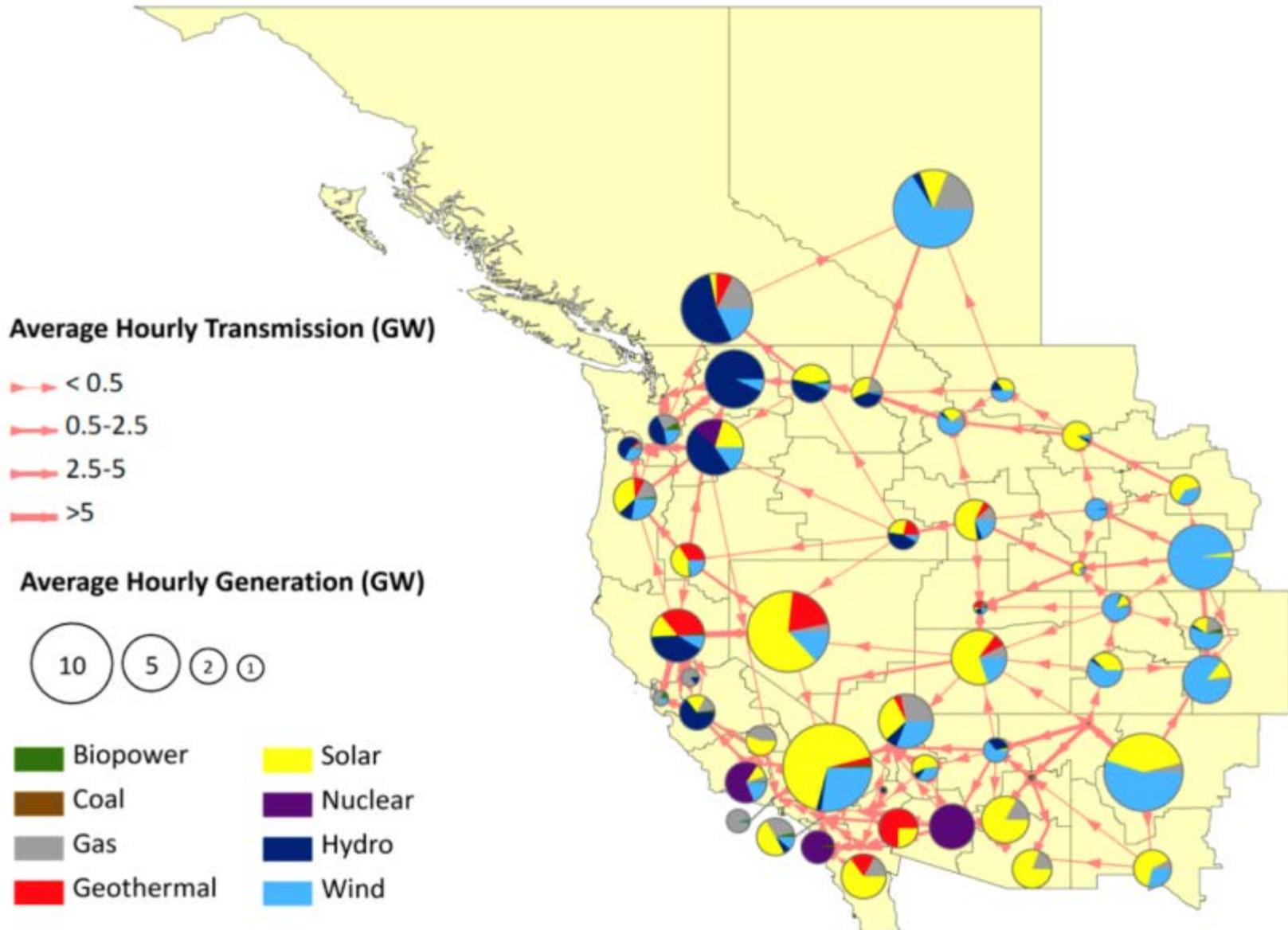


Sanchez et al. (2015)

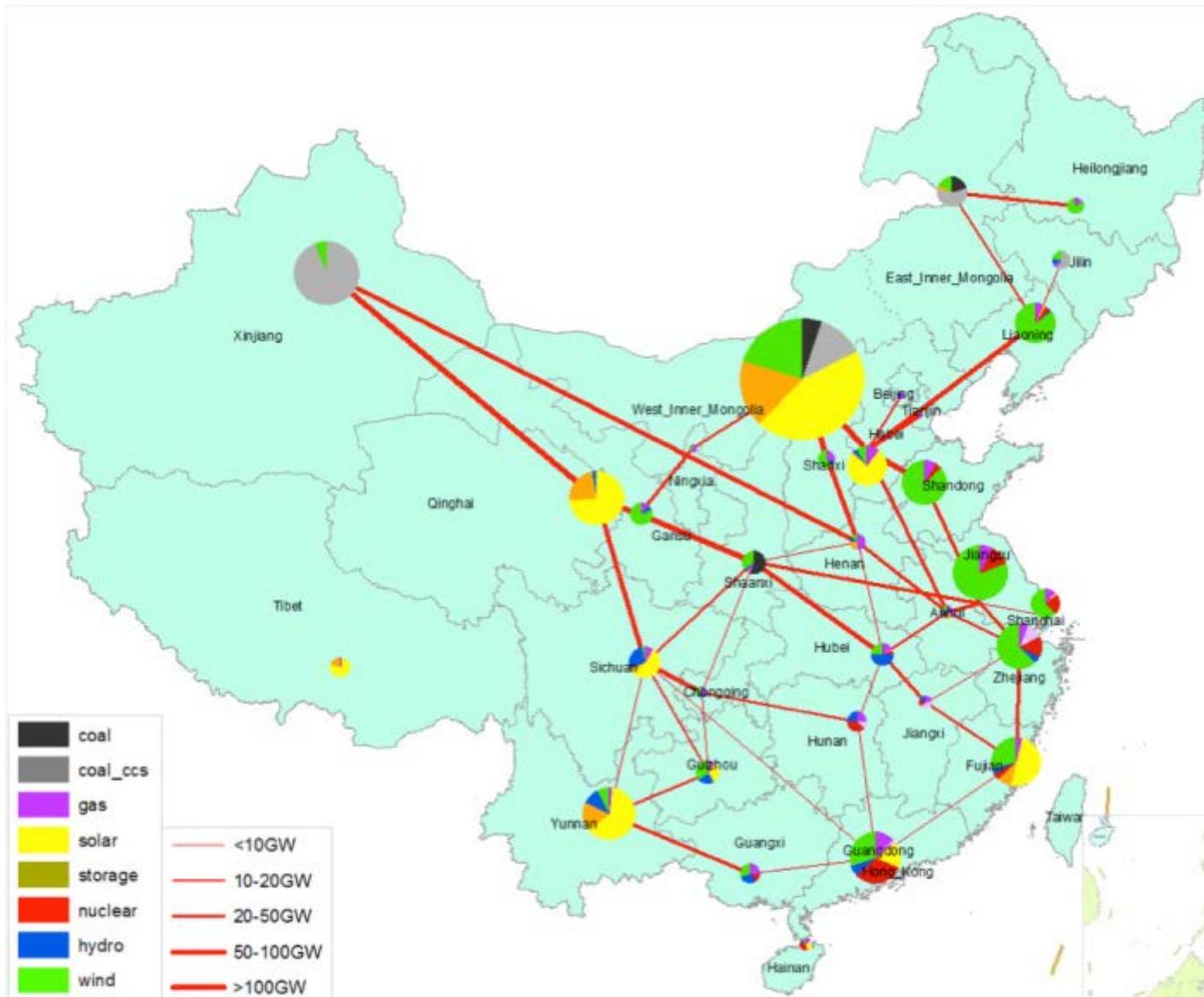


**3. “TRANSFORMATIONS”
LOOK DIFFERENT FOR
DIFFERENT COUNTRIES**

SunShot Solar Power Reduces Costs and Uncertainty in Future Low-Carbon Electricity Systems



Mileva et al. (2013)



PUBLICATIONS

- Sanchez, D. L., Nelson, J. H., Johnston, J., Mileva, A. & Kammen, D. M. Biomass enables the transition to a carbon-negative power system across western North America. *Nature Clim. Change* advance online publication, (2015).
- Mileva, A., Nelson, J. H., Johnston, J., and Kammen, D. M. (2013) “SunShot Solar Power Reduces Costs and Uncertainty in Future Low-Carbon Electricity Systems,” *Environmental Science & Technology*, 47 (16), 9053 – 9060. [dx.doi.org/10.1021](https://doi.org/10.1021)
- Wei, M., Nelson, J. H., Greenblatt, J. B., Mileva, A., Johnston, J., Ting, M., Yang, C., Jones, C., McMahon, J. E. and Kammen, D. M. (2013) “Deep carbon reductions in California require electrification and integration across economic sectors”, *Environmental Research Letters*, 8, [doi:10.1088/1748-9326/8/1/014038](https://doi.org/10.1088/1748-9326/8/1/014038)
- Nelson, J. H., Johnston, J., Mileva, A., Fripp, M., Hoffman, I., Petros-Good, A., Blanco, C., and Kammen, D. M. (2012) “High-resolution modeling of the western North American power system demonstrates low-cost and low-carbon futures”, *Energy Policy*, 43, 436–447.
- Max Wei, James H. Nelson, Michael Ting, Christopher Yang, Daniel M. Kammen, *Carbon Challenge: Scenarios for Achieving 80% Emissions Reduction in 2050* (Lawrence Berkeley National Laboratory: Berkeley, CA. http://eaei.lbl.gov/sites/all/files/California%20Carbon%20Challenge%20Report%20Nov%201_2012.pdf