

Feasibility and Benefits of Advanced Nuclear Reactor Hybrid Energy Systems

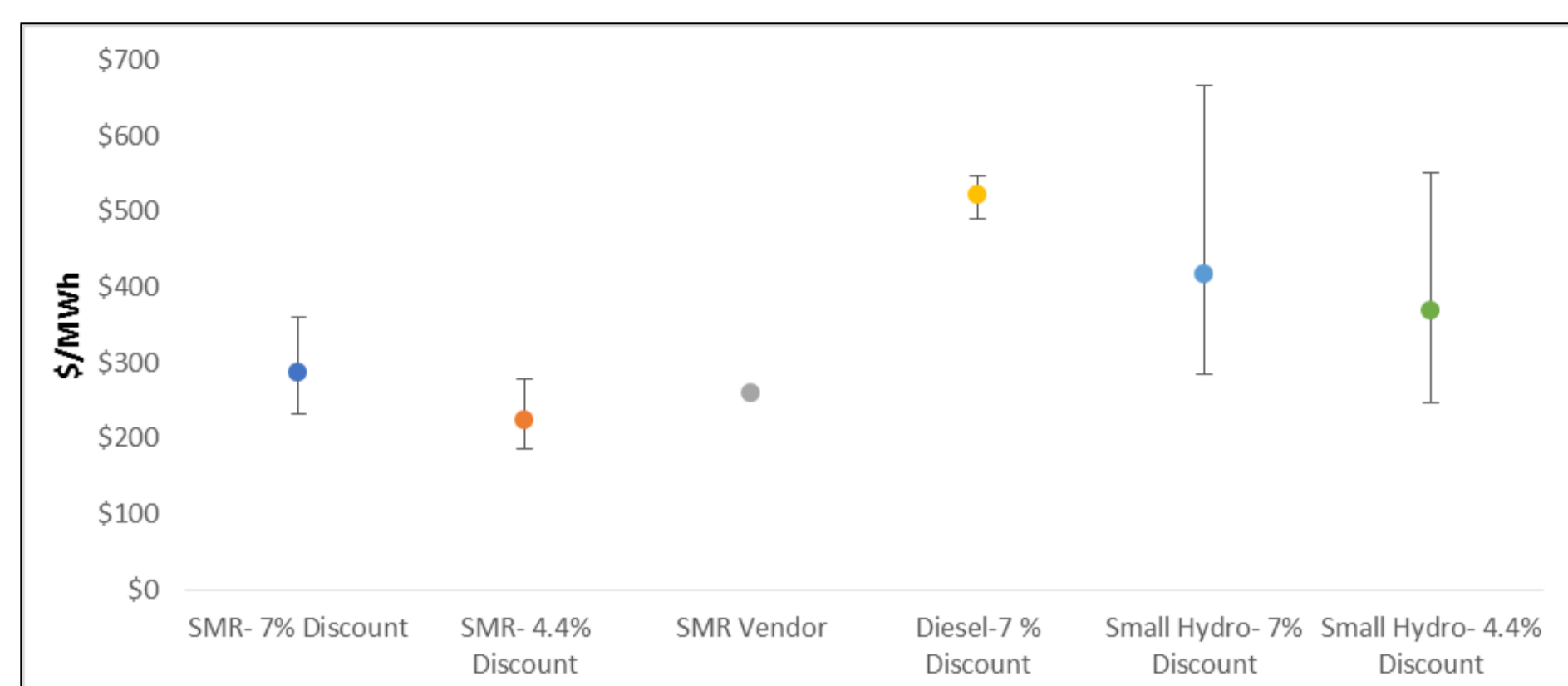
Project/Technical Lead
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NRCAN

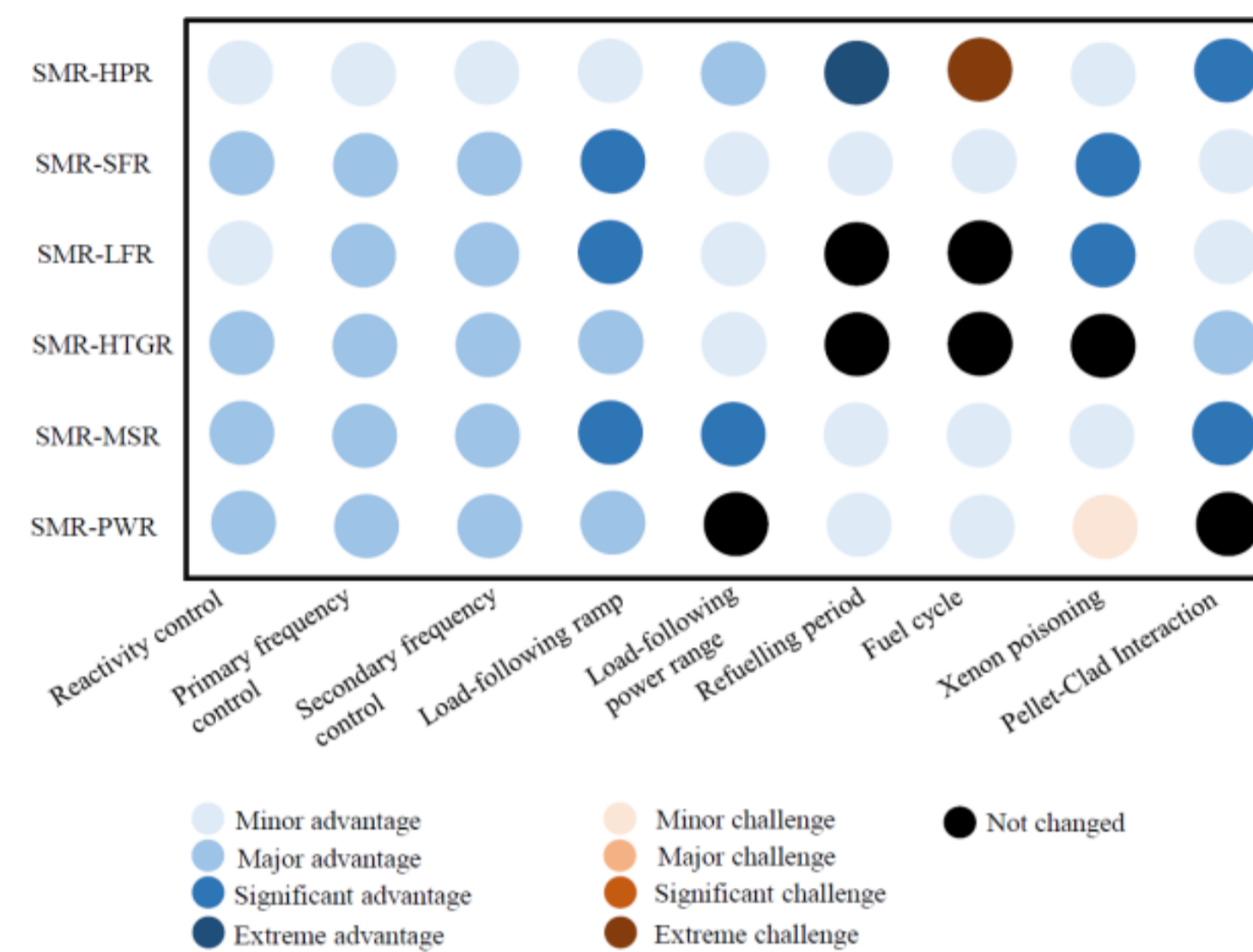
Objective/Purpose

Nuclear-Renewable Hybrid Energy Systems (NR-HES) are considered important for decarbonisation. The objective of this project is to develop the capabilities to evaluate and recommend how an NR-HES could be used to meet Canada's energy needs and support Canadian commitments to the Paris Agreement.

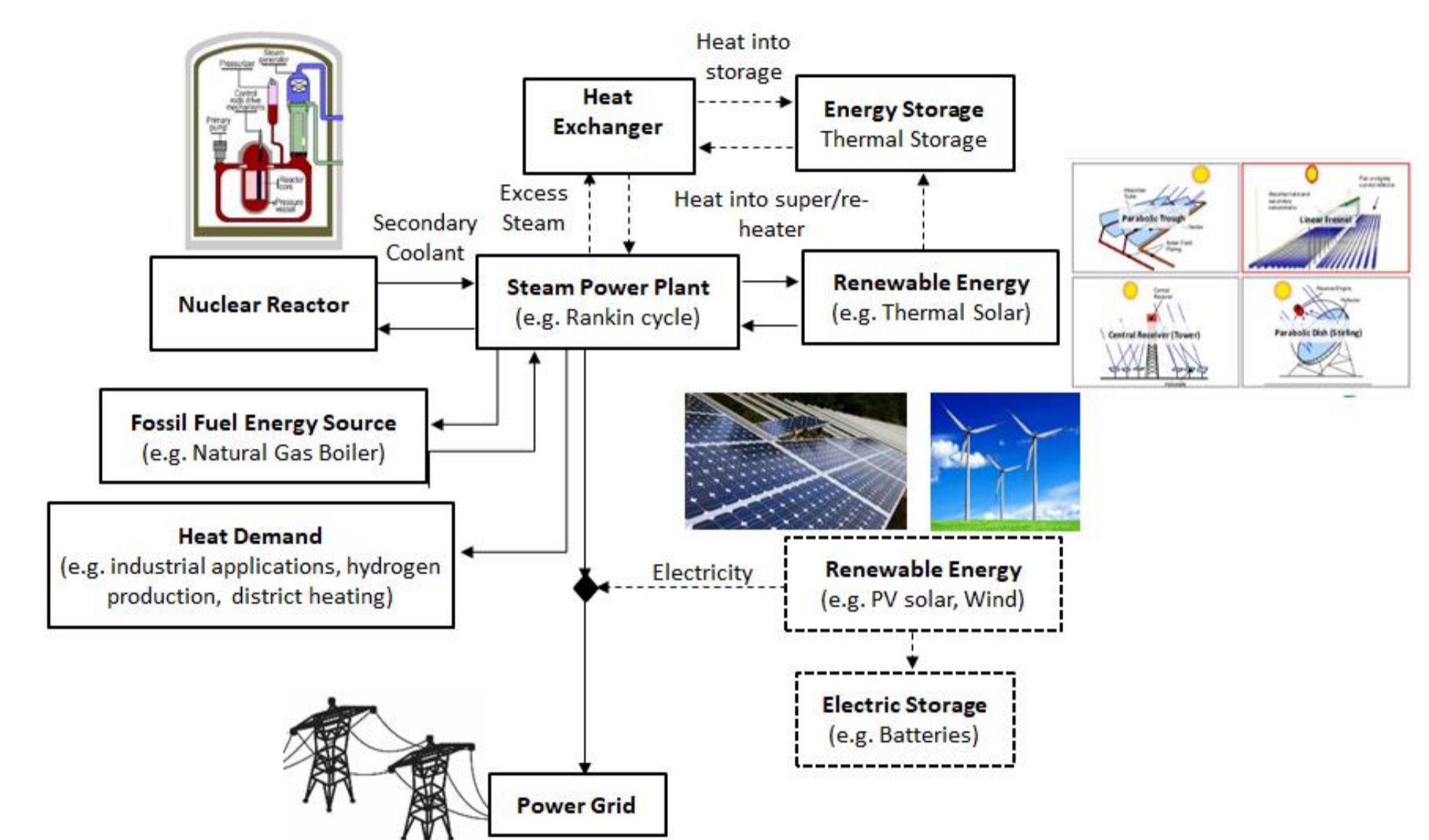
Pan-Canadian SMR Roadmap



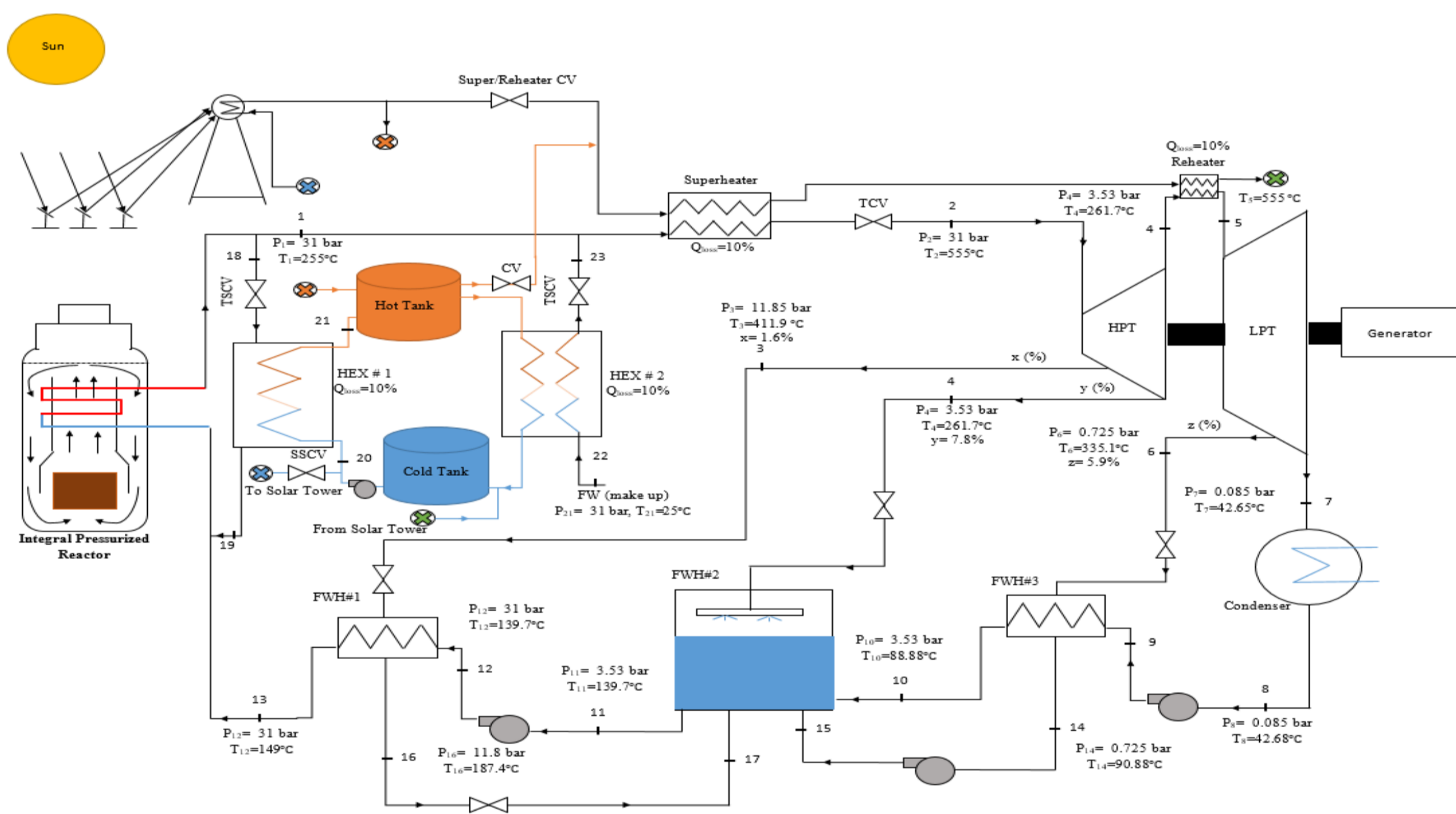
Load-Following Capabilities of SMRs



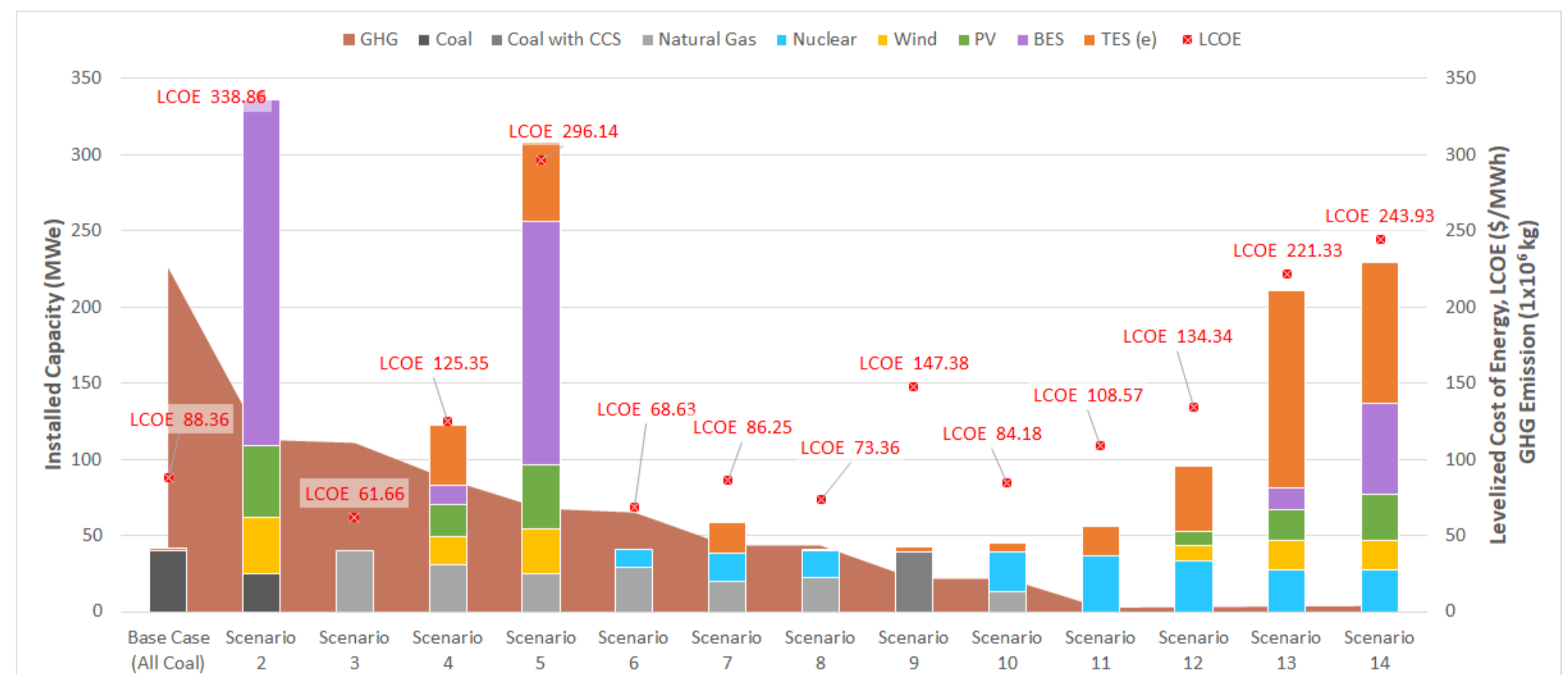
NR-HES & TES Modelling



TES Evaluation Model



NR-HES Model



Expected Outcomes

- A capability developed at CNL to evaluate various NR-HES and make recommendations regarding complementary technologies and possible ways to reduce CO₂ emissions from energy production.
- Model will be able to consider on-grid applications, industrial applications and remote communities.

Achievements and Successes

- Contributed to the Pan-Canadian SMR Roadmap.
- Evaluated of SMR load following capabilities.
- Completed an evaluation of energy storage options; sensible heat storage shows great potential.
- Developed initial NR-HES model.

Future Work

- Submit TES findings to journal for publication – March 2020
- Complete NR-HES Model – May 2020
- Complete scenario analysis using NR-HES model – Sept 2020
- Submit NR-HES Model findings for publication – March 2021

