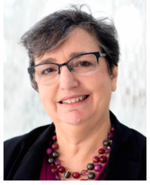
RESEARCH BRIEF
Start Date: Jul 5 2022 | Duration: 24 months

National Alliance for Water Innovation

Assessing the Impact of APRIME on Industrial Sector Supply Portfolios/Chemical Industry Case Studies



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Challenge

All too often when moving from science to practice, new technologies fail not because of the technology itself, but due to the misalignment of the organization's priorities, growth trajectories, resources, capacity, or needs (among other reasons). For instance, technology development timeframes within an industry might misalign with capital infrastructure investment (e.g. technologies typically require at least 10 years from initial conception to implementation, but industries may need to invest in infrastructure to meet market opportunities, regulatory requirements, or supply chain limitations within that 10-year timeframe). A framework is needed that can be used to identify potential opportunities within an industry that satisfy technoeconomic and organizational constraints in that situational context.

Research Approach

This project will develop and test a framework to increase the use of non-traditional waters and internal water reuse in the industrial sector using technology innovations that reduce the levelized cost of water and meet other site-specific pipe-parity metrics. The specific project objectives are to:

1. Develop a method for assessing how technology opportunities can affect water planning in the context of social system goals such as capital planning, regulatory considerations, or workforce capacity.
2. Estimate the potential contribution of technology innovations for achieving pipe parity at selected sites given possible water sources, industry needs, regionality, and climate change uncertainties.
3. Develop a circular water systems analysis tool for performing system level analyses on scenarios that inform industry (and potentially other sectors) of the opportunities for improving water management and achieving pipe-parity metrics.

Impact

Novel technologies developed without considering the broader organizational and social context are at risk of sub-optimal implementation, or even failure, due to lack of adoption or misalignment with organizational needs and trajectories. The approach implemented in this research will enable industries, governments and other stakeholders to make more informed decisions that lead to satisficing solutions that get implemented because they are aligned with stakeholder goals and local context.

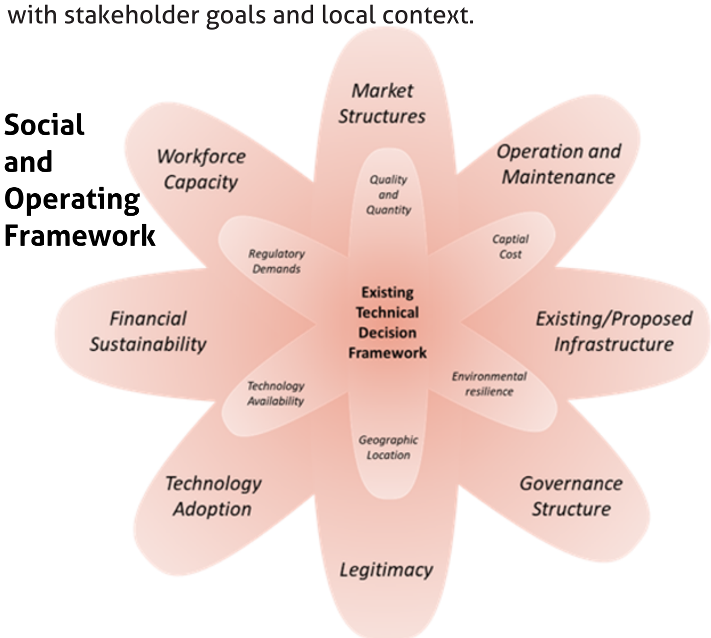

Figure 1. Conceptual representation of moving from a technoeconomic analysis (TEA) to a TEA embedded in the organization and institutional context.

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REFERENCES

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