

DOCKETED	
Docket Number:	23-ERDD-04
Project Title:	Industrial Decarbonization and Improvement of Grid Operations (INDIGO)
TN #:	249864
Document Title:	RMI Comments on the INDIGO Program
Description:	N/A
Filer:	System
Organization:	RMI
Submitter Role:	Public
Submission Date:	4/26/2023 9:45:31 AM
Docketed Date:	4/26/2023

*Comment Received From: RMI
Submitted On: 4/26/2023
Docket Number: 23-ERDD-04*

RMI Comments on the INDIGO Program

Additional submitted attachment is included below.

RMI Comments on Industrial Decarbonization and Improvement of Grid Operations (INDIGO) Program

RMI appreciates the opportunity to submit comments to the California Energy Commission (CEC) on the implementation of the INDIGO program outlined in AB 209.

RMI is an independent, non-partisan, non-profit organization that works to transform global energy systems to secure a clean, prosperous, zero-carbon future for all through market-based change in the world's most critical geographies.

Introduction

California industry emitted approximately 90 million tonnes of greenhouse gases in 2019, about 6% of total industry emissions in the US.¹ To achieve the state's emissions targets and contribute to our country's role in mitigating climate change,² California industry must make transformational changes, not just incremental improvements. RMI commends the CEC for its efforts to spur this transformation with INDIGO. In these comments, we offer recommendations we believe will maximize INDIGO's effectiveness. We also discuss likely challenges the CEC will face as it implements the INDIGO program and highlight some systemic issues that need to be overcome for widespread industrial decarbonization in California.

Prioritizing Projects for Transformational Change

Given the capital-intensive nature of equipment for deep decarbonization, long equipment lifetimes, and the relatively broad scope of the INDIGO program, it is critical that the CEC prioritizes awardees based on how effective the proposed solutions would be in achieving program objectives. To that end, RMI has four recommendations.

- **Support electrification where possible:** We encourage CEC to prioritize projects that electrify processes currently using fossil fuels (such as low temperature process heat). These projects simultaneously address three of INDIGO's preferential criteria: maximizing reduction of greenhouse gas emissions, reducing air pollution in under-resourced communities, and providing an opportunity for grid support. Electrification solutions avoid the challenges of carbon capture and storage systems and usually use less total energy than solutions powered by hydrogen or other low carbon fuels.³ We recognize, however, that electrification is not feasible in all applications and that in those cases INDIGO funding is best utilized in other ways. For example, production of primary steel from iron ore is better decarbonized with hydrogen.³
- **Prioritize energy efficiency projects that do not rely on continued fossil fuel use:** If INDIGO funding supports incremental efficiency projects that do not eliminate fossil fuel use, the funding will help extend the life of facilities incompatible with California's emissions goals. In particular, improving the efficiency of natural gas-powered processes could be quickly out-of-date where there is a viable path to eliminate hydrocarbon use.
- **Advance grid support projects that are unique to industrial sectors:** Given the speed of decarbonization needed and INDIGO's concentration on industry, funding awards should focus on advancing technologies and processes that are unique to industry. We do not think INDIGO funds are appropriate for technologies that are not specific to industry (and often qualify for funding or incentives from federal or other California programs). As an example, we recommend that CEC preference modifications to a paper plant's dewatering press system that allows shifting electric loads to periods of low electricity prices⁴ over a project that installs

battery storage. We recommend this prioritization because the load shifting is unique to the dewatering press process, while battery storage is broadly applicable outside of industry.

- **Encourage broad participation in demand-side programs:** INDIGO should help expand industrial facilities' ability to enhance grid reliability. CEC can encourage this by awarding projects that install equipment to enable participation in demand response or virtual power plant⁵ programs and go beyond emergency load reduction.

Barriers to Industrial Electrification Implementation

While the INDIGO program provides a much-needed injection of capital to cover equipment, materials, and other installation costs, the funding may not be enough to make industrial facilities' operational costs viable in the medium- and long-term. This concern over long-term economic viability may dissuade industrial facilities from electrifying their processes. In conversations with California industry, we identified two market barriers to achieving the INDIGO program's objectives: high California electricity prices and inadequate market incentives for demand-side solutions.

High Price of Electricity

Where possible, direct electrification is usually the most energy efficient pathway for decarbonizing industrial processes and fulfills several INDIGO program objectives. However, in stakeholder comments during the INDIGO workshop, and RMI's conversations with startups, we heard that industrial facilities and decarbonization entrepreneurs are discouraged by California's high electricity prices. While the INDIGO program funds would provide capital to deploy equipment, high electricity prices will challenge the medium- and long-term economic viability of electrification solutions.

Inadequate Market Incentives for Demand-Side Solutions

While emergency load reduction programs have proven useful in avoiding blackouts, there is further potential for expansion of demand-side programs in California through a more reliable market mechanism. In many cases today, industrial electricity demand is constant. INDIGO-supported investments to modify processes or install on-site renewable generation and/or storage (thermal or electric) could induce demand flexibility, and therefore enable industrial facilities to participate in such programs. However, unless the market incentives for distributed energy resources (DERs), virtual power plants and demand flexibility become more competitive, it could be difficult to convince industrial facilities of the value of providing grid support in these ways.

We recognize that the CPUC is actively working on these core issues of high power prices and valuing demand-side resources in California's electricity market (e.g., CPUC's white paper on Advanced Demand Flexibility Management⁶), but these remain critical barriers to implementation for innovative electrification technologies today. As it designs and implements INDIGO, we suggest that the CEC collaborate with other California agencies like CPUC and legislators to identify ways to reduce industrial electricity costs and make industrial participation in demand flexibility programs profitable.

Conclusion

The INDIGO program has the potential to accelerate industrial decarbonization in California. As described above, we recommend that the CEC direct INDIGO funds to kick start transformation of industrial processes consistent with California's commitment to rapid decarbonization. Further, we

encourage the CEC to collaborate with other California agencies to make industrial electrification cost competitive and spur demand flexibility.

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¹ Industry sectors as defined by the US EPA Greenhouse Gas Inventory Data Explorer, <https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/econsect/all>

² <https://rmi.org/insight/scaling-us-climate-ambitions/#:~:text=Scientists%20and%20the%20Intergovernmental%20Panel,avoid%20the%20worst%20climate%20impacts>

³ <https://rmi.org/we-need-hydrogen-but-not-for-everything/>

⁴ <https://info.ornl.gov/sites/publications/files/Pub45942.pdf>

⁵ <https://rmi.org/insight/virtual-power-plants-real-benefits/>

⁶ <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/demand-response/demand-response-workshops/advanced-der---demand-flexibility-management/ed-white-paper---advanced-strategies-for-demand-flexibility-management.pdf>