RMI Submission

Submission by RMI on views on the work programme 2023 topic of accelerating just energy transition.

Mandate: Matters relating to the work programme for urgently scaling up mitigation ambition and implementation referred to in paragraph 27 of decision 1/CMA.3 para 12.

23 May 2023

The Rocky Mountain Institute (RMI) is an independent non-profit founded in 1982 that transforms global energy systems through market- driven solutions to align with a 1.5°C future and secure a clean, prosperous, zero-carbon future for all. RMI now manages hundreds of projects and provides technical expertise to government and business. Today, the organization has a global staff of over 600 scientists, engineers, and business leaders to meet our current research and collaboration commitments.

RMI works in the world's most critical geographies and engages businesses, policymakers, communities, and NGOs to identify and scale energy system interventions that will cut greenhouse gas emissions at least 50 percent by 2030. RMI has offices in the USA, India, China and Nigeria, with a regionalization strategy in place to open entities in Africa/Nigeria, the Caribbean and South East Asia. Its core business is

to drive the efficient and restorative use of resources. RMI works to create a clean, prosperous, and secure low-carbon future through market-based solutions, shifting from fossil fuels to efficiency and renewable energy solutions.

To accelerate and sustain a just energy transition in the second half of the decisive decade, the focus also needs to shift towards accelerating renewable energy deployment in developing countries other than China and India.

Developing countries have shown that scaling renewable energy is not only possible but could happen faster than developed countries. The energy transition offers a unique opportunity for economies to advance in most of their sustainable development goals and improve their economies, life expectancy, security, and education in parallel to decarbonization.

The potential for renewable energy expansion is undeniable. Approximately 80% of the Global South is made of energy importers, making them susceptible to commodity and security risks and the need to decarbonize has never been more relevant.

To close the ambition and implementation gap, RMI works to implement actionable solutions to set the path forward for decarbonization in the decisive decade. RMI is delighted to present the Co-Chairs of the Mitigation Work Programme with a sample of its ongoing flagship programs, initiative and research in the Global North and the Global South as potential contributions to the technical discussions at the upcoming Global Dialogues.

Proposed contributions to the Global Dialogues

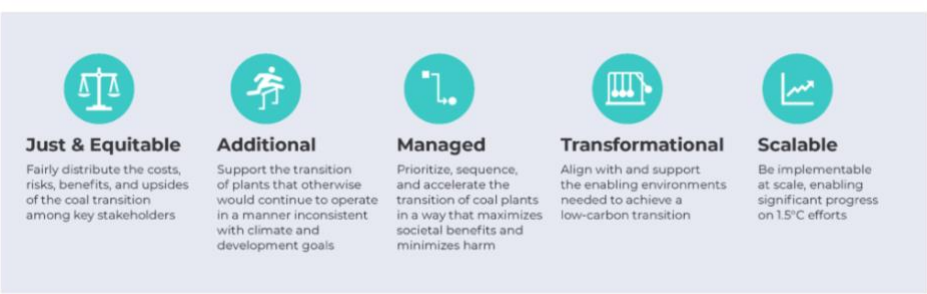
Financing the Coal Transition

RMI's report, Financing the Coal Transition shows how financial mechanisms can complement policy and regulation to help achieve a rapid, equitable, and smooth coal transition.

The economics of power generation are shifting rapidly in favor of clean energy, challenging coal's long history as a mainstay of economic development throughout the world. However, much more work needs to be done to transition the existing coal fleet in line with climate and development goals.

The privileged place coal has occupied in power generation for over a century has entrenched complex barriers—from the way that grids have been built to the incentive structures within electricity systems—that prevent markets from catching up to the economic trend toward clean energy. In the absence of solutions to address these barriers, the costs of uneconomic coal will fall largely on local communities through direct costs and unpriced impacts on local health and the environment.

The global community needs new solutions to address the social and economic complexities of the coal transition while responding to the urgency of the climate challenge. One set of solutions currently under development are the innovative financial mechanisms designed to support the transition from coal to clean energy.



Five key principles to guide the design of financial mechanisms for coal transition

This report helps make sense of the various financial mechanisms proposed to date and models the impacts of using different financial mechanisms to transition existing coal power plants. While it finds that financial mechanisms have the potential to generate wins for both the climate and communities, it also recognizes the risks of using finance to support the coal transition. To manage these risks, RMI proposes five key principles to guide the design of credible financial mechanisms.

Financial mechanisms can be a transformational tool in coal transition efforts—but only if implemented well. Ultimately, the devil will be in the detail as to how financial mechanisms are designed and governed to meet the critical needs of all stakeholders and help deliver a rapid and smooth pathway to a climate-safe future.

Potential Speaker: Koben Calhoun, Principal at RMI, leads the work of the institute in Southeast Asia and is deeply involved in the operationalization of the JETP in Indonesia.

Guidelines for Financing a Credible Coal Transition

Today, more than 95 percent of coal consumptions occurs in countries that have pledged to phase out coal or achieve net zero emissions. Despite these positive commitments, coal emissions have plateaued at a high level, with existing coal plants expected to draw down two-thirds of our remaining 1.5°C carbon budget unless action is taken to transition the current coal fleet. Many of these coal plants operate in markets where regulation or contractual structures insulate them from competition, allowing them to remain profitable despite the rapidly declining cost of renewables.

In this context, coal transition mechanisms (CTMs), or financial mechanisms that support an accelerated, managed transition from coal to clean energy, can be critical tools for turning coal phaseout commitments into action. CTMs are gaining significant interest worldwide, from ratepayer-backed bond securitization in the United States to multilateral development bank programs, such as the Asian Development Bank's Energy Transition Mechanism (ETM) and the Climate Investment Fund's Accelerating Coal Transition (ACT) Investment Program. Yet these mechanisms also carry risks that could undermine their ability to deliver on their intended outcomes.

In this working paper, Guidelines for Financing a Credible Coal Transition, Climate Bonds Initiative, Climate Policy Initiative, and RMI introduce a framework to help funders and coal plant owners address these risks, including:

- Risks that the CTM transaction does not deliver positive climate outcomes.
- Social, environmental, and economic risks to coal workers, communities, and regional governments

- Reputational risks attached to the optics of providing financing to coal plant owners.

This framework is organized into four stage gates that assess coal plant eligibility, coal transition pathways, social protection, and accountability associated with a CTM and puts forward recommended guidelines within each gate (see below).

These guidelines were developed through a consultative process with experts and stakeholders from public, private, and civil society institutions. We expect them to further evolve with both CTM experience and stakeholder needs.

We look forward to hearing your feedback on the guidelines. Please feel free to reach out to the contacts listed in the report to provide any inputs.

Potential Speaker: Tyeler Matsuo is a manager with the Carbon-Free Electricity program. She supports RMI's work on accelerating the coal transition globally and scaling climate finance in emerging markets and developing countries.

Financing Mechanisms to Accelerated Managed Coal Phaseout

RMI's new guidance for how financial institutions can play a key role in the managed phaseout of coal power.

High-emitting assets like coal power plants must retire early to accomplish the goals of the Paris Climate Agreement. Operating the world's current fleet of coal plants until the end of their economic lifespans would almost singlehandedly exhaust the world's dwindling carbon budget.

Despite renewable energy alternatives being significantly more economically competitive than new or existing coal assets, asset owners are often shielded from competitive pressures and incentivized to continue operating coal plants.

Solving this problem will require significant contributions from both public and private finance. Yet while private financial institutions (FIs) have signaled positive intent to contribute to the energy transition through climate commitments and sustainable finance targets, these same commitments can pose challenges for FIs seeking to finance the decarbonization of high-emitting assets.

First, FIs are being placed under increased pressure to divest or withdraw finance from high-emitting assets, which can impede their involvement with coal power assets outright, even where financial support is explicitly linked to managed phaseout. There is also uncertainty on what a responsible role for FIs looks like in these transactions that can accelerate just, equitable, and climate-aligned coal plant retirements while also securing risk-adjusted returns.

To support FIs in adopting managed phaseout as a viable and effective net-zero financing strategy, RMI's Center for Climate-Aligned Finance has created two working papers for private FI involvement in financing the managed phaseout of coal power. These papers, lay out guidance on:

- Metrics and targets: How new and supplementary approaches to measuring and disclosing progress and setting targets for managed coal phaseout financing can remove barriers and even incentivize and accelerate FI involvement.

- Financial mechanisms: How, where, and when FIs can use different financing mechanisms to support a transition away from coal power generation while securing risk-adjusted returns.

These papers are designed to offer a starting point for private FIs to play a key role in managed phaseout transactions today, and for other stakeholders, such as standard setters, to help support and collaborate with FIs in this area. Given the nascency of managed phaseout transactions, we expect that this guidance will continue to develop over time.

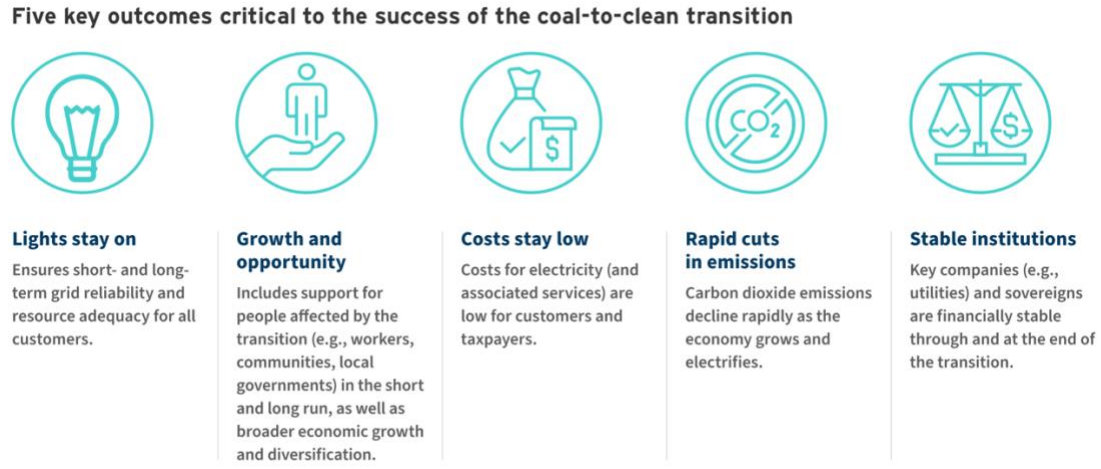
We look forward to hearing your feedback on the guidelines. Please feel free to contact us with any questions or to provide any feedback.

Potential Speaker: Whitney Mann is a manager on the Center for Climate-Aligned Finance's Alignment Insights team where she works on enabling financial institutions to align their investing and lending decisions with climate goals.

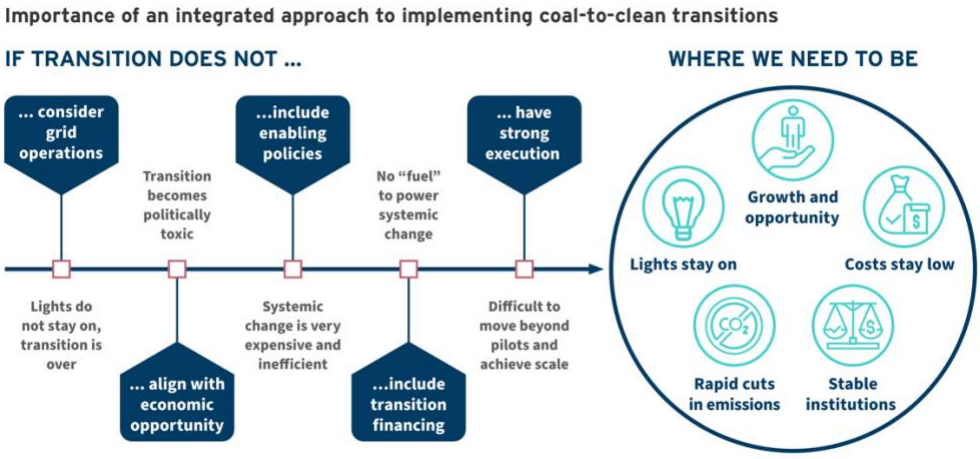
Power Sector Implementation of a Country Coal-to-Clean Transition

The past few years have seen significant momentum for the coal-to-clean transition with several emissions, coal phaseout, and financing commitments. Major coal-dependent countries, including South Africa, Indonesia, and Vietnam, have agreed to Just Energy Transition Partnerships (JETPs) that aim to transform and decarbonize multiple sectors of their economies.

However, the hard work to design and implement this transition now begins — a monumental task that must balance supporting ambitious climate action with robust economic growth. And thus, the speed and success of such a multi-faceted transition will rest on balancing and achieving several outcomes together.

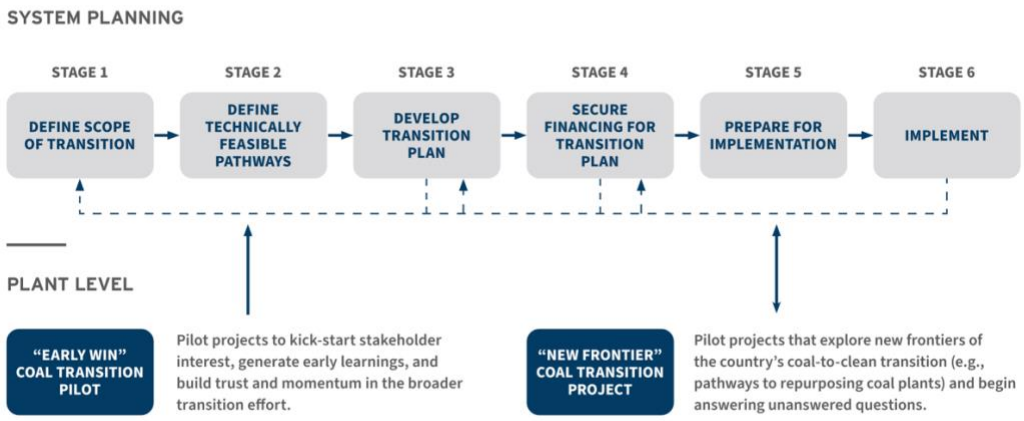


We need an integrated approach — one that considers grid operations, aligns with economic opportunity, and includes enabling policies, transition financing, and strong execution.

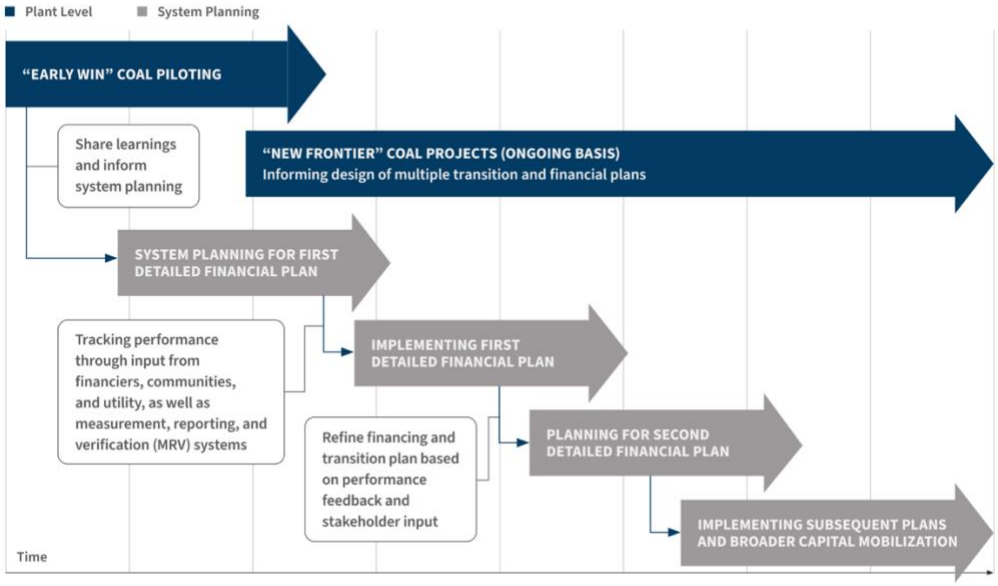


Such an approach raises a set of key questions that need to be answered along the road to implementation, some that are better understood than others. RMI indicates which questions are well-understood and which are less so, thus identifying where knowledge sharing will help drive the transition and where further research and analysis are needed. The briefs lay out how these various questions interconnect and share an integrated roadmap to address them collectively.

Integrated roadmap for country coal-to-clean transition, involving planning and implementation at the system and plant level.



Process to integrate system planning and learnings from pilots and build the bridge to broader capital mobilization.



<u>Potential Speaker</u>: Koben Calhoun, Principal at RMI, leads the work of the institute in Southeast Asia and is deeply involved in the operationalization of the JETP in Indonesia.

Ensuring Equitable Transition

Realizing the Green Jobs Promise

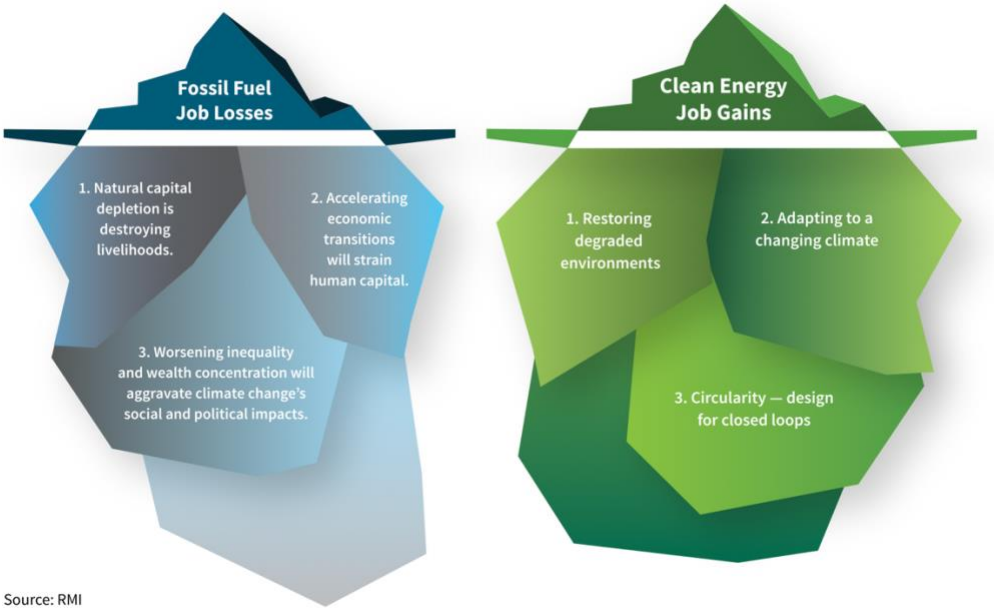
The switch to a carbon-free economy is the biggest economic opportunity of our era. The International Energy Agency and other analysts have predicted that this wave of market-driven innovation will create two to six "green jobs" for each fossil fuel job lost. The promised jobs are already arriving — the 2022

Annual Review by the International Labour Organization and the International Renewable Energy Agency reported that renewables alone had created more than 12 million jobs as of 2021.

But as well-researched and credible as such studies are, unfulfilled promises of prosperity have left many people skeptical about clean energy job claims, a skepticism that is commonly accompanied by the belief that the future holds less opportunity than the past. Even before COVID-19, two out of three people felt pessimistic that the gap between the rich and poor in their own country would ever improve. In fact, the U.N.'s World Social Report 2020 identifies four megatrends that are contributing to growing inequality for more than 70 percent of the global population: climate change, technological innovation, urbanization, and international migration. As a result, narrowly framing job numbers as a direct tradeoff between fossil fuel jobs lost and clean energy jobs gained risks undermining political and popular support for the clean energy transition.

A clean energy focus also misses the bigger picture of our rapidly changing global economy, obscuring the "hidden" costs and risks within our current economic system as well as the nascent opportunities embedded in a shift to a more sustainable economy. Compounding forces — pandemics and supply chain fragilities, new technologies and networked intelligence, and climate change and environmental degradation — are creating unprecedented rates of change in the global economy. Workers, communities, and companies cannot afford to ignore the big picture of what the future holds.

We must reframe the notion of green jobs within this broader context of economic risk, opportunity, and transformation. A more holistic framing centered on the concept of regenerative capitalism, in which achieving net-zero carbon emissions is but one step toward a long-term sustainable economy, can better position communities, companies, and workers globally to thrive as part of a more equitable and abundant future. This report looks beyond analytical findings of "more jobs" to begin charting the deeper work, analyses, and stories needed to inspire a leap from a job scarcity mentality toward one of purpose-inspired economic abundance. We propose calling this shift the Great Regeneration.



Source: RMI

Potential Speaker: Nick Pesta is a senior associate with RMI's Carbon Free Transportation team. He is one of the leading authors of the Realizing the Green jobs Promise report and his previous work for RMI includes working with external stakeholders to identify and analyze critical greenhouse gas reduction pathways for limiting Earth's warming to 1.5˚C.

Optimizing energy demand management and efficiency

Virtual Power Plant Partnership

Outdated regulatory landscapes emphasize scaling energy supply, which has largely benefited centralized large-scale fossil fuel power plants. As the energy transition evolves, there are increasing benefits to implementing demand-side energy policies that help balance and strengthen the grid, empower energy customers, and enable economy-wide electrification.

Virtual Power Plant Partnership (VP3) is an initiative based at RMI that works to catalyze industry and transform policy to support scaling VPPs in ways that help advance affordable, reliable electric sector decarbonization by overcoming barriers to VPP market growth. Virtual power plants are portfolios comprised of hundreds or thousands of households and businesses that offer the latent potential of their electric vehicles (EVs), smart thermostats, appliances, batteries, solar arrays, and additional energy assets to support the grid. VP3 members span the automotive, building, energy service, software, and other sectors needed to deliver VPPs. VP3 is about developing a scalable approach to working together, as a VPP industry, to scale the market and unlock the full potential of DERs.

Potential Speakers: Lauren Shwisberg is a principal in RMI's Carbon-Free Electricity Practice, leading research, and collaboration projects to support the rapid transition to a low-carbon electricity system. Her work examines the roles that renewable energy and distributed energy resources can play in grid planning and investment. Kevin Brehm is a manager with the Carbon-Free Electricity Practice where he works across CFE's consulting, research and convening functions. He specializes in strategies and policies to enable a just and attractive clean energy transition for rural America.

Case Studies

Please see below RMI led case studies on how we are leading the implementation work on the ground and helping escalate clean solutions globally:

Case Study 1: Redirection of fossil fuel electricity subsidies

Redirection of fossil fuel electricity subsidies to rooftop solar in low-to-middle income (LMI) Communities in the Dominican Republic Using Smart Blended Financing

The power sector in the Dominican Republic (DR) faces important challenges including large reliance on imported fossil fuels which make up 79% of the energy mix, the resulting high and fluctuating electricity prices in the sector, extremely high system losses around 32%, and poor grid resiliency. Of the consequences that these challenges present, perhaps the largest and most short-term problem is the high electricity prices to consumers, which sits around US$ 0.30 per kWh. The traditional strategy that the Government employs to combat the high prices is a massive electricity subsidy in which they pay the operational deficit of the three main distribution companies which accounts for approximately 45 percent of the operational expenses. Main drivers of the high yearly expenses include the high costs of fossil fuel

and the inefficiency of the distribution companies. The Electricity subsidy costs the government around US$ 1.5-2 billion per year, or 11 percent of the 2023 annual budget, to ensure that the country's nearly 2.8 million households can power their homes and support an acceptable quality of life for their families.

RMI's "Smart Blended financing" consists of using public and/or philanthropic financial resources to cover some portion of the cost of installing a rooftop solar energy system to attract commercial and private capital to finance the remaining amount and to increase savings for the costumer. The smart part of blended finance consists of using mathematical modelling to identify the optimal blend of financial resources to minimize the required grant amount and maximize the number of projects. While philanthropic capital is an easy option for blended financing models, in many cases this "free" capital does not exist at significant enough scale to instigate large-scale impact, or it does not exist at all**.** However, another option for "philanthropic capital" is the electricity subsidy since it is capital that the government is already committed to spending in the future that can be better utilized to quickly transform the power system. Our analyses show that, to drastically reduce the subsidy, we can incentivize rooftop PV systems installations at scale in highly subsidized sectors of the population. If the government of the DR invests three to five years of what would have been the electric subsidy, and a local financial institution like a cooperative provides the matching funds in the form of a loan, the blended financing model will help clients reduce their monthly bill from 15% to 25 % during loan repayment and more than 90% savings after the loan has been paid; and the need for electricity subsidy would largely disappear.

Transitioning to renewable energy, particularly through the widespread adoption of rooftop solar systems, is a vital step for the Dominican Republic. By redirecting current incentives to benefit low to middle-income communities and repurposing energy subsidy funds, the country can unlock economic growth, reduce poverty, and promote sustainability. RMI's Smart Blended Finance RMI-SBF models, where the government, local financial institutions and other stakeholders collaborate, enable affordable financing options for clients, resulting in substantial cost savings.

Potential Speakers: Max Lainfiesta is a manager for the RMI's Island Program. He focuses on scaling up solar and battery microgrid deployment in the Caribbean region and has a background in sustainable energy systems engineering.

Case Study 2: Bermuda Road to Clean Energy

Bermuda's Road to Clean Energy

Since 2018, RMI has served as a technical advisor to the Bermuda government, regulators, and utilities, by providing detailed analysis, information gathering, and strategic guidance. The team is currently assisting the Ministry of Transport in evaluating the performance of e-buses, exploring government fleet electrification opportunities, and developing a national transportation electrification plan.

In April 2022, Bermuda's public bus electrification initiative took off when the country's first 30 electric buses (e-buses), representing one-third of the island nation's fleet, went into service, bringing Bermuda one step closer to its goal of full fleet electrification by 2030.

The launch resulted from years of planning – in 2014, the country signed the Electricity Act, which formally regulates electricity sales and serves as a catalyst for clean energy projects, and in 2019 the Ministry of

Tourism and Transport, in partnership with the Department of Public Transport, issued a request for proposals for e-buses. In 2021, they purchased 30 e-buses that would be on the road less than a year later.

Electrification will benefit Bermuda in several ways: the country relies almost entirely on oil imports for its energy needs, so a pivot to electric vehicles also increases the country's energy independence. And while 99 percent of Bermuda's electricity generation currently depends on fossil fuels, the country's electricity-related carbon footprint will decrease as renewable energy sources continue to gain ground. Electrification also translates to meaningful progress toward meeting Bermuda's climate and energy goals.

Now, a year after the first public e-buses came online, research conducted by the Government of Bermuda and RMI has found that these 30 buses have had overwhelmingly positive financial and environmental impacts. In less than a year, the public e-buses have helped Bermuda:

a. Avoid 450,000 liters of diesel fuel.
b. Save 176,000 in fuel costs alone.
c. Improve health and air quality.

Potential Speaker: Aradhana Gahlaut is a Senior Associate in RMI's Carbon-Free Transportation team where she supports analytical decision-making on transportation electrification and sustainable mobility strategies using a data-centric approach.

Case Study 3: Shoonya Campaign in India

Shoonya Campaign in India

In India, the demand for rides and deliveries is expected to double by 2030 due to rapid urbanization and e-commerce growth. Meeting this growing transportation demand through conventional internal combustion engine vehicles will be expensive, polluting, and unhealthy.

Shoonya – Zero Pollution Mobility, championed by NITI Aayog and RMI, and supported by MyGov, is a corporate-led consumer awareness campaign aimed at scaling electric vehicle (EV) adoption for the ride-hailing and delivery sector in India. By building awareness and facilitating bold corporate action, the campaign aims to promote EVs and reduce air pollution from the transport sector in India.

The Shoonya campaign brings together a diverse consortium of stakeholders supporting all elements of the e-mobility ecosystem, including original equipment manufacturers, ridehailing companies, charging infrastructure providers, e-commerce providers, financers, and fleet aggregators. Shoonya has over 130 corporate partners in India, and as part of the campaign's corporate branding program, every vehicle, driver, and parcel delivered under the campaign carries the Shoonya seal. Over the past year, corporate partners have collectively completed over 20 million Shoonya deliveries and 15 million Shoonya rides, avoiding 13,000 tons of carbon emissions.

Through Shoonya, public and private sector leadership have come together behind the campaign. Innovative policies and industry ambition are creating a positive ambition loop to accelerate zero-pollution mobility in India. Shoonya has underscored the importance of effective collaboration to drive change at scale. The campaign aims to build from its successful first year of implementation, increasing the number of corporate partners, expanding public outreach, and creating resources to increase information availability.

Electrification of ride-hailing and urban deliveries, two early moving market segments, is one of India's most significant and attainable opportunities to improve urban air quality, accelerate EV adoption, and decarbonize the transport sector. Using electric vehicles for all deliveries and rides can reduce emissions by 54 million tons of CO2, 17,000 tons of PM, and 537,000 of NOx, saving roughly US$60 billion in oil expenditures annually. Shoonya, through its corporate- and consumer-facing engagement channels, is uniquely suited to help India capitalize on this opportunity. Within one year of the campaign launch, Shoonya has achieved resounding success. By gathering renowned industry and public participation in the campaign, Shoonya has kickstarted a widespread transition to a sustainable and cleaner future.

Potential Speaker: Samhita Shiledar is a manager at the India Mobility Project, developing a clean, shared, and electric mobility plan for an affordable, efficient, and reliable transportation future for India. Samhita's past work experience includes manufacturing operations and pollution control at Pidilite Industries, plant designing at Reliance Industries and microgrid assessment and water treatment design in the University of Michigan.

Case Study 4: Accelerating Clean Regional Economies (ACRE) - USA

Accelerating Clean Regional Economies (ACRE)

ACRE work with regional economic development agencies, policy makers, business, labor, and community stakeholders to help chart out and then support regional green growth investment strategies and the enabling policy frameworks needed to accelerate them. An initial effort in the Great Lakes is underway and is being designed to be a replicable model for other regions. We released our inaugural report on "Realizing America's Clean Energy Opportunity" in 2022.

This initiative directly addresses three key barriers to progress:

1. Governments and communities lack the information and capacity to assess suitable investment opportunities and the resulting economic benefits. We provide that analysis, drawing extensively on local input and expertise.
2. No forum exists to promote collaboration among actors with starkly different resources and widely divergent views; political polarization and mistrust prevents governments from playing that role. We bring diverse stakeholders together around their common interest in regional economic development, while investing in the capacity of under-resourced organizations whose voices are critical.
3. Concern about traditional livelihoods and a sense of alienation from decision making undermine political support for the low-carbon transition. We engage local communities where they live, informing them about concrete and specific economic opportunities and building support for the policies and investments needed to realize them.

As part of this effort, RMI creates regional investment strategies that map out investment options, model likely outcomes, develop equity and empowerment plans, and provide use-cases for the investment and policy communities. We develop these strategies in collaboration with trusted and influential experts from the region's land grant universities, think tanks, NGOs, businesses, and community organizations. Economic developers have expressed an urgent need for such regionally coordinated strategies, helping them take advantage of local specializations and creating clusters of interconnected clean energy industries.

Further, these strategies employ cutting edge techniques in economic complexity theory to understand the unique capabilities of a region and match these to the most feasible clean energy transition industries. This exercise is both a novel analytical approach and an important means of establishing credibility with local stakeholders who are rightly suspicious of solutions that are unfamiliar or poorly fitted to regional conditions and capacities.

These regional investment strategies provide the 'conversation starter' and strategic orientation for action. Using the investment strategy as a dynamic guide, we create action-oriented coalitions to address investment barriers, coordinate within and among low-carbon supply chains, and press for needed policy changes. Building the infrastructure and industrial capacity that a region needs for both development and decarbonization requires multi-state coalitions capable of collectively identifying investment barriers, solving problems, and advocating on behalf of state, local, and federal policy solutions. We provide analytical and coordination support for these coalitions as they develop and implement targeted plans to support low-carbon investment and policy solutions.

Potential Speakers: Lachlan Carey is a senior associate at RMI where he leads work on US regional economic development through clean energy investment. Previously Lachlan worked at the Center for Strategic and International. Aaron Brickman is a senior principal in RMI's US Program, leading the efforts at the intersection of clean energy and economic development.