



Baseline Assumptions in Integrated Assessment Models

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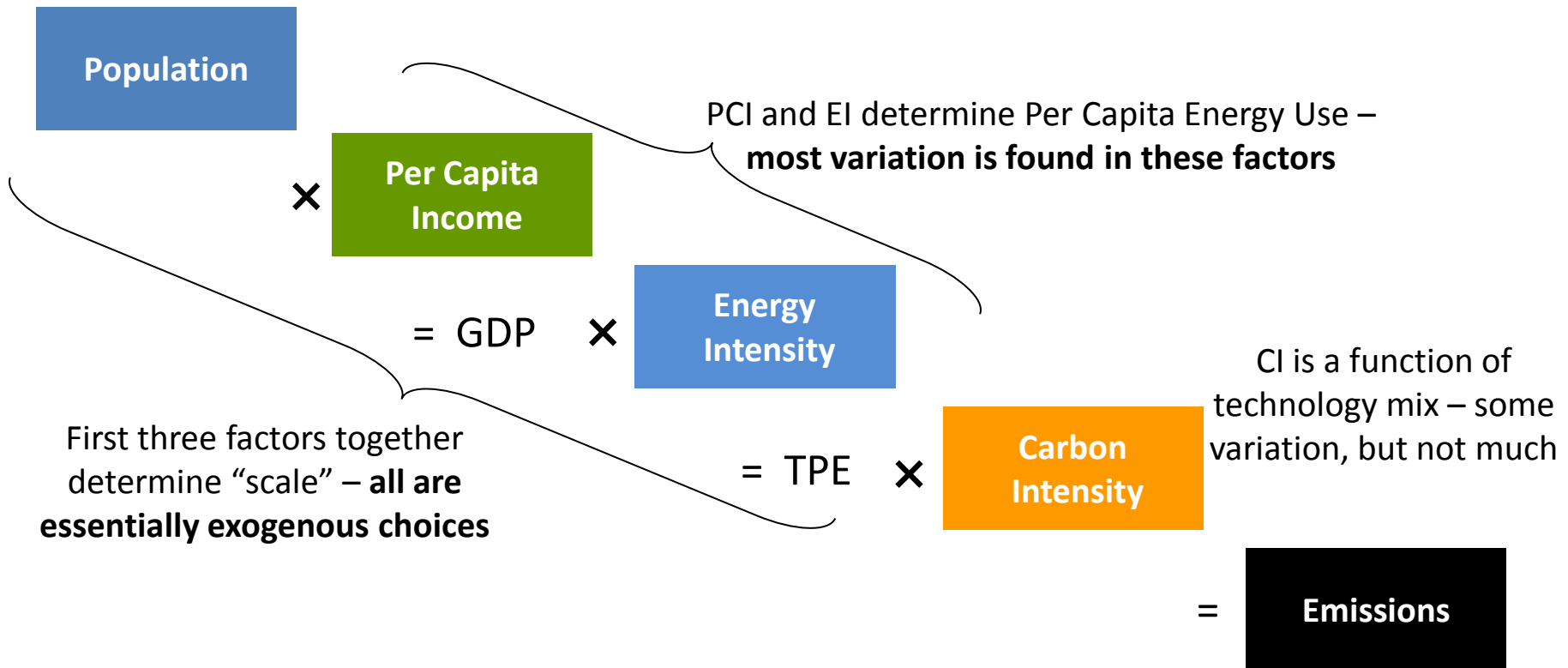
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The Role of the Baseline in Integrated Assessment

- Integrated assessment models are designed to describe *changes* in the energy system due to introduced policies
- The nature and cost of emissions abatement, and thus outcomes in policy scenarios, are determined *endogenously*
- By contrast, the outcomes in the baseline scenario are for the most part determined *exogenously*
- In particular, the *scale* of the system is largely determined by exogenous choices
- And while some aspects of the baseline energy technology *mix* are “decided” by the model, many are decided by the user

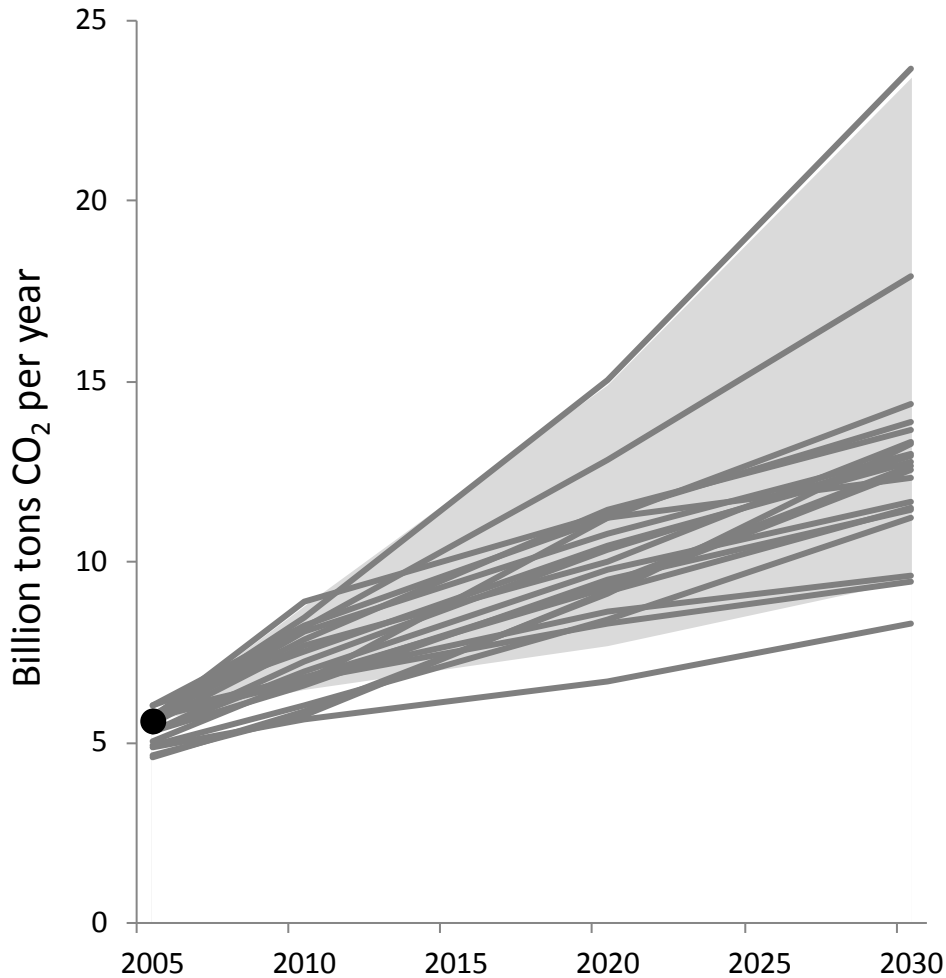
Emissions Drivers: Kaya Decomposition

Population assumptions vary little across models

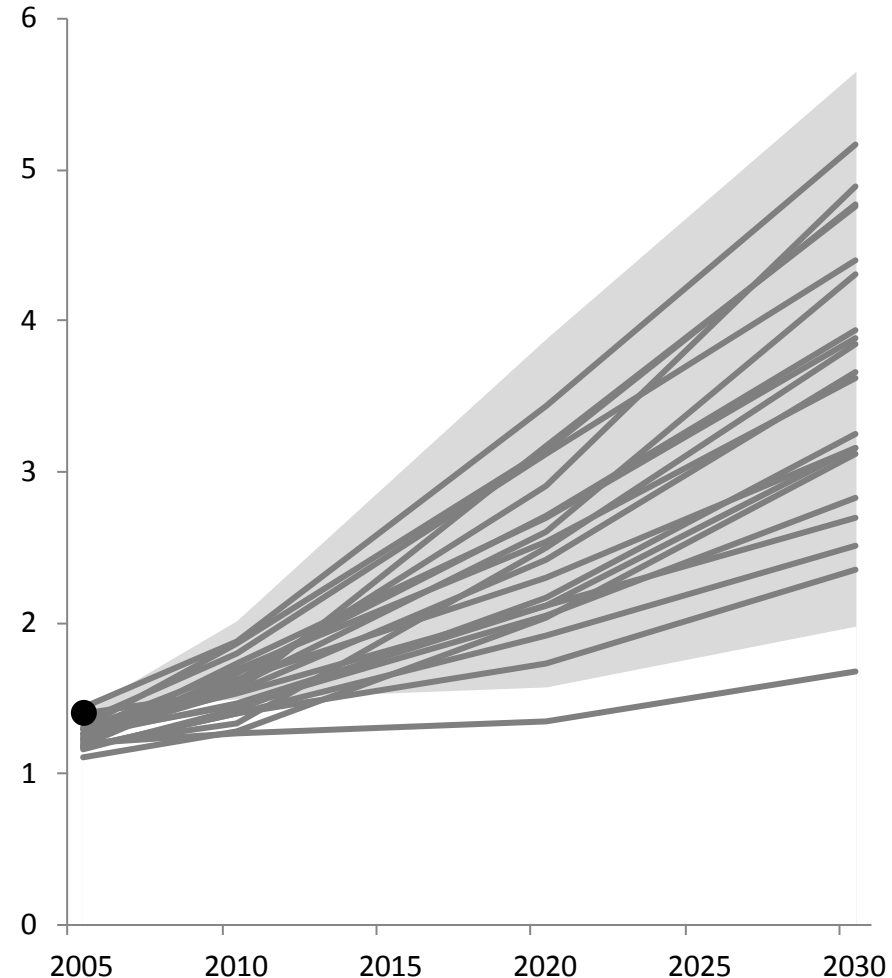


Asian Modeling Exercise Baseline Results

China



India

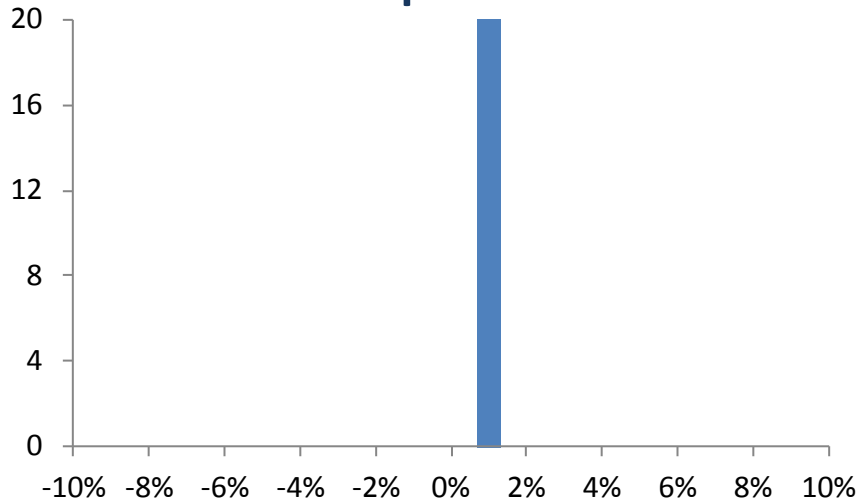


Shaded region reflects range with base year normalized

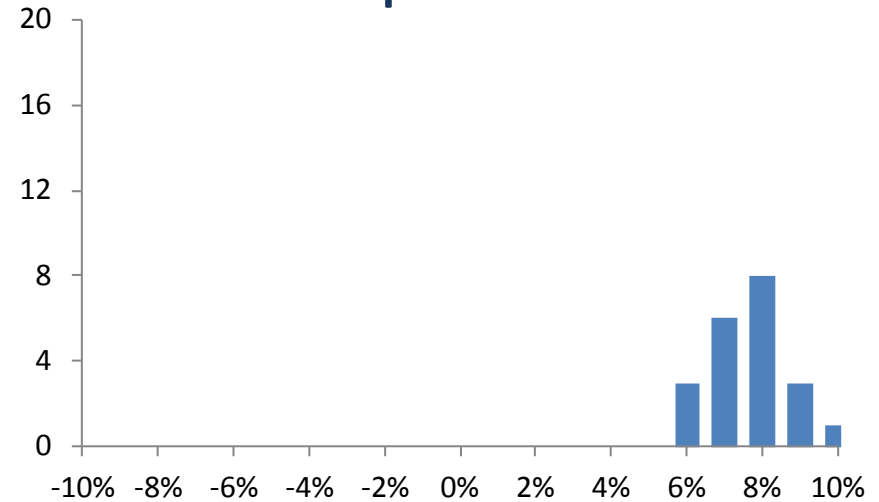
Annual Average Rates of Change, 2005-2020

Baseline Scenario for China (# of models)

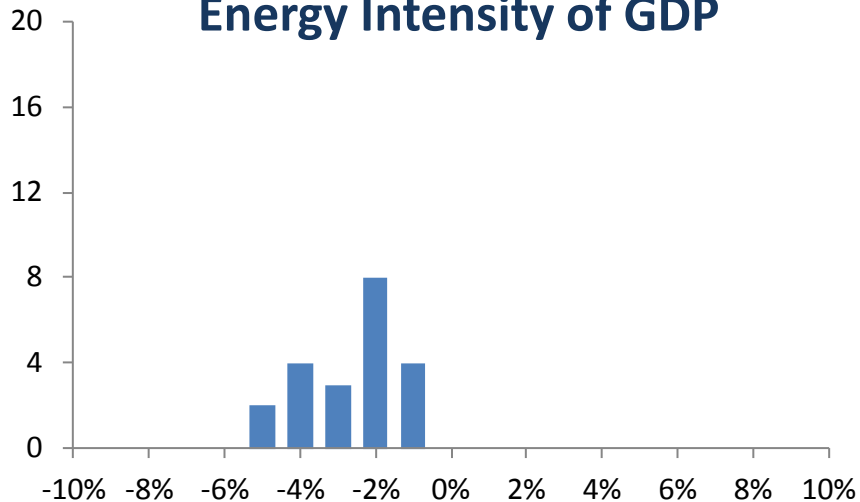
Population



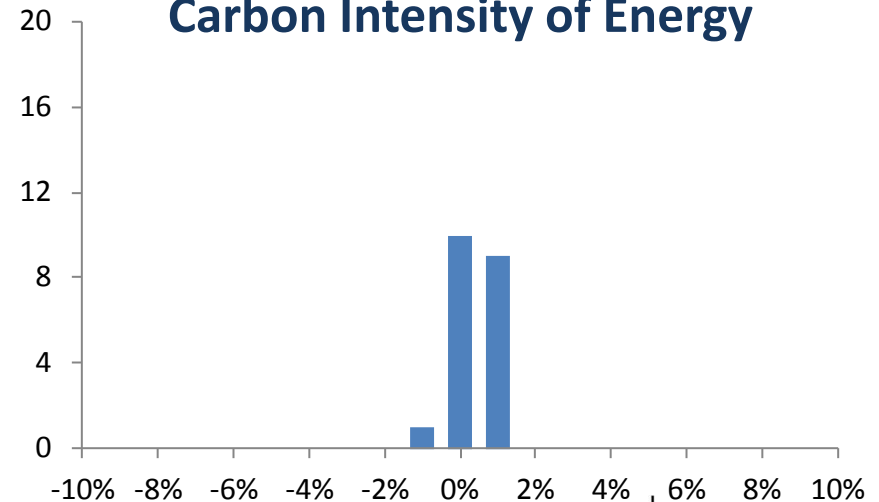
Per Capita Income



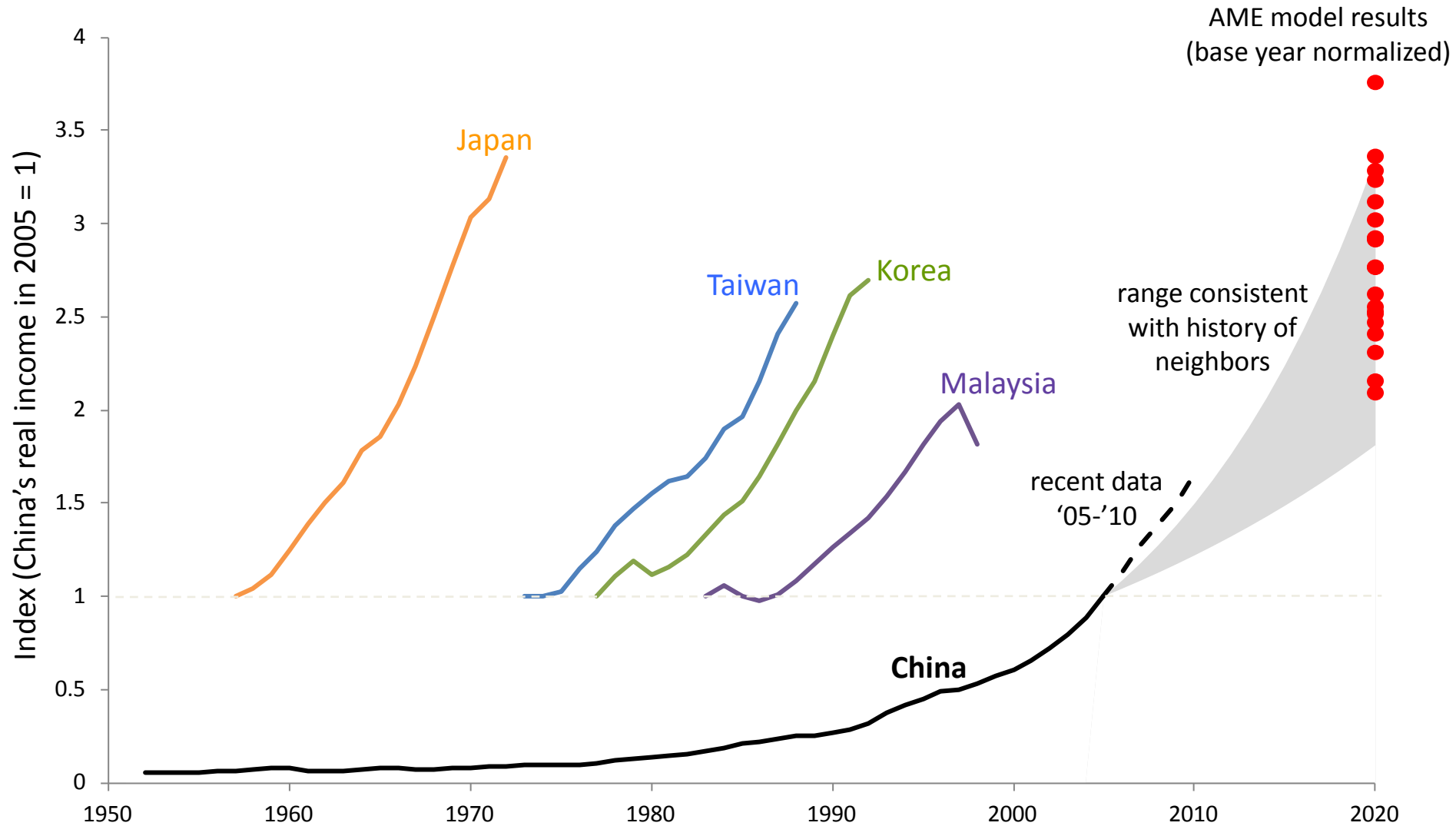
Energy Intensity of GDP



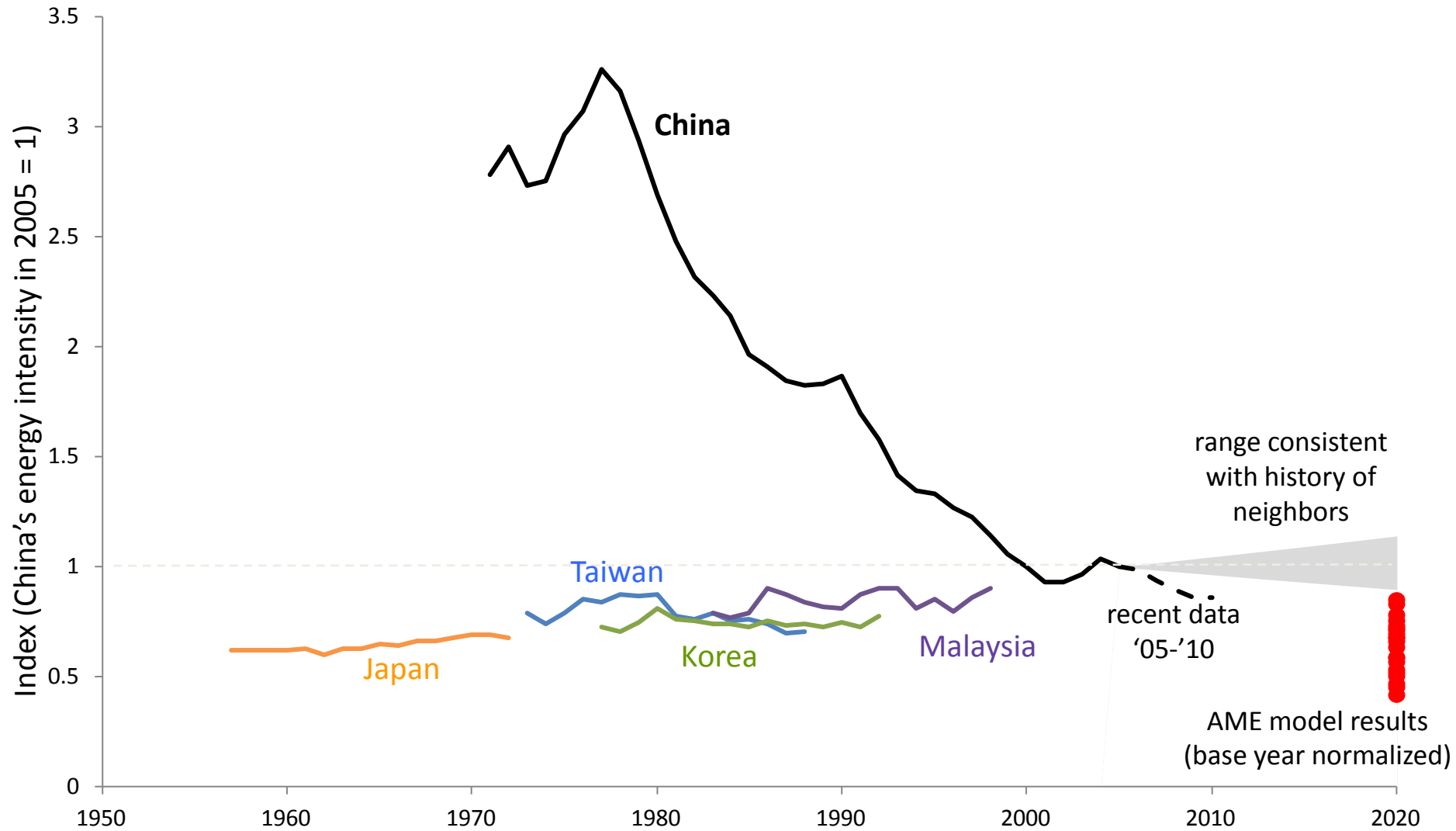
Carbon Intensity of Energy



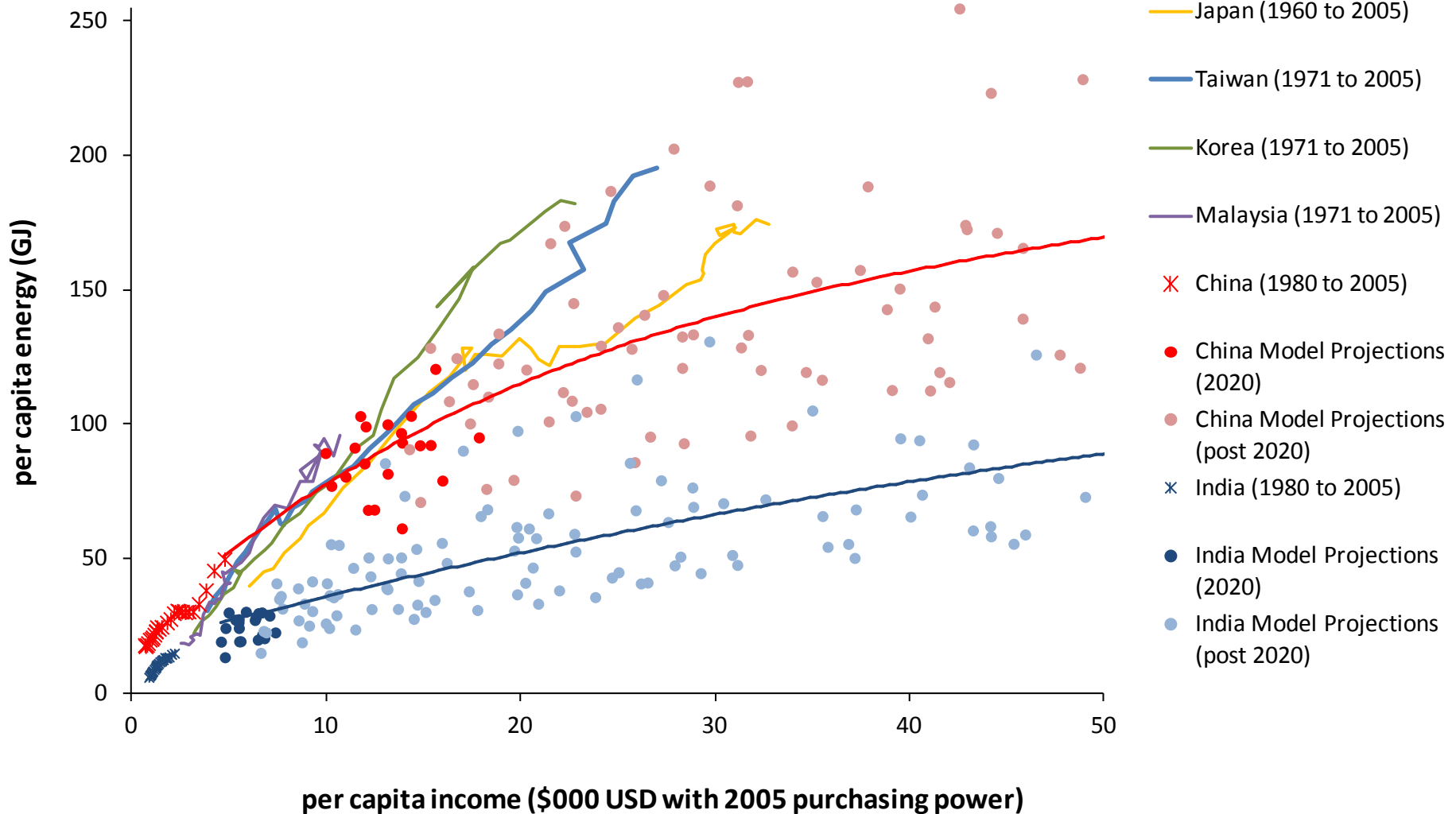
Historical Comparison of Real Per Capita Income in Asia



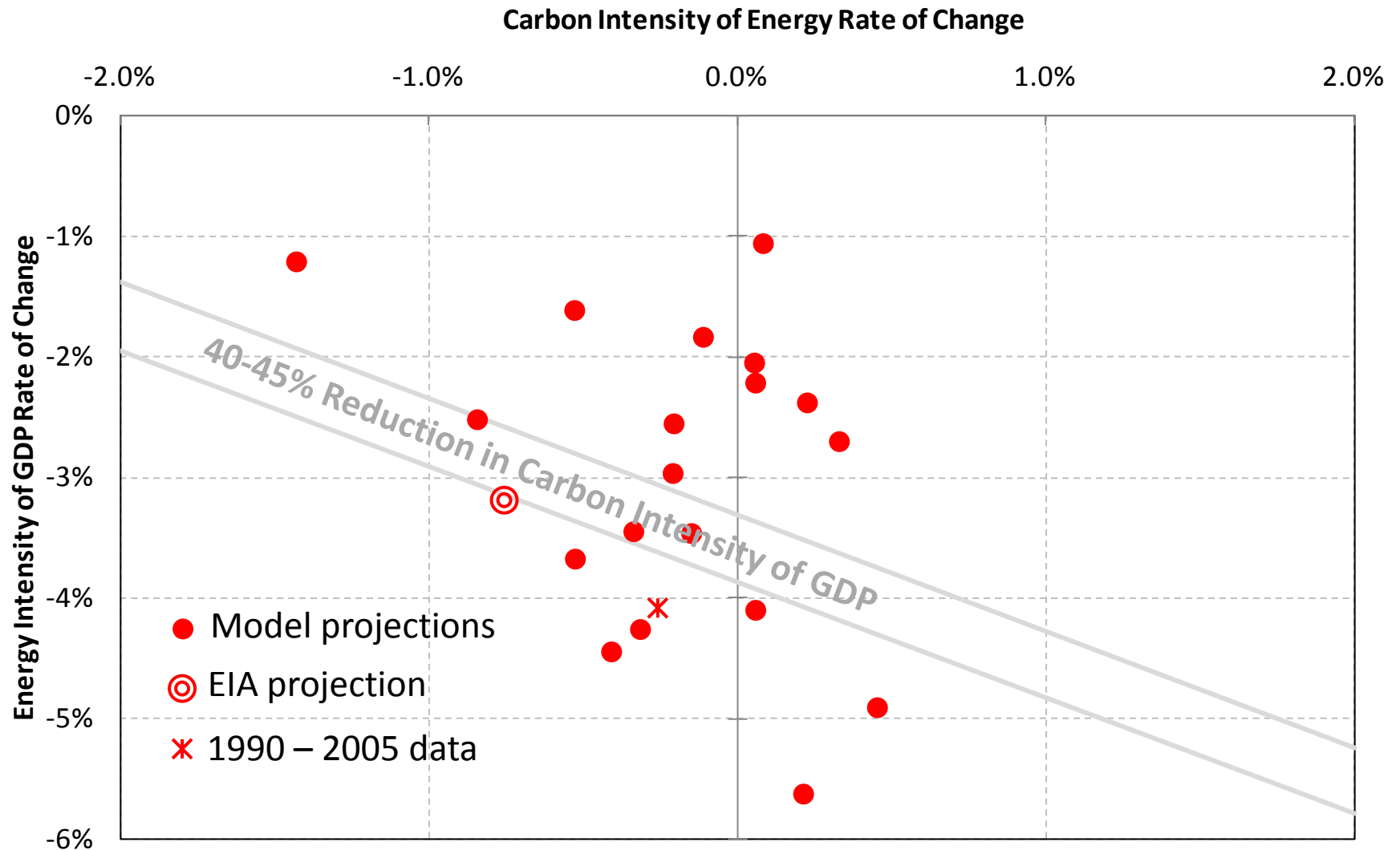
Historical Comparison of Energy Intensity in Asia



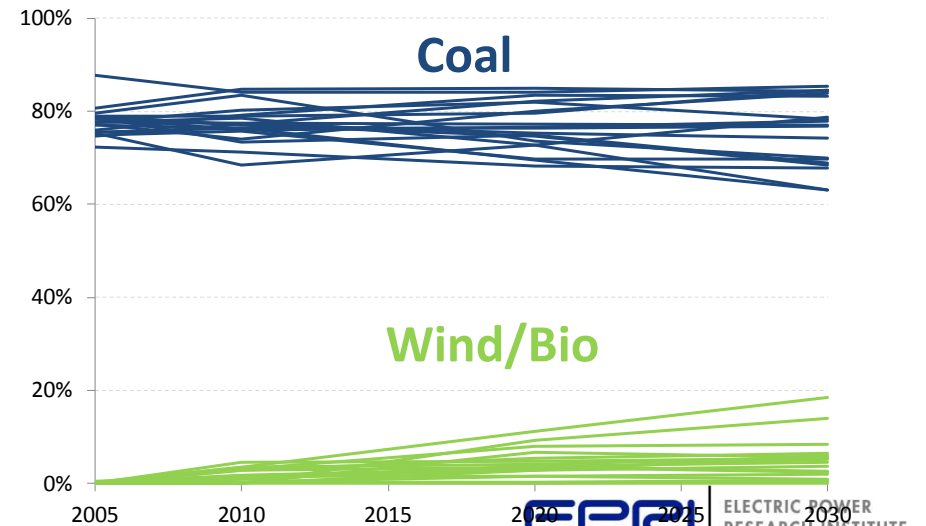
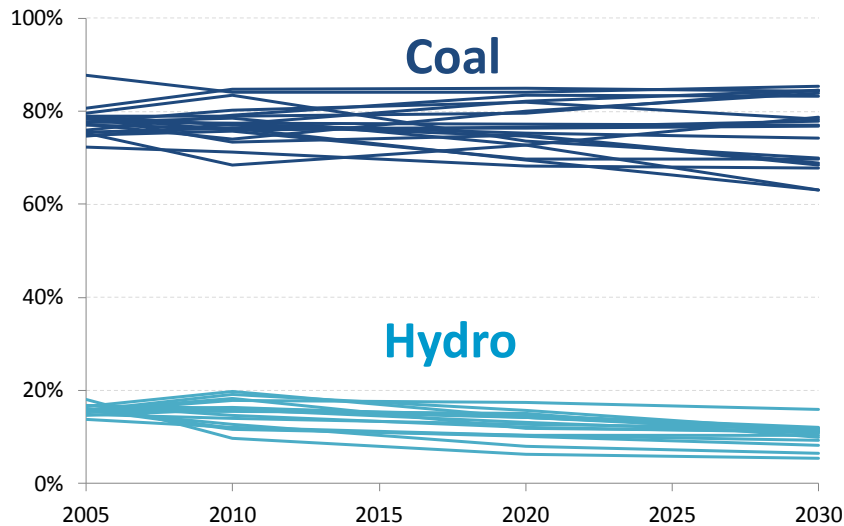
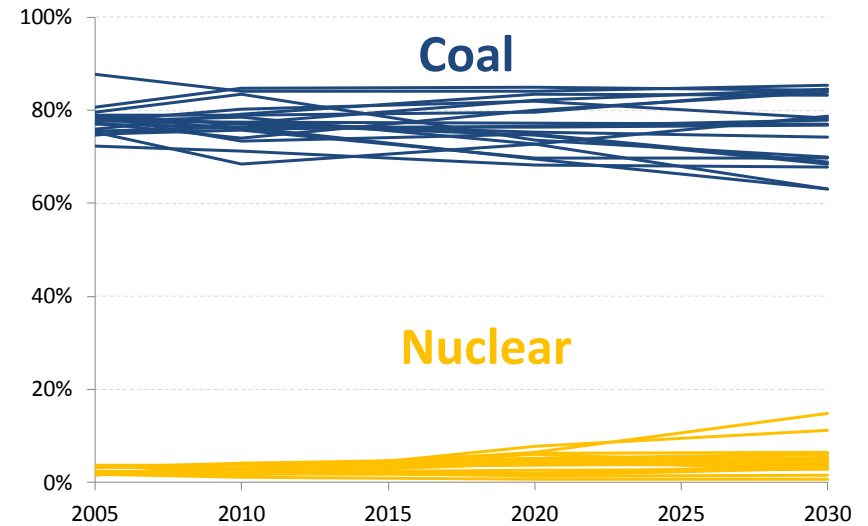
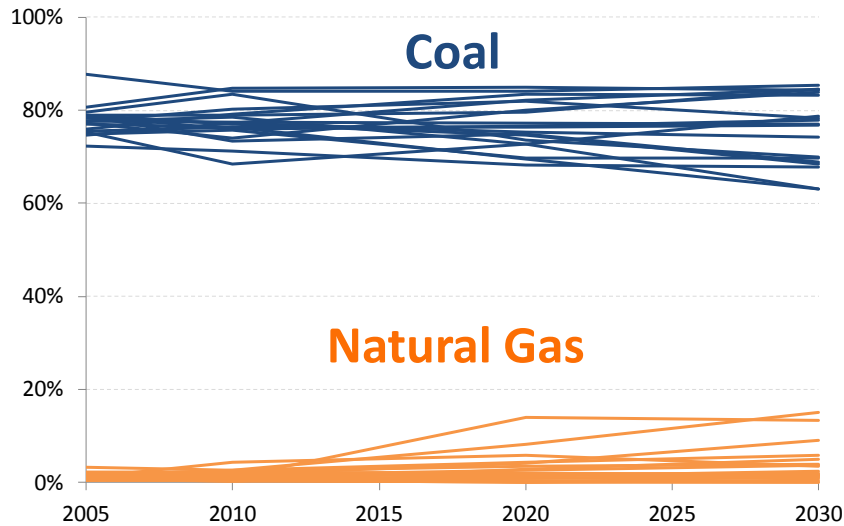
A different relationship emerges for India vs. China



Model Results Relative to China's Stated Target for 2005-2020



Little Projected Change in China's Baseline Electric Mix to 2030



Some Concluding Thoughts

- There is an undeniably large range of baseline emissions paths projected by models (the real uncertainty may be wider)
- This primarily reflects different exogenous assumptions for:
 - Per capita income
 - Energy intensity
- These factors are tremendously dynamic in Asian countries at current stages of development, difficult to project in the future
- The models exhibit, for the most part, similar depictions of the technology mix, as distinct from scale (consistent with modeled cost minimization, may not be consistent with reality)

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