



Secretariat

**CLIMATE GROUP**

# Regions Take Action:

## Clean Electricity

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



This document is excerpted from  
*Regions Take Action: The Benefits  
of Major Climate Policy.*



# 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.<sup>1</sup> 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.

<sup>1</sup> Epstein, Paul R., Jonathan J. Buonocore, Kevin Eckerle, Michael Hendryx, Benjamin M. Stouf 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.

## 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.



### 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.

## 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.

### 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.



### 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.



### Guiding vision

The clear vision of a 100% RPS is a critical enabling force. Centering on this guiding vision results in a bold and transformational policy while allowing for certain definitions to be worked out subsequently.

## Keys to Success

Hawaii’s RPS was the result of coordination, commitment, and strategic planning by a wide array of policymakers, industry leaders, and advocates. Some of the key elements to success include the following factors:



### Community engagement

To ensure the success of the RPS, policymakers and advocates coordinate and leverage their respective strengths to build a broad base of community support. In the years leading up to the RPS legislation, Blue Planet Foundation and other community organizations built a grassroots coalition of community members, students, and supportive business leaders.



### Governmental Champions

Within the state government, credit is frequently given to “brave politicians” who took a stand to pass the RPS. Hawaii state officials and policymakers played a critical role in building the support of utilities, the business community, and government agencies.



### Cost competitiveness of renewables

The economic advantages of renewable energy over oil-based electricity serve as a contributing force to justifying a 100% RPS.





## 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  $\text{SO}_2$ ,  $\text{NO}_x$ , and  $\text{PM}_{2.5}$ .<sup>2</sup>

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

### 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

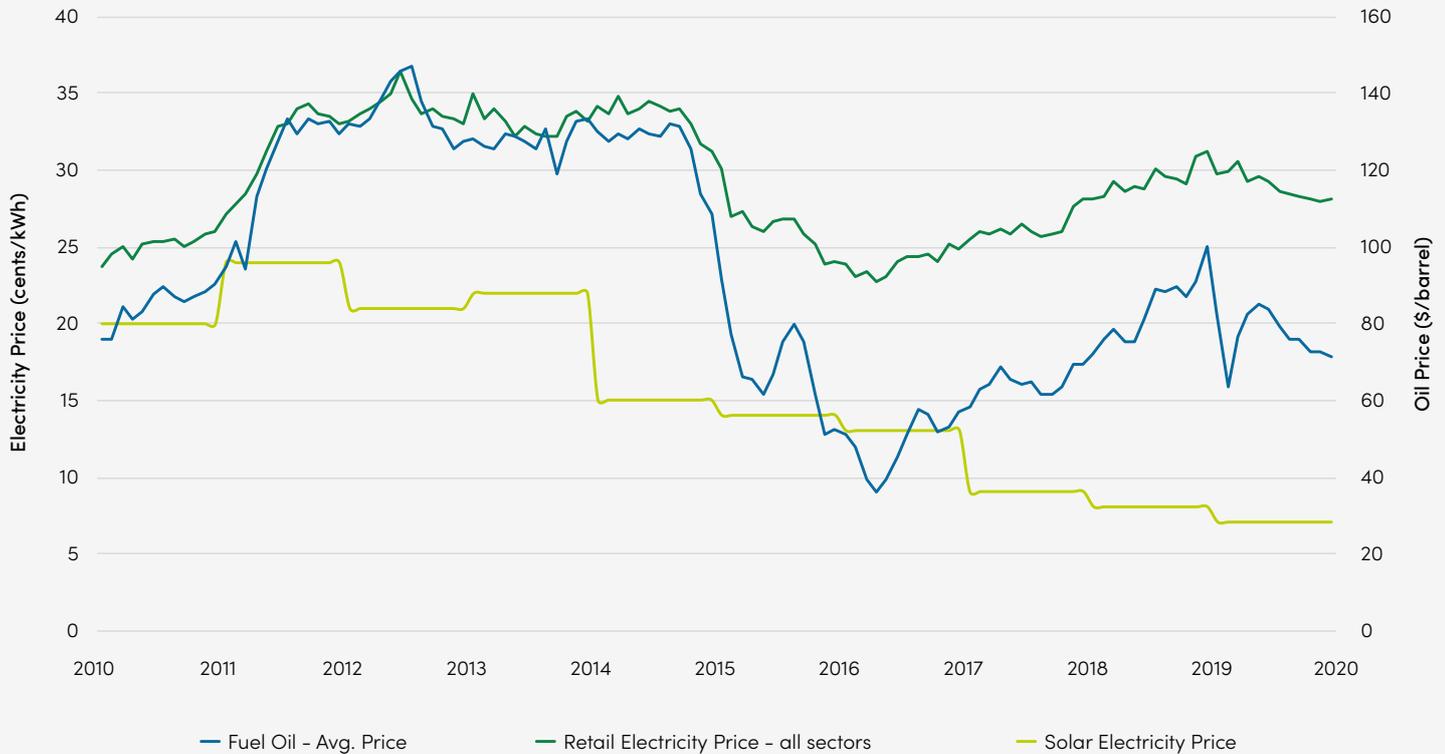
**Energy security.** The Hawaii RPS will eliminate dependence on oil and shelter the state from the costly and volatile swings of the global oil market.

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

<sup>2</sup> 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 Price<sup>3</sup>



### Additional case study resources:

- [State of Hawaii Public Utilities Commission Report to the 2019 Legislature on Hawaii's Renewable Portfolio Standards<sup>4</sup>](#)
- [DSIRE Summary of Hawaii RPS<sup>5</sup>](#)
- [Report: Powering Paradise<sup>6</sup>](#)

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*. [https://puc.hawaii.gov/wp-content/uploads/2018/12/RPS-2018-Legislative-Report\\_FINAL.pdf](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.**

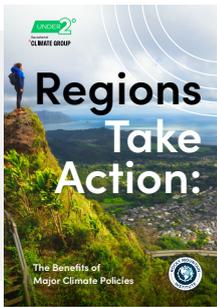
Ultimately, the success of a 100% renewable electricity policy depends on the coordination of a diverse set of political, commercial, and community stakeholders. To establish a legal and enforceable renewable energy commitment, policymakers and stakeholders must co-develop an actionable vision. Since 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.<sup>7</sup>

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.

<sup>7</sup> 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>.



These pages are excerpts from **Regions Take Action: The Many Benefits of Major Climate Policies**. This action is one of five featured actions which may be relevant to others in your region. Download and share the full guide for free at [under2coalition.org/news/regions-take-action](http://under2coalition.org/news/regions-take-action) or [rmi.org/regions-take-action](http://rmi.org/regions-take-action).



## 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.

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