Coordinated Expansion Planning (CEP): Models & Needs

Developed for the Energy Systems Integration Group

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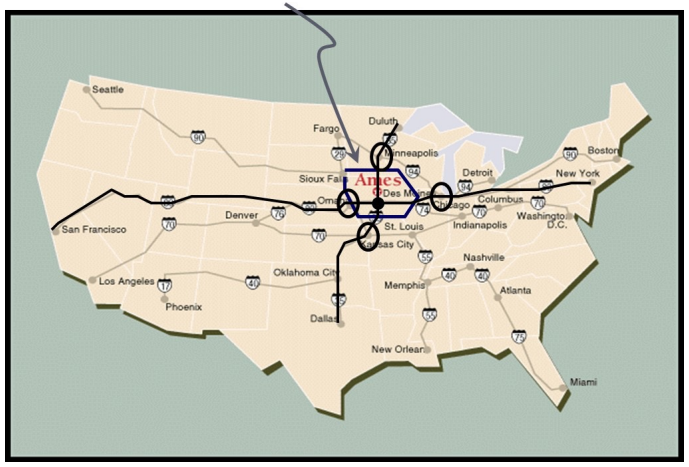
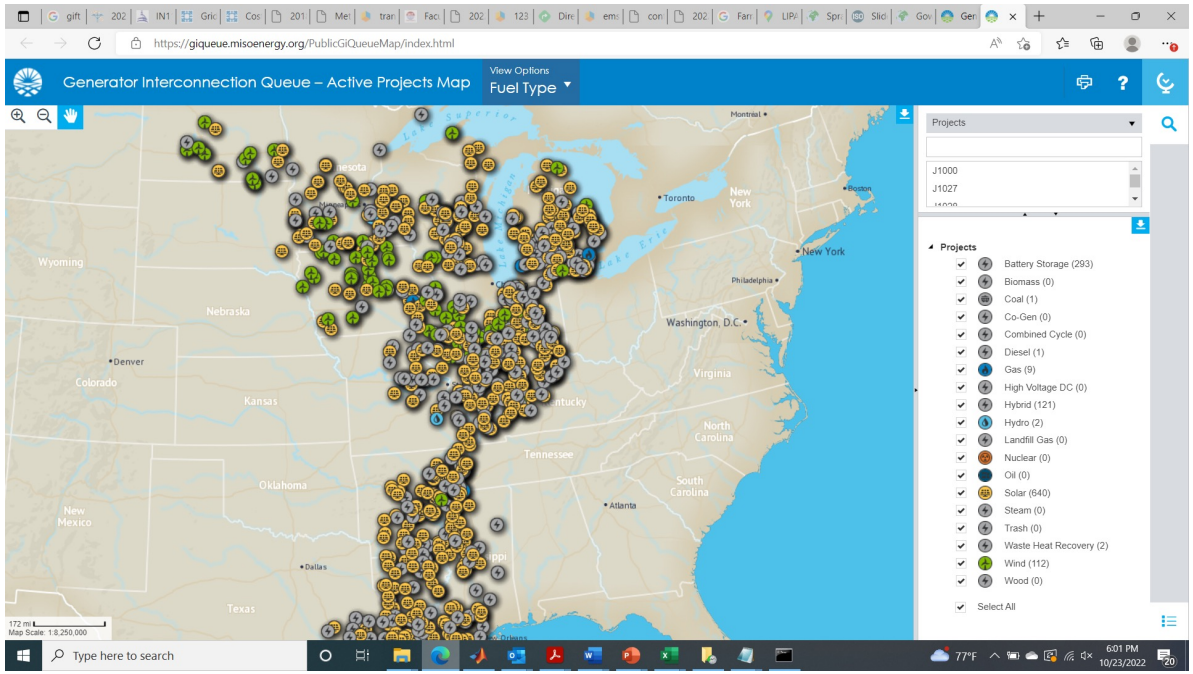
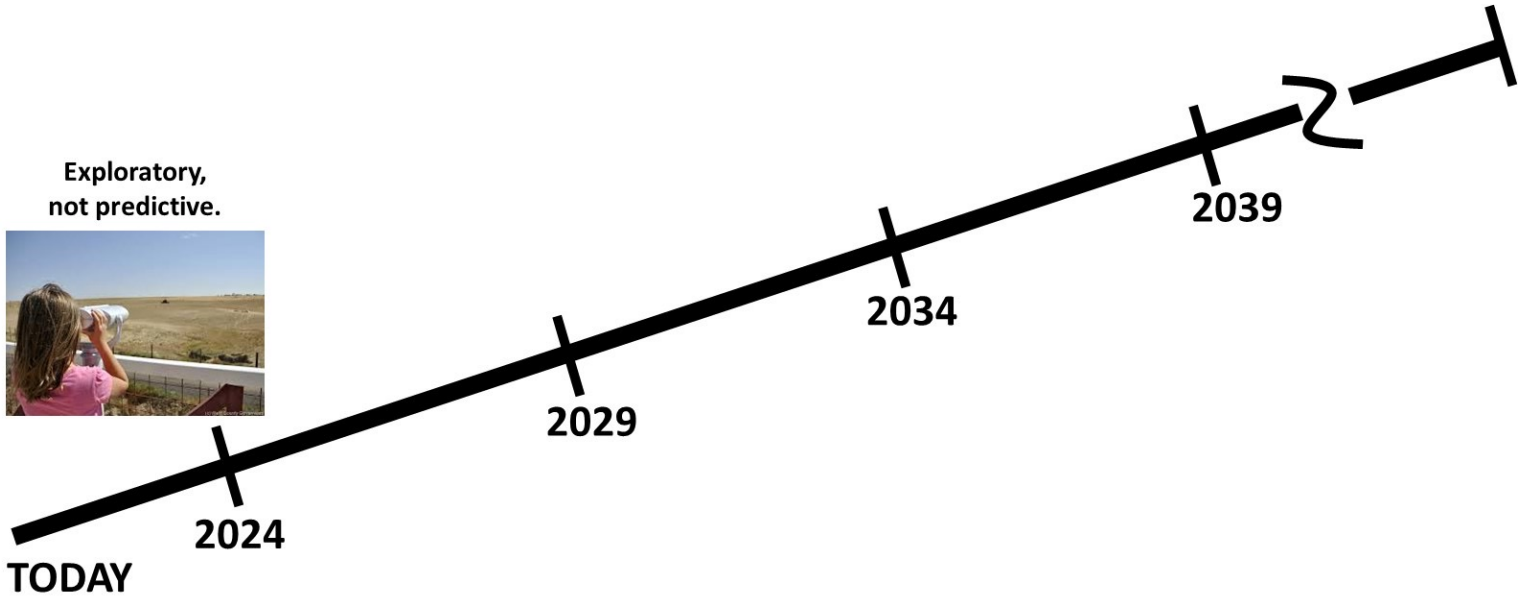


How can CEP be better used for transmission planning?

1. Easy/accurate back-and-forth between 90,000 bus pf/pcm and CEP models
   - Reduction
   - Translation
2. Plan *evaluator*: complements CEP optimizer.
3. Internet facility enabling stakeholders to see how CEP treats their projects, similar to MISO's GIQ map.



What role does CEP play in overall process?



- Exploring the future

- Integrating projects to facilitate portfolio development
- Facilitating participatory planning
- Identifying benefits

What model features are important for planners to enable?

- Scenario-based, to account for uncertainty

Refs: D. Mejia-Giraldo and J. McCalley, "Maximizing future flexibility in electric generation portfolios," IEEE Transactions on Power Systems, Vol. 29, Issue 1, 2014, pp. 279-288.
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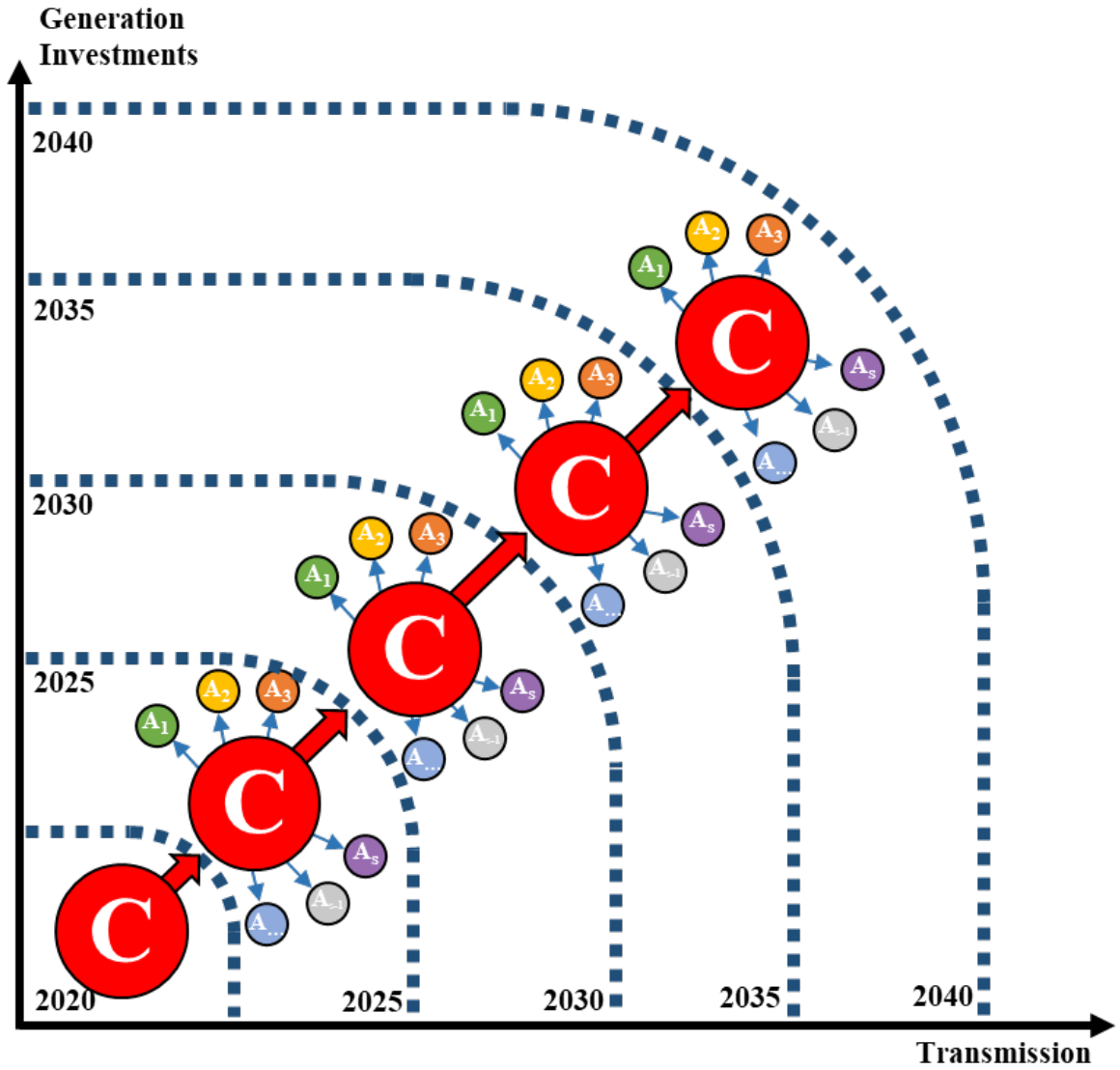
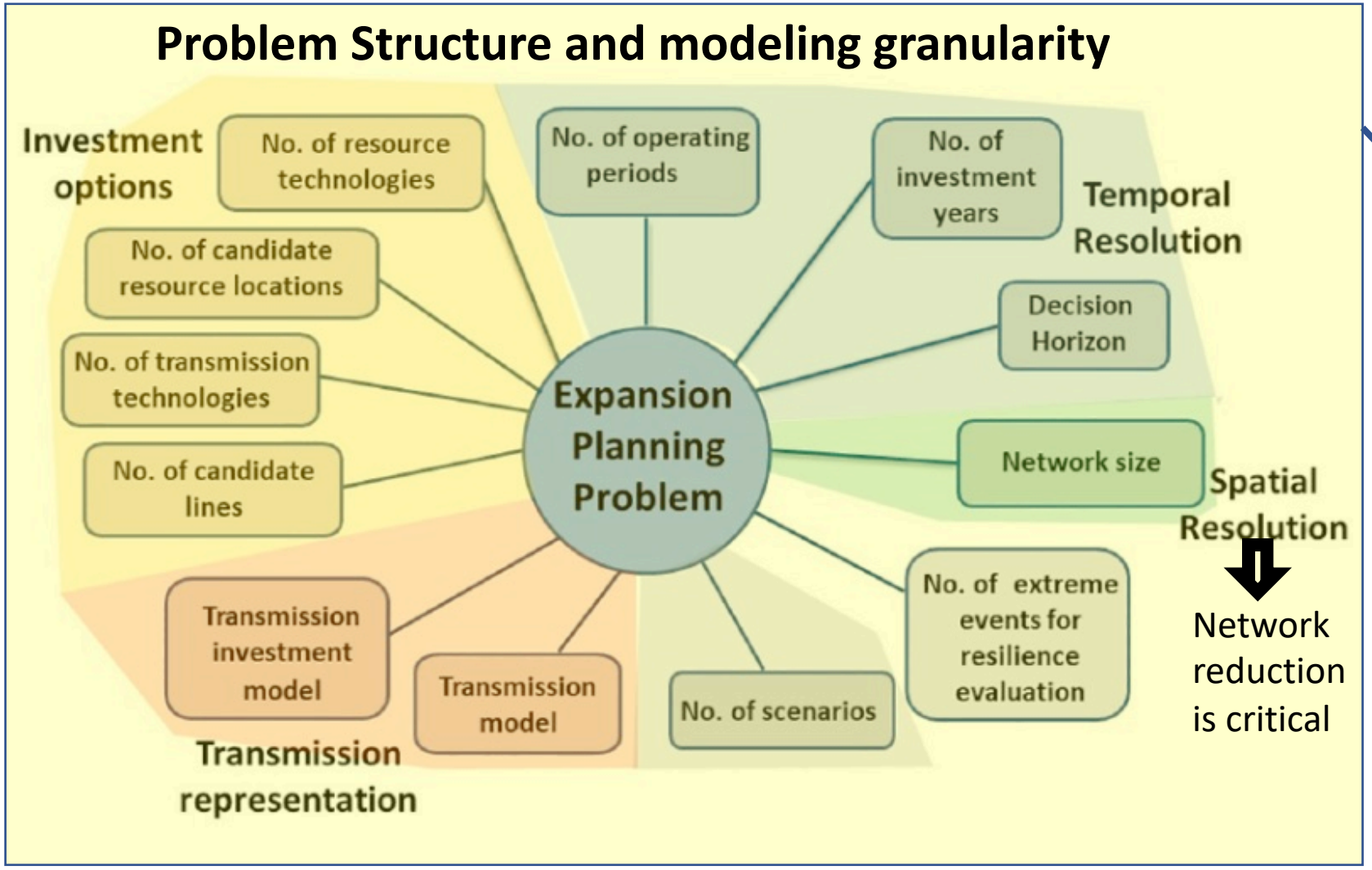
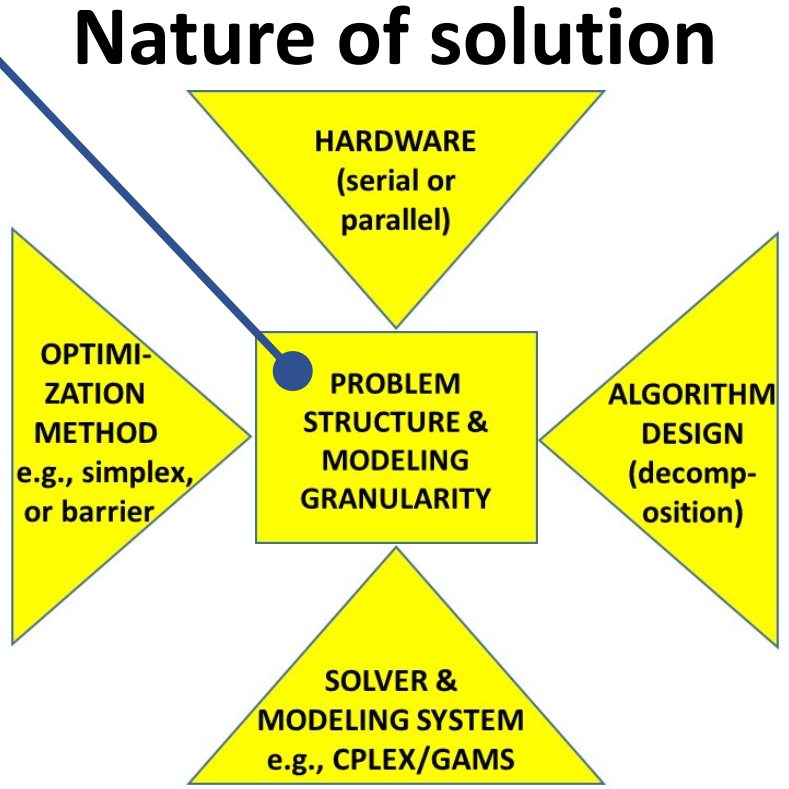


- Ancillary services
- Resilience
- Multisector evaluation

CEP: computation and modeling





Ref: P. Maloney, P. Chitkara, J. McCalley, B. Hobbs, C. Clack, M. Ortega-Vazquez, A. Tuohy, A. Gaikwad, and J. Roark, "Research to Develop The Next Generation of Electric Power Capacity Expansion Tools: What Would Address the Needs of Planners?" International Journal of Electrical Power & Energy Systems, for the special issue on, Recent Advancements in Electric Power System Development Planning with High-Penetration of Renewable Energy Resources and Dynamic Loads, Volume 121, 2020, ISSN 0142-0615, https://doi.org/10.1016/j.ijepes.2020.106089.