Can fusion help decarbonize the US power sector?
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Introduction
- The US has goals to achieve a carbon neutral electric grid by 2035, but EIA’s 2023 Energy Outlook projects a 2035 emissions intensity of ~150 gCO₂/kWh
- Unique solutions required for each region
- Fusion is safe, energy-dense, renewable option, but is complex, expensive and still developing

Research Highlights
- Fusion is a major contributor in all regions at low emissions ceilings
- Forcing fusion into the system at more lenient carbon caps increases system price by 1-6%

Methods
Linear programming is used to determine least-cost design of electric grid, at different emissions intensities

Discussion
- Fusion becomes economically viable at carbon ceilings of 40 – 20 CO₂/kWh
- Restricting fusion to baseload operations has a non uniform affects on regions. To compensate, regions will either:
  a) invest in other technologies
  b) increase fusion capacity
- Sourcing 10% of electricity load from fusion can decrease land requirements by up to 33%

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