



# MULTISOLVING AT THE INTERSECTION OF HEALTH AND CLIMATE

## LESSONS FROM SUCCESS STORIES



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# **Multisolving at the Intersection of Health and Climate**

Lessons from Success Stories

Climate Interactive

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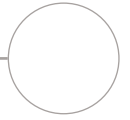
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By leveraging cross-sectoral collaboration, it is possible to design and implement projects that improve local health, produce financial savings, and advance long-term climate goals all at once. These “multisolving” initiatives deliver improvements in multiple sectors with the same investment of time, money, or political will, thus saving money, meeting multiple needs, and empowering diverse constituencies.

Although these projects are very appealing in theory, several obstacles prevent them from being implemented with greater frequency. The obstacles include:

- Disciplinary silos, where experts in one field do not have the knowledge to optimize gains in a different field
- Budgetary silos, where funding comes from an entity in one sector (e.g. the transportation department) but the benefits mostly accrue in a different sector (e.g. public health)
- Jurisdictional silos, where collaboration is needed between organizations operating at different scales or sectors
- Weak community engagement skills, where practitioners do not have the ability to create partnerships with impacted communities
- Lack of funding available for the prevention of health problems versus caring directly for sick people
- Costs and benefits measurement oriented toward the short term (e.g. quarterly or annually), while health and climate benefits may be realized over decades or lifetimes

Despite the obstacles, multisolving projects can be found all over the world, at scales ranging from individual hospitals to entire cities. To learn what is possible when addressing climate and health together and to document the strategies and approaches that enable multisolving, we conducted a global scan of examples of multisolving for climate and health. We selected 10 cases for further study:

1. Ciclovía Bogotá closes over 75 miles of roadways to cars on Sundays and holidays.
2. Espigoladors Gleaning Movement gleans, distributes through food banks, and processes unwanted food into jams, sauces, and soups.
3. Green Curtains grows edible or decorative climbing plants on the exteriors of buildings.

4. Healthy Meals for Patients and Environment serves vegetarian food and recycles all forms of waste in a dialysis center.
5. Healthy Streets for London improves air quality, reduces congestion, and makes London healthier and more attractive.
6. Operation TLC encourages behaviors such as turning off equipment, closing doors, and allocating patient quiet time.
7. ProAire unites multiple organizations to reach air quality goals.
8. Smarter Anesthetic Gases switches hospitals to using anesthetic gases that lower costs and emissions.
9. Walk to School encourages parents, teachers, and students to walk to school.
10. Warm Up New Zealand retrofits houses to reduce cold-related illnesses, energy costs, and carbon emissions.

With a multisolving approach to addressing health and climate challenges, people are designing the communities that they want to live in while at the same time preventing and preparing for climate change. For many of the projects, the system-wide benefits exceeded the costs. And the projects tended to create benefits, from more children walking to school, to a better patient experience, to increased opportunities for recreation, that were appreciated in the organizations and communities where the projects happened.

The study identified the following success factors that were common themes across the case studies:

- Leadership shown by individual or organizational champions of projects
- Cyclical learning and growth in partnerships over time
- Strong engagement and communication with partners, collaborators, and the communities being served by the project
- Measuring and communicating the multiple benefits of the project
- Including a strong financial plan or a low-cost project design
- Anticipating and confronting resistance to change

Based on the examples studied in the report, there are a core set of strategies applied by multisolving projects regardless of sector, scale, or geography. These projects tend to:

- Embrace learning, evolution, emergence, and opportunism, and expect surprises
- Start small, but plan for a circle of partners to grow over time
- Avoid fancy, high tech, or expensive interventions
- Cultivate vision and a long-term perspective
- Recognize the limits of the implementers' knowledge and perspective, and seek community and stakeholder input

For funders and others who would like to see more multisolving initiatives in the world, we recommend the following:

- Promote multisolving as an approach and build community and capacity around it
- Cultivate patience for the gradual processes of relationship building, behavior change, and data collection and analysis
- Find ways to fund the work in its earliest stages and be sensitive to its dynamic, organic nature





## INTRODUCTION

# MULTISOLVING FOR CLIMATE AND HEALTH

### IMAGINE A WORLD WHERE CLIMATE PROTECTION AND HEALTH IMPROVEMENT ARE APPROACHED TOGETHER

*In Milwaukee, eight-year-old Marta Vasquez hardly uses her asthma inhaler anymore. Now that she and her little brother walk to school through a green corridor beside the river in the heart of her neighborhood, she breathes much easier and can even run at recess. Marta's mother is also breathing easier these days. She has a well-paying job for a company specializing in energy efficiency. The company's building is topped by a green roof and kept cool in the summer by a green curtain that drapes the building's walls. While the health of Marta and her neighbors has improved in the last few years, Milwaukee's carbon emissions have fallen, as less energy is used for heating and cooling.*



*In San Jose, Martin Williams leaves his car at home and bikes to work at least three days a week, thanks to a new cycling route with a dedicated lane protected from cars. He's lost five pounds while shrinking his carbon footprint, and he finds he is sleeping better and feeling happier, two things he attributes to his increased exercise. On top of that, he is putting the money he would have spent filling his car with gas into a fund to take his family on vacation next year.*



*Mrs. Farhad is a grandmother living outside of Detroit. She hasn't been to the emergency room for her COPD, a respiratory disorder worsened by living in cold damp conditions, in two years, since her primary care physician prescribed new windows and a furnace as part of an innovative program funded by the public health department in her state. Based on a pilot program in the UK, the Michigan program saved money from health budgets and reduced the energy bills of people on fixed incomes, all while reducing greenhouse gas emissions.*

None of these stories is a reality today, but each of them could be. These scenarios draw on examples we found in our search for programs around the world where policies and investments were designed to respond to climate change while improving health.

As you will see in this report, such examples are rare and face obstacles in implementation and replication, but, as the economist Kenneth Boulding said, "What exists is possible." Our goal is to gather these diverse

examples encompassing a variety of fields, from urban design to energy systems to transportation and the built environment. We highlight examples of what exists as testimony to what is possible, pointing to lessons and success factors to inform and inspire even more experimentation at the nexus of addressing climate change and improving health.



# MULTISOLVING, A NEW TERM FOR A NEW WAY OF APPROACHING CLIMATE CHANGE AND HEALTH

Consider the following policy interventions:

- Cycling infrastructure that promotes physical activity and reduces transportation emissions
- Green infrastructure that reduces both the urban heat island effect and greenhouse gas emissions from heating and cooling buildings
- Plant-based diets that improve nutritional health while reducing emissions from agriculture

In most situations, projects like these would be implemented by experts with very different skillsets and job descriptions, who likely work in different organizations or departments. Investments to support them would most likely happen via distinct budgets, and policy would be set by different jurisdictions. Yet all three examples have something in common: they all protect the global climate while improving individual and community health.

At Climate Interactive, we have coined the word “multisolving” for efforts that improve metrics in more than one sector with the same investment of time, money, or political will (Figure 1-1). Multisolving isn’t limited to climate and health benefits, but in this report, we focus on examples where people worked together across disciplines and issue areas to implement solutions that are both health-boosting and climate-protecting.

When it comes to climate change, many, but not all, responses are multisolving. New clean energy infrastructure that provides good local jobs is multisolving, as is infrastructure that protects from extreme events while creating facilities that are also useful under normal circumstances.

There are several reasons to multisolve:

- To save money by meeting two or more needs with one investment
- To enlarge political power by meeting the needs of two or more constituencies
- To align the needs of people today and future generations by meeting current needs while protecting the long-term climate
- To align the needs of local communities with the needs of global humanity by solving local problems in ways that also protect against global climate change

As we learn more about different areas of multisolving and work with multisolvers around the world, we have noticed that the intersection of climate and health offers some of the most promising opportunities for multisolving.

Multisolving is a specific, and sometimes novel, way of framing climate and health. As we will see in the next section, many projects focused on climate and health are motivated by concerns about future impacts of climate change on health. While the multisolving approach certainly includes avoiding those negative consequences, it also recognizes that many solutions to climate change can directly improve health, often in fairly immediate time frames.

## WHAT IS MULTISOLVING?

Multisolving is a strategic approach to solving the interconnected problems facing the climate and human society. In essence, a multisolving policy or project is one that generates multiple benefits in climate change, health, the economy, equity, disaster resilience, etc.

## WHY MULTISOLVE?

1. The wide array of benefits means that multisolving initiatives typically generate more savings than costs.
2. Having different categories of benefits wins over diverse constituencies who normally might not collaborate.
3. With a multisolving strategy, we can design the communities that we want to live in, even as we prevent and prepare for climate change.
4. Multisolving means living in a more beautiful, healthful, connected, resilient, and just world.

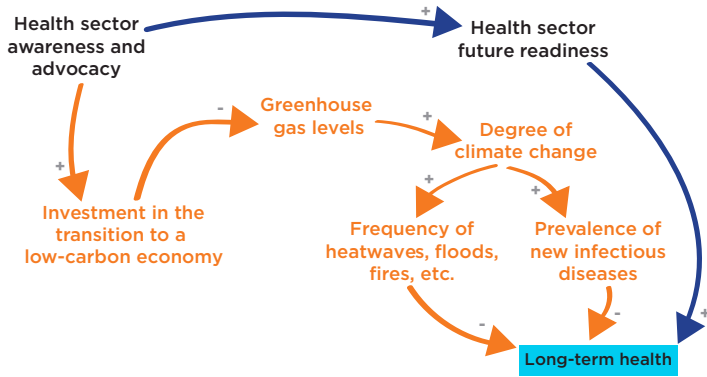
**FIGURE 1-1**

Multisolving is a strategy for producing multiple benefits to both human communities and the global climate.

## IMPACTS OF FUTURE CLIMATE CHANGE ON HEALTH ARE IMPORTANT, BUT THEY ARE ONLY PART OF THE STORY

When climate change and health are thought of together, the first thing that typically comes to mind is the ways that a warmer climate would harm human health (Figure 1-2). In this framing of “climate-health intersections,” people think of heat waves, stronger storms, flooding, wildfires, and infectious disease agents shifting into new regions as the climate warms. These are important connections, and new organizations, research programs, and projects are emerging to address these intersections and mobilize the health community in response. Examples of this framing include the 2016 US Climate and Health Assessment,<sup>2</sup> a scientific assessment of how climate change is already affecting human health, and how those effects may change in the future.





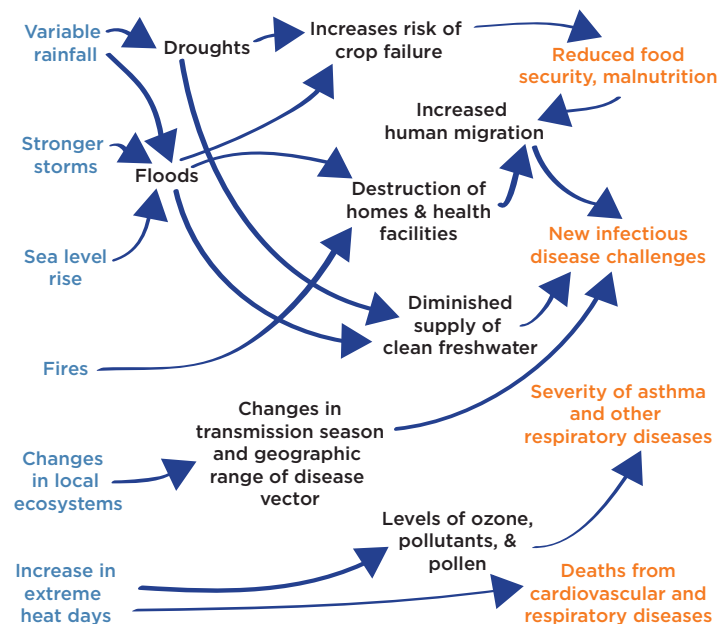
**FIGURE 1-2**

A typical framing of health-climate intersections focuses on the ways that changes in climate will, over decades or even centuries, impact human health. These are important connections, but not the only ones that exist between climate and health.

Building awareness of the long-term implications of climate change for health is important for helping societies adapt to unavoidable climate change. The needs are many, including:

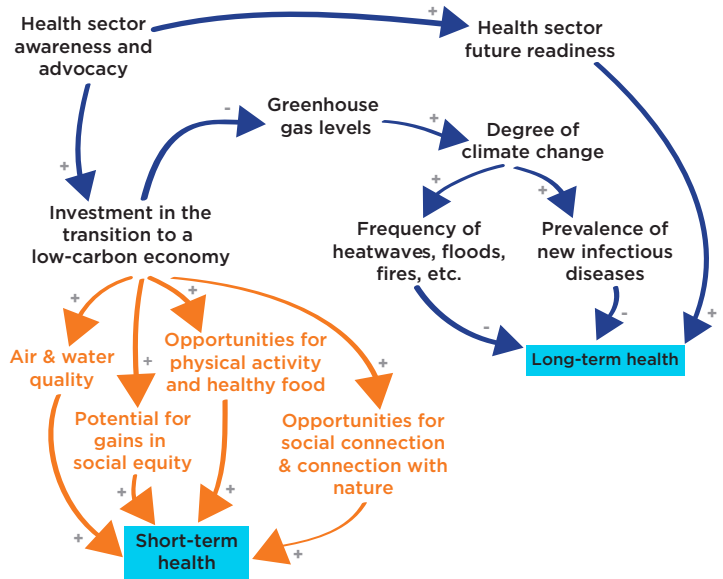
- Training future healthcare professionals to respond to emerging climate-related threats
- Incorporating future climate scenarios in emergency preparedness planning
- Including climate concerns in long-term capital budgets and facilities plans

Drawing attention to the long-term health impacts of climate change (Figure 1-3) encourages those with a stake in health systems, from healthcare professionals to health system leaders to parents and patients, to add their voices to the effort to limit



**FIGURE 1-3**

Representative impacts of climate change on health.<sup>3</sup>



**FIGURE 1-4**

Investment in a transition to a low-carbon economy has benefits for health in the short- and medium-term, especially via changes to lifestyle and the built environment, and in the long-term via the prevention of future climate change related health risks.

future climate change. With more studies quantifying the health impacts of climate change both in terms of preventable human suffering and needless financial cost,<sup>4</sup> stakeholders in the health system become natural advocates for efforts to prevent dangerous long-term climate change and its associated health impacts.<sup>5</sup> Health system leaders can become important spokespeople advocating for collective action to protect the climate.<sup>6</sup>

However, identifying climate as a long-term health threat is only part of the story. The connections between climate change and health are considerably more complex and interrelated. A more nuanced framing of the interconnections between climate change and health shows that many actions taken to prevent long-term climate change also provide a second category of health benefits (Figure 1-4). From retiring coal-fired power plants that contribute to asthma-exacerbating air pollution to shifting people out of climate-threatening single occupancy vehicles and thus increasing their physical activity, a significant subset of climate advocates' favored policies and investments have the power to deliver short term benefits to public health.

**The health dividend from ambitious climate action is actually a double dividend. Many climate investments pay off first in terms of short-term, local benefits for individual and community health and then later by reducing the long-term, global impacts of climate change on health.**

We use the term “multisolving” to refer to investments and policies that have the potential to produce benefits in climate protection in the long term as well as health (and other) benefits in the short to medium term. In times of limited budgets and increasing urgency for addressing both health and climate change, solutions that simultaneously lead to gains in both areas offer compelling opportunities.

A few examples of multisolving for climate and health make the potential clearer:

- Replacing a coal-fired power plant located in a highly-populated area with a source of clean, renewable energy would reduce CO<sub>2</sub> emissions (climate benefit) while also improving air quality and reducing respiratory illness (health benefit)
- Building a community garden in a low-income neighborhood would increase residents’ access

to a variety of healthy foods (health benefit) while reducing CO<sub>2</sub> emissions from transporting food (climate benefit)

- Investing in green space for urban stormwater management helps protect against the expected climate impact of more intense rainfall (climate benefit) while providing a green space for recreation, exercise, and community connection (health benefit)

Six areas of investment and policy are particularly well-suited for multisolving opportunities, as described in Figure 1-5. Each area represents a type of climate response (either reducing long-term greenhouse gas emissions or increasing a community’s preparedness for future unavoidable climate change) and has the potential to create gains in the health of individuals and communities.

MULTISOLVING POLICY AREAS		
	Examples of Climate Benefits (long term, global)	Examples of Health Benefits (short term, local)
<b>Climate adaptation</b>	Increased resilience to extreme events	Community-based public health response services also provide benefits during non-emergency conditions
<b>Urban design</b>	Reduced CO <sub>2</sub> emissions from transportation	Increased physical activity from walking and cycling reduces obesity and chronic disease
<b>Fossil fuel free</b>	Reduced CO <sub>2</sub> emissions from energy generation	Reduced air and water pollution from mining, refining, and burning fossil fuels reduces asthma and respiratory disease, heart disease, and premature birth
<b>Energy efficiency</b>	Reduced CO <sub>2</sub> emissions from built environment	More comfortable homes provide health benefits, and reduced home energy costs allow low-income residents greater spending on other needs
<b>Food and diet</b>	Plant-based foods have a lower carbon footprint	Reducing the fraction of meat in diets provides health benefits
<b>Nature-based solutions</b>	Plants sequester carbon and are protective against climate impacts	Presence of trees and green space reduces air pollution and improves mental health and opportunities for recreation and physical activity

**FIGURE 1-5**

Examples of six different categories of multisolving, each with climate and health benefits.

## UNDERLYING ECONOMIC, SOCIAL, AND CULTURAL FACTORS INFLUENCE CLIMATE AND HEALTH, PROVIDING TARGETS FOR MULTISOLVING

The current health of individuals and communities is influenced by some of the same underlying factors that influence the long-term health of the global climate. Because of this, policies and investments that reduce the risk of long-term global climate change can also contribute to local and immediate improvements in health conditions. By engaging with decision-making around the transition to a low-carbon economy, health system leaders could help ensure that the process of protecting the climate for the long-term is leveraged to capture immediate and local health gains.

At each step of the way in the current fossil fuel dominated energy system – from mining fossil fuels to burning them to power the economy – there are health impacts (Figure 1-6).

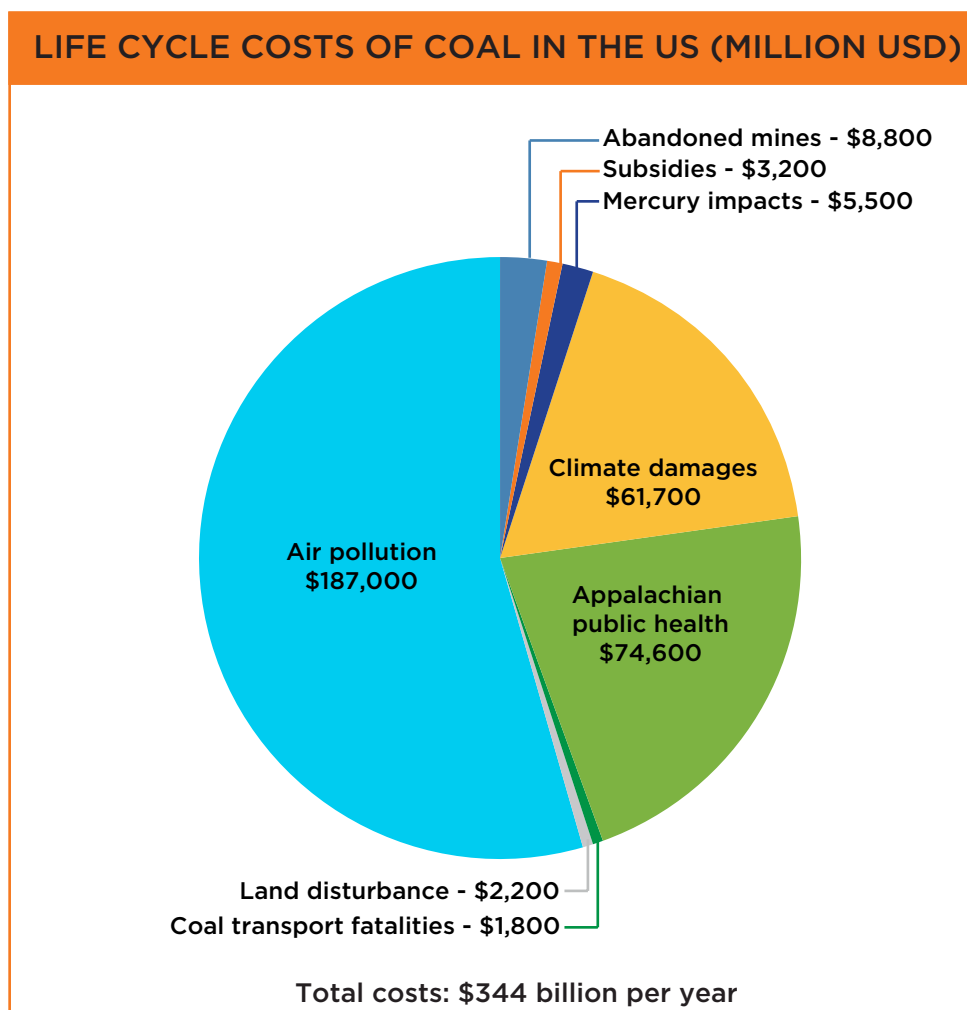
- Mining produces water pollution and threats to worker health and safety
- Transportation, particularly of unconventional oils like those extracted from tar sands, risks fire, explosion, and contamination of bodies of water along pipelines or routes traveled by rail cars
- Refining produces environmental toxins and air pollution
- Combustion creates air pollution and climate change

One life-cycle study of the use of coal in the United States<sup>7</sup> quantified the economic impact of each of these stages. Figure 1-7 shows that most of the impacts of coal use are health-related, and the local, immediate impacts are costlier than the annualized long-term global climate damages of coal use.

HEALTH IMPACTS ALONG THE FOSSIL FUEL LIFE CYCLE					
	Extraction	Transport	Refining	Combustion	Fossil fuel enabled design of the built environment
Short term & local	<ul style="list-style-type: none"> <li>• Water pollution</li> <li>• Accidents</li> <li>• Explosions</li> <li>• Hazardous working conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Accidents</li> <li>• Explosions</li> <li>• Air and water pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Toxic exposures in nearby communities</li> <li>• Hazardous working conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Air pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Sedentary lifestyles</li> <li>• Social isolation</li> </ul>
Long term & global		<ul style="list-style-type: none"> <li>• Health risks from climate change</li> </ul>		<ul style="list-style-type: none"> <li>• Mercury deposition</li> <li>• Health risks from climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Health risks from climate change</li> </ul>

**FIGURE 1-6**

The use of fossil fuels impacts health throughout the life cycle, from extraction to combustion.<sup>7</sup>



**FIGURE 1-7**

The annual costs from reliance on coal in the US. The long-term global costs are shown in yellow. The short-term local costs are shown in shades of blue, green, gray, and orange.<sup>7</sup>



In addition, in societies grown accustomed to fossil fuels, there have been many, often unconscious, design choices enabled by the availability of inexpensive fossil fuels that have also impacted health. For example:

- Reliance on the automobile results in a reduction of walking and other active modes of transportation, contributing to obesity and associated chronic diseases
- Less need for social cohesion exists than for past generations because physical labor, which once demanded cooperation amongst family members or community members, can be easily replaced by fossil-fuel powered devices

These underlying design principles of societal organization influence both individual and planetary health. The underlying health of a middle-aged person is a cumulative result of thousands of factors, including diet, exercise, stress, and exposure to toxic substances. Similarly, the level of greenhouse gases in the atmosphere (and resulting climate change) is the result of billions of small factors – how people moved around, what they ate, and how they stayed comfortable in their homes – over past decades.

The conditions of both our climate and our health are thus mirrors that reflect how we have chosen to organize our communities and our lives. This observation is reflected in the philosophy of a “culture of health” in the health sector<sup>8</sup> and in climate approaches that focus on the design of human-centered, livable communities, whose infrastructure promotes well-being and where consumption of energy is considered carefully in terms of its ability to improve quality of life. Viewed through this lens, our climate crisis and our health crisis are two symptoms of a set of shared underlying problems. Focusing on the shared underlying causes of poor health in our communities and global climate change in our world unlocks the potential for more creative and powerful

solutions both to public health challenges and climate change.

Recognition of the interconnection of these two issues is becoming more common. In 2015, the Lancet Commission produced a report entitled *Health and Climate Change: Policy Responses to Protect Public Health* that emphasized the ways in which our response to climate change presents opportunities for public health.<sup>9</sup> New organizations and networks, such as the Health and Environment Alliance<sup>10</sup> and Climate for Health<sup>11</sup> are appearing, and organizations stewarding public health, from the World Health Organization<sup>12</sup> to the American Public Health Association,<sup>13</sup> have begun highlighting the importance of health-climate intersections. In 2016, the World Health Organization sponsored a global conference on climate and health.<sup>14</sup>

### **EQUITY: ANOTHER SHARED FACTOR IMPACTING BOTH CLIMATE AND HEALTH CHALLENGES AND OPPORTUNITIES**

Equity, especially economic and racial equity, influences the health of individuals and communities. Equity also shapes our response to climate change and influences who is most vulnerable to climate change impacts.

Health equity ensures that “everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care.”<sup>15</sup>

Leaders working on the transition to clean energy or adaptation to unavoidable climate change employ the concepts of a “Just Transition,” “Climate Justice,” or the idea of a “Just Recovery” from climate change related extreme events. Each of these related concepts acknowledges the fact that climate change impacts disproportionately fall on low-income communities of color and argues for deliberate policies to ensure that investments to reduce carbon footprints and build resilience benefit vulnerable and disenfranchised communities.

In their largely parallel efforts towards health equity and a Just Transition, innovative leaders in both health and climate have a common set of motivations, similar rationales for acting, and similar demands and policy recommendations. This suggests the potential for a stronger alliance than has been observed to date.

Because equity is so important to addressing both climate change and health, there could be a natural alliance between these two areas of practice. Steps to improve equity, from undoing systemic racism to giving under-represented voices more decision-making power, could be expected to deliver win-wins in both climate and health. The legacies of systemic

racism are some of the biggest obstacles to meeting goals in climate and health, and aligning the resources and strategies of health equity and climate equity advocates could increase the successes of both.

The steps needed to address climate change necessitate the remaking of society's systems, from energy generation to housing to transportation to education to land use. In that remaking could be found powerful opportunities to create more equitable

communities.

**If the climate response is carried out with equity as a goal, climate successes could become equity successes, which could become health successes.**

Given these connections, ensuring the success of Just Transition efforts could be seen as a significant opportunity for health.



## THE POTENTIAL DIVIDENDS OF MULTISOLVING FOR CLIMATE AND HEALTH ARE LARGE

Evidence, both from forward-looking modeling studies and from retrospective assessments of policy implementation and investment, suggests that the potential savings for health from well-designed climate actions can be large.

### MODELING STUDIES

A study conducted by the European Health and Environment Alliance (HEAL) examined the potential health benefits if the European Union were to increase the ambition of its UN climate pledge from a 20% reduction in emissions to a 30% reduction by 2020. The study found that the annual health benefits of this increase were valued at around €30.5 billion, with a cost of €46 billion per year to meet the more ambitious climate target.<sup>16</sup> The health benefits examined in this study included benefits from reduced air pollution, but did not include the benefits of

avoided climate impacts nor the health benefits from increased active transportation (i.e. walking and cycling).

The study also compared two different strategies for the EU to meet the more stringent climate goal. The €30.5 billion of benefits described above were in a scenario where all emissions reductions were made domestically within the EU. If some of those reductions were instead made via offsets (that is, EU parties would pay for emissions reductions elsewhere in the world), the costs would fall to €33 billion per year, but the benefits would also fall, to around €14.6 billion. In a purely domestic emissions reductions program, the health benefits alone recoup 70% of the investment cost. But that falls to around 44% in a program where some of the emissions reductions happen internationally. This highlights that, for achieving multisolving goals, how and where emissions reductions are implemented may be as important as how much emissions are reduced.

Another modeling study<sup>17</sup> compared scenarios for reducing urban transport emissions in London and found that not all methods for reducing greenhouse gas emissions produce the same level of health benefits. This study compared a scenario in which emissions were reduced by promoting more walking and cycling with another scenario where emissions were reduced via investments in more efficient automobiles. The two scenarios resulted in similar greenhouse gas emissions reductions (38% vs. 35% reductions in CO<sub>2</sub> emissions, respectively), but the walking and cycling scenario prevented a dramatic number of premature deaths compared to the efficient automobile scenario (530 premature deaths prevented per million people vs. 17).

At the global scale, a study conducted by the World Bank examined scenarios for decarbonizing sectors like transportation, industry, and electricity generation. Across the sectors they examined, the researchers found that during the lifetime of the investment, the savings produced from health benefits and reduced



costs for fuel would more than pay back the initial cost of the investment.<sup>18</sup>

## REAL WORLD RESULTS

Researchers studying the multiple benefits of the transition to clean energy that is underway around the world are consistently reporting that the health benefits of the transition are large, in some cases larger than the climate benefit, when the two are compared in monetary terms.

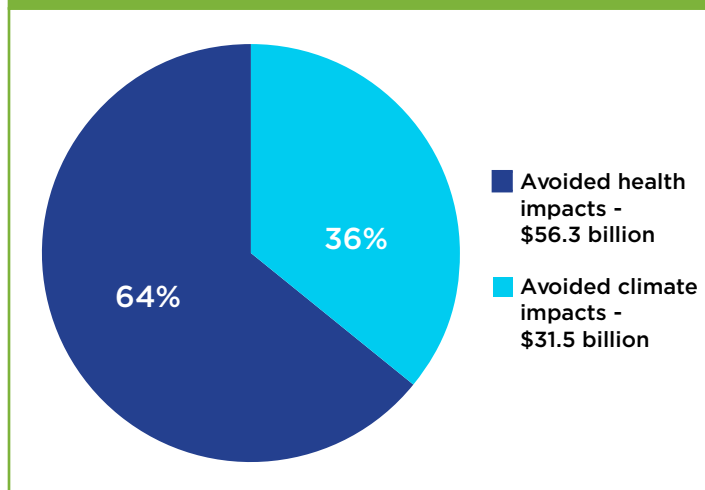
A 2017 study<sup>19</sup> conducted by researchers at the Lawrence Berkeley National Laboratory quantified the economic value of the health benefits from reduced air pollution resulting from the scale up of wind and solar in the US from 2007 to 2015. They found that reduced air pollution prevented 7,000 premature deaths during that period. That reduction in premature deaths, along with reductions in other public health costs of air pollution, resulted in cumulative health-related savings of \$56.3 billion. For comparison, the researchers also calculated the expected savings from avoided climate change impacts at \$31.5 billion (see Figure 1-8).

**The ongoing scale-up of clean energy in the US is clearly producing a health dividend in addition to climate protection, and current estimates suggest that the health benefit is larger in monetary terms than the climate benefit.**

A recent study<sup>20</sup> examined the health benefits from 2009 to 2014 of the Regional Greenhouse Gas Initiative (RGGI), an agreement among states in the northeastern US to reduce greenhouse gas emissions from power plants. These states are on track to reduce greenhouse gas emissions from electricity generation to 45% below 2005 levels by 2020. The study found that RGGI prevented hundreds of deaths from air pollution, thousands of cases of asthma exacerbation, and tens of thousands of lost work days. The economic value of these health benefits was estimated at \$5.7 billion over that period. Overall the net benefits of the project, including health and fuel savings, were positive in each participating state.

Multisolving is also paying dividends in rapidly industrializing countries like China and India. China has been a leader in recognizing these health-climate connections. A study conducted by Chinese and US researchers found that coal consumption was the biggest contributor to air pollution health impacts in China, accounting for approximately 366,000 premature deaths in 2013.<sup>21</sup> The researchers found that air pollution was the 5th most common cause of death in the country. China's recently announced plans to reduce coal use in its most populous cities was motivated in large part by concerns over air quality and health.<sup>22</sup> This public health motivation has been reported as a key factor in cultivating the political support needed to move away from economically

## AVOIDED HEALTH & CLIMATE IMPACTS



**FIGURE 1-8**

The monetary value of the avoided health and climate impacts resulting from the scale up of clean energy in the US from 2007 to 2015.

important energy sources like coal, as well as a factor driving China's greenhouse gas emissions reduction commitments to the United Nations.<sup>23</sup>

Smaller developing countries also see the potential to secure gains in public health as a result of investments in a clean energy economy. For instance, in countries where access to electricity is a factor that limits economic opportunity, health, and educational opportunity, investments in micro-solar installations provide access to electricity. As the clean energy typically replaces polluting sources of energy like diesel generators and kerosene lanterns, the investments also reduce indoor and outdoor air pollution and thus improve the health of many, including the most vulnerable populations, such as women and children.<sup>24</sup>

There are further examples of multisolving at subnational levels. For example, cities like Copenhagen and Amsterdam have focused on walking and cycling infrastructure, reducing emissions from transportation while also improving health and well-being for city residents.

In the US, California has been a leader in implementing climate policy in ways that improve health and well-being. In 2012, the state's climate legislation mandated that 25% of revenues from the carbon cap and trade program be directed towards investments in vulnerable populations. There is a growing list<sup>25</sup> of multisolving examples in the state. A "cash for clunkers" program helps get polluting vehicles off the road while providing low income families a reliable vehicle for access to education and employment - a significant factor allowing families to move out of poverty and secure the health gains that come with access to employment and services. At the point of transaction for replacing the cars, the same program

connects people to public health screening services and immunizations. Other programs use the cap and trade revenue to invest in green spaces and parks, training for jobs in the clean energy economy, and ride-sharing programs for migrant farmworkers.

## CLIMATE INVESTMENTS COULD BE A NEW SOURCE OF HEALTH BENEFITS

With the symptoms of climate change becoming stronger over time, investments to prevent future climate change as well as investments to adapt to the climate change that we cannot prevent are anticipated, and some studies have made efforts to quantify the scale of the needed investments. The substantial investments that are required are each a potential target for multisolving. To what extent can the needed investment be shaped in a way that also provides health benefits?

When researchers at the Deep Decarbonization Project compared spending on health and energy supply in the US using estimates from the Energy Information Agency, they found that health spending is around 17% of GDP, and spending on energy infrastructure is about half of that (8.6% of GDP in 2012). In other words, the annual investment in energy supply in the US is a sizeable fraction of the investment in health.<sup>26</sup>

Spending on energy doesn't increase much in a climate-safe scenario. The Deep Decarbonization researchers estimated the additional energy system costs per year and found them to be only slightly increased over a fossil fuel heavy scenario. In 2050, energy spending in the climate-safe scenario would be about 0.8% of GDP more than in the fossil-heavy scenario.

**Could we steer the needed energy system investments towards options that produce increased health benefits as well as climate benefits? If we could, both our health and energy budgets would be pushing toward good health for all.**

Similarly, what if even a fraction of health spending were aligned to help capture greenhouse gas reductions that also improved health? Since the Deep Decarbonization pathway requires a small percentage increase in energy spending, health investments that support a low carbon trajectory could exert quite high leverage.

In addition to the anticipated spending on reducing greenhouse gas emissions, two other kinds of climate-related spending are expected in the coming years: climate change adaptation spending and spending on recovery and rebuilding after extreme events made more severe by unavoidable climate change. A recent review<sup>27</sup> of studies on the costs of climate change adaptation in the United States found that by mid-century, the costs could be tens of billions to hundreds

of billions of dollars per year.

Adaptation spending will also be significant in cities and states. For instance, the port of San Francisco is working on a plan that would require up to \$5 billion in spending to adapt to expected increases in sea level rise.<sup>28</sup> A study<sup>29</sup> of current levels of adaptation spending found that New York City spent \$2.7 billion, or \$320 per person, on climate change adaptation in 2014. In the same year, Paris and London both spent between \$1.5 and 1.6 billion (\$670 per capita in Paris and \$200 in London).

Where adaptation projects are insufficient to fully protect people and infrastructure, there will be post-climate-disaster spending to rebuild infrastructure. A 2013 report<sup>30</sup> by the US Department of Commerce estimated that the costs of rebuilding after Hurricane Sandy were \$29.5 billion in New Jersey and \$41.9 billion in New York.

Each of these investments is an opportunity for gains in health, but only if the investment is made with awareness of the opportunities and with policy and design knowledge informed by a health perspective.

These opportunities become more concrete when thinking about specific projects. Take the example of a bridge destroyed by climate-related flooding. The bridge could be rebuilt in several possible ways. The new bridge could be a replica of the original bridge, which would miss out on both the climate adaptation and public health opportunities. Alternatively, the bridge could be rebuilt for the higher precipitation amounts that are expected with climate change in many regions, which would be a win for climate but neutral for health. Finally, it could be rebuilt with climate-ready engineering and a bike lane to encourage more frequent and safer cycling, which would be a win for both climate and health.

Similarly, if a program were to be developed for energy efficiency retrofits, the program could target buildings with the worst energy performance, a win for climate. If the program selected projects based on the confluence of poor energy performance and the health or energy poverty level of the residents, the same level of emissions reductions could be coupled with increased gains in health.



# OBSTACLES TO MULTISOLVING

*Modeling studies and real-world examples show that designing integrated policy and investment approaches to serve goals in climate and health can produce gains for both issues. However, projects that align the two issues are still rare. Those seeking to multisolve for climate and health face at least six different barriers.*

## DISCIPLINARY SILOS

Many multisolving policies and investments require operational knowledge of areas that cross traditional disciplinary boundaries. Implementers of energy and climate policies might not have the expertise in public health to feel confident in optimizing health gains from an energy project. Or health experts may feel that they have neither the expertise nor the responsibility to address climate change when they work on projects to improve public health. In those cases where experts across these disciplines do find themselves collaborating on projects, differing technical languages, ways of measuring success, and approaches to problem-solving can all present obstacles or make project work seem more time-consuming and complex.

In interviews we conducted with US health experts, the role of disciplinary boundaries in limiting multisolving on climate and health was notable. Many of those we interviewed expressed that they did not feel equipped to tackle issues in energy and climate, and many reported that they didn't have climate and energy experts within their networks.

## BUDGETARY SILOS

Often the investment needed for a multisolving approach is considered an investment in climate mitigation or in energy infrastructure. As such, it may require funding from entities like energy or transportation ministries in countries or the public works department in cities. Yet the benefits tend to be measured in terms of improved health or reduced hospitalizations. While multisolving may be a net cost-effective approach for the country or city overall, the health gains are not typically something that practitioners working in climate or energy are rewarded for, either in terms of career advancement or future budgetary allocation.

## JURISDICTIONAL SILOS

Because many of the most promising opportunities for multisolving are investments or policies that change the way communities are built or operate, implementing them often requires the participation and collaboration of multiple jurisdictions. For example, a complete streets program that makes streets more walkable, greener, and more socially connected might require actions and investments

from the public works department, the transportation department, business associations, neighborhood groups, and public health officials. Or a program that aims to improve well-being via access to good paying jobs in the low-carbon economy might require workforce development resources, changes to procurement policies, and the participation of local companies. Multisolving may also require collaboration among organizations used to operating at different scales. For instance, a state transportation agency may need to collaborate with a municipality and small neighborhood associations to create a bike path linking two parks. Assembling and maintaining the required levels of partnership and collaboration can thus be a barrier to implementing multisolving.

## WEAK COMMUNITY ENGAGEMENT SKILLS

Many of the most promising multisolving solutions improve the situation of vulnerable populations at risk from both climate change and social or environmental factors that are not health promoting. Solutions such as energy efficiency retrofits for low-income households or walkable infrastructure aimed at communities of color have the potential for improving health and climate together, but such projects are best implemented with involvement from the impacted

### SIX OBSTACLES TO MULTISOLVING FOR CLIMATE AND HEALTH

1. Disciplinary silos
2. Budgetary silos
3. Jurisdictional silos
4. Weak community engagement skills
5. Challenge of funding prevention vs care
6. Long-term benefits within systems oriented toward short-term decision making

**FIGURE 1-9**

Multisolving projects face obstacles, from siloed budgeting and decision making to the challenges in funding prevention and long-term well-being.



communities. In this way, multisolving is less the domain of technical experts and more the domain of those who can create the conditions for partnerships, including partnerships that involve representatives of impacted communities. The need for community engagement skills can feel daunting to practitioners whose training may have been more focused in fields like civil engineering, climate science, energy systems, patient care, or public health.

### CHALLENGE OF FUNDING PREVENTION VS CARE

Many of the multisolving opportunities at the intersection of climate and health improve health by improving the environment within which people live and work, providing more physical activity, cleaner air, more equity, improved social determinants of health, or more social connection. Such improvements generally provide a health benefit via prevention rather than by directly caring for sick people. To the extent that health budgets are skewed towards care and away from prevention and investments in social supports,<sup>31</sup> investing in multisolving for climate

and health may require new approaches towards improving health and a shift in thinking from a treatment mindset to a prevention mindset.

### REALIZING LONG-TERM BENEFITS WITHIN SYSTEMS ORIENTED TOWARD SHORT-TERM DECISION MAKING

Climate benefits typically are long-term, measured in avoided warming over decades or centuries. Health benefits can be realized more quickly, but the types of health benefits most commonly associated with multisolving for climate and health may only be realized over the course of people's lifetimes rather than as an immediate result of a particular project or event. The health benefits are of a quicker time scale than the climate benefits, but for systems that measure costs and benefits on quarterly or annual time scales, multisolving may still be too slow to be appealing. Helping stakeholders understand the potential and value of such slower-onset benefits can be a challenge in decision-making systems focused on quarterly or yearly costs and rewards.



## BRIGHT SPOTS - MULTISOLVING FOR CLIMATE AND HEALTH

*With the many advantages of multisolving, especially in an era of constrained budgets and rising needs, it can be instructive to seek out examples where people have successfully addressed climate and health in an integrated way.*

Because the potential for multisolving is not widely understood and because of the obstacles described above, we wanted to learn more about the bright spots where multisolving has been accomplished around the world. How did people accomplish it? How did they maneuver around obstacles, build effective partnerships, and realize climate and health benefits together?

Curious about these questions, we embarked on a search for examples where people found ways to come together to create improvements in health and climate in an integrated fashion. We conducted a global scan of on-the-ground projects that addressed climate and health together. We examined over 100 cases from around the world, ranging from small programs within individual hospitals to major initiatives in megacities.

Our main criteria for including cases in our examination were that the gains in climate and health were deliberate, not accidental. Many climate initiatives produce health benefits (for example by limiting the combustion of fossil fuels), but we were most interested in those examples where goals in both climate and health were on the minds

of the project implementers. We further narrowed the cases to provide examples from a range of geographies, sectors, and scales. And we only focused on cases that had been ongoing long enough to have observable results, information about the obstacles encountered, and insights into how project implementers approached those challenges.



Based on these criteria, we focused on ten case studies for more detailed investigation, including, where possible, interviews with the project implementers to learn more about the work and the lessons they took from it.

Those ten case studies are laid out in the following pages. We hope reading them will give you a good understanding of both the common elements that are seen in most multisolving efforts and the unique elements that differ with culture, sector, and scale of efforts. In the final chapter of this report we reflect

on some of the common elements and lessons we've taken from our investigation of these ten cases and the other cases we were not able to include in this report.

Each case study is presented as a two-page summary to allow you to compare cases at a glance and focus on those cases which are most interesting. Highlights of each case are summarized in Figure 1-10, which captures some of the diversity of scales, sectors, and geographies at which multisolving for climate and health is occurring.



## CASE STUDIES OF MULTISOLVING FOR CLIMATE AND HEALTH

	<u>Country</u>	<u>Scale</u>	<u>Sector</u>	<u>Description</u>
<b>Ciclovía Bogotá</b>	Colombia	City	Transport	Closes over 75 miles of roadways to cars on Sundays and holidays
<b>Espigoladors Gleaning Movement</b>	Spain	Community	Food, Waste	Volunteers glean, distribute through food banks, and process food into jams, sauces, and soups
<b>Green Curtains</b>	Japan	Business	Buildings, Energy, Food, Nature	Grows edible or decorative climbing plants on exterior of buildings
<b>Healthy Meals for Patients and the Environment</b>	Malaysia	Business	Food, Waste	Dialysis center serves vegetarian food and recycles all forms of waste
<b>Healthy Streets for London</b>	England	City	Transport	Improves air quality, reduces congestion, and makes London healthier and more attractive
<b>Operation TLC</b>	England	Business	Energy, Buildings	Encourages behaviors such as turning off equipment, closing doors, and allocating patient quiet time
<b>ProAire</b>	Mexico	City	Energy, Transport	Unites multiple organizations to reach air quality goals
<b>Smarter Anesthetic Gases</b>	Australia	Business	Waste	Hospitals switch to anesthetic gases that lower costs and emissions
<b>Walk to School</b>	England	Country	Transport	Encourages parents, teachers, and students to walk to school
<b>Warm Up New Zealand</b>	New Zealand	Country	Buildings, Energy	Retrofits houses to reduce cold-related illnesses, energy costs, and carbon emissions

**FIGURE 1-10**

The ten case studies featured in this report span a range of geographies, sectors, and scales.

# CASE STUDY GUIDE

## COUNTRY, SECTOR, AND SCALE

The icons located to the right of the title of each case study represent the country that the initiative is located in in dark blue, the scale of the project in cyan, and the sector or sectors corresponding to the project in yellow. Refer to Figure 1-10 for a list of the countries, scales, and sectors involved in each case study.



**FIGURE 1-11**

Example country, sector, and scale icons.

## CLIMATE AND HEALTH BENEFITS

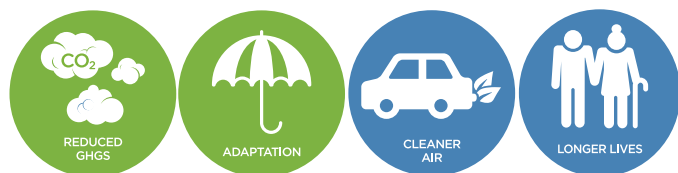
On the second page of each case study are icons depicting the project's climate and health benefits. The climate benefits are shown in green and the health benefits in blue.

The climate benefits are as follows:

- Reduced GHGs
- Less waste
- Conserve energy
- Renewable energy
- Conserve resources
- Adaptation

The health benefits are as follows:

- Cleaner air
- Less noise
- Active lifestyle
- Better diets
- Well-being
- Fewer medical visits
- Longer lives

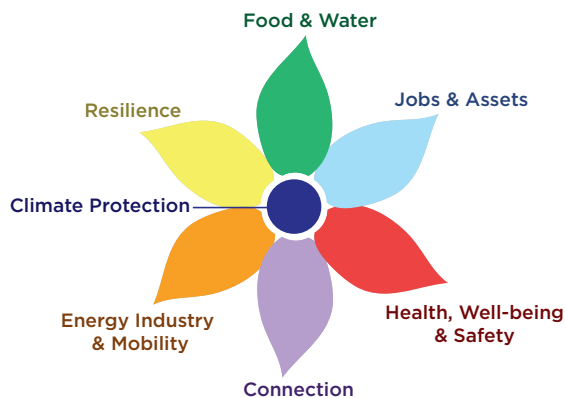


**FIGURE 1-12**

Example climate and health benefits.

## FLOWER

The FLOWER graphic in Figure 1-13 is used to highlight the multiple benefits resulting from each project. FLOWER stands for the Framework for Long-Term, Whole-System, Equity-Based Reflection. It is a visual framework that provides a way to diagram six common types of policy benefits: benefits to food and water (the green petal); to jobs and assets (the blue petal); to health, well-being, and safety (the red petal); connection to the environment and human communities (the purple petal); energy industry and mobility (the orange petal); and resilience to extreme events (the yellow petal). If the petal is colored in, that means that the project provides a benefit within that category. For example, if an initiative helps create jobs, then the blue petal will be shaded in. If the petal is grayed out, then the project does not provide that benefit.



**FIGURE 1-13**

The full FLOWER diagram for categorizing project benefits.



# BOGOTÁ'S RECREATIONAL BIKEWAY (CICLOVÍA BOGOTÁ)

SINCE 1974  
BOGOTÁ, COLOMBIA  
CITY OF BOGOTÁ



## PROJECT GOALS

- Provide space for physical activity
- Promote healthy habits
- Reduce obesity and chronic diseases
- Reduce greenhouse gas emissions
- Alleviate social inequity
- Reduce noise levels

Ciclovía de Bogotá is a government-led project that closes 75 miles of roadways in Colombia to motorized vehicles every Sunday and holiday, adding up to over 70 closures a year, providing recreational space for cyclists, skaters, runners, and walkers.<sup>1</sup> Launched by young activists in 1974, Bogota's Recreational Bikeway (Ciclovía) was further developed by the Colombian government to encourage physical activity and improve air quality.

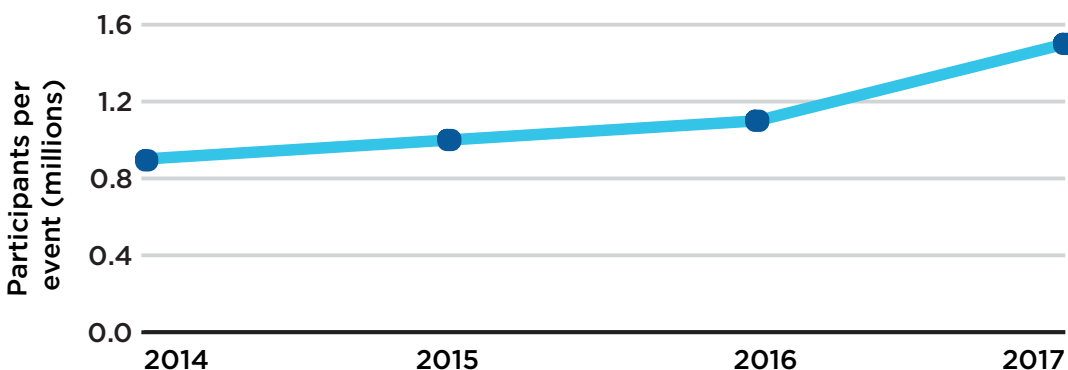
Citizens also benefit from the opportunities offered by complementing services, such as bicycle rental and repair stations, food vendors, veterinary booths, and product vendors. Other activities such as free yoga, aerobics, and dance classes are part of the related event, Recrovía. Today, average participation in each Ciclovía is approximately 1,500,000 people, or 20% of Bogotá's population.

## OVERCOMING OBSTACLES

Funding comes from taxes on phone bills, cigarettes, and alcohol. To stretch funds, the program has a large volunteer team, including hundreds of students, managing route closures.

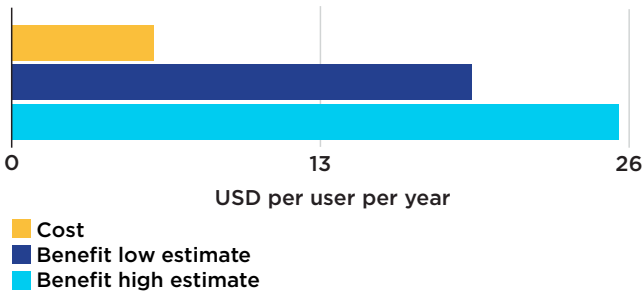
Originally, Bogotá's Ciclovía was coordinated by the District Transport Secretariat. Its management was passed to the District Institute of Recreation and Sport (IDRD) in 1995, as the initiative was not getting the support, funds, and attention that matched its potential.

## AVERAGE PARTICIPATION IN CICLOVÍA<sup>2</sup>





## HEALTH BENEFIT RELATIVE TO COST<sup>3</sup>



## LEADERSHIP AND COLLABORATION

**BUSINESS**  
Local (A)

**GOVERNMENT**  
Local (A, D, F, I)

**HEALTHCARE**  
Health Secretariat (A, I)

**SOCIAL MISSION**  
Local (A, I)  
Regional (A)

**VOLUNTEER**  
Local (A, C)

A: Advocacy, C: Champion,  
D: Design, F: Funding,  
I: Implementation

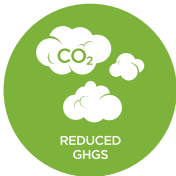
IDRD is currently the owner and leader of Ciclovía and was formerly the design and implementing entity.<sup>5</sup> Strategic partners such as the Mobility Secretariat, Health Secretariat, Education Secretariat, Government Secretariat, Metropolitan Police, municipal governments, and Transit Police have key roles in the initiative.

## REPLICATION

Bogotá's cycling path has been replicated in México, Brazil, Perú, Chile, and elsewhere in Latin America through Recreational Cycling Routes of the Americas. The model is being adopted outside of Latin America, inspiring initiatives such as the Superblocks of Spain, the Journée Sans Voiture in Paris, Open Streets in Philadelphia, CicLAvia in Los Angeles, 32 miles of car-free Sunday Bikedays in Ottawa, and events in Bangalore, India, and Cape Town, South Africa. As of January 2017, 122 US cities had hosted Open Streets events.<sup>4</sup>

## BENEFITS

CLIMATE BENEFITS



Reduces carbon dioxide emissions by more than 16% every weekend<sup>6</sup>

HEALTH BENEFITS



FEWER MEDICAL VISITS



ACTIVE LIFESTYLE



WELL-BEING



LESS NOISE



CLEANER AIR



LONGER LIVES

## OTHER BENEFITS



**JOB & ASSETS**  
HEALTH, WELL-BEING, & SAFETY

**CONNECTION**  
ENERGY & MOBILITY

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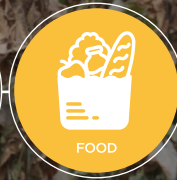
ALCALDÍA MAYOR DE BOGOTÁ D.C.

**BOGOTÁ MEJOR PARA TODOS**



# ESPIGOLADORES GLEANING MOVEMENT

SINCE 2014  
BARCELONA, SPAIN  
ESPIGOLADORES



## PROJECT GOALS

- Reduce food waste
- Donate food to people at risk of social exclusion
- Promote healthy eating habits
- Create equitable job opportunities
- Reduce CO<sub>2</sub> emissions and conserve water

In 2014, a gleaning social enterprise began in northeastern Spain. Through Espigoladores, fresh fruits and vegetables that are discarded due to aesthetic imperfections or over-supply are collected and donated to social organizations addressing hunger or processed for sale.

Espigoladores' vision is to reduce food waste by rescuing and transforming "ugly" foods into healthy products. By doing so, they also address hunger and unemployment in Spain. Despite rising hunger levels, 8.5 million tons of food, or 359 lbs. per person,<sup>1</sup> are wasted every year in Spain. Gleaners are often volunteers, and people at risk of socio-economic exclusion are employed in the processing facilities. Gleaners take home some of the food, and participating producers and food companies receive a digital web stamp acknowledging their commitment to social responsibility.

## OVERCOMING OBSTACLES

As their mission is to overcome the negative conceptions of aesthetically unappealing fruits and vegetables, Espigoladores' behavior change campaign, "I'm imperfect too," encourages consumers to support giving second chances to the imperfect in society.<sup>2</sup>

The program uses a variety of solutions to address funding concerns. A local family business offered Espigoladores food processing space during the project's initial stages, and endorsements from celebrity chefs helped raise most of the funds needed to build their own processing workshop. By processing 5% of the food collected into a range of sauces and other products, Espigoladores earns income that sustains its activities.

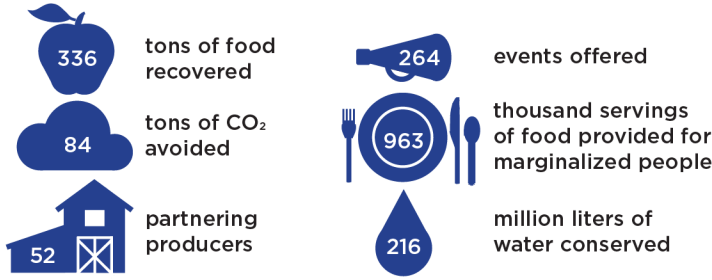
## THE GLEANING MODEL<sup>3, 4</sup>



Through Espigoladores, "Society gets educated about the importance of 'imperfections and second chances' (for food (wasted) and for people (unemployed))."



## ESPIGOLADORS AT A GLANCE<sup>5</sup>



## LEADERSHIP AND COLLABORATION

### BUSINESS

Food producers (A)  
Local businesses (I)  
Food Banks (I)

### GOVERNMENT

City Council of El Prat (F)  
Barcelona Provincial Council (F)

### SOCIAL MISSION

Espigoladors (C, D, I, A)

### VOLUNTEERS

Consumers (A, I)  
Gleaners (A, I)

A: Advocacy, C: Champion,  
D: Design, F: Funding,  
I: Implementation

The social enterprise was founded by several young Catalan residents and currently employs 11 staff. Since 2014, it has engaged over 960 volunteer gleaners, farmers, and environmental activists. The success of the movement is based on dialogues that build trust with producers and food companies and well-organized logistics with gleaners, communities, and food distribution points.

## REPLICATION

Espigoladors is changing people's perceptions of food waste and promoting healthy eating habits. They have been invited for talks and training sessions at schools, markets, and factories. They intend to replicate the model in different parts of Catalonia and Spain, promoting a culture of eliminating waste while creating social, economic, and environmental benefits.

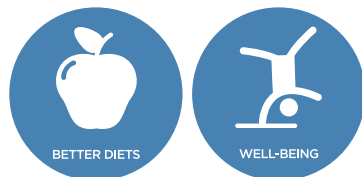
## BENEFITS

CLIMATE BENEFITS



Reducing food waste helps reduce land use pressure and emissions from agriculture, as well as reducing methane emissions from landfills.

HEALTH BENEFITS



## OTHER BENEFITS



**FOOD & WATER**  
**JOB & ASSETS**  
**HEALTH, WELL-BEING, & SAFETY**

**CONNECTION**  
**RESILIENCE**

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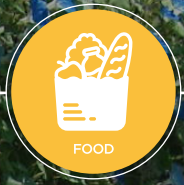


espigoladors



# GREEN CURTAINS

SINCE 2007  
JAPAN  
KYOCERA



## PROJECT GOALS

- Reduce energy consumption
- Save on energy costs
- Promote healthy diets
- Reduce CO<sub>2</sub> emissions

Since 2007, Kyocera, a Japanese manufacturer of electronic components and photovoltaic systems, has been covering the outer façades of its buildings with Green Curtains to lower indoor temperatures, save energy, and reduce pollution.

Living curtains of decorative or edible climbing plants, such as morning glory and bitter melon, help to cool the air through water evaporation, reducing the use of air conditioning while at the same time providing natural shade and sequestering carbon emissions. Additionally, the company uses food from these plants for cafeteria meals and distributes some to employees for free.<sup>1</sup>

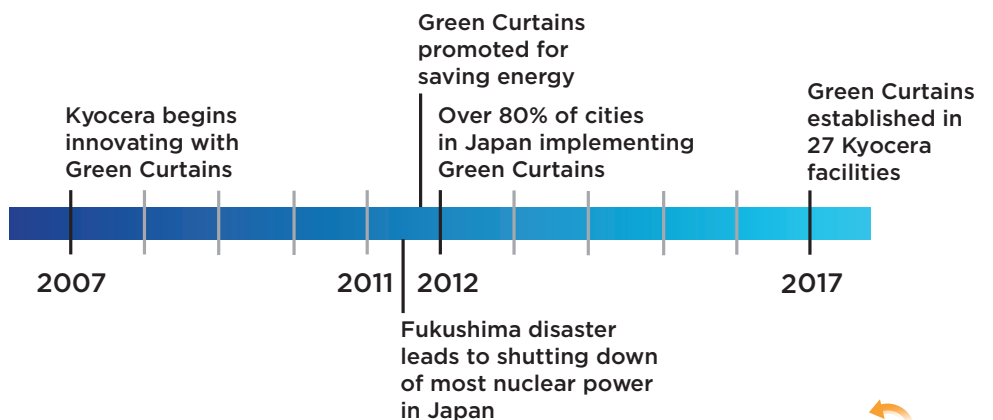
The project was initially launched in Kyocera's Okaya factory and advocated for by the city of Okaya and an environmental citizen's alliance, Eco Life Okaya. It has now spread to 27 factory locations in Japan. As of 2016, Kyocera's Green Curtains covered an area of more than 31,000 ft<sup>2</sup>, resulting in significant summer energy savings and positive aesthetic effects.<sup>2</sup>

## OVERCOMING OBSTACLES

To encourage the spread of Green Curtains, Kyocera created guidebooks and DIY kits and distributes seedlings to its employees and local residents.






Kyocera documented the energy savings impact by conducting thermographic testing to compare the temperature in areas with and without Green Curtains.

## GREEN CURTAINS TIMELINE





## BENEFITS OF GREEN CURTAINS ACROSS JAPAN<sup>3, 4, 5</sup>

-  **2°C** Reduction in indoor temperature
-  **15°C** Reduction in outdoor building surface temperature
-  **1.5** Hours/day reduction in air conditioner use
-  **\$256** Monthly energy cost savings in Kamiita town hall building
-  **5** Types of Green-Curtain-grown vegetables served in company cafeterias

## LEADERSHIP AND COLLABORATION

### BUSINESS

Kyocera (C, D, F, I)

### GOVERNMENT

City governments (A, C, D, I)

### SOCIAL MISSION

Eco Life, Okaya (A, D)

### VOLUNTEERS

Employees, citizens (A, I)

A: Advocacy, C: Champion,  
D: Design, F: Funding,  
I: Implementation

While Kyocera's Green Curtains started in its Okaya factory in cooperation with the local government and an NGO, the project has become a preferred Corporate Social Responsibility initiative since it directly results in energy savings and involves employees. Since 2011, the Japanese government has promoted Green Curtains as an energy conservation solution following the Fukushima nuclear disaster that affected electricity supply. The government organizes an annual photo contest for Green Curtains, and Ecobank, an environmental NGO in Aichi, has published a Green Curtains teaching manual.

## REPLICATION

Over 80% of cities in Japan were implementing Green Curtains by 2012, and as of 2017, there were 231 local governments and 130 elementary schools in Kyoto alone taking part in the Green Curtain movement. Restaurants in Tokyo are serving meals prepared from their Green Curtains, city residents have embraced Green Curtains to cool their homes, and many Japanese companies have emulated Kyocera in establishing Green Curtains.

## BENEFITS

### CLIMATE BENEFITS



Vegetation helps reduce the urban heat island effect.

### HEALTH BENEFITS



## OTHER BENEFITS



**FOOD & WATER**  
**JOBS & ASSETS**  
**HEALTH, WELL-BEING, & SAFETY**

**CONNECTION**  
**ENERGY & MOBILITY**  
**RESILIENCE**

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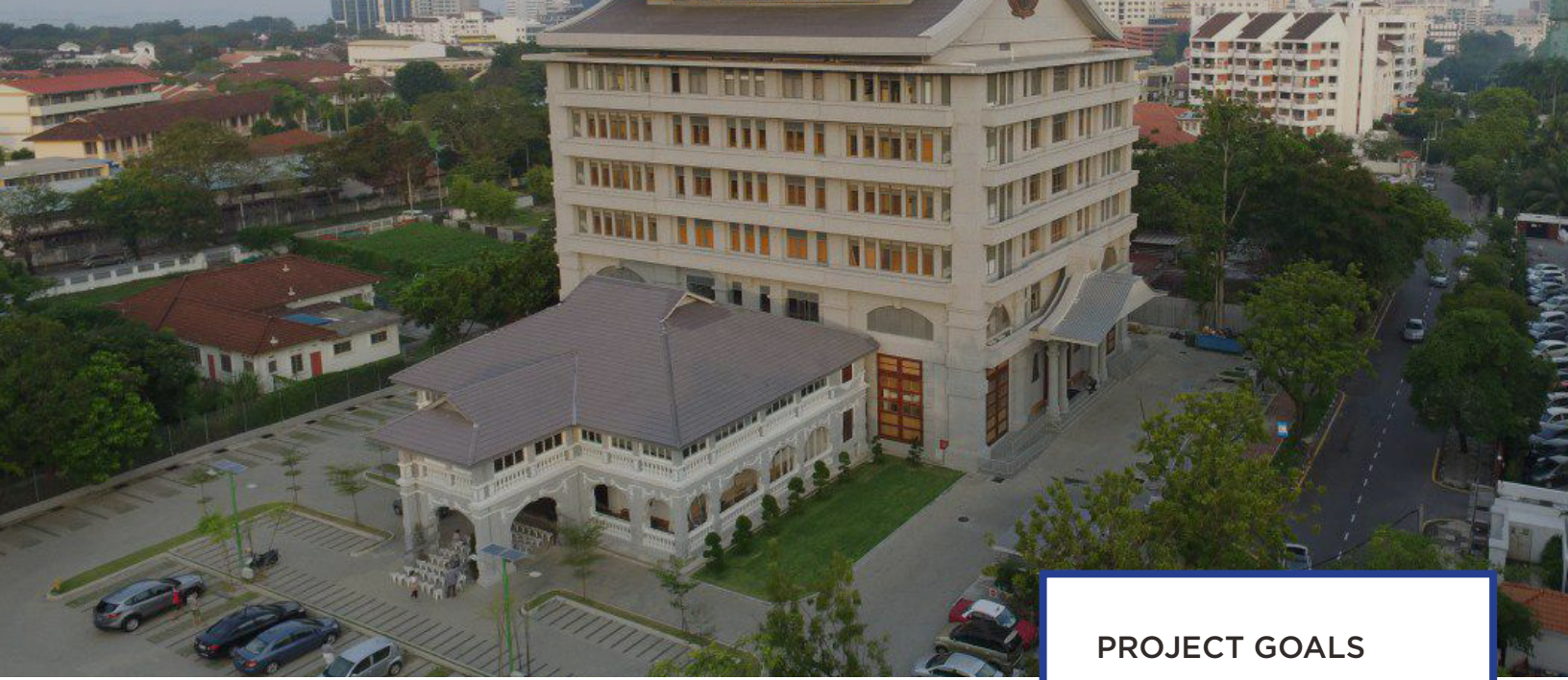
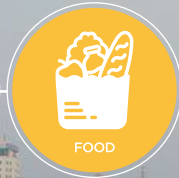


# HEALTHY MEALS FOR PATIENTS AND THE ENVIRONMENT

SINCE 1997

PENANG, MALAYSIA

BUDDHIST TZU-CHI DIALYSIS CENTER



## PROJECT GOALS

- Reduce the Center's environmental footprint
- Reduce and recycle waste
- Promote healthy diets
- Provide a livelihood for patients

The Tzu-Chi Dialysis Center in Penang, Malaysia has helped to transform the spirit of loving-kindness into actions to improve health, patient livelihoods, and the environment by practicing a vegetarian diet and using recyclable food containers. All meals prepared at or brought to the Center are vegetarian, and only recyclable food containers are allowed in the Center. Dialysis patients help implement the recycling project, enabling them to contribute to society and live independent lives.<sup>1</sup>

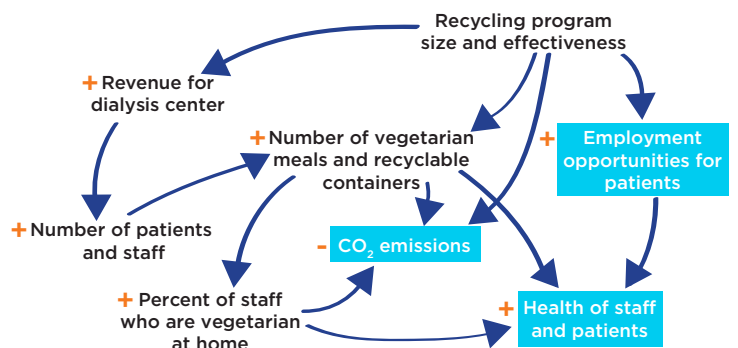
The Center in Penang was opened in 1997 with the goals of offering free dialysis, creating health awareness campaigns, and turning waste into resources. As of 2016, they had a total of 126 patients and 87 staff, and vegetarian staff members had increased from 28 to 51 in one year.

## OVERCOMING OBSTACLES

The Center reports little resistance to vegetarian meals, which could be attributed to their core values of gratitude, respect, and love. New staff and patients are informed of the policies during admission, hiring, orientation, and on their first day at work. They receive new recyclable food containers when they join or are admitted to the Center and are reminded of these policies annually.

Financially, the Center relies on donations from the public and revenue from recycling projects. They estimate that money from recycling pays one-third of the monthly operating expenses.<sup>2</sup>

## A WEB OF BENEFITS





## ONE YEAR SNAPSHOT<sup>3, 4</sup>

Avoid 5,800 plastic bags



Replace 5,800 meat servings with vegetarian option



= 10.9 tons avoided CO<sub>2</sub>

Equivalent to taking 2.3 vehicles off the road



## LEADERSHIP AND COLLABORATION

**HEALTHCARE**  
Tzu-Chi Dialysis Center  
(C, D, I)

**VOLUNTEERS**  
Staff, patients (A)

A: Advocacy, C: Champion,  
D: Design, I: Implementation

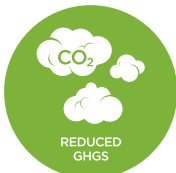
The Tzu-Chi Foundation is a faith-based, non-governmental organization working to ensure that healthcare contributes to environmental protection and the well-being of patients. Staff, volunteers, and patients in Tzu-Chi establishments are the main implementers and beneficiaries of the recycling and vegetarianism policies.

## REPLICATION

The policies of vegetarian meals and recycling are present in all Tzu-Chi medical establishments in 54 countries around the world. Other environmental protection activities are also being undertaken, with a focus on promoting the core values of Tzu-Chi to those who interact with the institution.

## BENEFITS

CLIMATE BENEFITS



HEALTH BENEFITS



Recycling proceeds pay for dialysis treatments and enable patients to have independent lives upon recovering.

## OTHER BENEFITS



**FOOD & WATER**  
**JOB & ASSETS**  
**HEALTH, WELL-BEING, & SAFETY**

**CONNECTION**

## CONTACT INFORMATION

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# HEALTHY STREETS FOR LONDON

2017—ONGOING  
LONDON, ENGLAND  
TRANSPORT FOR LONDON & MAYOR OF LONDON



Healthy Streets for London was launched in February 2017 to support the Mayor's Transport Strategy. It works at three levels:<sup>1</sup>

- i. Street - walking and cycling space; better public spaces
- ii. Transport network - public transport; walking and cycling routes
- iii. Strategic - development patterns enabling walking or cycling to shops, school, or work

The approach outlines ten indicators of a healthy street:

- things to see and do
- places to stop
- shade and shelter
- clean air
- pedestrians from all walks of life
- easy to cross
- people choose to walk and cycle
- quiet
- safe-feeling
- people feel relaxed

The approach is being incorporated into the Mayor of London's Statutory Strategies, ensuring stakeholders deliver the goals at no additional cost to transport or planning authorities.

Healthy Streets aims to help the city reduce CO<sub>2</sub> emissions by 60% of 1990 levels by 2025 and increase the number of Londoners walking or cycling for at least 20 minutes every day.

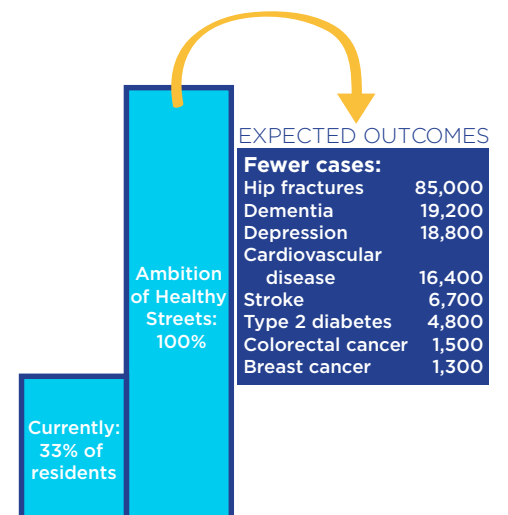
## OVERCOMING OBSTACLES

London's public health and transport communities have long shared goals to increase active travel and reduce the harms of road danger, pollution, and noise, but they have not yet reached the scale of activity required to make a large impact on population health. With this in mind, Transport for London (TfL) and the Mayor's Office hired a consultant in public health to incorporate health considerations into the Transport Strategy.<sup>2,3</sup>

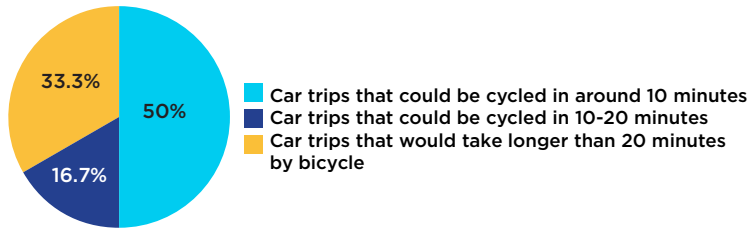
## PROJECT GOALS

- Make communities greener, healthier, and more attractive places in which to live, play, and do business
- Improve air quality
- Reduce traffic
- Reduce death and injury
- Help the city meet its climate targets

## IF LONDONERS WALKED OR CYCLED FOR AT LEAST 20 MINUTES PER DAY<sup>4</sup>



## CAR TRIPS THAT COULD BE REPLACED BY BICYCLE<sup>5</sup>



## LEADERSHIP AND COLLABORATION

**BUSINESS**  
Business Improvement Districts (D, F, I)

**GOVERNMENT**  
Transport for London (A, C, D, F, I)  
London Boroughs (D, I)

**HEALTHCARE**  
Public Health England & NHS (D, I)

**SOCIAL MISSION**  
Living Streets & others (A, I)

A: Advocacy, C: Champion,  
D: Design, F: Funding,  
I: Implementation

The Mayor, Deputy Mayor for Transport, and Walking and Cycling Commissioner shaped the Healthy Streets approach with help from a public health consultant. Transport for London, local healthcare organizations, the private sector, and residents all contribute to implementation, with the Mayor's Transport Strategy setting priorities for highway authorities. In addition to project implementation, TfL also coordinates transport funding to the city and its 32 boroughs.

## REPLICATION

As this program is in its early stages, there has yet to be any replication. However, project leaders are articulating their design principles and approach in ways that could inform and inspire other cities.

## BENEFITS



## OTHER BENEFITS



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**MAYOR OF LONDON**

# OPERATION TLC

2013—2015

EAST LONDON, UNITED KINGDOM

BARTS HEALTH NHS TRUST AND  
GLOBAL ACTION PLAN



## PROJECT GOALS

- Save energy
- Reduce spending
- Reduce emissions
- Demonstrate patient benefits from energy efficiency

Operation TLC is a hospital behavior change program that links reduced energy costs with improved patient experience. Initiated in 2013 by Barts Health NHS Trust and Global Action Plan (GAP), the program encouraged staff in six hospitals to turn off unused equipment, switch off lights, and close doors, allowing the hospitals to save money from energy efficiency, create a healing environment for patients, boost staff productivity, and reduce emissions.<sup>1</sup>

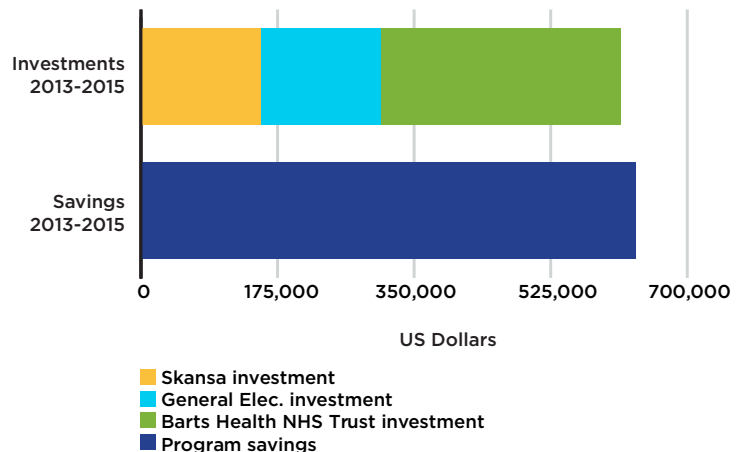
The program reached 15,000 Barts Health NHS Trust employees and helped place the hospitals on a path to meeting their target of reducing CO<sub>2</sub> emissions to 34% of 2007 levels by 2020, part of the NHS commitment to the UK Climate Change Act of 2008.

## OVERCOMING OBSTACLES

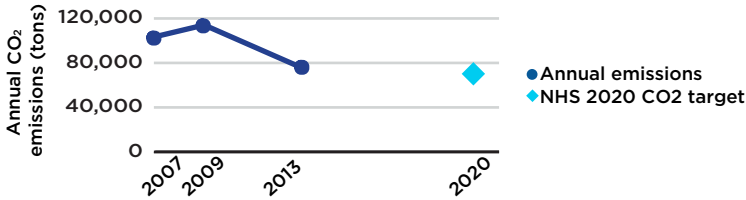
Staff availability and buy-in was a challenge, as hospitals are under increasing pressure to treat an aging population with tightening budgets. Efforts were made to design organizational processes that would help develop positive attitudes, change behaviors, and achieve project goals. These included consulting staff to find practical actions and creating ways to share successes. Additionally, Queen Mary University conducted research on program impacts, and hospital staff were more willing to listen once they saw those benefits.

Limited knowledge of building and facility maintenance was another barrier to this program. Operation TLC facilitated the development of staff knowledge and confidence in these areas and worked with GE and Skanska to make energy efficient improvements.

## COSTS AND BENEFITS<sup>2</sup>



## CO<sub>2</sub> REDUCTIONS AT BARTS HEALTH NHS TRUST<sup>3</sup>



## LEADERSHIP AND COLLABORATION

### ACADEMIA

Queen Mary University (E)

### BUSINESS

GE & Skanska (F, I)

### HEALTHCARE

NHS Trust (D, F)  
Barts Health NHS Trust (A, C, D, E, F, I)

### GOVERNMENT

Department of Health (F)

### SOCIAL MISSION

Gap (D, I)

### VOLUNTEERS

Hospital Staff (D, I)

A: Advocacy, C: Champion  
D: Design, E: Evaluation,  
F: Funding, I: Implementation

Former Barts Health NHS Trust Environmental Manager Fiona Daly and GAP co-designed and delivered the program. GAP considered the interests of various hospital stakeholders including the Chief Nurse, Finance Director, Director of Sustainability, and Estates Director. Additionally, as staff participation in program design provided them a sense of ownership, the team worked together to empower nurses, volunteers, and other hospital staff to become TLC advocates.

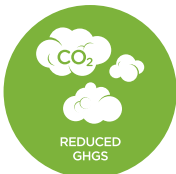
## REPLICATION

Operation TLC has become an award-winning behavior-modification program, where training hospital staff to adopt simple energy efficient behaviors saves health organizations energy and money while also creating healing environments for patients.

Since 2013, Operation TLC has been adopted by 12 other NHS Trusts, saving \$859,769 in costs and 2600 tCO<sub>2</sub> in carbon emissions. In 2017, Global Action Plan and Global Green and Healthy Hospitals launched a series of Operation TLC resources to engage hospital staff on efficient use of energy in their institutions.<sup>4</sup>

## BENEFITS

CLIMATE BENEFITS



REDUCED GHGS



CONSERVE ENERGY

HEALTH BENEFITS



LESS NOISE



WELL-BEING

25% fewer patient privacy intrusions  
38% fewer requests to change room temperature  
33% fewer sleep disruptions<sup>5</sup>

## OTHER BENEFITS



**JOBS & ASSETS**  
**HEALTH, WELL-BEING, & SAFETY**

**CONNECTION**  
**ENERGY & MOBILITY**

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Operation **TLC**  
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# PROGRAM TO IMPROVE AIR QUALITY IN MEXICO CITY - PROAIRE

SINCE 1990

MEXICO VALLEY METROPOLITAN ZONE

MEXICO CITY GOVERNMENT & METROPOLITAN ENVIRONMENT COMMISSION



Since 1990, the Mexican government has created four Comprehensive Programs Against Air Pollution, which have become increasingly ambitious and include strategies for transport, planning, environmental education, and reforestation.

The current program, ProAire IV, contains 81 measures and 116 actions across eight themes:

- reduction of energy consumption
- cleaner and more efficient energy across all sectors
- promotion of public transport and regulation of fuel consumption
- technology shift and emissions control
- environmental education and sustainability
- culture and citizen participation
- green areas and reforestation
- institutional capacity building and scientific research
- strengthening of health protection

Specific initiatives include fuel quality standards, a no-driving-day program, bus fleet renewal, subway and bike-sharing expansion, and air monitoring system modernization.

## OVERCOMING OBSTACLES

The main obstacles of the programs included securing financing, documenting health impacts, and coordinating among the participating governments. These issues all prompted Mexico City (CDMX) to become more involved in coordination.

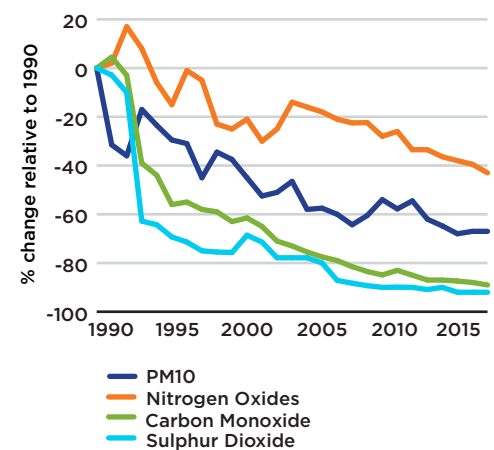
CDMX is working with national and international institutions to develop information on mortality and morbidity, secure a robust air quality monitoring system (SIMAT), and promote the evaluation of health impacts and economic costs.

To address funding, CDMX has its own financing for the development of health protection and environmental improvement actions, supported by the federal government, the Federal District Environmental Fund (Mexico City), and the Environmental Fund for Climate Change. Funding has been enhanced by private sector contributions, including investments in industrial facilities, new automobile technologies, and public transportation.<sup>1</sup>

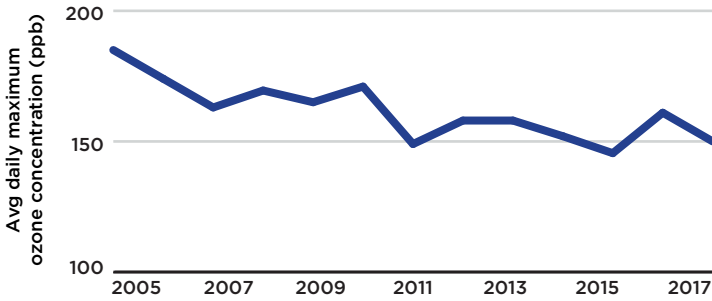
## PROJECT GOALS

- Improve air quality and reduce ozone concentration levels
- Reduce health risks from air contaminants
- Reduce greenhouse gas emissions

## AIR QUALITY IMPROVED WHILE CO<sub>2</sub> EMISSIONS FELL<sup>2</sup>



## IMPROVEMENT OF AIR QUALITY IN MEXICO CITY 2005–2017<sup>3</sup>



## LEADERSHIP AND COLLABORATION

### ACADEMIA

Over 5 institutions (D, E, I)

### BUSINESS

At least 7 business associations (A, F, I)

### GOVERNMENT

At least 20 local, 6 state, 10 federal governments (A, D, F, I)

### HEALTHCARE

Secretariat (A, I)

### SOCIAL MISSION

At least 10 NGOs (A, I)

A: Advocacy, D: Design, E: Evaluation, F: Funding, I: Implementation

The federal government initiated the Comprehensive Program Against Air Pollution, PICCA, in 1990. During the second program period, ProAire II (1995-2000),<sup>6</sup> the Metropolitan Environmental Commission (CAM) was created to coordinate between government levels. Since then, ProAire III (2002-2010)<sup>7</sup> and ProAire IV (2011-2020)<sup>8</sup> have been led by Mexico City in coordination with CAM and with support from the health, transport, social development, water, and energy sectors.

## REPLICATION

Shortly after ProAire II was launched in the Mexico Valley Metropolitan Zone (ZMVM), other zones and states throughout Mexico developed programs. As of October 2017, there were 20 active ProAire programs at the state level, with 12 others under development.<sup>4</sup>

State ProAire programs have inspired a federal program, Megalopolis ProAire 2017-2030,<sup>5</sup> an air quality improvement program derived from the needs to integrate the 20 ongoing ProAire programs and expand ZMVM ProAire's scope to adjacent urban areas. Megalopolis ProAire has stronger air quality, climate, and health multisolving objectives embedded in its design and is closely aligned with Mexico's UN climate pledge.

## BENEFITS



## OTHER BENEFITS



**JOBS & ASSETS**  
**HEALTH, WELL-BEING, & SAFETY**  
**CONNECTION**

**ENERGY & MOBILITY**  
**RESILIENCE**

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**SEMARNAT**  
SECRETARÍA DE MEDIO AMBIENTE  
Y RECURSOS NATURALES



GOBIERNO DEL  
ESTADO DE MÉXICO

**CDMX**  
CIUDAD DE MÉXICO



# SMARTER ANESTHETIC GASES

2012-2015

MELBOURNE, AUSTRALIA

WESTERN HEALTH HOSPITALS



## PROJECT GOALS

- Reduce CO<sub>2</sub> emissions
- Save money

In 2012, anesthesiologist Forbes McGain and his colleagues at Western Health Hospitals in Australia took initiative to educate their peers on the need to use anesthetic gases more efficiently and shift to gases with lower global warming impact. Desflurane has a global warming potential that is 2,500 times higher than that of CO<sub>2</sub>, meaning a change away from desflurane and nitrous oxide gases to sevoflurane and propofol could considerably reduce anesthesia's environmental footprint. Desflurane is also a costly gas, and reducing its use saves money while protecting the climate. From 2012-2015, Western Health Hospitals were able to reduce the use of desflurane by over 50% and nitrous oxide by 15%, saving \$22,500 per year.

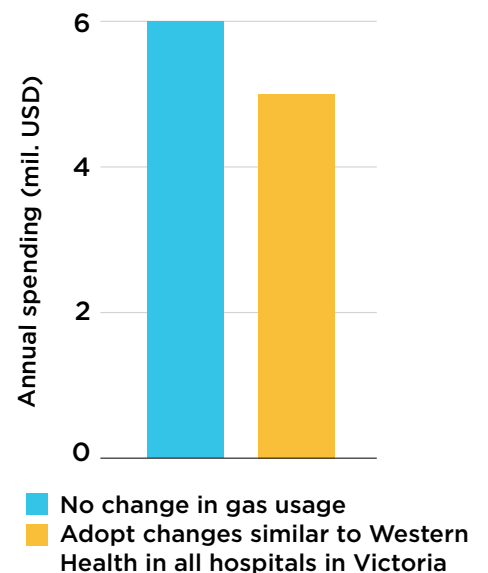
## OVERCOMING OBSTACLES

Doctors prioritize patient care, so suggesting a change in procedures to reduce the environmental impact of anesthetic gases required a long-term engagement process. Rather than the whole department changing at once, only a few individuals initially adopted these changes. Through presentations to the department and visiting doctors on the effects of certain anesthetic gases on climate change and hospital expenses, the doctors championing the effort communicated the need to use these gases more efficiently and/or find replacements. Consistent dialogue was key to increasing the numbers of anesthesiologists adopting the changes.

## SAVINGS FROM SWITCHING GASES<sup>1, 2</sup>



POTENTIAL, SCALED TO ALL HOSPITALS IN STATE





**“Be humble when wishing to change other people’s behavior; aware of your deficiencies; accept that our combined knowledge is far from complete; and learn from the process of change.”  
—Dr. Forbes McGain**

## LEADERSHIP AND COLLABORATION

**HEALTHCARE**  
Drs McGain & Horton  
(A, C, I)  
Western Health Hospitals  
(A, D, I)

**SOCIAL MISSION**  
Doctors for the  
Environment (A)

**A: Advocacy, C: Champion,  
D: Design, I: Implementation**

The initiative was championed by Dr. Forbes McGain with support from Richard Horton, Director of Anesthesia, who modeled the change in his own practice. Western Health removed desflurane from the anesthetic machines, only providing it upon request, and trained new doctors and nurses to avoid the use of desflurane and nitrous oxide.

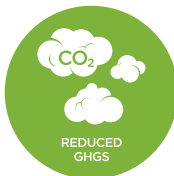
## REPLICATION

As a member of Doctors for the Environment Australia, Dr. McGain has encouraged fellow doctors to emulate Western Health’s efforts in their own hospitals.

The health system of Western Health’s home state of Victoria spends \$6 million per year on anesthetic gases. Western Health doctors estimated that if all Victorian hospitals changed the anesthetic gases they use, they could save up to \$1 million per year, with a large reduction in emissions and no compromise to patient care.

## BENEFITS

CLIMATE BENEFITS



Reductions in the usage of desflurane and other gases saved 154 tons of CO<sub>2</sub> emissions per year.<sup>3</sup>

HEALTH BENEFITS



The quality of patient care was not compromised by the reduction in gas usage.

## OTHER BENEFITS



**JOBS & ASSETS  
HEALTH, WELL-  
BEING, & SAFETY  
CONNECTION**

## CONTACT INFORMATION

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Western Health

# WALK TO SCHOOL OUTREACH PROJECT

2012-2015

UNITED KINGDOM

LIVING STREETS AND DURHAM  
COUNTY COUNCIL



## PROJECT GOALS

- Increase the physical activity level of school children
- Reduce traffic congestion during peak hours
- Reduce CO<sub>2</sub> emissions

The nonprofit organization Living Streets designed the Walk to School campaign to make walking to school a natural choice for teachers, parents, and children, improving their health while also reducing congestion and emissions. The campaign currently reaches 13 million people, working with over 750,000 children in 2,000 schools. Every year, thousands more take part in national programs such as Walk once a Week (WoW) and Walk to School Week.

Walk to School aligns with the government's target to get 55% of children walking to primary school by 2025, following a generation-long decline in the number of children walking to school (from 70 to 47%).<sup>1</sup> The initiative also supports the Department of Transport's strategy to reduce traffic congestion and carbon emissions.

## OVERCOMING OBSTACLES

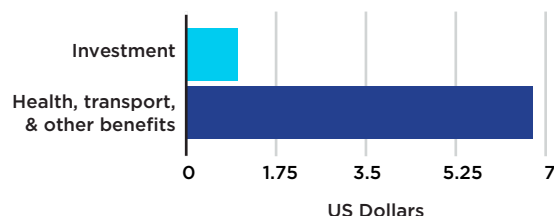
Through school route audits, Living Streets is able to identify the walk-to-school barriers that most concern students, parents, and staff. Project coordinators then work with local authorities, schools, and other partners to find solutions to those barriers, which include everything from road congestion to a lack of street lights.<sup>2</sup>

Living Streets works with local authorities to fund simple, cost-effective improvements for physical infrastructure challenges. They ensure the buy-in of everyone on issues such as land ownership, engineering, road works, council approvals, budgets, realistic time frames, and metrics.

By using a range of innovations to engage stakeholders and adapting their resources to the needs of those stakeholders,

Living Streets ensures project ownership. Additionally, regular monitoring and evaluation allows them to reflect on their performance and design for change based on evaluation results.

## RETURN ON INVESTMENT FROM WALK TO SCHOOL CAMPAIGNS<sup>3</sup>





## DURHAM WALK TO SCHOOL OUTREACH RESULTS<sup>4</sup>

A 2.5 year, \$6.8 million project to increase walking to school at more than 1,000 schools in Durham led to...



33% decrease in cars used for school travel



26% more children walking to school

## LEADERSHIP AND COLLABORATION

### GOVERNMENT

County Councils (A, C)  
Local Sustainable Transport Fund (F)  
Schools (I)

### SOCIAL MISSION

Living Streets (A, C, D, I)  
Modeshift (C, I)

A: Advocacy, C: Champion,  
D: Design, F: Funding,  
I: Implementation

The Durham County Council, Living Streets, and Modeshift led a partnership of 13 local governments to obtain funding from the Local Sustainable Transport Fund for a Walk to School Outreach project engaging 854 primary and 184 secondary schools.<sup>5</sup>

Living Streets helped ensure alignment with local authorities' priorities and coordinated a joint approach to decision making and behavior change. Modeshift provided badges as incentives for children walking to school.

## REPLICATION

Durham County Council is partnering with 15 local authorities to expand the project and incentivize walking rather than driving to businesses and communities in areas of high congestion.

## BENEFITS

CLIMATE BENEFITS



HEALTH BENEFITS



## OTHER BENEFITS



**JOBS & ASSETS**  
**HEALTH, WELL-BEING, & SAFETY**  
**CONNECTION**

**ENERGY & MOBILITY**  
**RESILIENCE**

## CONTACT INFORMATION

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Website: [www.livingstreets.org.uk](http://www.livingstreets.org.uk)



# WARM UP NEW ZEALAND

2009—ONGOING

NEW ZEALAND

ENERGY EFFICIENCY AND CONSERVATION  
AUTHORITY (EECA)



Warm Up New Zealand is a government-subsidized residential energy efficiency and clean energy program, addressing respiratory illnesses and winter mortality rates. The Energy Efficiency & Conservation Authority (EECA) collaborated with home insulation companies, regional councils, energy trusts, and other partners to provide low-income households with grants covering 60% of the cost of insulation.

From 2009 to 2013, Warm Up New Zealand: Heat Smart focused on homes built before 2000. A positive cost-benefit analysis led to the creation of Warm Up New Zealand: Healthy Homes, which ran from 2013 to 2016. An extension of Healthy Homes is in progress, targeting homes with low-income residents or those with health needs related to cold, damp housing. The EECA recommends households to service providers and works with doctors and District Health Boards to develop referral pathways into the program.

Combined, these programs are insulating over 300,000 homes, reaching 20% of the New Zealand housing stock, and creating around 2,000 jobs.

## OVERCOMING OBSTACLES

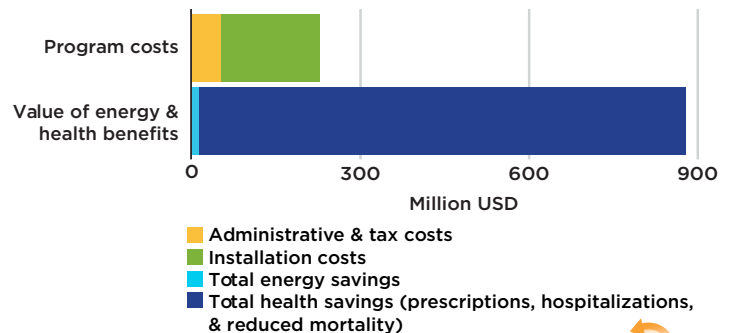
Upfront costs of insulation and clean heating were addressed by offering simple repayment options for costs not covered by grants, including repayment through property tax bills.

To gain buy in, EECA invested in a media campaign creating awareness on the benefits of insulation. Additionally, it researches the quality and safety of all insulation and heating service providers, sets guidelines on insulation and clean heating systems, and conducts regular audits.

## PROJECT GOALS

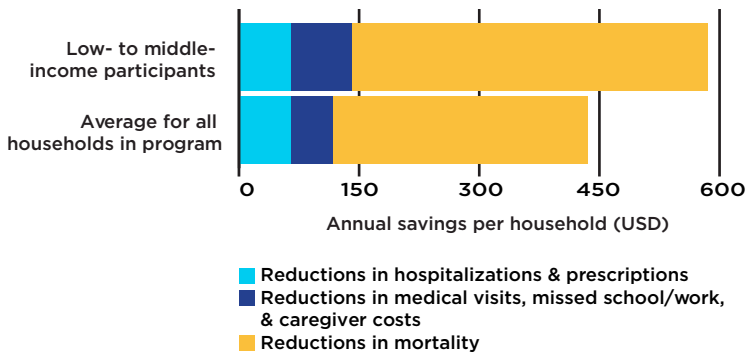
- Stimulate employment in the construction and insulation sectors
- Ensure warmer, drier, healthier homes
- Improve energy efficiency & energy security
- Reduce carbon emissions

## 30-YEAR COST-BENEFIT ANALYSIS OF HEAT SMART PROGRAM<sup>1</sup>





## HEALTH SAVINGS PER HOUSEHOLD IN HEAT SMART PROGRAM<sup>2</sup>



## LEADERSHIP AND COLLABORATION

### ACADEMIA

Universities (E)

### BUSINESS

Banks (F)  
Insulation Companies (I)  
Energy Trusts (F)

### GOVERNMENT

EECA (A, C, D, F, I)  
Ministry of Health (I)  
Regional councils (F, I)

### HEALTHCARE

Doctors (A, I)

### SOCIAL MISSION

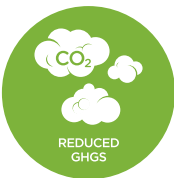
Non-profits (F)  
Charities (F)

A: Advocacy, C: Champion,  
D: Design, E: Evaluation,  
F: Funding, I: Implementation

EECA designed and provided the initial funding, while regional councils and other partners were involved in project implementation. Where private partners directly funded communities for insulation, EECA was involved in technical assistance and quality assurance.

## BENEFITS

CLIMATE BENEFITS



REDUCED GHGS



CONSERVE ENERGY



ADAPTATION

Well insulated homes stay comfortable during power outages.

HEALTH BENEFITS



CLEANER AIR



WELL-BEING



FEWER MEDICAL VISITS



LONGER LIVES

Reduced mortality, especially for people over 65 years old with a pre-existing respiratory or circulatory condition<sup>3</sup>  
Warmer, dryer, more comfortable homes

## REPLICATION

Private partners have come on board and financed home insulation programs in different parts of New Zealand.

Following this program, there have been changes in the Residential Tenancies Act, and beginning July 1, 2019, ceiling and underfloor insulation must meet a set standard in all rental properties.

## OTHER BENEFITS



**JOBS & ASSETS**

**HEALTH, WELL-BEING, & SAFETY**

**CONNECTION**

**ENERGY & MOBILITY**

**RESILIENCE**

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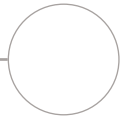


Energy Efficiency and Conservation Authority  
Te Tari Tiaki Pūngao



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The ten case study briefings in this report are part of a scan examining over 100 cases from various sectors and scales in 52 countries. The scan and in-depth research provide a picture of the overall state of multisolving for climate and health, pointing to a small but growing movement with common challenges, leadership skills, and techniques, despite differences in geographies, sectors, and scales. The following sections focus first on the overall state of the movement, then on success factors and implications for the replication and expansion of multisolving.

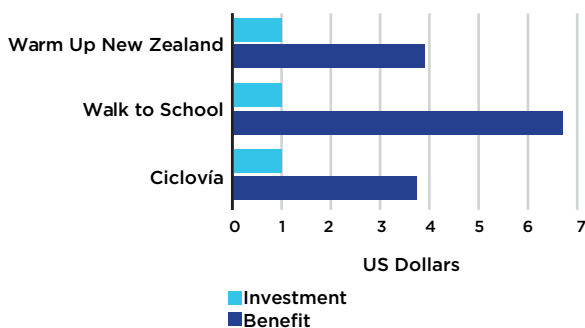
## THE STATE OF MULTISOLVING FOR HEALTH AND CLIMATE

### THE MONETARY BENEFITS OF MULTISOLVING PROJECTS OFTEN APPROACH OR EXCEED THEIR COSTS

Not all of the projects we examined quantified the benefits of their work, but in the cases where they did, the overall benefits and the health benefits were significant.

Some of the projects reported benefits per dollar of investment (Figure 2-1):

- In the case of Warm Up New Zealand,<sup>1</sup> a study by the Ministry of Economic Development showed \$3.90 of benefit for every \$1 of investment in insulating homes
- An independent study of the Walk to School<sup>2</sup> program found that for every \$1 invested in the program, the community accrued \$7.64 in benefits
- In Bogotá's implementation of the Ciclovía<sup>3</sup> project, every dollar invested created between \$3.20 and \$4.30 of savings in direct medical costs



**FIGURE 2-1**

Value of benefits per dollar invested for three multisolving case studies.

Other projects calculated a payback period:

- Operation TLC<sup>4</sup> resulted in savings of 3% of annual spending on energy, with a payback period on the investment of 12 to 18 months

Other projects produced savings, though assessments of these projects provided less information about the investment required:

- In the Smarter Anesthetic Gases case study, the intervention reduced costs by 5% while reducing greenhouse gas impacts with no compromise to the quality of patient care<sup>5</sup>
- Green Curtains in Japan saved one town around \$250 per month on heating and cooling costs<sup>6</sup>

Although more research is needed, along with more consistent methodologies for comparing benefits across projects, these examples begin to demonstrate that the system-wide benefits of multisolving projects can be considerable.

**In an era of growing needs and pressures, the financial rationale for multisolving may be one of the most compelling reasons to seek and support such projects.**

Often, the benefits of multisolving are helpful to individuals and organizations outside of the body that funded the work. For example, the original investment in Green Curtains in Japan came from private companies wishing to reduce their heating and cooling costs,<sup>7</sup> but the vegetative “curtains” growing up the building walls also reduced harmful air pollution for passing pedestrians.

Given the work the world faces this century to restore degraded ecosystems, polluted air and water, and struggling human communities, multisolving shows how investments toward specific goals can also create ripples of benefit that spread beyond that singular goal.

## A NASCENT, HIDDEN MOVEMENT

The leaders implementing these innovative, cross-sectoral projects at the intersection of health and climate often don't see themselves as a part of a larger movement. Most are clear that they are doing something innovative and that they are crossing boundaries intentionally, but few are aware that, around the world, other leaders like them may be taking similar approaches and meeting similar challenges.

The lack of a sense of connection between multisolving projects is not surprising. Where would a leader implementing a conservation and healthy diet project at a hospital in Asia meet a public works official designing green infrastructure at the city scale in North America or the leader of a national energy efficiency program in Europe? Most likely, such leaders all read different journals (perhaps in different languages), attend different conferences, and seek help from different experts, consultants, and mentors.

Multisolvers on climate and health may see themselves as parts of discrete movements (for instance "greening hospitals" or "adaptation and resilience" or "green cities"), but they may not notice that beyond each of these categories is a broader movement of people tackling health and climate challenges together. This lack of a sense of community may translate into missed opportunities for learning and sharing of best practices.

The fields of systems thinking, organizational learning,<sup>8</sup> and collective impact<sup>9</sup> provide examples of the sorts of learning communities that can spring up around approaches for addressing complex challenges. In these fields, people come together from diverse content areas and differing situations in order to build their capacity and share lessons learned. While multisolving projects share elements of these fields (e.g. seeing connections between parts and bringing together groups of stakeholders to implement change), multisolving projects are also

distinct. Collective impact projects aren't always focused on multiple benefits across silos, and systems thinking projects may not always bring together diverse stakeholders. It may be that cultivation of a new kind of community of practice<sup>10</sup> is needed for multisolving.

It is our hope that, by using the term multisolving to describe these diverse and distributed projects and grouping them together in reports like this one, we can begin to help those pioneers see themselves as part of a rising global phenomenon, able to support, encourage, and learn from one another.

## MULTISOLVING IS HAPPENING AROUND THE WORLD, AT DIVERSE SCALES AND SECTORS

Figure 2-2 shows three different ways of categorizing the multisolving cases in our wider scan. The scan wasn't designed to systematically sample multisolving projects, so we can't make firm conclusions about the predominance of multisolving at particular scales, geographies, or sectors over others. But the categorization exercise does show that multisolving for climate and health is happening at many levels, in all parts of the world, and across diverse sectors ranging from energy to transportation to climate adaptation and resilience.

The question of scale for multisolving is particularly interesting. The case studies demonstrate that projects happening at smaller scales often connect laterally or inspire change at higher levels. On the other hand, inspiration or policy at higher levels (such as national or state) can create the conditions for multisolving at lower levels in businesses and communities.

Some projects grow to impact larger scales than that of the initial project. For example, the ProAire effort was initially conducted at the city scale in Mexico City and gradually expanded to a current total of 20 active states with 12 more in preparatory stages.<sup>11</sup> Over time ProAire has given rise to national- and state-level policies that help support and incentivize the needed changes within Mexico City. In turn, these changes have rippled out to impact other areas and scales, such as Megalopolis ProAire, which encourages measures at the federal level.

Other projects spread through different jurisdictions or sectors as conditions change. For instance, the Green Curtains program in Japan was initiated at a company level, but with electricity shortages associated with the Fukushima disaster, government policy encouraged the spread to cities and other companies. As companies began encouraging their staff to experiment, additional programs arose in private residences, and NGOs began forming to encourage Green Curtains in schools.

Still other projects start locally but eventually generate networks, linking projects at the same scale



across a region. The Ciclovía project began in Bogotá, but it was replicated in other cities, which joined efforts in a network called “Recreational Cycling Routes of the Americas.” These have now crossed borders and taken other names around the world.

### MULTISOLVING SOLUTIONS OFTEN INVOLVE CULTURE CHANGE, BEHAVIOR CHANGE, OR RELATIONSHIP BUILDING

While some of the examples we found of multisolving for climate and health did include technological changes (e.g. substituting a less potent greenhouse gas for anesthesia or increasing the energy efficiency of residential building stock), many of the projects had a culture or behavior change component. For example, projects that turned busy streets into pedestrian walkways for festivals or projects that promoted a plant-based diet did not rely on new or sophisticated technological breakthroughs. Instead they required new thinking and slow, steady, and deliberate interventions to support new habits and mindsets.

Several implications of this observation seem worthy of further study:

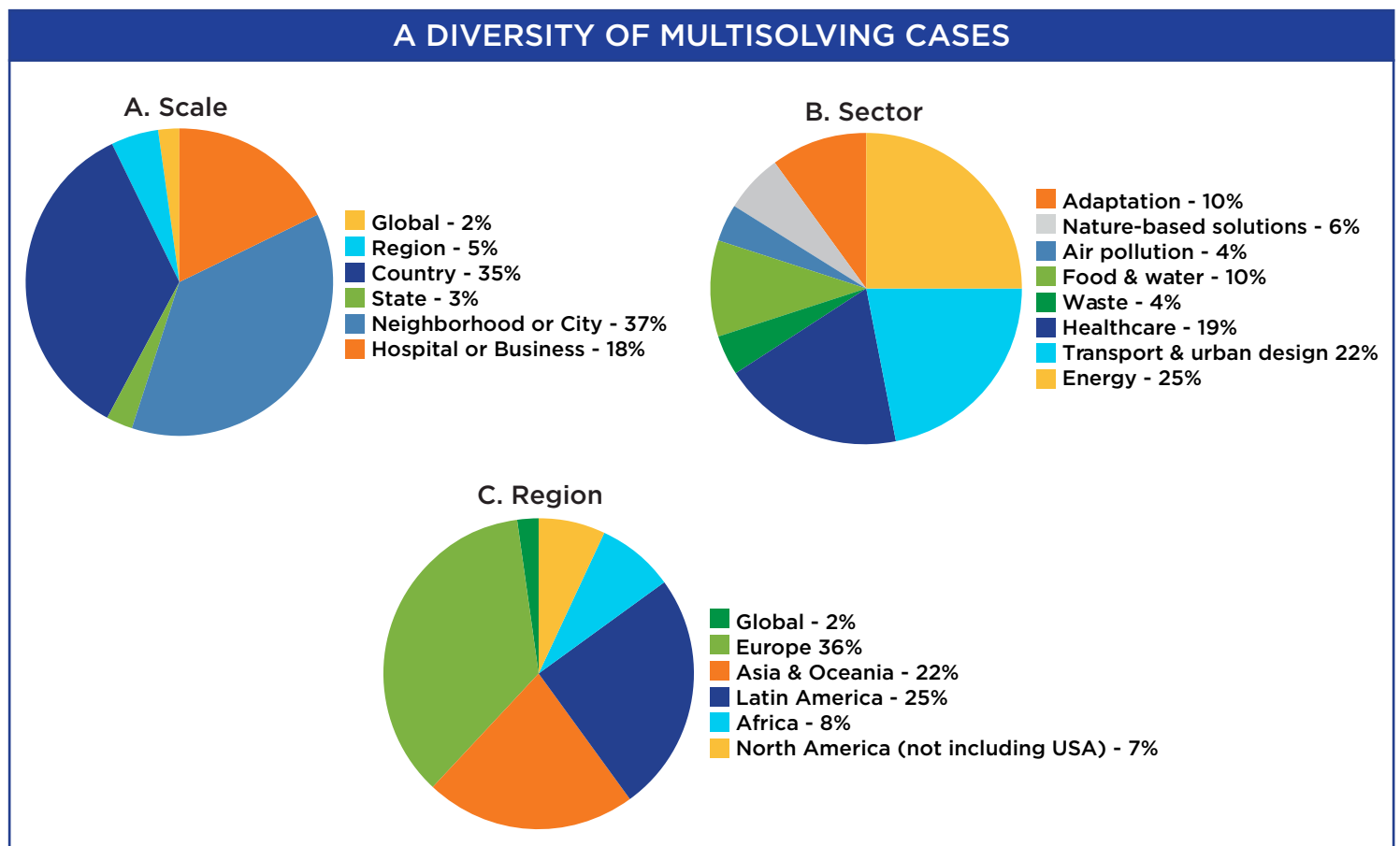
- Multisolving projects may be inexpensive relative to other ways of addressing climate change

or improving health, since they don’t always require large upfront capital investments for new technologies.

- Multisolving projects may include a behavior change component, and budget and staffing plans may need to include the resources to support people learning new skills or adopting new habits.
- Multisolving projects may ultimately be culture-change projects within communities and organizations. They model a different way of solving problems that emphasizes the interconnection of problems (and solutions) and collaboration across sectors and silos.

Given the predominance of cultural and behavioral change in multisolving projects, multisolving interventions may create ripples in the places where they are implemented, leaving a smarter and more interconnected system in their wake, with a culture that is primed for seeing and acting on interconnections.

**This suggests there may be a third dividend that emerges from multisolving, in addition to the aforementioned climate and health dividends: an interconnection dividend.**



**FIGURE 2-2**

Multisolving cases identified in our wider scan represent a range of sectors, geographies, and scales.

Emerging research suggests that, from businesses to cities, higher levels of interconnection and trust correlate with more effective problem-solving and more innovation.<sup>12, 13</sup> Successful multisolving projects may produce, as a result of the relationships they forge, a more interconnected and trust-rich ecosystem of individuals and organizations.

### **MULTISOLVING PROJECTS TYPICALLY INCLUDE INTER-INSTITUTIONAL OR INTER-SECTORAL PARTNERSHIPS, THOUGH THE SHAPE VARIES FROM PROJECT TO PROJECT**

Not surprisingly, most of the multisolving projects we examined included implementation or decision-making bodies composed of diverse stakeholders and organizations. While some structure for collaboration was common, there was no “one-size-fits-all” formula that stood out.

One type of structure we observed has a lead implementing body, which, in consultation with partners and advisors, is responsible for the project. Ciclovía in Colombia is one example of this type of organization, with the District Institute of Recreation and Sport responsible for implementation.

Another common model has a government entity providing the initial funding, with a diverse array of organizations doing the work of implementation. Warm Up New Zealand follows this model. Healthy Streets for London also fits this model, with the Mayor’s Office taking primary responsibility and creating opportunities for many organizations to contribute.

In other cases, multisolving happens when multiple departments of a government or organization come together in a committee or task force. In these cases, the collaboration is more distributed. TRANSPerú,<sup>14</sup> a sustainable urban transport project involving several ministries within the national government in Perú, is a good example of this type of organization.

In our scan, we did not detect a preponderance of one type of collaboration structure over another. In fact, the collaborations seemed to evolve to fit the situation and the project needs. While collaboration is a constant in multisolving, the structure of the collaboration appears to be flexible and adaptable, and it may change over time.

### **MANY MULTISOLVING PROJECTS TARGET VULNERABLE POPULATIONS WHILE ALSO PROVIDING MORE UNIVERSAL BENEFITS**

Multisolving project leaders often see vulnerable communities as partners with time and ideas to contribute to a desired future, not simply as problems in need of solutions.

In many of the case studies, improving the situation of marginalized or vulnerable populations was a

project goal. Warm Up New Zealand targets families living in poorly insulated homes. Operation TLC benefits hospitalized patients. Healthy Streets for London designs walking and cycling streets accessible to people with disabilities, the elderly, and the less privileged in London. The Espigoladors Gleaning Movement focuses on providing food to those in need and hiring from vulnerable groups, youth, and women.

Many of these projects also involve the targeted populations in providing project services or influencing project design. For example, Ciclovía Bogotá uses volunteer efforts from youth and the elderly. In the Healthy Meals for Patients and the Environment case, patients who have recovered and are in need of employment contribute time to the recycling programs at the Center.

Additionally, the leaders of multisolving projects often design mechanisms to consult with and elevate the voices of the vulnerable populations who are impacted by their projects. For example, Operation TLC and Walk to School both involved impacted people (hospital staff and children and families, respectively) in designing the programs.

**While multisolving projects pay special attention to the needs of vulnerable populations, their benefits often also accrue to a wider segment of the community.**

For example, everyone in London will breathe healthier air as a result of the Healthy Streets program, and society as a whole benefits in the long run if children arrive at school better prepared to learn. In this way, many multisolving programs exhibit what John A. Powell calls “targeted universalism,”<sup>15</sup> where a program designed to help increase equity or meet the needs of a vulnerable population also results in change that benefits everyone. And, of course, the climate protection generated by multisolving projects is a universal benefit, reducing harm globally and for future generations.

### **MULTISOLVING IS OFTEN A RESPONSE TO CRISIS**

For several of the multisolving cases we included, a crisis (or the nexus of two crises) helped provide the motivation for the project. For example, the Espigoladors movement emerged in response to increases in unemployment and economic hardships



related to austerity programs in the country, while also addressing a crisis of food waste. The Warm Up New Zealand project was initially motivated by a desire to create jobs during a period of economic downturn, while on the other hand addressing health challenges relating to poor home insulation among the less privileged. Alarming health indicators, from cases of childhood obesity to frequency of asthma cases, motivated several of the projects we studied.

In other cases, crisis prompted the scaling up or replication of multisolving projects. For example, companies and local organizations in Japan had been experimenting with Green Curtains for several years when the Fukushima crisis constrained the country's energy supply. The companies had already developed methodologies and instructions for building the vegetative shade structures, and with promotion from

the national government, the projects spread to other companies, municipalities, and schools.

### MULTISOLVING REMAINS UNCOMMON

Multisolving is still the exception, not the rule, both for projects with a focus on climate and for those with a focus on health. Although we found multisolving projects on every continent and in every sector we examined, multisolving projects are nevertheless unusual. Given the relative rarity of multisolving projects, we were very interested in the strategies employed by the projects we did find. The following section shares some of the common obstacles encountered by multisolving projects, and some of the solutions and approaches employed to overcome those obstacles.



## SUCCESS FACTORS

### CHAMPIONS

Leadership, both individual and organizational, plays an important role in effective multisolving. In some of the case studies, the leadership demonstrated by an individual champion was critical. For example, in the Smarter Anesthetic Gases project, an individual doctor was the proponent of switching to an anesthesia protocol with less global warming impact. In other cases, an organization took the initial steps. For example, in the UK Boiler on Prescription project<sup>16</sup> from our wider case study scan, an energy utility prototyped a program where doctors prescribed home insulation upgrades for patients. While multisolving projects typically bring together many stakeholders across diverse sectors, many efforts start small, with just one or a few committed leaders who are able to invite others into their vision.

advance the initial seeds of a project was critical in many of the projects we studied. For example, the Espigoladors Gleaning Movement in Spain was initiated by young people who were offered use of space by a local business. Their efforts then grew in reputation and scale after some celebrity chefs began to promote the project.

Dialogue, persistence, and patience are common elements that help good ideas become adopted by

### CYCLICAL LEARNING AND GROWTH

While many multisolving projects started with the leadership of one or a few individuals or organizations, the case studies we examined in detail showed there was often a progression building from those small seeds.

Multisolving requires collaboration across sectors, and successful projects tend to grow and spread beyond the original ideas and energy of those who initiate them. Finding allies who can expand and

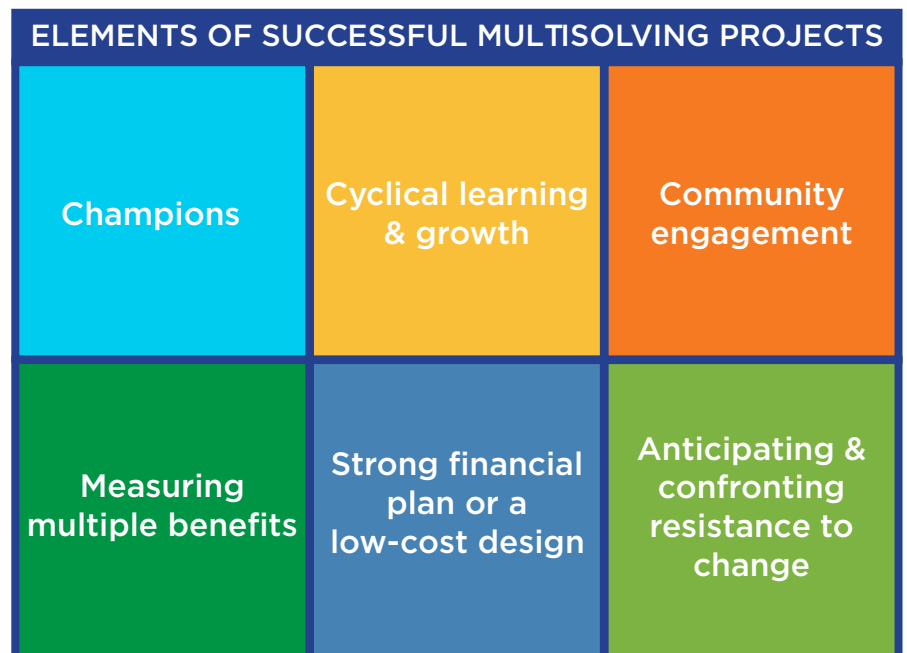


FIGURE 2-3

Six factors seemed particularly important in the multisolving projects we studied.

a broader group than the initial project visionaries. In both the Smarter Anesthetic Gases project and Operation TLC, there was consistent dialogue between individual project champions and hospital staff, a process that required patience to listen, discover obstacles, and devise the best paths to influence. In the Healthy Meals for Patients and the Environment case study,<sup>17</sup> dialogue on the benefits of eating vegetarian meals and using recyclable food containers were part of the culture at the Tzu Chi medical organizations.

Multisolving projects also expand their scale and reach by tapping the power of volunteerism. For example, in the Bogotá Ciclovía project in Colombia, a large and complex network of volunteers, including youth and the elderly, are deployed during the 70 times per year that streets are opened for walking, cycling, and community activities. Espigoladors has engaged over 900 volunteers in its gleaning activities since 2014.

As project partners learn and as results are delivered, the scope of multisolving projects tends to increase too. One example of this tendency towards growth and evolution can be seen in the current vision of the team who developed the Walk to School program in the UK. Currently they are raising funds to apply a similar approach to encourage walking to work and to shops.<sup>18</sup>

## COMMUNITY ENGAGEMENT

Most of the projects paid special attention to communication with partners, collaborators, and the communities being served by the project.

Consistent communication and an investment in training were elements of many of the projects. In Operation TLC, which reduced energy use while improving patient comfort in the UK, training staff to implement the program went beyond communications. Project leaders consulted with staff to find out what actions were practical in their departments, researched the health benefits of actions and their safety, and created ways to acknowledge and share staff successes.

Engagement of the community was often an element of successful multisolving projects, although the approach to community engagement differed. A good example we found in our initial scan is a project that transformed a community situated on a landfill in Moravia, Colombia,<sup>19</sup> improving well-being while reducing methane emissions from the landfill. The project partners intentionally focused on recruiting local community-based groups as implementing partners in the work. The local residents' trust of these groups was a major factor in the success of the project.

## RESEARCHING AND MEASURING MULTIPLE BENEFITS

Research and data collection provided the basis for obtaining support and partners, as well as for scaling up and replicating many of the projects we identified in our scan. Being aware of and able to communicate benefits outside of the disciplinary boundaries of the initiating organization or partners provided a way to solicit collaboration from other stakeholders. For instance, in Operation TLC the initial project idea came from those with a focus on energy and sustainability, but the project also tracked and quantified benefits regarding patient care. Fiona Daly, former Environmental Manager at Barts Health NHS Trust, described the importance of measuring and communicating impact: "The more we did, the more they proved, the more people saw the benefits."<sup>20</sup>

Several of the projects in our case studies made use of external evaluators to help quantify a range of benefits and put a monetary value on those benefits relative to their costs. For example, the Warm Up New Zealand project initiated by the Energy Efficiency and Conservation Authority<sup>21</sup> was funded initially via national budgets focused on jobs and energy, but when the project began to measure a suite of benefits, the scale of the opportunity for health was recognized, allowing the project to efficiently use public resources while also partnering with the Health Ministry and attracting third party funders.

Some projects even built in provisions for measuring and tracking benefits. For example, a Healthy Street Portfolio Board has been developed to assess investment decisions against the healthy street indicators using the Health Economic Assessment Tool (HEAT).





## **STRONG FINANCING PLAN OR A LOW-COST DESIGN**

Not all of the multisolving cases we found in our scan required financing. Some projects simply inspired or instituted a behavior, culture, or policy change,

such as substituting one anesthetic gas for another or switching to more plant-based dishes in food service.

Beyond these relatively inexpensive projects, one barrier to multisolving that at least some of the projects encountered was scarcity of financial resources, which also manifested as scarcity of time. Tight budgets and increasing mandates and responsibilities can leave many potential multisolvers feeling stretched and leery of taking on more obligations.

Many of the projects we examined overcame this challenge by devoting time and thought to researching and communicating the benefits of the project. Making the case for multiple benefits and finding partners who are champions for each of the benefits of a particular investment is especially important in circumstances where budgets are tight and organizations already feel under-capacity relative to their responsibilities.

For projects with upfront capital needs, designing ways to finance the projects was something most multisolvers attended to deliberately. However, we found that there was no one-size-fits-all formula for financing. In fact, we observed a very wide array of approaches to financing, including:

- Private funding
- Public funding
- Mix of private and public funding
- Specialized banks (often with an environmental or social mission)
- Self-sustaining funding, in which a project generates a revenue stream that allows the project to continue in a sustainable fashion

Self-sustaining funding examples are particularly interesting, as they suggest a way to ensure the longevity of projects beyond the tenure of the project's founders, as well as a resilience to changing budgetary situations. In the Colombian

Ciclovía project, which periodically opens streets to pedestrians, local points of commerce such as food stations, bike rentals, and riding tours are set up, and the associated fees help fund the system. In the Espigoladors Gleaning Movement, sales of products made from otherwise wasted foods help pay salaries and transport costs. In another project in our scan, the Secretary of the Environment in Mexico City set up an exchange market (the Mercado de Trueque),<sup>22</sup> where people can exchange their recyclable waste for “green points,” which they can later trade for locally grown food. The revenue from the collected waste helps cover the costs of the food offered in exchange.

In some cases, project implementers found innovative ways to align objectives in order to finance their ideas. Warm Up New Zealand provided one such example. Home insulation was a priority at the Energy Efficiency & Conservation Authority at the same time that there was a conversation within the national government about how to create jobs following the 2008 financial crisis.<sup>23</sup> From this intersection of goals, the national government directed funds to EECA for the creation of Warm Up New Zealand. Later in the program, as the health benefits were better understood, the Health Ministry also began to contribute.

## **ANTICIPATING AND CONFRONTING RESISTANCE TO CHANGE**

Several of the leaders we interviewed listed resistance to change as a barrier they had to overcome in their projects. Even when a multisolving project, policy, or investment produces a better outcome or saves time or money, it may require doing things differently, thinking differently, or working with different types of people. Each of these is a source of resistance to change.

One multisolving leader we spoke with commented that many people he worked with didn't believe that people could (or would) accomplish the behavioral changes that were needed for the project to succeed. He attributed several factors to the success of the effort:

- Instituting new procedures
- Seeking input from those who would have to change their behavior to help design the program
- Focusing on communications and training
- Measuring the benefits of the change and communicating those impacts back to the people implementing the change

One study from our scan, the Moravia community project in Colombia,<sup>24</sup> where people were relocated to better living conditions (in the process reducing methane emissions from the nearby landfill), reported high levels of resistance to change in the community. Although difficult, the community's living conditions

were at least familiar, and people resisted relocation because of social ties that had developed in the informal community. The project implementers worked hard to overcome this source of resistance to change, and the success of their efforts resulted from their ability to build relationships with local organizations trusted by the community. Compassion for the impacted community and understanding their resistance to change were key ingredients in the success of this project.

Lack of confidence that the proposed intervention

could in fact produce the desired change was another source of resistance that some of the project leaders identified. In several of the projects we examined, leaders proceeded with the proposed change in a small way, perhaps individually or with only a few partners, showing what was possible and documenting results. The careful attention to quantifying benefits was mentioned as a factor that allowed the innovation to be adopted by a wider group in several projects, including the Smarter Anesthetic Gases case study.



## REPLICATION

We were interested in the extent to which multisolving projects are gaining attention and being replicated. We saw at least some replication in most of the 10 case studies we examined, but the extent of replication varied from case to case.

At the smallest scale, projects saw internal replication. For example, an innovation by one doctor was eventually taken up and promoted by the whole department in the Smarter Anesthetic Gases project in Australia.

On a larger scale, we observed replication within networks or organizations that encompassed the originating project. For example, Operation TLC, the hospital project that saved energy and improved patient experience in the UK, is being replicated by other hospitals within the National Health Service.

Ciclovía Bogotá, the project that opens up streets to people, was one of the most widely replicated projects in our pool of case studies, having been replicated

throughout Latin America, North America, Africa, Asia, and Europe. Bogotá Ciclovía was started in the 1970s and is among the longest-lived projects we examined. Its relatively longer period of existence may explain the higher levels of replication.

As we delved into the stories of multisolving projects, we found that they tend to be unique and determined by the particulars of their situation. They often evolve from small seeds, have some elements of opportunism, and are path dependent in the sense that early steps taken by the initiators help create the conditions for the next steps. Many multisolving projects also fit the particular needs of communities, ecologies, businesses, and societies. They address a problem on the minds of a group of people in a particular place. For example, Oscar Ruiz Brochero, the current president of the Recreational Cycling Routes of the Americas network, pointed out in an interview that replication can be inspired by different objectives in different parts of the world, from improving social inclusion in Cape Town to improving air quality in Mexico City.

The site-specific, path-dependent nature of multisolving suggests that replication efforts should focus as much on the attitudes and approaches taken by successful multisolving projects as on specific project design elements. What were the ways of thinking, the communication strategies, and the collaborative mechanisms that allowed particular projects to succeed? We expect that these attitudes and approaches could be replicable regardless of the particular sectors and geographies of different projects. For instance, Healthy Streets for London has much to teach people desiring to create more walkable communities in their own city, but it also likely has lessons for those wanting to institute community gardens or energy efficient housing.





# RECOMMENDATIONS FOR THOSE WISHING TO EMPLOY MULTISOLVING IN THEIR OWN WORK

## **EMBRACE LEARNING, EVOLUTION, EMERGENCE, AND OPPORTUNISM, AND EXPECT SURPRISES**

Across the examples we looked at, we found that multisolving projects often started small, addressing a need or problem that people cared about in a new or creative way.

Often the project leaders took an experimental approach. For example, the Warm Up New Zealand project experimented with several types of boilers before settling on the one that best fit their needs.

While the projects we studied took diverse and sometimes circuitous paths, many attributed part of their success to practical demonstration of the potential for multiple benefits, including quantification of baselines, measuring improvements, and budgeting time and resources for communicating results. Several of the cases started with one or a few leaders who slowly built a circle of partners by devising ways to measure or demonstrate a suite of benefits that brought collaborators in from other sectors.

The exact results of a multisolving project may be path dependent and even unpredictable at the outset, but multisolvers should make a plan for documenting and communicating the results that do emerge, even in small initial attempts and pilot projects.

## **EXPECT TO START SMALL, BUT PLAN FOR YOUR CIRCLE OF PARTNERS TO GROW OVER TIME**

We saw very few projects where the full multi-sectoral team was in place at the beginning of the project. More typical was the small team or even the individual visionary who was able to bring others along as the project began to produce results that aligned with others' goals, as resources began to materialize, and as clear needs for skills or networks were identified. Based on the projects in our scan, we would stress the power of demonstration projects that can be initiated by a small group as a way to draw in interest and

partners, as opposed to up-front efforts to create a large multi-sectoral network in the abstract.

Realizing that they will have to expand their team to accomplish their goals of producing multiple benefits across diverse sectors, multisolvers can plan accordingly by documenting their first steps and quantifying early results as much as possible. The mindset of an experimentalist can help as well. For example, multisolvers can test out different approaches to communicating the project vision and track which approaches are most effective. Making plans at the outset to train and integrate new partners as the work progresses may also be strategic for projects that anticipate expansion.

## **KEEP IN MIND THAT MULTISOLVING DOESN'T HAVE TO BE FANCY, HIGH-TECH, OR EXPENSIVE**

Some of the most powerful examples of multisolving that we found in our scan created new connections among people, instituted new behaviors, or used existing capital in new ways. In this sense, creativity is one of the biggest assets for multisolving. Like the hospital staff who began turning off unneeded equipment or the companies who started adding green curtains to their facilities, often multisolving starts with seeing an existing situation in a new light or putting existing pieces together in new ways.

## **CULTIVATE VISION AND A LONG-TERM PERSPECTIVE**

The multisolving process may not be fully controllable, and all of the outcomes may not be knowable in advance. It is nevertheless useful to cultivate vision and a long-term perspective. The leaders of the projects we studied often had a long-term vision and concrete ideas for how the project might sustain itself financially. Often, they found ways to build a self-sustaining source of funding into the project. They also asked: How can behavior change be built into

## RECOMMENDATIONS FOR THOSE WISHING TO MULTISOLVE

**Embrace learning**, evolution, emergence, and opportunism, and expect surprises.

**Expect to start small**, but plan for your circle of partners to grow over time.

Keep in mind that **multisolving doesn't have to be fancy**, high-tech, or expensive.

**Cultivate vision** and a long-term perspective.

**Recognize the limits of your knowledge** and perspective.

**FIGURE 2-4**

These recommendations could help facilitate successful multisolving.

protocols, procedures, or the training of new staff or partners? Where will the knowledge and memories behind the work reside if there is a change in staff or leadership?

Some projects also influenced laws or ordinances, codifying changes into local or national policy. For example, as a result of the Warm Up New Zealand Project, there have been changes in the Residential Tenancies Act that set standards for building energy efficiency in rental properties. Similarly, ProAire, the air quality program in Mexico City, gave rise to a number of new laws at multiple levels of governance, helping ensure longevity of the measures that have reduced emissions and improved air quality in the region.

### **RECOGNIZE THE LIMITS OF YOUR KNOWLEDGE AND PERSPECTIVE**

Multisolving will, by definition, take leaders outside the bounds of what they know how to do. Multisolvers need partners who can see the things they miss and

who can add knowledge the initial leadership might lack. Asking for help and cultivating a learning attitude both facilitate multisolving.

An important part of recognizing one's own limits may arise with regard to vulnerable communities, low-wealth communities, or communities of color, where multisolving can make a big difference. Embedding values of collaboration, equity, and justice into that work will be especially important for individuals or institutions who are based outside of those communities. What are the goals of people within the community? What are their worries and their needs? A project's success likely depends upon asking these questions and listening to and acting on the answers. Successful multisolving projects often find ways to create project design, visioning, and leadership roles for members of the communities that the project intends to serve.



## **RECOMMENDATIONS FOR THOSE WISHING TO SEE MORE MULTISOLVING IN THE WORLD**

### **PROMOTE MULTISOLVING AS AN APPROACH AND BUILD COMMUNITY AND CAPACITY AROUND IT**

Leaders of the projects featured in this report likely don't know very much about each other's work or think of themselves as a part of a community of practice. Learning more about how multisolvers do what they do, setting up opportunities for them to learn from one another, and creating opportunities for training, capacity building, and reflection could help boost this sort of work in the world.

When encouraging more multisolving in the world, it may be worthwhile to aim to replicate the attitudes and approaches of multisolvers, in addition to the specific details of any one project, because the projects are so shaped by the particulars of local situations. Building capacity in the "way" of multisolving as much as the "what" of it may be the most effective strategy to encourage more multisolving at the intersection of climate and health.

### **CULTIVATE PATIENCE**

While the many benefits made possible by multisolving are urgently needed, these projects have tended to develop gradually, at speeds determined by processes like relationship building, data collection and analysis, and behavior change. Even if projects replicate existing models, new relationships, fresh data collection, and site-specific communication and



behavior change programs will be needed for the new project. One implication of these observations is that measuring progress through different stages (from small seeds through proof of concept, data collection, analysis, expansion of partners, etc.) may offer the most reliable indications of success, as opposed to expecting immediate large shifts in CO<sub>2</sub> emissions or health indicators.

### **FIND WAYS TO FUND THIS WORK IN ITS EARLIEST STAGES AND BE SENSITIVE TO ITS DYNAMIC, ORGANIC NATURE**

Multisolving projects often start small, learn by doing, and follow somewhat opportunistic paths as the projects meet local needs with solutions that fit the particular place and people. Such projects may be overlooked by models of funding that demand pre-specified outcomes in detail or that don't recognize the time and resources that are required for the learning, listening, communicating, and relationship building required for multisolving. Further study and

conversation with multisolvers is needed to build confidence in this impression, but we emerged from our scan of multisolving projects with the sense that funding models that prioritize relationship building, trust, cross-disciplinary learning, and communication with stakeholders may be most effective at increasing the prevalence of multisolving.

In addition, funders and others can commit to supporting multisolving projects' needs for measuring their impacts in terms of multiple benefits. Multisolvers may not know all of the benefits in advance and may need technical or financial support in order to be able to measure a wide range of outcomes. Even small and preliminary or pilot projects can benefit from investments in documenting outcomes, because that data may well be the motivating force that allows the project to attract additional partners and resources. Good communication, supported by data and metrics, was one of the main forces we noted that helped multisolving projects grow from small seeds to having wider impact.



## **HEALING THE CLIMATE, HEALING OURSELVES: MULTISOLVING EMBODIES AN EMERGING SYSTEMS PARADIGM**

There is no step-by-step guidebook to completing a multisolving project.

How projects are financed, what scale they start at, where they end up, which types of benefits they produce, and what mixture of volunteers and staff are involved were all different across the various projects.

What the projects have in common is something less concrete, but no less important: a set of values, an ability to see interconnections, and strategies for collaboration. Included in this set of approaches is:

- A developmental approach that starts at a small scale and expands via new relationships and networks
- A collaborative approach that pools knowledge and resources
- An experimental approach that tests alternatives in rapid succession
- A prioritization of careful, high-fidelity communication in multiple directions (i.e. internally in the project team and with layers of stakeholders)
- A research orientation that measures and documents progress across a suite of metrics and is able to present a picture of benefits relative to costs

Relating, learning, experimenting, reaching out, and communicating - the habits of multisolvers are very similar to the processes observed in complex adaptive systems,<sup>25</sup> from learning organizations to neural networks to ecosystems. For those working at the intersection of two of the most complex adaptive systems on the planet — the human organism and the global climate — perhaps it is not surprising that multisolving's successes arise from processes that mimic our bodies, our brains, and the biosphere.







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## NOTES

For currency conversions, we used the Oanda.com Currency Converter and the most recent date of the case study if no specific date was given.

FLOWER was developed by Climate Interactive. More information on FLOWER and how to use it for your own projects can be found at [climateinteractive.org/flower](http://climateinteractive.org/flower).

## PHOTO CREDITS

The cover photo and photographs on pages 2, 3, 9, 14, 17, 40, 42, 43, 44, 45, and 49 were taken by Shanna Edberg.

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