

Regions Take Action:

The Benefits of
Major Climate Policies



Acknowledgments

The authors acknowledge Michael Northrop and the Rockefeller Brothers Fund, whose thought leadership and generous support made this handbook possible.

The authors also thank the following individuals and organizations for offering their insights and perspectives on this work:

Akshima Ghate

Rocky Mountain Institute

Cara Carmichael

Rocky Mountain Institute

Chris Yunker

Hawaii State Energy Office

Clay Stranger

Rocky Mountain Institute

Dimpy Suneja

Rocky Mountain Institute

Donovan Gordon

New York State Energy Research and Development Authority (NYSERDA)

Fernando Sampaio

Produce, Conserve, Include (PCI)

Frédéric Marquet

State government of Hauts-de-France, France

Libby Ferguson

The Climate Group

Luke Pritchard

Governors' Climate and Forests Task Force

Marika Metz-Hall

Department of Business, Economic Development, and Tourism

Mauricio Philipp

State government of Mato Grosso, Brazil

Melissa Miyashiro

Blue Planet Foundation

Paolo Natali

Rocky Mountain Institute

Rolf Bateman

The Climate Group

Scott Glenn

Hawaii State Energy Office

Sophie Benger

The Climate Group

Thomas Koch Blank

Rocky Mountain Institute

Vanessa Ulmer

NYSERDA

Wendy MacPherson

NYSERDA



About Rocky Mountain Institute

Rocky Mountain Institute (RMI)—an independent nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the

adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. RMI has offices in Basalt and Boulder, Colorado; New York City; the San Francisco Bay Area; Washington, D.C.; and Beijing.



This guide was produced in partnership with the Under2 Coalition and The Climate Group.

About the Under2 Coalition and the Climate Group

The Under2 Coalition is driven by a group of ambitious state and regional governments committed to keeping global temperature rises to under 2°C. The coalition comprises more than 200 governments that represent over 1.3 billion people and nearly 40% of the global economy.

The Climate Group is the Secretariat to the Under2 Coalition and works with governments to accelerate climate action through three work streams: planning deep decarbonization pathways, scaling innovative policy solutions, and mainstreaming transparency and reporting.

Authors

Seth Coan, Jacob Corvidae, Jake Glassman, Ben Holland

*Authors listed alphabetically. All authors from RMI.

Contacts

Jacob Corvidae, jcorvidae@rmi.org

Seth Coan, scoan@rmi.org

Suggested Citation

Seth Coan, Jacob Corvidae, Jake Glassman, and Ben Holland.
Regions Take Action: The Benefits of Major Climate Policies.
Rocky Mountain Institute, September 2020.
www.rmi.org/regions-take-action

Download and Share

This guide can be downloaded and shared for free at under2coalition.org/news/regions-take-action or rmi.org/regions-take-action.

Table of Contents

12-21

22-33

34-45

46-55

56-67

				
Clean Electricity	Carbon-Free Buildings	Healthy Transportation	Innovative Industry	Sustainable Land Use
Overview 14	Overview 24	Overview 36	Overview 48	Overview 58
Leadership in Action 15	Leadership in Action 25	Leadership in Action 27	Leadership in Action 49	Leadership in Action 59
Key Milestones 16	Key Milestones 26	Key Milestones 38	Key Milestones 50	Key Milestones 60
Keys to Success 18	Keys to Success 28	Keys to Success 40	Keys to Success 52	Keys to Success 62
Benefits 19	Benefits 29	Benefits 41	Benefits 53	Benefits 63
Case Study Resources 20	Case Study Resources 32	Case Study Resources 42	Case Study Resources 54	Case Study Resources 66
Broader View 21	Broader View 33	Broader View 43	Broader View 55	Broader View 67

Introduction	6
Five Actions to Be Carbon-Free	8
How to Use This Guide	10
The Multiple Benefits of Climate Action	10
The Climate Decade	11
Take Action Today	11
Useful Resources	68

Introduction

The risk and current impacts of climate change mean we must act. We can advance major economic and social benefits while preventing the worst of climate change. We can create great outcomes for our communities without jeopardizing them with extreme weather, floods, droughts, wildfires, and pandemics. This guide helps show the way.

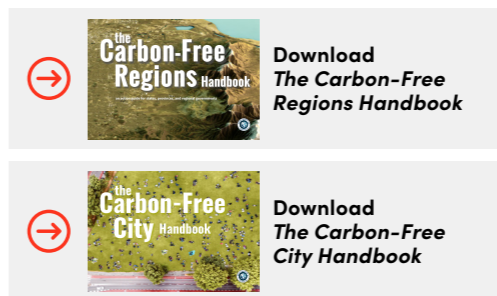


Regions Take Action: The Benefits of Major Climate Policies shows how regional governments are reaping the immediate benefits of decisive climate action while also safeguarding the future. For these governments, a few key actions are driving great impacts on the economy, equity, health, and air quality, as well as resilience and security.

Five regions share their experiences here. These regions and their actions are at the heart of this guide for two reasons. The work they are doing is transformative and leads the way into the new climate economy. Also, the actions they have taken are widely applicable to many other governments. These actions aren't just examples of what the leaders did; they are blueprints for what many regions should do now.

To make transformative change, support is needed across a variety of regional government departments and ministries. It cannot be driven by climate champions alone. **Regions Take Action**, designed as a resource for officials, highlights multiple benefits relevant to a particular sector. It is also available in shorter formats so that specific, relevant sections can be shared separately.

The guide focuses on five high-impact actions and draws on the broader set of actions identified previously in *The Carbon-Free Regions Handbook*.



The Intergovernmental Panel on Climate Change (IPCC) reports that it is critical to limit global warming to 1.5°C over the next 10 years.¹ To avert a global climate catastrophe that could destabilize economies and cause untold social unrest, we must cut greenhouse gas (GHG) emissions in half by 2030. This must be accomplished while fulfilling the responsibility ministries and departments have to improve their sectors and their citizens' quality of life. Thus, we are in "the climate decade."

State, provincial, and regional governments have a critical and unique role to play. They can drive transformative change at scale and provide a critical link between national and local climate action. States, provinces, and regions have direct responsibility for key areas of policy related to climate and are thus able to show the many benefits of transformative action.

Regional governments have a unique ability to create change. They enable counties and cities to take action, and they prove solutions that other regions and national governments can adopt. Because of their unique ability to drive both city and national action, regions have a tremendous role to play in shaping global outcomes.

The Actions

This guide illustrates five actions where regional governments can take transformative climate action and support a set of broader benefits and needs.

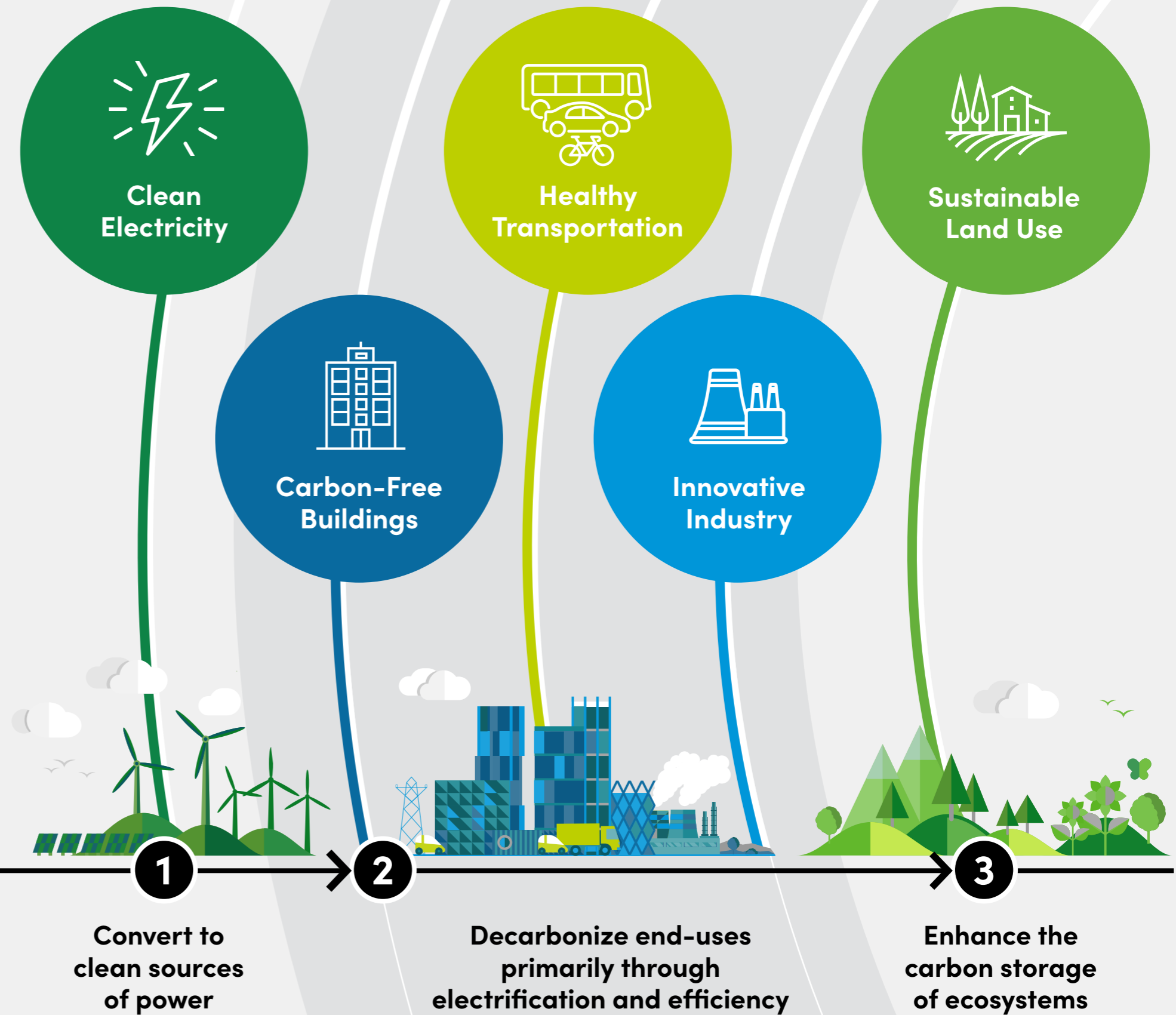
The five actions are:

- Clean Electricity
- Carbon-Free Buildings
- Healthy Transportation
- Innovative Industry
- Sustainable Land Use

¹ Intergovernmental Panel on Climate Change. 2018. *Global Warming of 1.5°C. Special Report 15*. <https://www.ipcc.ch/sr15/>.

5

actions to be carbon-free



These activities will ideally run in parallel, as they are interrelated strategies. For example, a carbon-free building sector becomes easier when electricity is moving toward clean generation. While each action is ambitious, the examples show how determined action can also spur benefits on a larger scale.

To facilitate broader acceptance of these actions, this guide highlights the following benefits which, in addition to emissions reductions, result from these actions:

Equity and inclusion. Actions that are designed to ensure just treatment, equality of opportunity, and equal access to information and resources for all

Economic development. Actions that support the economic engines of our communities, promote job growth, and bolster prosperity

Air quality and health. Actions that promote health and well-being through improved environmental and social conditions

Resilience and security. Actions that help sustain life and livelihoods, promote safety, and reduce risk

How to Use This Guide

Each priority action is presented within a stand-alone document that can be detached from the broader handbook and shared with relevant departments, officials, and staff.

Each action features a case study of leadership in action to show how these policies and programs can be instituted. The intent is to impart lessons learned in surmounting the challenges associated with instituting transformative policies.

Each case study illustrates an example of a transformative solution for each sector. While they may not represent the entire solution for a sector and are necessarily shaped by their local contexts, the highlighted approaches demonstrate tangible pathways toward achieving the more comprehensive solution of decarbonizing the economy.

This guide is brief by design. For more examples, resources, and the actual policy documents, refer to [*The Carbon-Free Regions Handbook*](#).

The Multiple Benefits of Climate Action

Deploying low-carbon technologies and strategies will have impacts well beyond reducing GHG emissions. Climate action effects include positive human health implications; improved ecosystem functioning; and additional macroeconomic, social, or equity impacts.² For example, one study estimates that decreased air pollution resulting from climate action to meet a 1.5°C scenario leads to approximately 153 million fewer premature deaths worldwide.³ In the United States alone, the economic value of the avoided deaths is estimated at \$37 trillion.⁴ These benefits may, in some ways, measure up to the climate change mitigation benefits.

Most major policies are not enacted to address climate change alone; rather, by solving connected problems, we can introduce truly transformative policies and create new opportunities. When non-carbon benefits of climate action are properly considered and articulated, they become game-changers for decision makers.

2. Ürge-Vorsatz, Diana, Sergio Tirado-Herrero, and Navroz K. Dubash. 2014. "Measuring the Co-Benefits of Climate Change Mitigation." *Annual Review of Environment and Resources* 39 (1): 549–82. https://www.researchgate.net/publication/267098768_Measuring_the_Co-Benefits_of_Climate_Change_Mitigation.
3. Shindell, Drew, Greg Faluvegi, Karl Seltzer, and Cary Shindell. 2018. "Quantified, Localized Health Benefits of Accelerated Carbon Dioxide Emissions Reductions." *Nature Climate Change* 8 (April) 291–95. <https://doi.org/10.1038/s41558-018-0108-y>.
4. Shindell, Drew. 2020. "Health and Economic Benefits of a 2°C Climate Policy." Testimony before the House Committee on Oversight and Reform Hearing on The Devastating Impacts of Climate Change on Health. August 5, 2020. <https://oversight.house.gov/sites/democrats.oversight.house.gov/files/Testimony%20Shindell.pdf>.

The Climate Decade

Many crises face us today. We cannot ignore them. Given the interconnected nature of climate, resource availability, economic growth, and equity, we cannot address one crisis at a time. *One stone, two birds* is a proverb that spans many cultures. We need holistic policies that solve many problems at once. The result: better communities and a stronger country.

We are now in the Climate Decade. If we do not halve global emissions by 2030 and treat climate change with the

seriousness needed then we will lose our chance to stop the worst impact of temperature rises. This means that we all need to work together: businesses, governments, states, regions, cities and individuals. We need to see tangible commitments and changes across all sectors. Put simply, we need to see action. This guide is here to act as a starting point for states and regions. We hope to see it widely adopted and its suggestions for emissions reduction expanded to governments everywhere. We can fight climate change and limit its impacts but we have to take action now. There is no time to wait.

Take action today:

Commit to and plan
for these five ambitious actions.

Share these actions
with relevant officials and policymakers to build momentum.

Adapt
these actions to **implement** in your jurisdiction.

Launch
regional actions that effect
national and global change.

Measure
and report on progress.



Clean Electricity

Commit to creating clean electricity. Renewables are cost-effective investments and clean electricity is fundamental to a carbon-free society.



Clean Electricity

After years of declining costs and support from progressive policies, clean and renewable energy resources are now competitive with fossil fuels, producing significant and tangible benefits for the energy system and our quality of life. Electric utilities across the globe are retiring coal plants, subnational governments are prioritizing renewable sources for electricity, and people are reaping the rewards of cleaner and healthier options.

For years, moderate carbon reduction targets have been commonplace in many places around the world, but governments are now stepping up their ambitions with 100% renewable and clean energy targets, standards, and requirements. Policymakers have succeeded in passing these policies, not just by communicating climate concerns but by presenting a broad set of benefits associated with renewable energy—in particular, public health, energy security, economic development, and resiliency.

The rise of renewable energy tracks closely with the decline of coal, bringing about improvements in public health in communities struggling from disproportionate exposure to pollution.¹ In addition, the global renewable energy industry continues to support the economy, with 11 million jobs currently and a projected 24 million jobs by 2030. In the United States alone, clean energy jobs outnumber jobs in fossil fuel industries by three-to-one.

A fully clean and renewable electricity system is the foundation of a zero-carbon energy economy. Without significant progress in decarbonizing the electricity sector, efforts related to buildings, electric mobility, and industry will not achieve their full impact and promise. Though clean energy, such as wind and solar, continues its expansion, there is still much to be done. It is clear now that a zero-carbon future is within our grasp, but a fully renewable electricity system requires ambitious leadership, transformative policies, and a comprehensive vision.

As subnational leaders pursue policies to transition fully to clean and renewable electricity, it is critical that they consider the successes and challenges of their peers around the globe. A vision for a 100% renewable electricity system is the first step, but the road to reaching that goal is filled with political and technical challenges. Fortunately, leaders in this space are making great progress toward overcoming obstacles and providing invaluable lessons for scaling a clean and renewable future for all.

¹ Epstein, Paul R., Jonathan J. Buonocore, Kevin Eckerle, Michael Hendryx, Benjamin M. Stout III, Richard Heinberg, Richard W. Clapp, et al. 2011. "Full Cost Accounting for the Life Cycle of Coal." *Ecological Economics Reviews in the Annals of the New York Academy of Sciences* 1219 (February): 73–98.



Leadership in Action

Hawaii, USA: 100% Renewable Energy Portfolio

Hawaii was the first state in the United States to enact legislation for a 100% renewable electricity system. In the early 2000s, the state began the process of establishing and frequently updating its renewable portfolio standard (RPS).

What began as a process of incrementally increasing the standard culminated in 2015, when Hawaii voted

to set an RPS of 100% by 2045. In doing so, the government set the bar not only for Hawaii but for governments across the globe. Today, Hawaii's RPS stands as a model for transitioning to a fully renewable energy future. Hawaii's success in actualizing this vision is the result of the efforts of a broad base of ambitious, committed, and collaborative stakeholders.





Driving Forces

Several factors contributed to the state of Hawaii passing the 100% RPS:

Energy and economic security.

Hawaii's reliance on oil as a fuel for electricity makes the state vulnerable to the volatile and high-cost nature of the global oil market. Low-income households spend an average of 15% to 20% of their income on electricity.

Resilience.

Hawaii's vulnerability to its oil dependence came into sharp focus after the 2011 tsunami wiped out the Fukushima nuclear plant and forced Japan to offset its losses with emergency imports of oil. This created chokepoints in supply and drove unseen levels of price volatility.

Economic development.

Many Hawaiians refer to renewable energy as "indigenous energy" for its potential to harness the power of the sun and offshore winds. The renewable energy industry also provides plenty of opportunity for job growth on the islands.

Key Milestones

Net Energy Metering (NEM) and 9% RPS

Hawaii enacts NEM, which allows customers to be compensated at the full retail electricity rate for excess solar generation exported to the grid. At the same time, Hawaii establishes a 9% RPS.

ACT 155: 50% RPS

A partnership between the state of Hawaii and the US Department of Energy, the HCEI establishes Hawaii as an innovation test bed to transform the energy sector into one based on renewable energy and energy efficiency.

Fukushima Daiichi disaster

The 2011 tsunami that wiped out the Fukushima Daiichi nuclear plant forces Japan to offset its energy losses with emergency imports of oil, which sends global oil prices upward and, for Hawaii, makes electricity prohibitively expensive. This leads to a rapid adoption of rooftop solar, which quickly becomes a highly competitive alternative.

Utility Scale Wind Project

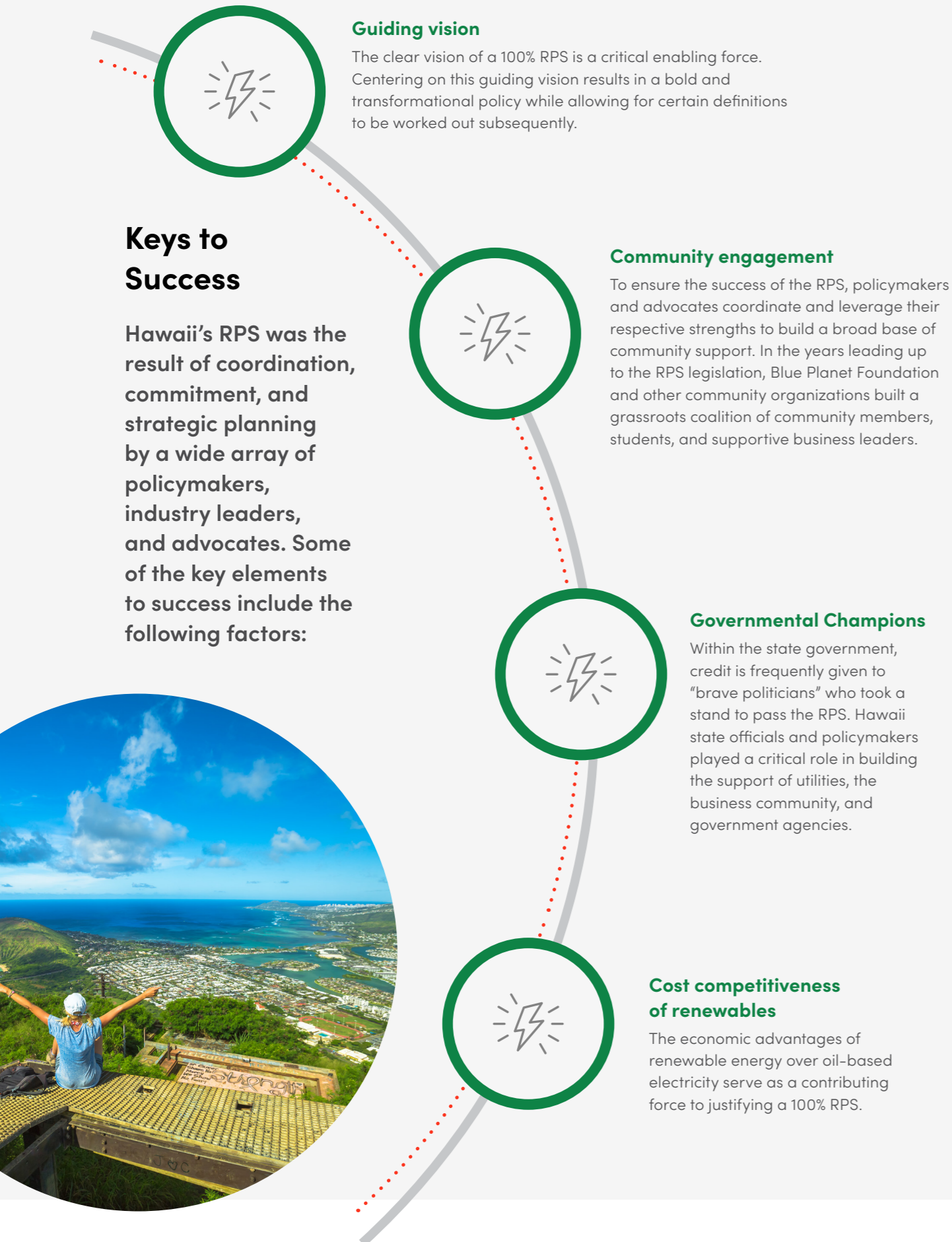
The 30 megawatt Kaheawa Wind Power project is installed on the island of Maui.

Hawaii Clean Energy Initiative (HCEI)

Act 155, Session Laws of Hawaii 2009, increases the RPS goals as a percentage of electricity sales to meet or exceed 25% by 2020 and 40% by 2030.

100% RPS established

Hawaii becomes the first US state to proclaim a 100% renewable energy target for each of its six separate island electric systems.



Benefits

In addition to its carbon reduction potential, Hawaii’s progress toward achieving 100% clean and renewable electricity will produce a number of improvements to the economy of Hawaii and the lives of the people who live there.

Economic Development

Job growth. As of 2017, there were 2,715 solar jobs in Hawaii, which ranks fifth in the nation for solar jobs per capita.

Renewable industry. The RPS will require extensive build-out of solar and wind installations, as well as critical grid infrastructure, which will result in long-term, sustained economic growth and job opportunities.

Health

Emissions. The RPS reduces electricity sector emissions of SO_2 , NO_x , and $\text{PM}_{2.5}$.²

Health costs. The total health and environmental benefits of RPS across the United States are valued at an estimated \$97 billion.²

Equity

Multifamily dwellings. Going forward, Hawaii intends to significantly increase the supply of rooftop and community solar energy for residents of apartment buildings and other multifamily dwellings.

Land use. Hawaii stakeholders are working closely with communities to ensure an equitable distribution of renewable energy assets to prevent disproportionate use of some lands over others.

Resiliency and Security

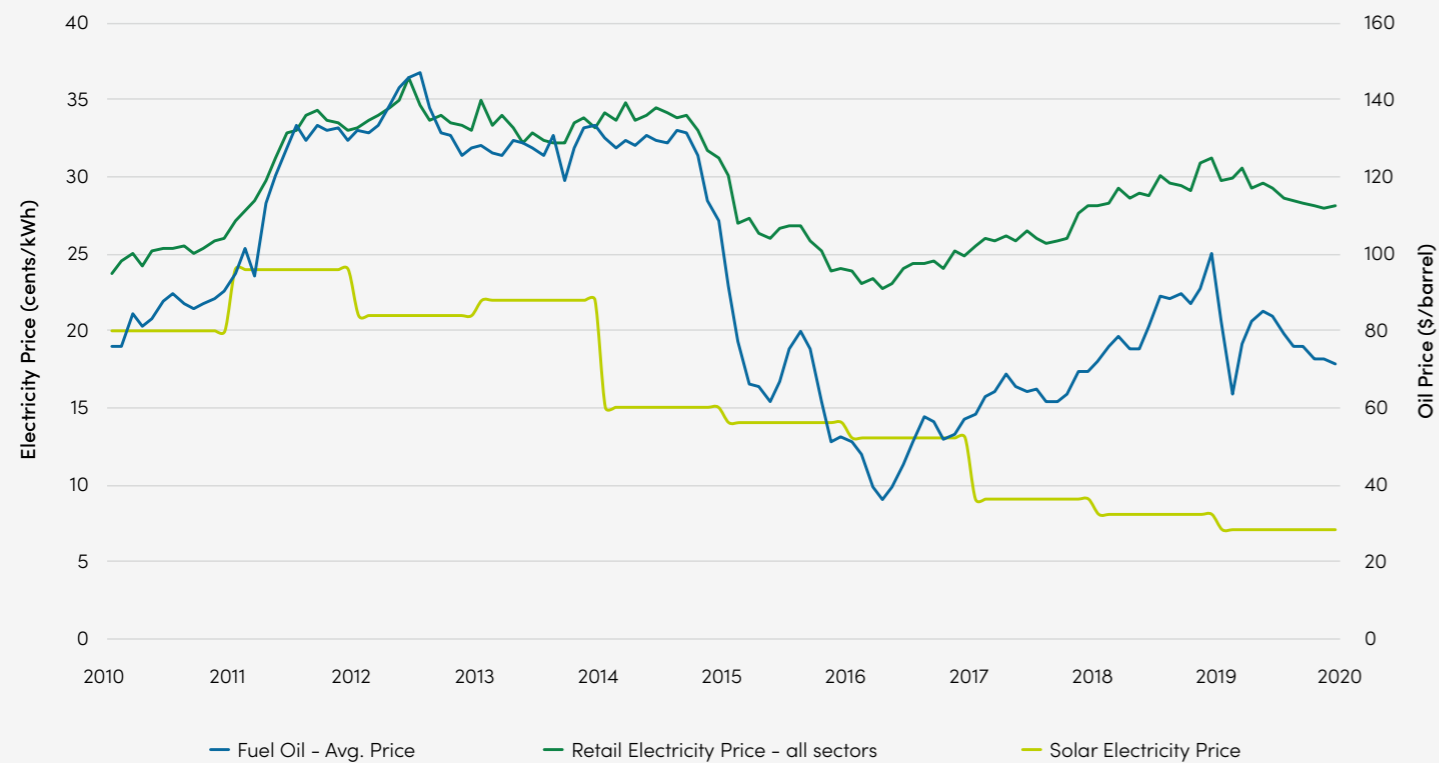
Energy security. The Hawaii RPS will eliminate dependence on oil and shelter the state from the costly and volatile swings of the global oil market.

Grid resiliency. In response to the RPS, Hawaiian utilities are modernizing their systems to prevent grid failure and ensure access to power.

² Mai, Trieu, Ryan Wiser, Galen Barbose, Lori Bird, Jenny Heeter, David Keyser, Venkat Krishnan, Jordan Macknick, and Dev Millstein. 2016. *A Prospective Analysis of the Costs, Benefits, and Impacts of U.S. Renewable Portfolio Standards*. National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory. <http://www.nrel.gov/docs/fy17osti/67455.pdf>.

Solar prices are lower and less volatile.

Hawaii Oil and Electricity Price Volatility Compared with Average Solar Price³



Additional case study resources:

- [State of Hawaii Public Utilities Commission Report to the 2019 Legislature on Hawaii's Renewable Portfolio Standards⁴](#)
- [DSIRE Summary of Hawaii RPS⁵](#)
- [Report: Powering Paradise⁶](#)

³ Hawaii electricity price (cents/kWh) and crude oil imports price (\$/barrel) cited from State of Hawaii Department of Business, Economic Development, & Tourism. Solar prices (cents/kWh) are based on US average, cited from International Renewable Energy Agency, IRENA (2020), Renewable Power Generation Costs in 2019.

⁴ State of Hawaii Public Utilities Commission. 2018. *Report to the 2019 Legislature on Hawaii's Renewable Portfolio Standards*. https://puc.hawaii.gov/wp-content/uploads/2018/12/RPS-2018-Legislative-Report_FINAL.pdf.

⁵ Database for State Incentives for Renewables & Efficiency. 2018. "Renewable Portfolio Standard." May 31, 2018. <https://programs.dsireusa.org/system/program/detail/606>.

⁶ Cross-Call, Dan, Jason Prince, and Peter Bronski. 2020. *Powering Paradise: How Hawaii Is Leaving Fossil Fuels and Forging a Path to a 100% Clean Energy Economy*. Rocky Mountain Institute. <http://www.rmi.org/insight/powering-paradise>.



Broader View

As an island state with a predominantly petroleum-based electricity sector, Hawaii is uniquely well positioned to capture the benefits of renewable energy, but the insights gleaned from its efforts are nonetheless relevant to all subnational governments.

In developing economies, where energy demand and the associated infrastructure investments will increase dramatically over the coming decades, decision makers have a choice to leapfrog over fossil fuels-based energy and invest in clean and renewable electricity.

Ultimately, the success of a 100% renewable electricity policy depends on the coordination of a diverse set of political, commercial, and community stakeholders. To establish a legal and enforceable renewable energy commitment, policymakers and stakeholders must co-develop an actionable vision. Since the success of passing Hawaii's RPS, 13 other US states have followed suit with 100% clean and renewable electricity targets. Elsewhere across the globe, after recognizing the resiliency benefits of renewable energy, Fukushima Prefecture has established a goal of 100% renewable electricity ⁷

Policymakers must also complement their ambitious targets with a technically driven, defensible, and equitable approach to adapting the electric utility business model. For many subnational governments, this may require replacing the traditional approach to electricity.

sales and infrastructure cost recovery with a performance-based approach—an enabling regulatory framework for transitioning clean, resilient, and affordable electricity.

This shift in thinking is especially relevant in light of the disproportionate electricity costs and levels of exposure to pollution low-income communities bear worldwide. Though the renewable energy industry continues to grow and make great progress toward achieving an array of climate, health, and economic benefits, there is much work to be done to ensure universal availability of its benefits. To that end, policymakers should strive to build equity and broad availability into their strategies. Doing so will unlock the potential for a global transition to 100% clean and renewable electricity.

⁷ McCurry, Justin. 2020. "Fukushima Unveils Plans to Become a Renewable Energy Hub." *The Guardian*, January 5, 2020. <https://www.theguardian.com/environment/2020/jan/05/fukushima-unveils-plans-to-become-renewable-energy-hub-japan>.



Carbon-Free Buildings

Construct and upgrade our buildings to be all-electric and efficient, which will also create local jobs and healthier, comfortable places to live and work.



Carbon-Free Buildings

The buildings sector is on the verge of a major renovation, and technologies and strategies for carbon-free buildings are in style. More than being fashionable, policies supporting carbon-free buildings, when done right, provide multiple direct benefits to improve health, equity, and resilience and drive economic growth.

These benefits can hardly be overstated. Building energy efficiency and electrification strategies lead to improved indoor and outdoor air quality, saving lives and improving health. Better access to technology and services lowers energy bills for disadvantaged populations and addresses energy affordability. Energy efficiency and flexibility in buildings help balance the grid's loads and reduce grid infrastructure costs. With adequate support and policies, the energy services and retrofit industry will continue, if not accelerate, its current rate of impressive growth, providing widespread economic growth and job opportunities.

Now more than ever, transformative solutions are available, and well-designed building sector policies are aimed at three core tenets to maximize the benefits for the sector:

Electrify: Removing fossil fuel use in buildings by upgrading to all electric equipment.

With Efficiency: Reducing energy use and enabling smart, flexible adjustment of energy needs through better design and retrofit of buildings.

And Low-Carbon Materials: Using low-carbon materials in new construction and major retrofits; reusing rather than manufacturing new carbon-intensive materials where possible.

Furthermore, with increased awareness that the building sector is one of the largest sources of anthropogenic CO₂ emissions, it has come under sharp focus as an opportunity for decarbonization policy across the globe. About 40% of global energy-related CO₂ emissions are attributable to the buildings sector—28% from building operations and 11% from building materials and construction.¹ To limit climate change to 1.5°C, we need to drastically accelerate the rate of energy retrofits for existing buildings as well as ensure that all new buildings are zero or near-zero net carbon. In addition, since people spend approximately 90% of their time in buildings, creating healthy indoor environments is very important. Increasing awareness about the health and wellness opportunities of building design is also beginning to drive important policy changes with both health and climate benefits.

Improving buildings remains one of the largest untapped and cost-effective decarbonization strategies, and regions will do well to participate in this revolution of the building industry. The path toward a carbon-free building sector is a path toward prosperity.

¹ Global Alliance for Buildings and Construction. 2019. *2019 Global Status Report for Buildings and Construction*. <http://wedocs.unep.org/bitstream/handle/20.500.11822/30950/2019GSR.pdf?sequence=1&isAllowed=y>.



Leadership in Action

New York State, USA: Climate Leadership and Community Protection Act

In 2019, New York State enacted the Climate Leadership and Community Protection Act (CLCPA), sweeping legislation that establishes the strongest economy-wide GHG emissions limits in the United States.

The policy calls for New York to realize carbon neutrality, with direct emissions reductions of 85% by 2050, including a 40% reduction from 1990 levels by 2030.

Buildings are explicitly addressed as a core consideration in achieving these targets, and the CLCPA is supported by a large set of complementary policies in the buildings sector.

For state agencies, much of their new and existing building decarbonization efforts now occur under CLCPA framing. The state's comprehensive strategy to move its building stock to carbon.

Key Milestones

The CLCPA exists in an ecosystem of connected state policies. Key policies are listed below in order of issuance:

Statewide emissions targets set

The New York State Energy Plan sets ambitious GHG emissions reduction targets, which are subsequently embedded in the CLCPA.

Analysis reveals key role of energy efficiency

The state publishes *New Efficiency: New York*, and its analysis reveals that New York will not meet these GHG reduction targets unless stronger action is taken regarding energy efficiency; one-third of the emissions reductions needed to achieve the 40% by 2030 goal will come from building energy efficiency strategies.

Governor commits to advancing toward a carbon-neutral building stock

Governor Andrew M. Cuomo launches the state's Green New Deal, including a directive to chart a path to making New York's statewide building stock carbon neutral.

New initiative significantly scales up funding

The PSC issues "Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios through 2025," a large-scale undertaking aimed at advancing energy efficiency and heat pump deployment in the state.

NYSERDA launches Clean Energy Fund

NYSERDA launches the \$5 billion Clean Energy Fund, spanning four portfolios: market development, innovation and research, solar affordability through NY-Sun, and the New York Green Bank.

Utilities required to drive emissions reductions

The state Public Service Commission (PSC) issues its Accelerated Efficiency Order, which more than doubles utility energy savings goals through 2025 relative to historic levels.

CLCPA helps unify the existing policy landscape

The CLCPA is signed, and it provides an avenue for codifying, uniting, and strengthening much of the state's work in the building sector, with exact details to be set through a scoping process.

neutrality includes a process of committing nearly \$5 billion between 2020 and 2025 to incentives and market development activities for energy efficiency and heat pump deployment. Much of these investments are funded by ratepayers and administered by utilities to achieve ambitious energy savings targets. These initiatives are expected to save customers much more on energy costs and will simultaneously accelerate market adoption of low-carbon technologies.

The New York State Energy Research and Development Authority (NYSERDA), the state's clean energy and innovation agency, plays a complementary role in these efforts. NYSERDA's investments emphasize

reducing the costs of energy efficiency retrofits, building electrification, and high-performance new construction; advancing and demonstrating strategies to achieve deeper energy savings; providing financial and technical assistance, including to low-income consumers; and providing financing for market participants. Other components of New York's strategy include advancing building energy codes and stretch codes; procuring state agency commitments to lead by example in their facilities; and continuing to develop a Carbon Neutral Buildings Roadmap and a Building Electrification Roadmap to articulate policies and programs for longer-term market transformation.



Driving Forces

Factors that led New York to enact the CLCPA include:

Threat of climate impacts.

New York and its leadership increasingly recognize that dramatic decarbonization is necessary to mitigate climate impacts that pose a significant threat to the state's economy and infrastructure. The effects of Hurricane Sandy represent a tangible example of what the state hopes to avoid.

Green economic opportunity.

New York recognizes that the development of green technologies and sustainable practices creates jobs and strengthens the state's economy.

Grassroots advocacy.

Multiple groups of stakeholders (e.g., environmental, labor, and community interests) came together with clear demands to advance the state's new energy economy, address climate change, advance climate justice, and enhance resilience.

Keys to Success

Core factors in New York State's success include the following:

Establishing a clear mandate

Provides a framework under which many other existing initiatives now fall. The CLCPA is a guiding document that codified a number of Governor Cuomo's goals and executive orders, and it ensured that existing and future decarbonization programs reflect the CLCPA mandate.

Reflecting constituent interests

Incorporates stakeholder feedback into the planning and policy process. Key stakeholders include affordable housing advocates, who have helped to elevate equity considerations, and market actors, who have encouraged the use of energy efficiency and heat pump incentives that are easy to understand and access.

Incentives and information

Gains support from consumers and market actors as a result of state policies that advance goals through a portfolio of incentives, technical assistance, and demonstration projects.

Scalability and consistency

Achieves statewide consistency through unprecedented collaboration between utilities and state agencies. For statewide heat pump and low- to moderate-income (LMI) initiatives, the overall program structure, customer experience, and contractor experience are designed to be similar throughout the state.

Optimizing impact

Tracks progress on a number of key performance indicators, which allows the state to better understand and then adjust its initiatives. For specific initiatives, metrics include the number of utility programs implemented, cost reductions in certain technologies, and the number of heat pump installations.

Accelerating market adoption

Removes barriers to advanced technologies, such as heat pumps, so they become the default options. This includes ensuring that high-quality, affordable installations become standard practice; market fragmentation is reduced; and consumers have easy access to information.



Benefits

The CLCPA's main goal is to build an equitable and inclusive clean energy economy in New York. The benefits of the state's proactive leadership in this sector include:

Economic Development

Keep revenue in state while supporting clean technologies. New York residents spend \$14 billion on heating every year, including \$8 billion on gas heating and \$4 billion on oil heating. Most of this money leaves the state. Eliminating fossil fuel heating would keep billions of dollars in New York.

Job creation. Policies that support transformative technologies like heat pumps create jobs directly through installation and indirectly through multiplier effects and private sector investments. In addition, New York's policies directly fund workforce development, including, for example, training people to install heat pumps in their communities.

Infrastructure costs savings. Policies that promote "non-wires alternatives" can reduce capital investments associated with electric transmission and distribution infrastructure,² and policies that promote electrification may avert expensive gas pipeline infrastructure.³

Desirability. As cities around the world grow rapidly, regions with sustainable building policies that promote a cleaner, healthier environment are more able to attract and retain residents and are seeing a greater influx of foreign direct investment as well.⁴

Health

Air quality. Fuel combustion in buildings affects indoor air quality and poses serious health risks from particulate pollution and gases like NO₂ and

2 Stanton, Tom. 2015. *Getting the Signals Straight: Modeling, Planning, and Implementing Non-Transmission Alternatives Study*. National Regulatory Research Institute. <https://pubs.naruc.org/pub.cfm?id=536EF440-2354-D714-51CE-C1F37F9B3530>.

3 Golden, Rachel. 2019. *Building Electrification Action Plan for Climate Leaders*. Sierra Club. <https://www.sierraclub.org/sites/www.sierraclub.org/files/Building%20Electrification%20Action%20Plan%20for%20Climate%20Leaders.pdf>.

4 Pisani, Niccolò, Václav Ocelík, and Ganling Wu. 2019. "Does It Pay for Cities to Be Green? An Investigation of FDI Inflows and Environmental Sustainability." *Journal of International Business Policy* 2 (1): 62–85.



CO. In New York City alone, research shows that PM_{2.5} particulate pollution, for example, causes 3,000 premature deaths, 2,000 hospitalizations for respiratory and cardiovascular diseases, and 6,000 emergency department visits for asthma annually.⁵ Policies that advance efficiency and electrification mitigate these problems.

Equity

Benefiting LMI communities. The CLCPA explicitly states that at least 35% of the benefits of spending on clean energy and energy efficiency must go to disadvantaged communities. Examples of equity benefits of the CLCPA and related New York energy policies include:

- Providing bill payment assistance/ discounts through the Low-Income Affordability Program
- Conducting energy literacy outreach, education, and awareness campaigns through a customer hub
- Increasing access and affordability of key technologies (e.g., efficiency technologies, heat pumps, renewables)

- Coordinating and improving access to information by aligning LMI initiatives with other state and local programs
- Continuous improvement of LMI-related initiatives by tracking progress (e.g., households served, costs, and savings) and modifying initiatives to maximize benefits and minimize costs

Resilience and Security

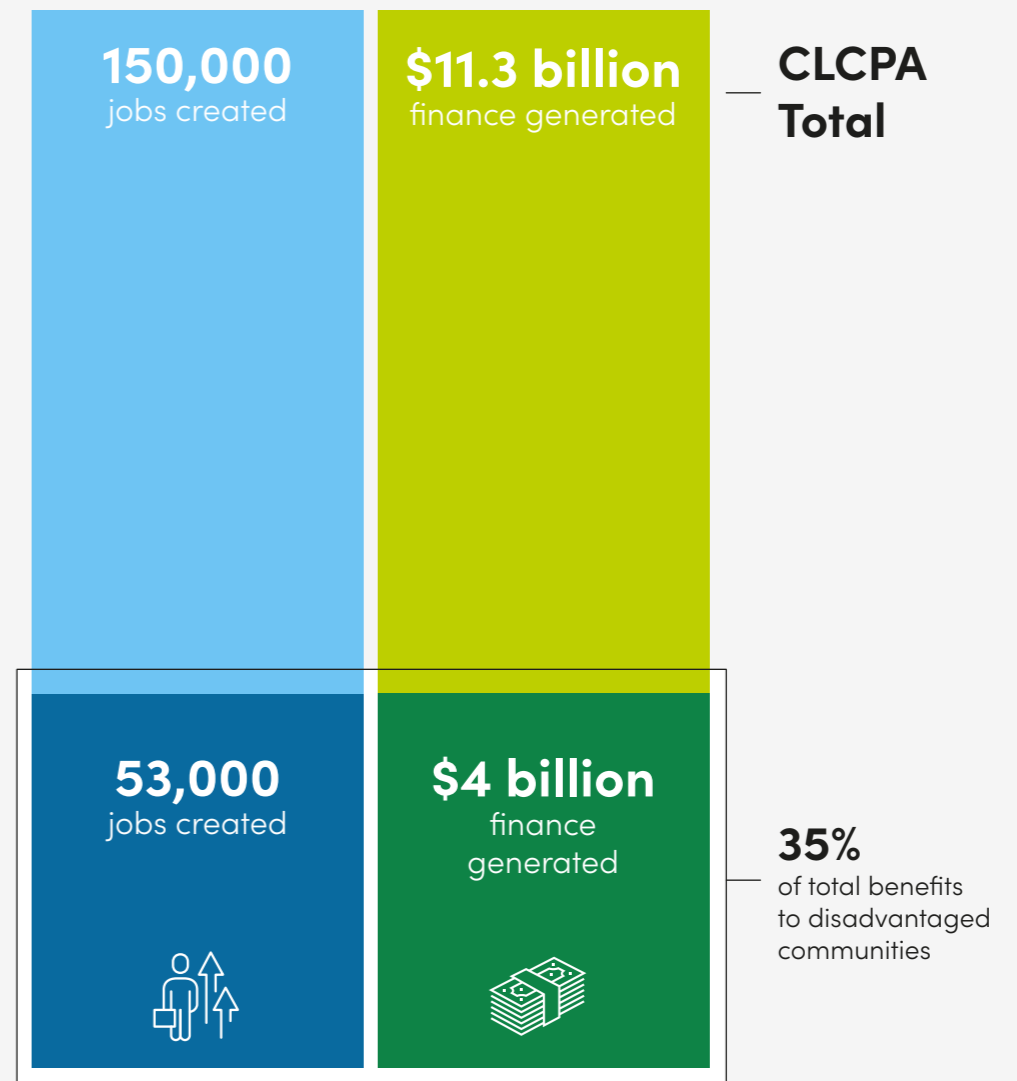
Climate resilience. These policies advance climate resilience for New York, which, like many places around the world, faces worsening climate impacts. Extreme weather, sea level rise, increased temperatures, air pollution, and health effects are already being experienced and are of particular concern.

Community resilience. These policies advance community resilience by providing career opportunities in marginalized communities.

⁵ Kheirbek, Iyad, Katherine Wheeler, Sarah Walters, Grant Pezeshki, and Daniel Kass. 2011. *Air Pollution and the Health of New Yorkers: The Impact of Fine Particles and Ozone*. New York City Department of Health and Mental Hygiene. <https://www1.nyc.gov/assets/doh/downloads/pdf/eode/eode-air-quality-impact.pdf>.

Building policy can create equity.

Estimated Average Annual Job and Income Benefits of the CLCPA, Total and to Disadvantaged Communities⁶



Note: The CLCPA requires that at least 35% of the benefits from spending on clean energy and energy efficiency go to disadvantaged communities.

⁶ Total jobs created and income generated based on Demos policy brief (The Climate and Community Protection Act). Jobs and income going to disadvantaged communities extrapolated by multiplying Demos figures by the CLCPA requirement that 35% of spending benefits disadvantaged communities. Jobs created and income generated apply to direct and indirect employment only.



New York Resources

→ [New York Climate Leadership and Community Protection Act](#)⁷

The following resources relate to key building sector policies that interface with the CLCPA:

→ [“Governor Cuomo Announces Additional \\$2 Billion in Utility Energy Efficiency and Building Electrification Initiatives to Combat Climate Change”](#)⁸

→ [“In the Matter of a Comprehensive Energy Efficiency Initiative”](#)⁹

→ [Toward a Clean Energy Future: A Strategic Outlook 2020–2023](#)¹⁰

→ [New Efficiency: New York](#)¹¹

→ [NYS Clean Heat: Statewide Heat Pump Program Implementation Plan](#)¹²

⁷ Bill No. A08429. 2019. New York State Assembly. https://nyassembly.gov/leg/?default_fld=&leg_video=&bn=A08429&term=2019&Summary=Y&Actions=Y&Text=Y.

⁸ New York State. 2020. “Governor Cuomo Announces Additional \$2 Billion in Utility Energy Efficiency and Building Electrification Initiatives to Combat Climate Change.” News release, January 16, 2020. <https://www.governor.ny.gov/news/governor-cuomo-announces-additional-2-billion-utility-energy-efficiency-and-building>.

⁹ “In the Matter of a Comprehensive Energy Efficiency Initiative.” 2020. Matter no. 18–00381. New York State Department of Public Service. <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=18-M-0084>.

¹⁰ NYSERDA (New York State Energy Research and Development Authority). 2020. *Toward a Clean Energy Future: A Strategic Outlook 2020–2023*. <https://www.nyserda.ny.gov/-/media/Files/About/Strategic-Plan/strategic-outlook.pdf>.

¹¹ NYSERDA (New York State Department of Public Service). 2018. *New Efficiency: New York, New York*. <https://www.nyserda.ny.gov/-/media/Files/Publications/New-Efficiency-New-York.pdf>.

¹² *NYS Clean Heat: Statewide Heat Pump Program Implementation Plan*. 2020. New York State Energy Research and Development Authority, Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., Niagara Mohawk Power Corporation d/b/a National Grid, New York State Electric & Gas Corporation, Orange and Rockland Utilities Inc., Rochester Gas and Electric Corporation, 2020. <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b4DCD9A46-A766-4AEC-9D11-B042B4905251%7d>.

Broader View

Policy solutions for modernizing buildings are relevant across the globe but can vary depending on climatic, infrastructure, economic, and political contexts. Many cities around the world—New York City; Vancouver, Canada; and Vienna, Austria, to name just a few—are leading the charge to modernize their building stock. However, cities and states must work together to align as closely as possible on goals, policies, and building codes.

We are adding to the planet the equivalent of another New York City every month.¹³ Emerging economies are driving this massive boom in new construction, and these regions may drive significant progress by focusing on building sector policies that facilitate carbon-free new construction.

On the other hand, over 80% of buildings that will exist in 2030 are already built.¹⁴ Regions with a higher proportion of existing building stock compared with new development, including many developed countries, may do well to focus on policies that improve the performance of existing buildings.

Furthermore, as building systems and technologies are evolving, policymakers are faced with a growing list of options to consider. For example, in some cases, hydrogen may be a viable alternative fuel for buildings.¹⁵ Nevertheless, as the electric grid gets cleaner, whether it be through electrification of buildings or use of renewable hydrogen in buildings, policies that support carbon-free buildings provide a pathway for improved health, economic benefits, and carbon emissions reductions.

Building sector policies also have the potential to work synergistically to advance progress in other sectors. For example, policies that promote the use of low-carbon building materials or access to electric vehicle charging at certain buildings can create jobs in upstream manufacturing or service industries.

There is not a one-size-fits-all policy framework. In certain contexts, such as New York, jurisdictions can pursue building strategies within a larger agenda that accomplishes other interconnected social, economic, and environmental goals. Alternatively, building sector policies can be implemented through targeted legislation, executive action, existing regulatory authority, or other means, depending on the jurisdiction’s political context and priorities.

¹³ Architecture 2030. n.d. “New Buildings: Operational Emissions.” Accessed July 13, 2020. <https://architecture2030.org/new-buildings-operations/>.

¹⁴ Bradtner, Stefanie. “The Global Building Stock Is Expected to Exceed 183 Billion Square Meters in 2026.” *Guidehouse Insights*, April 26, 2018. <https://guidehouseinsights.com/news-and-views/the-global-building-stock-is-expected-to-exceed-183-billion-square-meters-in-2026>.

¹⁵ Fuel Cells and Hydrogen Joint Undertaking. 2019. *Hydrogen Roadmap Europe: A Sustainable Pathway for the European Energy Transition*. https://www.fch.europa.eu/sites/default/files/Hydrogen%20Roadmap%20Europe_Report.pdf.



Healthy Transportation

By creating better mobility options and electrifying vehicles, air pollution can be reduced while giving people more choices for transportation.



Healthy Transportation

The transportation sector is a primary contributor to air quality, economic, and climate concerns, but recent advancements in vehicle electrification show great potential for eliminating the negative impacts of petroleum-fueled cars and trucks. A little over 10 years ago, electric vehicles (EVs) were nonexistent in the global vehicle market. Today, they account for 2.6% of global car sales and are continuing to capture significant market share; in 2019, global EV sales registered a 40% increase over 2018. Many experts anticipate EV sales to overtake internal combustion engine vehicles (ICEs) by 2030.

EVs offer significant health benefits over ICEs. Having no tailpipe, EVs produce considerably lower levels of volatile organic compounds (VOCs), sulfur oxides (SO_x), nitrogen oxides (NO_x) and particulate matter (PM_{2.5} and PM₁₀), which makes them a clear part of the solution to transportation-related health concerns.

EVs also offer economic advantages for drivers. Given the comparatively lower cost of electricity, EVs are considerably cheaper to operate than vehicles fueled by petrol, gasoline, and natural gas. These lower operational costs enable EVs to achieve a much lower total cost of ownership than ICEs. These savings pass directly to drivers, easing the high cost of transportation for many.

Transportation accounts for 24% of global energy-related CO₂ emissions.¹ In many locations, transportation's share of the problem continues to grow. Vehicle ownership and demand are climbing in developing nations, with carbon-intensive vehicles claiming the lion's share of the vehicle market. The commercial market, too, poses significant challenges, as freight and delivery services are producing increasing amounts of carbon emissions.²

Subnational governments can unlock a broad set of benefits if they employ a comprehensive approach to decarbonizing mobility. Though the following case study focuses on the very important approach of electrifying vehicles, policymakers should also consider measures for reducing dependence on personal vehicles, expanding nonmotorized transportation infrastructure, and creating car-free districts. Together, these measures will lead to a cleaner, healthier, and better quality of life.

- 1 IEA (International Energy Agency). n.d. "Transport: Improving the Sustainability of Passenger and Freight Transport." Accessed August 5, 2020. <https://www.iea.org/topics/transport>.
- 2 Scott, Mike. 2019. "Shipping Sector Comes Under Increasing Pressure to Cut Its Carbon Footprint." *Forbes*, June 28, 2019. <https://www.forbes.com/sites/mikescott/2019/06/28/shipping-sector-comes-under-increasing-pressure-to-cut-its-carbon-footprint/#3363789c1487>



Leadership in Action

Delhi, India: EV Policy

The Delhi EV Policy, passed in December 2019 and enacted in August 2020, is arguably the most comprehensive subnational policy of its kind. With a strong focus on demand creation, the policy calls for 25% of all new vehicles to be battery operated by 2024. This target is estimated to amount to 500,000 EVs and 4.82 million tons in CO₂ emissions savings.

While many subnational EV policies around the world have chosen to focus on four-wheeled personal vehicles,

Delhi's policy covers a wide array of vehicle types, with incentives for electric two-wheelers; shared transport vehicles, such as three-wheelers and buses; as well as goods carriers and freight vehicles. These other vehicle types produce tremendous amounts of air pollutants and carbon emissions. For instance, two-wheelers and three-wheelers contribute about 75% of the vehicular PM_{2.5} emissions in Delhi, which is equal to the total amount of pollution from trucks and eight times that of buses.



Key Milestones

Delhi realizes the potential of EVs

Through a series of stakeholder workshops and analyses, the Delhi government identifies EVs as a key solution to the problem. There was an understanding within the government that policy could accelerate the transition to EVs.

Policymakers engage stakeholders

The draft policy is put forward for discussion among various stakeholders representing government agencies, industry, civil society, and academia. An estimated 300 stakeholders participate in the process and provide feedback on the draft policy.

Awareness of air pollution increases

Understanding the threats to quality of life and public health, the government of Delhi seeks to develop a policy that combats vehicles' contribution to air pollution. Studies indicated that 30% of the particulate matter in Delhi is emitted from tailpipes.

Leaders formulate draft policy

The Delhi government develops a policy for consideration by cabinet ministers and various stakeholders. The policy focuses on electric two-wheelers, shared transport vehicles, goods carriers, and freight vehicles.

Government enacts policy

The final policy emerges as a highly comprehensive set of demand incentives aimed at making EVs affordable. The policy also provides several non-fiscal incentives, such as waivers on road tax, registration, and parking fees.



Driving Forces

The Delhi EV Policy provides the following incentives and policies by vehicle type:

Two-Wheelers

- Purchase incentive of 5,000 Indian rupees (INR) per kilowatt-hour (kWh) of battery capacity.
- "Scrapping incentive" of 5,000 INR for the scrapping and deregistration of an old internal combustion vehicle. The incentive is subject to a matching contribution made by the dealer at the time of the sale.
- Mandate that all companies providing last-mile deliveries must transition 50% of their two-wheeler fleet to electric by March 2023 and 100% by March 2025.

Electric Autos, Rickshaws, and Carriers

- Purchase incentive of 30,000 INR
- Interest reduction of 5% on loans for the purchase of electric autos

Four-Wheelers

- Purchase incentive of 10,000 INR per kWh of battery capacity

Buses

- Commitment that electric buses must account for 50% of all new buses in the fleet of the government of the National Capital Territory of Delhi

The Delhi EV Policy also includes incentives for the expansion of charging infrastructure. To that end, the government has committed to providing accessible charging or battery swapping facilities within 3 kilometers' travel of anywhere in Delhi. To ensure this expansion, the Delhi government will subsidize the cost of installation.



Benefits

Economic Development

Cost savings. Delhi's transition to EVs will produce significant individual cost savings and community-wide economic benefits.

Efficiencies. Analysis conducted by RMI finds that the EVs sold through 2024 will require 120.8 petajoules less energy than an equivalent ICE, which in turn will save \$865 million.³

Economic stimulus. Those funds effectively act as a large economic development stimulus into the region. Further, the Delhi government intends to attract significant investment from a variety of industries, including automotive manufacturers, electric distribution companies, charging station providers, financing services, and others, which will help further the advancement of the EV market. Together, these entities will provide jobs and improve the Delhi economy.

Health

Air quality. The Delhi EV Policy is directly aimed at improving air quality. Delhi is well known for its air quality problems, and vehicles play a significant role in those problems, contributing up to 40% of PM_{2.5}, 20% of PM₁₀, and more than 80% of NO_x, CO, and non-methane volatile organic compounds (NMVOCs).⁴

Emission reductions. Analysis suggests that the Delhi EV Policy will offset 159 tons of PM_{2.5} tailpipe emissions by 2024.⁵ Commercial drivers and citizens most exposed to vehicular emissions will see direct and near-term improvements to health and quality of life.

Reduced exposure to pollutants. Drivers of Delhi's omnipresent green and yellow autos and other carriers will have the opportunity to purchase a clean, zero-emissions vehicle at a steeply discounted price and in turn significantly reduce their exposure to harmful pollutants.

3 Dialogue and Development Commission of Delhi and Rocky Mountain Institute. 2019. *Accelerating Delhi's Mobility Transition: Insights from the Urban Mobility Lab in Delhi*. Rocky Mountain Institute. <https://rmi.org/insight/urban-mobility-lab-delhi/>.

4 Suneja, Dimp. 2020. "Delhi's Electric Vehicle Policy: Will It Be a Game Changer." Rocky Mountain Institute. January 17, 2020., <https://rmi-india.org/delhis-electric-vehicle-policy-will-it-be-a-game-changer/>.

5 Ghate, Akshima. 2019. "Delhi EV Policy: Govt Lays Foundation for a Clean Mobility Future." Rocky Mountain Institute. December 28, 2019. <https://rmi-india.org/delhi-ev-policy-govt-lays-foundation-for-a-clean-mobility-future/>.

Vehicle demand generation

The Delhi EV Policy provides motivation in the form of up-front purchase incentives, loan interest waivers, and a "scrapping bonus" that serves as payment for retiring an internal combustion vehicle. The incentives help EVs achieve cost parity with ICEs. In addition, the policy includes a number of non-fiscal incentives, such as waivers on road tax, registration, and license fees.

Demand assurance to industry

The policy sends a clear signal to industry that EV market is viable and here to stay. By incentivizing demand across all vehicle types—two-wheelers, three-wheelers, and four-wheelers—the Delhi EV Policy raises the visibility of electrification and invites industry participation.

Charging infrastructure expansion

Delhi offers a host of incentives for charging infrastructure as well as reduced-rate tariffs that further improve the cost-effectiveness of owning and operating an EV.

Skills training

Innovative jobs and skills training programs provide hands-on education and training for charging station operators, technicians, and drivers.

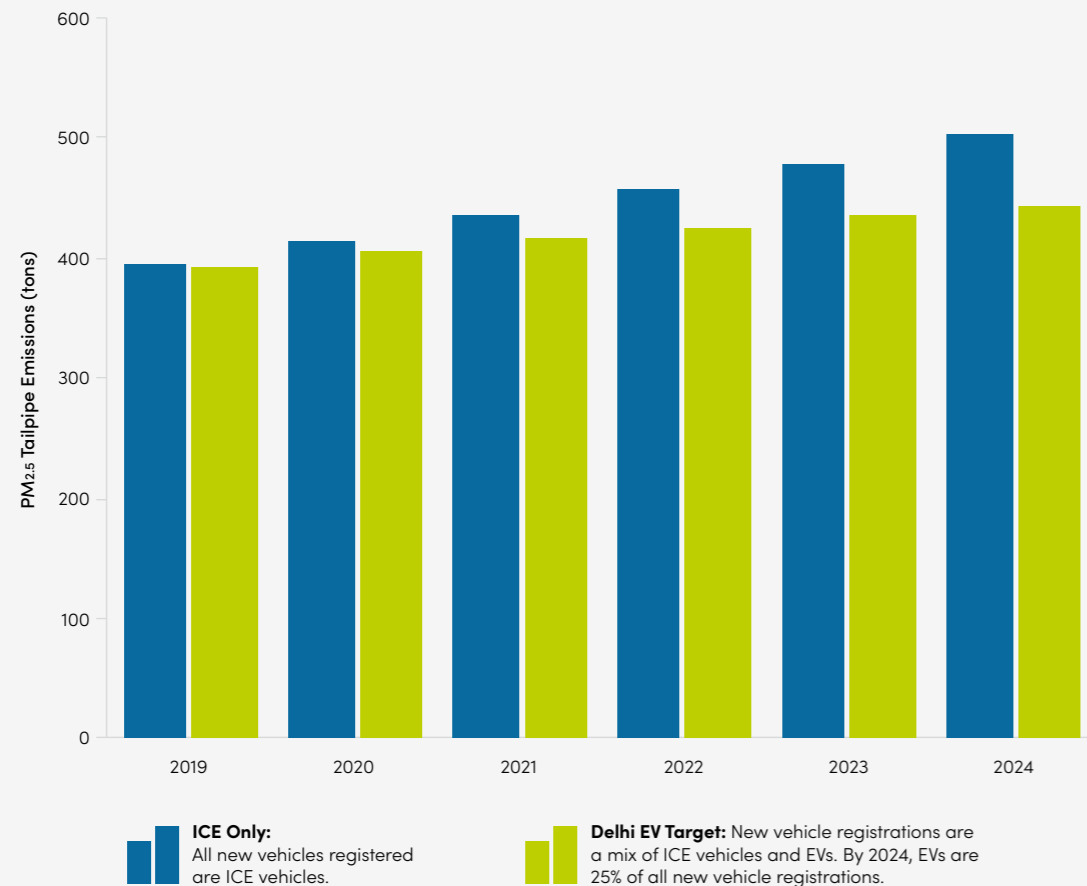
Keys to Success

The Delhi EV initiative has seen mounting success as a result of the following factors:



EVs reduce air pollution.

Lifetime PM_{2.5} emissions of all new vehicles registered in the specified year⁶



Note: Total avoided PM_{2.5} emissions is estimated at 159 tons from new vehicle registrations. However, this does not account for long-term vehicle stock turnover and an accelerated adoption of EVs from incentives, which will result in significantly greater emissions reductions.

EV Policy Resources

- [Delhi EV Policy: Delhi Transport Department⁷](#)
- [Dialogue and Development Commission of Delhi and Rocky Mountain Institute: Accelerating Delhi's Mobility Transition: Insights from the Urban Mobility Lab in Delhi³](#)

⁶ Dialogue and Development Commission of Delhi and Rocky Mountain Institute. 2019. *Accelerating Delhi's Mobility Transition: Insights from the Urban Mobility Lab in Delhi*. Figure 5. Rocky Mountain Institute. <https://rmi.org/insight/urban-mobility-lab-delhi/>.

⁷ GNCTD Transport Department. 2018. "Delhi Electric Vehicle Policy." <https://transport.delhi.gov.in/content/delhi-electric-vehicle-policy-2018>



Broader View

In the initial months following the outbreak of COVID-19, Delhi and many other states across the globe got a firsthand look at life without extreme levels of air pollution. Cars stopped moving, industry significantly slowed down, and people everywhere saw where they live in a new light. Those images will serve as unforgettable reminders of the negative consequences of our carbon-intensive and polluting practices—particularly in our transportation choices—and the opportunities to make positive changes for our health and environment.

Delhi is, of course, a unique example of a place that contends with very high levels of air pollution, which has undoubtedly enabled the government to build support for its EV policies. However, air quality is a universal problem with direct effects on everyone's health, happiness, and prosperity. As subnational and developing economies continue to grow, so too will the demand for mobility and the potential for untenable levels of air pollution and carbon emissions. Given that reality, it is imperative that policymakers employ ambitious measures to incentivize EV adoption.

It is also important to acknowledge the full breadth and diversity of mobility options as Delhi did with its EV policy. After all, electric mobility technologies and services continue to expand globally. Policymakers would do well to pursue electrification policies for public transit as well as smaller modes of mobility. Shenzhen, China, for instance, has electrified its entire fleet of 16,000 buses, giving the city the single largest deployment of electric buses in the country.⁸

⁸ Sisson, Patrick. "How a Chinese City Turned All Its 16,000 Buses Electric." *Curbed*, May 4, 2018. <https://www.curbed.com/2018/5/4/17320838/china-bus-shenzhen-electric-bus-transportation>.



In addition to focusing on the personal vehicle market, a number of smaller and shared services show promise in reducing emissions. Electrifying two-wheelers, three-wheelers, scooters, and e-bikes, and supporting micro-mobility services will provide additional benefits through clean alternatives to larger personal vehicles.

Another approach that subnational governments, cities, and countries may take is to attract manufacturing capacity and investment. Many state governments across the globe are creating incentives to attract automakers and battery manufacturers to

where the services are needed most. Also, in India, the state of Uttar Pradesh has crafted a policy to attract manufacturers through a set of interest subsidies.⁹ In addition to the creation of jobs from a growing sector of the economy, the economies of scale captured through increased manufacturing will help ensure a steady supply of readily available EVs, continued improvements to vehicle performance, and cost reductions.

EVs also hold the promise of playing a beneficial role in the electricity sector, underscoring the synergies between

sectors. As mobile sources of storage, EVs can capture cleaner energy from rooftop solar or when renewables are available on the grid. Further, as technology advances, EVs may provide grid services by delivering energy back into the system. Such vehicle-to-grid (V2G) opportunities may provide private and commercial EV owners with a revenue source, enabling them to sell power to electric utilities. This future will require significant investment in infrastructure and smart charging technologies that enable a seamless integration between EVs, buildings, and the grid. Integrated resource planning and policies that account, well in advance, for the impending increase of

EV and the associated interactions with buildings and the grid will drastically reduce infrastructure costs over time.

Finally, we cannot overlook the equity implications of vehicle electrification. All over the world, lower-income people are disproportionately exposed to air pollution—whether from living in communities, using services, or working in industries with high exposure to pollutants. Electrifying public transit, cleaning up congested corridors, and giving people access to zero-emissions services will allow people of all walks of life to enjoy cleaner air and improved health.

⁹ Prateek, Saumy. 2018. "Uttar Pradesh Releases Draft EV Manufacturing Policy." *Mercom India*, March 15, 2018. <https://mercomindia.com/uttar-pradesh-ev-manufacturing-policy/>.



Innovative Industry

With a clean energy supply, industry can move to electric power while also creating solutions to drive a clean energy economy. This includes new processes, low-carbon-materials, digital technologies, and more.



Innovative Industry

Industry and industrial practices march forward constantly, forever advancing and innovating. Policies that support innovation in industry and manufacturing on a regional scale can provide widespread benefits, including job creation and retention, economic competitiveness, climate resilience, health, and equity benefits through the inclusion of marginalized or disadvantaged groups.

System-wide, comprehensive approaches to transform the industrial sector are gaining traction. As digital technologies and renewable energy have grown more rapidly, so have the available opportunities.



System-wide transformation also is helping to maintain regional competitiveness. For example, the creation of a circular economy to increase productivity and reduce waste is increasingly feasible through the use of digital communication and logistics technologies.

Industry innovation can include, for example, building low-carbon eco-industrial parks, increasing energy efficiency in the transport of goods, and producing low-carbon materials for construction and manufacturing. Comprehensive policies that revolutionize multiple aspects of industry—energy use, waste, transport, information, materials, and more—have the potential to create true transformation by taking advantage of synergies between these pieces of the supply chain. Repurposing waste, for example, may reduce the need for both raw material inputs and transport.

Direct emissions from industry represent more than 20% of global GHG emissions,¹ and total emissions in the sector, when electricity use and heavy transport are included, are much higher. The sector is therefore critical to achieving decarbonization goals. Within industry, policies should work to address large sources of emissions that are generally not sharply reduced in the absence of policy intervention, such as iron, steel, and cement production. Due to industry's systemic nature, these innovations have the potential to provide profound economic, social, and environmental benefits.

¹ EPA (United States Environmental Protection Agency). 2019. "Global Greenhouse Gas Emissions Data." September 13, 2019. <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>.



Leadership in Action

Hauts-de-France: France's rev3 Initiative

Hauts-de-France, a region in northern France's industrial heartland, faces economic challenges related to the decline in manufacturing and the resulting loss of jobs.

Working to jump-start the region's economy, leaders in Hauts-de-France have recently undertaken a new, forward-looking approach—rev3—to pursue what they refer to as the "Third Industrial Revolution," a new economic era resting on digital technologies, renewable energy, and low-carbon materials. This work stems from the recognition by Hauts-de-France leaders that the economy of the future is carbon neutral and that industry will benefit greatly by leading the way toward decarbonization.

Rev3 positions Hauts-de-France to take advantage of the massive economic opportunities of the Third Industrial Revolution and become one of the world's leading manufacturing economies. It will accomplish this goal by using new technologies to repurpose and reinvent existing systems, making the region's economy sustainable, resource efficient, and productive. The initiative includes five interlocking pillars: distributed renewable energy, sustainable buildings, energy storage, internet technologies, and mobility. Funding is provided to projects that advance the policy's goal, with more than 700 projects now underway as part of rev3.

Key Milestones

Author/advisor introduces new economic vision

Jeremy Rifkin visits Hauts-de-France, highlighting the idea of the Third Industrial Revolution and the opportunity that it represents for the region.

Plan receives official government support

The Chamber of Commerce and Industry organizes a series of stakeholder workshops regarding the Third Industrial Revolution.

Rev3 expands to cover all of Hauts-de-France

French Territorial Reform³ creates the Hauts-de-France region by merging the regions of Nord-Pas-de-Calais and Picardy, and rev3 expands to cover all of the new territory.

Experts draft economic roadmap

The Third Industrial Revolution Master Plan² provides the government with a blueprint for future policy, formally outlining a path forward.

Rev3 implements funding mechanisms

Rev3 implements a variety of funding mechanisms, such as grants and equity investing through the CAP 3RI fund, a citizen-funded rev3 savings account, and crowdfunding sources to provide support for qualifying projects.



Driving Forces

A number of factors led Hauts-de-France to enact the rev3 policy, including:

Economic risk and opportunity.

Hauts-de-France faced economic challenges as factories moved out of the region, coal mining ceased, and jobs diminished. Leaders there began to view a solution like rev3 as an opportunity to build long-term economic strength in the region.

Individual leadership.

Author and political advisor Jeremy Rifkin introduced the concept of the Third Industrial Revolution to Hauts-de-France in 2012. He helped craft the vision for rev3 and prompted the Hauts-de-France government to create rev3 as an institutionalized program.

Historical perspective.

Hauts-de-France had been a leader in the First Industrial Revolution but had been less economically successful during the Second. Knowing what happened in Hauts-de-France when it experienced both the highs and lows of these historical periods made Hauts-de-France leaders determined to harness the power of the Third Industrial Revolution and not be left behind.

Throughout this process, rev3 has focused primarily on creating innovative financing tools to support independent projects that work toward the rev3 vision. This funding ecosystem now includes over 40 public financial stakeholders (e.g., European, national,

and local agencies) and private financial stakeholders (e.g., banks, shared equity funders). These institutions offer a variety of project options, including grants, capital investment, and loans.⁴

² TIR Consulting Group. 2013. Nord-Pas de Calais: Third Industrial Revolution Master Plan–2013. <https://en.calameo.com/ccj-hauts-de-france/read/0028209601062e1413c26>

³ Government of France. 2014. "Territorial Reform." November 21, 2014. <https://www.gouvernement.fr/en/territorial-reform>

⁴ CCI Hauts-de-France. 2016. La Vie rev3 des Hauts-de-France. https://rev3.fr/wp-content/uploads/sites/7/2017/10/LA-VIE-REV3-DES-HDF_pages.pdf

Keys to Success

The rev3 initiative has seen mounting success as a result of the following factors:



Forward-thinking vision

Jump-starts the region's economy by working on the greatest areas of advancement and opportunity, such as distributed energy generation and energy storage, rather than remaining static and focusing on outdated practices. Taking a strategic approach toward embracing change positions the region as an economic leader.

Holistic approach

Works to engage multiple sectors, in addition to industry, in the region's economic transition. This work includes, for example, modernizing the mobility sector so that manufactured goods can be moved efficiently, as well as working with universities to undertake research and provide vocational training.

Supporting local priorities

Tailors solutions specifically to the region's local needs. This is possible because of a flexible structure that allows the region's five departments and its urban municipalities to independently drive progress toward the rev3 goal—rather than all solutions being implemented by the regional government.

Funding mechanisms

Offers a variety of funding options (e.g., regional government, European Union, and equity funds) to directly support projects that advance rev3 goals.

Capacity building

Provides support through networking, advice, and training resources in addition to helping to fund participating projects. This integrative approach is valuable because many projects do not need rev3 funding to succeed but are interested in other types of support.

Positive and inclusive messaging

Builds support by emphasizing that everyone in the region is invited to participate. Its message focuses on opportunity, progress, and the bright future that rev3's success will bring, as well as the benefits to projects that participate (e.g., financial and advisory support). This message also helps build a shared regional identity for Hauts-de-France, which was created in 2016.

Benefits

The rev3 initiative aims to revolutionize the Hauts-de-France economy by combining job creation, economic development, and climate change mitigation. The policy's benefits are interconnected, with comprehensive economic development resting on and enhanced by inclusion, for example.

Economic Development

Job creation. Rev3 is predicted to create 160,000 jobs by 2050. In a region that has long faced economic decline, rev3 provides transition opportunities, particularly for workers in declining sectors of the economy. Job creation will occur through the policy's support of new projects, new industries, and new approaches to existing problems.

Job preservation. Rev3 creates a supportive environment that encourages existing companies to remain in the region, helping prevent manufacturing plants from closing and jobs from moving overseas. This includes supporting existing companies that are undertaking innovative projects as well as growing the talent pool for these companies through education and training programs.

Economic competitiveness. Rev3 helps position Hauts-de-France as a global leader in sustainable manufacturing, attracting and retaining companies while pioneering new approaches in industry. The policy enhances region-wide economic competitiveness in the face of challenges such as globalization.

Health

Air quality. Modernizing and decarbonizing industry will transform Hauts-de-France's polluting industries, improve air quality, and lower related health impacts. Hauts-de-France has the worst air quality in France, with about 6,500 premature deaths annually caused by pollution (Frédéric Marquet, interview by Seth Coan and Jake Glassman, July 29, 2020).

Equity

Inclusion. Rev3 aims to include everyone in Hauts-de-France in the region's economic transition, including industry, finance, academic, governmental, and civil society stakeholders. It also focuses substantially on those that are marginalized or have faced economic hardship, such as workers left behind by the disappearance of the region's once-thriving coal mining industry. Engaging citizens can improve their quality of life by providing new opportunities for income or training for new types of employment.

Environmental justice. Since industrial pollution disproportionately affects vulnerable communities, cleaner processes and less fossil fuel use directly support greater quality of life.

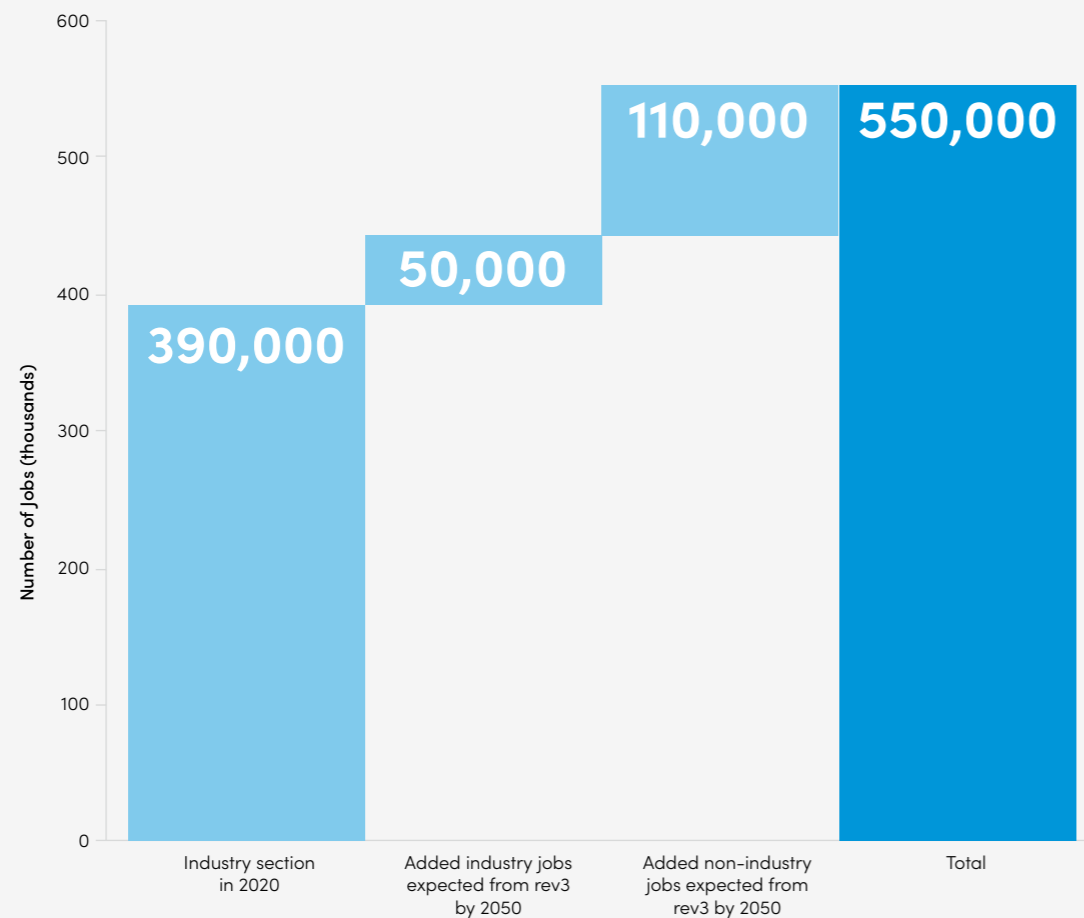
Resilience and Security

Economic resilience. Strengthening the region's economy will provide resilience against economic stressors. This is particularly important during economic downturns, such as the one caused by the COVID-19 pandemic. Technological innovation will help insulate Hauts-de-France from the economic decline of carbon-intensive industries.

Climate resilience. Pursuing the development of renewable energy, smart grids, and energy storage will lower GHG emissions, which helps prevent extreme weather risks. It will also enhance climate resilience in the region by providing power when extreme weather affects the grid. Hauts-de-France is a coastal region with numerous important ports, and sea level rise poses a significant threat as well.

Low-carbon industry creates jobs.

Expected Job Creation over Time from rev3⁵



Rev3 Resources

- [Hauts-de-France: A smart, sustainable, and connected region⁶](#)
- [La Vie rev3 des Hauts-de-France²](#)
- [Third Industrial Revolution Master Plan³](#)

⁵ Hauts-de-France employment in industry and construction based on data from France's National Institute of Statistics and Economic Studies. Addition of new jobs from rev3 based on (1) total expected job additions of 160,000 by 2050 from The Climate Group (Partner region profile – Hauts-de-France) and (2) the Third Industrial Revolution Master Plan's likely distribution of net job gains across sectors (p. 81). In the latter document, industry jobs are understood to be represented by construction (9%), manufacturing and agriculture (15%), and transportation and logistics (7%). Thus, $(160,000) \times [(9\%) + (15\%) + (7\%)] = 50,000$, and $160,000 - 50,000 = 110,000$.

⁶ Enterprise Europe Network, CCI International Picardie, Region Hauts-de-France, and CCI International Nord de France. 2016. *Hauts-de-France: A Smart, Sustainable and Connected Region*. <https://www.3dnetzwerk.com/wp-content/uploads/2016/12/Introducing-REV3-in-Hauts-de-France.pdf>.



Broader View

Transforming the industrial sector is useful throughout the globe but is most relevant in regions containing a prominent manufacturing sector, facing economic hardship, or benefiting from particular industrial opportunities. Regions without significant manufacturing capacity can address the sector indirectly by focusing instead on the demand side (e.g., procuring particular products or materials that are not manufactured within the policy's jurisdiction).

Rev3 is a public-private collaboration that provides funding opportunities for projects that advance its goals. There are other similar structures, such as IN4climate.NRW,⁷ a platform for stakeholders to work toward a carbon-neutral industrial sector in the German state of North Rhine-Westphalia. Other states pursue more targeted projects. For example, the Net Zero Plan for New South Wales, Australia, includes a few singular industry initiatives, such as the Emissions Intensity Reduction Program, which funds carbon capture, fuel switching, and energy efficiency measures in industry.⁸

In addition to presenting great opportunities, the industrial sector also contains some of the more difficult decarbonization challenges in our economy. Policymakers should take particular care regarding "harder to abate" emissions, which include those

from materials such as steel, cement, plastic, and aluminum. Because these are sizable industries, addressing their emissions is challenging, but the rewards are great. For example, incentivizing the production of low-carbon cement can benefit air quality and health while creating jobs.⁹

Policymakers will do well to take advantage of the widespread opportunities in the industrial sector. While both comprehensive and narrowly focused approaches are valuable, whole-system approaches seem to provide the greatest potential for overall benefits. Whole-system approaches, addressing all major components of a region's industrial sector, create synergies among solutions that can bring about the most cost-effective and lasting economic, environmental, and social benefits.

⁷ Ministry of Economic Affairs, Innovation, Digitization and Energy of the State of North Rhine-Westphalia. n.d. "IN4climate.NRW." Accessed July 27, 2020. <https://www.in4climate.nrw/en/index/>.

⁸ New South Wales Government. 2020. *Net Zero Plan Stage 1: 2020–2030*. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Climate-change/net-zero-plan-2020-2030-200057.pdf>.

⁹ Kerlin, Kat. 2020. "Concrete Solutions That Lower Both Air Emissions and Air Pollution." *UC Davis News*, March 23, 2020. <https://www.ucdavis.edu/news/concrete-solutions-lower-both-emissions-and-air-pollution>.



Sustainable Land Use

We must preserve and enhance the natural resources that create beautiful places, economic opportunities, and essential carbon “sinks” that pull pollution from the air.



Sustainable Land Use

Policies to decarbonize land use provide valuable non-carbon benefits, such as market development opportunities, preservation of ecosystem services, air and water quality improvements, and opportunities to engage with disadvantaged communities and improve quality of life.



Regional land use issues are multidimensional, underscoring the need for an inclusive stakeholder engagement process. Land use policies and approaches that bring together a large set of public and private sector stakeholders to align their interests and mitigate land use issues in a particular region are increasingly gaining traction. These initiatives, often referred to as “jurisdictional approaches,” are usually undertaken at the subnational level and focus on a single state or multiple states.

About 23% of global GHG emissions come from land use activities such as agriculture and forestry. Natural land processes also absorb about a third of anthropogenic CO₂ emissions.¹ Thus, the land use sector represents both a challenge as well as a great opportunity, and we cannot meet a 1.5°C limit to climate change without addressing land use challenges and seizing the opportunities they present.

When land use policy solutions are inclusive, they can better incorporate the wide-ranging interests of people on the ground and can serve as a tool for accomplishing a range of connected social, economic, and environmental goals.

¹ IPCC (Intergovernmental Panel on Climate Change). 2019. “Land Is a Critical Resource, IPCC Report Says.” News release, August 8, 2019. https://www.ipcc.ch/2019/08/08/land-is-a-critical-resource_srccl/.



Leadership in Action

Mato Grosso, Brazil: Produce, Conserve, Include Strategy

The state of Mato Grosso is a leading agricultural producer in Brazil. It supplies nearly 30% of the country’s soy and has the largest cattle herd in the country.

Though the percentage is shrinking each year, about 60% of the state is covered by native vegetation,² including Amazon rainforest. Agricultural expansion in Mato Grosso is driving deforestation throughout the state.

Determined to increase agricultural productivity across the state while maintaining native vegetation and reducing deforestation, Mato Grosso’s government and partners from different sectors created the Produce, Conserve, Include (PCI) strategy in 2015. This

strategy describes a new, sustainable vision for the future of Mato Grosso and includes specific, measurable targets to achieve this vision. Meeting these aggressive targets requires a multistakeholder effort, and the PCI brings together government agencies, civil society, producer groups, and companies to develop solutions.

The PCI aims to decouple agricultural production from deforestation at the state level, increasing production through agricultural intensification while reducing deforestation. Developing carbon markets is a crucial part of the strategy, making it possible for farmers to be paid for conservation and reforestation.

² PCI (Produce, Conserve, Include). n.d. “PCI Monitoring Dashboard.” Accessed June 18, 2020. www.pcimonitor.org.

Key Milestones

Prior policies lay groundwork for bolder action

Numerous efforts to address deforestation in Mato Grosso, most of which were led by European market actors and environmental nongovernmental organizations (NGOs), provide mixed success and set the stage for more ambitious action.

Strategy launches at COP21

The coalition's work and its underlying structure become known as the PCI, which formally launches at COP21 in Paris.

The PCI undertakes strategic planning

The PCI defines priority actions regarding financing mechanisms, land regularization, market access, land tenure, technology, and the dissemination of good practices.

World Bank helps the PCI receive recognition

Mato Grosso receives a \$250 million development loan from the World Bank which includes substantial funding for the PCI. Among other requirements, the loan requires that the Mato Grosso government formally recognizes the PCI Institute as a partner, and the government does so.

Governor assembles stakeholder coalition

Former Governor Pedro Taques provides decisive political leadership by bringing together nearly 50 interested stakeholder groups to address land use challenges in Mato Grosso.

Structure receives formal legal recognition

The governor recognizes the coalition as the State Committee, a formal initiative to reconcile land use interests through a consensus-based process.

The PCI becomes separate from the government

The PCI's work gains autonomy, becoming housed within the PCI Institute, an independent body supported by, but not controlled by, the state government.



Driving Forces

The factors that led to the PCI's development include:

Mounting pressure.

Previous efforts to address deforestation had proven insufficient, the need for economic development and better stewardship of natural resources remained, and tension was continuing to build between stakeholders.

Emerging economic risk and opportunity.

International supply chain actors expressed increasing concerns over sustainability that were perceived to put Mato Grosso agricultural markets at risk. At the same time, stakeholders recognized the opportunity to take advantage of the growing global demand for sustainable commodities.

Maturation of carbon markets.

Growing international interest in the purchase of carbon offsets and the development of these markets provided a foundation for the PCI work.

Aligning stakeholder interests.

The overlap between multiple land use issues in Mato Grosso became increasingly clear. Stakeholders recognized that challenges like market access for smallholder farmers and land restoration, for example, would best be solved as part of a comprehensive, "big tent" process rather than addressed individually. New political leadership in the state, existing models for partnership between industry and conservation, and the need to attract investment contributed to this alignment.

Keys to Success

While the PCI is a work in progress in Mato Grosso, this visionary initiative has laid a solid foundation upon which to build. Some of the critical factors that are driving the initiative toward success include the following:



Stakeholder inclusivity

Ensures that communication and feedback are integrated into the PCI's processes and that a wide array of interests from all major stakeholder groups (government, private sector, civil society, etc.) is represented in these conversations.



Shared vision

Aligns stakeholders on achieving 21 specific, measurable targets through a consensus process. This alignment is critical to moving past disagreement and directing the group's resources toward shared goals. A focus on the opportunities resulted in broad stakeholder buy-in and made it politically expedient for new political administrations to preserve the PCI. This framing makes the PCI an asset rather than a political liability.



Long-term planning

Focuses on building long-term transformation of the region's entire land use system over many years. This vision requires long-term planning and incremental progress, such as the steps needed to secure carbon offset funding, and much of the PCI's targets are oriented toward a 2030 timeline.



Monitoring and transparency

Builds trust in the PCI's processes by tracking progress toward the key performance indicators and displaying the data publicly on [PCImonitor.org](https://pcimonitor.org).



Early supporters

Certain organizations provide tangible early support, which establishes credibility around the PCI as a proof of concept for its implementation. This early support came from the Sustainable Trade Initiative (IDH) as well as \$50 million from Germany and the UK through the [REDD Early Movers program](#).



Independence

Exists independently from the government but at the same time allows for government support and representation within the PCI Institute's decision-making framework. This independence helps insulate the PCI from political changes while giving the government a seat at the table.



Funding mechanisms

Focuses primarily on identifying funders, funding mechanisms, and implementation partners as well as developing the legal framework through which funds can flow. Acquiring this funding is critical, and the PCI is exploring opportunities from grant money, credit money from banks, farmer investment, and corporate purchases of carbon offsets.



Benefits

Creating opportunities with near- and long-term benefits for the region while mitigating climate change and conserving natural resources have been the PCI's main goals from the start. Furthermore, the initiative is designed to take advantage of the synergies between benefits—for example, economic development drives better health and improved security outcomes.

Economic Development

Market transformation. The PCI initiates a transformation of Mato Grosso's agricultural economy, which involves many connected benefits. These include:

- Increasing efficiency, transparency, and inclusion for farmers
- Becoming a Verified Sourcing Area (VSA) for low-carbon products, allowing farmers to be paid a premium for certified commodities
- Creating a mechanism to provide offsets in the global carbon market
- Intensifying agriculture, which will improve production on degraded land, resulting in greater economic returns while safeguarding natural resources

Stabilizing markets. The PCI is a flagship model of a jurisdictional approach, with other states in Brazil and part of southeast Asia modeling their work off the PCI. As these solutions grow, this scaling serves to expand the market and support all regions undertaking the policy.

Company benefits. Jurisdictional approaches can benefit participating companies by setting up processes and structures that reduce participants' monitoring costs, mitigate long-term risk, and help them achieve their goals related to both social and environmental responsibility.³

³ Environmental Defense Fund. n.d. "The Jurisdictional Approach: Forests." Accessed June 18, 2020. <https://supplychain.edf.org/resources/the-jurisdictional-approach/>.

Health

Protecting air quality. Protecting native ecosystems from fires related to land use change can prevent harmful air pollution. Research has shown that, for example, preventing peatland fires in Singapore, Malaysia, and Indonesia could save about 24,000 lives per year across the three countries.⁴

Inhibiting disease spread. Reforestation and forest conservation have the potential to mitigate the emergence and spread of infectious diseases by limiting human exposure to foreign pathogens.⁵ Land use change that has diminished the area of natural habitat has played a major role in increasing the risk of infectious disease throughout history.



Equity

Protecting indigenous communities.

Indigenous communities face many challenges, such as agricultural land grabbing, which pose a direct threat to their culture and existence. The PCI has included indigenous communities in the process, helping to advance their economic development and protect indigenous lands from the threat of large-scale agriculture.

Supporting smallholder farmers.

Smallholder farmers in Mato Grosso often lack access to credit, have trouble getting their products to market, and are burdened by bureaucratic requirements. As a result, they face disproportionate economic hardship, and their farms are frequently bought and consolidated by large corporations. The PCI has specific targets to mitigate each of these challenges and advance smallholder interests.

Resilience and Security

Enhancing economic resilience and independence.

Mato Grosso depends on many basic products, such as vegetables and dairy, mainly from out-of-state markets even though there are many producers within the state. By strengthening the in-state supply chain for smallholder producers of these products, the PCI will enhance economic resilience by making Mato Grosso less dependent on external supply chains.

Preservation of forest resources. Globally, many communities rely on forests for their livelihoods, particularly in developing countries like Brazil. Preserving natural ecosystems protects these places as sources of food, medicine, fuel, and other natural products that people can use for

⁴ "The Human Health Benefits of Conserving and Restoring Peatlands." 2019. United Nations Environment Programme. November 8, 2019. <https://www.unenvironment.org/news-and-stories/story/human-health-benefits-conserving-and-restoring-peatlands>.

⁵ B.A. Wilcox and B. Ellis, "Forests and Emerging Infectious Diseases of Humans," *Unasylva* 224 57 (2006), accessed August 2020. <http://www.fao.org/tempref/docrep/fao/009/a0789e/a0789e03.pdf>.



themselves and sell for income. Long-term conservation can also allow these communities to set up nature-related tourism operations as additional sources of income.⁶

Protection of ecosystem services.

Initiatives like the PCI protect ecosystem services, which provide valuable benefits. These include protecting watersheds, maintaining soil health, regulating pests and disease, improving air quality, and helping pollinate crops.⁷

Biodiversity conservation. The PCI aims to permanently protect and restore large swaths of the country's natural ecosystems in one of the most biodiverse areas on the planet. Biodiversity protection itself is an explicit goal of numerous major efforts, including the international treaty known as the Convention on Biological Diversity, which nearly all of the world's countries, including Brazil, have ratified.⁸

⁶ Shaw, Julie. 2018. "Why Is Biodiversity Important?" *Conservation International*. November 15, 2018. <https://www.conservation.org/blog/why-is-biodiversity-important>.

⁷ U.S. Mission to International Organizations in Geneva. 2010. "The Importance of Biodiversity for Development." April 20, 2010. <https://geneva.usmission.gov/2010/04/20/usaid-biodiversity/#:~:text=Biodiversity%20conservation%20protects%20plant%2C%20animal,and%20pollinating%20crops%20and%20trees>.

⁸ Convention on Biological Diversity. n.d. "List of Parties." Accessed June 18, 2020. <https://www.cbd.int/information/parties.shtml>.

Sustainability creates economic opportunity.

Economic Growth Rate of Brazilian Economy vs. Growth Rate of Mato Grosso Agricultural Sector from the PCI⁹



PCI Resources

- ➔ [Mato Grosso Jurisdictional Sustainability Profile¹⁰](#)
- ➔ [Produce, Conserve, Include Pitchbook¹²](#)
- ➔ [PCI Documents and Downloads¹¹](#)
- ➔ [PCI Webinar through Tropical Forest Alliance¹³](#)
- ➔ [PCImonitor.org²](#)

⁹ Annual Brazilian GDP growth of 1.4% based on World Bank Data (Report No: 123808-BR) average annual GDP growth between 2010 and 2019. Annual growth of Mato Grosso agricultural sector of 10% based on (1) GDP of Mato Grosso of \$22.6B from Brazilian Institute of Geography and Statistics from 2016; (2) World Bank estimate of agricultural sector as 50% of Mato Grosso economy (Report No: 123808-BR); and (3) total annual investment of \$1.3B, based on \$13B by 2030 that the PCI aims to acquire ("World Bank Press Release: Mato Grosso to Enhance Fiscal Sustainability while also Protecting the Environment"), divided by 10 to annualize for 2021–2030. Thus, $(\$1.3B) / [(\$22.6B) \times (50\%)] = 11.5\%$, rounded to 10%.

¹⁰ Nepstad, D., C. Stickler, O. Carvalho, M. Leal, J. Shimada, O. David, and A. Ribeiro. 2018. *Jurisdictional Sustainability Profile: Mato Grosso, Brazil*. Energy Innovation Institute, CIFOR, GCF Task Force. https://earthinnovation.org/wp-content/uploads/2014/09/Profile_MATOGROSSO_2018_ENG.pdf.

¹¹ Produzir, Conservar, Incluir. n.d. "Documentos & Downloads." Accessed June 18, 2020. http://pci.mt.gov.br/?post_type=docs.

¹² PCI. 2019. *Produce, Conserve, Include Pitchbook: An Overview of Initiatives That Support Corporate Engagement in Mato Grosso, Brazil*. <https://www.idhsustainabletrade.com/uploaded/2019/05/PCI-PitchBook-final-online.pdf>.

¹³ TFA (Tropical Forest Alliance). 2020. "A Closer Look: Produce, Conserve, Include (PCI) in Mato Grosso." Webinar, May 8, 2020. <https://www.youtube.com/watch?v=PmvzzcrsQYs>.



Broader View

Solving land use issues is particularly important in areas with high levels of emissions from land use, vulnerable communities, and at-risk natural resources. As a result, jurisdictional approaches are most commonly applied to tropical forests. However, the core strategies of a jurisdictional approach could be adapted to a variety of terrestrial, or even marine, ecosystems throughout the world (e.g., protecting peatlands or providing a sustainably certified supply of seafood).

Not only can jurisdictional approaches address different land use challenges in different geographies, but the structure of the approach itself is adaptable. Existing initiatives vary significantly. For example, Ghana's jurisdictional approach exists at the country level, not the state level, and is at its core a REDD+ program, in contrast to the PCI, which is multifaceted.¹⁴ In the Orinoquía region of Colombia, the approach is implemented within the government rather than as an independent entity.¹⁵

Policymakers should also recognize that, though promising, jurisdictional approaches are fairly nascent, and it is too early to gauge their collective level of success. In particular, stakeholders

should be aware of challenges associated with pursuing burgeoning market opportunities through the approach, including the complexities around carbon accounting, sustainable product certifications, and additionality of offsets.

Regardless of the particulars of the structure or geographical context of a land use strategy, whether it is market based or government led, an inclusionary process is critical to the lasting success of land use policies. The principle of inclusion is the starting point from which comes the framework and strategy to match regional context and local needs.

¹⁴ Fishman, Akiva, Edegar Oliveira, and Lloyd Gamble. 2017. *Tackling Deforestation Through a Jurisdictional Approach: Lessons from The Field*. World Wildlife Fund. https://c402277.ssl.cf1.rackcdn.com/publications/1146/files/original/wwf_ja_brasilia_final_exec_sum_w_cover.pdf?1520454599.

¹⁵ BioCarbon Fund. n.d. "Orinoquía Sustainable Integrated Landscape Program." Accessed July 1, 2020. <https://www.biocarbonfund-isfl.org/programs/orinoquia-sustainable-integrated-landscape-program>.

Useful Resources

The following is a consolidated list of resources and tools. This list does not represent the full breadth and depth of resources available, but rather serves as a starting point for policymakers to further explore the benefits of climate mitigation policy.

Benefits References

American Public Health Association. n.d. "The Health Benefits of Climate Action." Accessed September 22, 2020. https://www.apha.org/-/media/files/pdf/topics/climate/guide_section5.ashx?la=en&hash=17FFFD85B9D4B9650CA07D0A018F46385611E795.

Climate and Clean Air Coalition. n.d. "Multiple Benefits Pathway Framework." Accessed September 22, 2020. <https://www.ccacoalition.org/en/content/multiple-benefits-pathway-framework>.

Woolf, Tim, Chris Neme, Mike Alter, Steve Fine, Karl Rábago, Steve Schiller, Kate Strickland, and Brenda Chew. 2020. *The National Standard Practice Manual (NSPM)*. <https://www.nationalenergyscreeningproject.org/national-standard-practice-manual/>.

Vandyck, Toon, Kimon Keramidas, Stéphane Tchung-Ming, Matthias Weitzel, and Rita Van Dingenen. 2020. "Quantifying Air Quality Co-Benefits of Climate Policy Across Sectors and Regions." *Climatic Change*. <https://doi.org/10.1007/s10584-020-02685-7>.

Shindell, Drew, Greg Faluvegi, Karl Seltzer, and Cary Shindell. 2018. "Quantified, Localized Health Benefits of Accelerated Carbon Dioxide Emissions Reductions." *Nature Climate Change* 8 (April) 291–95. <https://doi.org/10.1038/s41558-018-0108-y>.

SDSN and IDDRI. 2015. *Pathways to Deep Decarbonization*. https://www.iddri.org/sites/default/files/import/publications/ddpp_2015synthesisreport.pdf.

Ürge-Vorsatz, Diana, Sergio Tirado-Herrero, and Navroz K. Dubash. 2014. "Measuring the Co-Benefits of Climate Change Mitigation." *Annual Review of Environment and Resources* 39 (1): 549–82. https://www.researchgate.net/publication/267098768_Measuring_the_Co-Benefits_of_Climate_Change_Mitigation.



Benefits Tools and Calculators

- | | |
|---|--|
| → American College of Physicians: Climate Change Toolkit | → Institute for Global Environmental Strategies: Evaluating Transport Projects |
| → Ashden: Climate Action Co-Benefits Toolkit | → LEAP: The Low Emissions Analysis Platform |
| → California Climate Investments: CCI Co-benefit Assessment Methodologies | → Stockholm Environment Institute: NDC-SDG Connections |
| → California Climate Investments: CCI Quantification, Benefits, and Reporting Materials | → United States Environmental Protection Agency: Tool Finder for Local Government Clean Energy Initiatives |
| → Climate Interactive: Simulation Models | → World Health Organization: Health and Climate Change Toolkit |
| → Energy Innovation Policy and Technology LLC: Energy Policy Simulator | |

