CHAPTER 12

The Future of Climate Action: From Systems Change to Behavior Change

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Climate science is zeroing in with increasing certainty on current and future climate impacts, global heating trends, and their implications for human and environmental health, economies and security. Forecasts remain conservative, however. A study[1] by the University of Adelaide shows that estimates used by the United Nations Intergovernmental Panel on Climate Change (IPCC) are overly conservative and the threats are much greater than the IPCC predicted.

Carbon dioxide (CO_2) levels continue to spike, reaching their highest ever[2] in 2020, at 417 parts per million. This is well above the 350 parts per million that the National Aeronautics and Space Administration's Goddard Institute for Space Studies recommends[3] for sustainable life on earth. Oceans are absorbing this CO_2—roughly 25 percent[4] of it, or 22 million tons of CO_2 daily[5]—undermining the shell-building and skeleton-building capacities of marine life, and impacting the food chain upon which much of the world depends.

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These CO_2 levels correspond with rising temperatures,[6] and so it is unsurprising, yet deeply troubling, that the five hottest years on record[7] occurred in the last five years and the 20 hottest years on record occurred over the past 22 years. This global heating—as *The Guardian*[8] newspaper started calling it—is impacting the environment at alarming rates by melting glaciers, warming oceans and raising sea levels, causing devastating heat waves, droughts and wildfires, increasing the ferocity and frequency of storms, and flooding, and ushering in a litany of destabilizing trends, as noted below.

Global Heating Is Forcing Glaciers to Melt Faster Than Ever Before. Himalayan glaciers are melting at double[9] the rate they melted between 1975 and 2000. Greenland lost 4 trillion pounds[10] of ice in one day and is losing ice four times faster than previously thought. If Greenland loses all ice, global sea levels will rise 7 meters,[11] making life in many coastal communities uninhabitable.

Global Heating Is Making Oceans Warmer, Forcing Water to Expand. Last year witnessed the highest[12] ocean temperatures on record. This, coupled with the glacier melt above, raised sea levels 5 to 8 inches over the past 100 years. Based on current warming trends, sea levels could rise over 6 feet by 2100,[13] displacing millions of people. As waters get warmer and sea levels rise, storms become more damaging to coastal infrastructure and flooding becomes more frequent.

Global Heating Is Making Weather Patterns More Extreme. As global heating raises air temperatures, warmer air causes more evaporation, which makes more water available for precipitation. Warmer air also holds more water vapor, which results in heavier and more torrential downpours. Additionally, heat waves, droughts, and wildfires, caused by rising global temperatures, are becoming more common, and imperil communities and crops globally.

Global Heating Is Exacerbating Water Crises in Cities Worldwide. With increasing heat waves and droughts, cities such as Chennai and Cape Town and Sao Paulo and Sanaa are running out of available water, forcing water-insecure communities to migrate, survive on shipped or desalinized rations, or fight over supplies.

All this has a deleterious impact on global economies, human health, and security. The toll from rising CO_2 and warming temperatures is costly in human and financial terms: 7 million people die prematurely from air pollution each year, according to the World Health Organization,[14] and just the top ten global climate disasters, in 2018 alone, cost governments

$85 billion.[15] The IPCC warns[16] that if urgent action is not taken to limit greenhouse gas emissions and keep global warming within 1.5 degrees Celsius (above pre-industrial temperatures), life on this planet becomes untenable.

Social Science: Climate Attitudes and Behaviors

Despite the alarming trends, these facts are not generating the action that is necessary to substantially reduce emissions. A study in the *Journal of Environmental Psychology* found that those who expressed the greatest concern about climate change were also the least likely to report individual-level actions.[17] This is a problematic disconnect, but it is ripe with opportunities.

When it comes to attitudes, climate change is perceived as a top global security threat. That is a solid foundation on which to build a behavior change agenda. In a 26-nation survey[18] conducted by Pew Research Center, global climate change was considered the top threat by the greatest number of countries—and understandably so. In the World Economic Forum's Global Risks Report 2020, climate impacts comprised the top-five long-term risks in terms of likelihood.[19] This sets the stage for proactive action against that security threat, despite the fact that international security institutions—e.g., the United Nations Security Council—do not yet have the mandate to act on climate security threats.

Without an international force to respond to climate threats, the public may feel overwhelmed by the threat and unable to act. Compare this with the threat of terrorism in the United States, for example, and there are two distinct differences: (1) the public's ability to take action in response to their fear of terrorism is bolstered by a singular, government-promoted proposition that if they *see something*, they should *say something*, thus helping citizens to feel empowered; and (2) the government's trillion-dollar investments in military measures to respond to the terrorism threat bring with it the assurance or appearance of protection.

When it comes to dealing with the climate security threat, however, neither of these dynamics are present. The call to personal action is not as simple and national governments have not financially doubled down on climate threats on par with counterterrorism investments.

While the 2015 Paris Climate Agreement—which was supported by 196 state parties to the UN Framework on the Convention of Climate Change—got us closer to this kind of international response (also, see

Waheguru Pal Singh Sidhu's Chapter 13 on the UN), it remains insufficient because the timelines and targets are not aggressive enough and new administrations from previously signed parties (e.g., the United States) are pulling out of the agreement, undermining the urgency of the climate security threat.

Without a forceful international response to what is rightly perceived as the top global security threat, and without clear, simple actions the public can take to fight this threat, people can feel helpless[20] at the prospects of overcoming this threat. In lieu of action on climate threats on par with how nations respond to terrorism threats, sub-national actions and individual actions become even more critical to carbon cutting and essential in offering the public a behavioral outlet consistent with their climate attitudes.

National Responses to Climate Change

National governments are failing in their response to climate change. According to the UN Environment Programme's latest Emissions Gap Report,[21] countries are not fulfilling their mitigation promises from the Paris Climate Agreement. Scientists[22] say that greenhouse gas emissions need to peak and decline by 2020. National commitments need to ratchet up, not relax. The group of twenty economies (G20) that should be taking the lead on carbon reductions, given many of these nations' access to green technology, are still subsidizing heavily polluting coal and, in recent years, tripled[23] their subsidies. Coal, consequently, was the single biggest contributor to 2018's rise in emissions.[24] Global emissions, meanwhile, need to be cut in half in the next decade if the international community wants to slow the escalating flooding, droughts, heatwaves and attendant adverse security, economic and health impacts facing frontline communities in these climate security zones. National governments are not even close to that level of cutting and, instead, many governments are increasing carbon emissions. Given the absence of aggressive and ambitious leadership, sub-nationals are filling the void.

Sub-national Responses to Climate Change

In light of national governments' lackluster responses, regions, provinces, states, cities, companies, universities, religious communities, nonprofits, and individuals are setting ambitious climate targets to reduce emissions, waste, and ramp up renewable energy. The Under2 Coalition, for example, commits sub-national governments to emissions reductions "80-95 percent below 1990 levels, or to below 2 annual metric tons per capita, by 2050 – the level of emission reduction necessary to limit global warming to under 2 degrees Celsius by the end of this century."[25] Over 200 governments representing 43 percent of the global economy joined the coalition. Similarly, over 200 companies have committed to powering their businesses with 100 percent renewable energy, as part of the RE100 campaign,[26] led by the Climate Group and the Carbon Disclosure Project (for other public–private partnerships, see Waheguru Pal Singh Sidhu's UN chapter).

Cities are equally active and ambitious. The C40 Cities[27] organization works with nearly 100 of the largest global cities to commit to the Paris Agreement and develop local climate plans, while members of the Carbon Neutral Cities Alliance commit to 80–100 percent greenhouse gas emissions reductions by 2050 or sooner—as well as 100 percent renewable energy and zero waste, representing some of the most aggressive leadership in this space.

Nonprofits are proffering solutions, too. One of the most comprehensive contributions is Project Drawdown, which calculates the most effective ways to reduce carbon emissions. In their top ten most effective ways to slow global warming, half of the solutions are food-related (e.g., transitioning to plant-rich diets, reducing food waste, restoring tropical forests) and population growth-related (e.g., educating girls, family planning). Yet, these carbon-cutting measures are not discussed enough in climate circles.

Even individuals—such as Greta Thunberg and the school strike for climate movement—are inspiring a sea-change in sub-national climate action and activism. While this chapter focuses primarily on sub-national actors at the municipal level, the student strike movement has contributed substantially to climate awareness and activism around the world, raising an unprecedented level of attention to the climate crisis and positively disrupting the status quo.

In total, these efforts by sub-national actors have increased dramatically over the past decade, getting the attention of national governments and the UN, where they are being quantified by the UN Environment Programme. This shows the level of seriousness by sub-nationals and the level of reliance on sub-nationals that the UN and others now expect.

Sub-national Case Study: City-Level Responses to Climate Change

There are clear reasons why cities are invested. Unique to the other sub-national actors, cities represent the majority of the world's population, energy use, and carbon emissions. They are the most likely to be impacted now, and in the future, by air pollution and extreme weather caused by global heating. Rising sea levels and worsening storm surges are a few of the impacts facing coastal cities, which is why cities are taking aggressive action. What is beneficial about cities taking the lead on climate action, from a public attitude and behavior perspective, is that the public has more trust in their mayor or city representative,[28] versus state or national governments. This helps with public attitudes and behaviors if citizens are seeing locally what is being done to reduce emissions and recruited to take simple, clear actions.

Cities are radically rethinking how they should be developed and designed, implementing systems change across the cityscape. Seven game changers from Carbon Neutral Cities Alliance's *Game Changers: Bold Actions by Cities to Accelerate Progress Toward Carbon Neutrality*[29] report, for example, show how serious cities are when it comes to systemic change. The game changers include: (1) adopting zero-emissions standards for new buildings, (2) building a ubiquitous electric vehicle (EV) charging infrastructure, (3) mandating the recovery of organic material, (4) electrifying buildings' heating and cooling systems, (5) designating car-free and low-emission vehicle zones, (6) empowering local producers and buyers of renewable electricity, and (7) setting climate budgets to drive decarbonization.

There are more systems-level game changers to consider, including embodied carbon, which refers to "carbon dioxide emitted during the manufacture, transport and construction of building materials, together with end of life emissions."[30] Cities are also looking at carbon capture, sequestration, and equity-centered approaches—both game changers in how cities approach climate policy. But the seven game changers above

are a starting point for transforming cities and their carbon footprint. Now, a quick dive into each.

Adopting a Zero-Emissions Standard for New Buildings. In many major cities, buildings—and the energy required for heating, cooling, lighting, and appliances—represent the largest carbon footprint. By adopting a zero-emissions standard for all new buildings—which requires that new buildings be highly efficient and use only renewable energy—cities have an opportunity to send a strong message regarding how they want their future to look. Fortunately for cities, super-efficient buildings are becoming less expensive to build. While this game changer does not address existing building stock, which requires heavy retrofitting, zero-emissions building standards critically shape the direction of future building stock and set a new precedent for more sustainable design, function, and operation.

Building a Ubiquitous Electric Vehicle Charging Infrastructure. In order to get people to stop driving petrol and diesel vehicles, it needs to be easier for them to drive, and charge, the electric alternative. In many cities, it is still quite difficult to reliably depend on charging infrastructure, but that's changing. There are at least 1.5 million chargers installed globally, with China leading the way on EV infrastructure with the total number of charge points and strong buildouts in Shanghai, Beijing, Shenzhen, and Qingdao.

The market is shifting quickly and electric vehicles are here to stay, according to the International Council on Clean Transportation.[31] Cities are doubling down on their EV commitments. Amsterdam and Oslo, for example, are committing to zero-emissions transport over the next decade, while cities like Shenzhen, which boasts the world's first fully electric bus fleet, and Tianjin are rolling out tens of thousands of new energy vehicles (i.e., plug-ins and hybrids). These efforts are outpacing national government initiatives on zero-carbon transportation and illustrate what is possible when cities act fast.

Mandating the Recovery of Organic Material. Most recoverable organic material is going to the landfill and, as it decomposes there, emits harmful methane, which is approximately 28 times[32] more powerful than CO_2 in its global warming capacity over a 100-year timeframe (and over 80 times more powerful over a 20-year timeframe). By recovering it and turning it into compost, cities avoid these landfill-based methane emissions, while absorbing carbon and other greenhouse gas emissions. This is exciting new territory for cities. Soil's ability to sequester carbon is the

new frontier in the climate space, providing an enormous opportunity for cities.

Electrifying Buildings' Heating and Cooling Systems. Many of the world's buildings run on oil, gas, and even coal, emitting massive amounts of greenhouse gas emissions. By electrifying buildings heating and cooling systems, a city can power them, instead, with renewable energy. Retrofitting existing buildings will not be easy, but it will be necessary if cities want to drastically cut emissions. City-wide district heating systems offer an easier switch for cities because they can transition the heating and cooling of whole building blocks. That's why the UN Environment Programme launched the *Global District Energy in Cities Initiative,* to assist local governments—from Cartagena and Marrakesh, to Belgrade and Pune—in scaling-up modern district heating. Cities unable to invest in district heating will need to electrify their stock one building at a time, which is time and resource intensive but represents the next essential phase of building decarbonization.

Designating Car-Free and Low-Emission Vehicle Zones. In addition to getting people out of petrol and diesel cars and into electric vehicles, this game changer shapes how the quality of life in the city center can be improved with fewer vehicles. When city leaders introduce low-emission vehicle zones, it is important to incentivize what the city wants more of (i.e., low-emission vehicles, mass transit) and put a price on what they want less of (i.e., high-emission vehicles, single-occupancy vehicles). Cities around the world—from locales in Kenya and Argentina to Croatia and Morocco—are committing to car-free city centers. This will soon be the norm. Cities are rolling out congestion pricing and putting a price on, and zoning out, transport-related pollutants. In doing so, considering the 7 million premature deaths annually from air pollution, the health benefits from these car-free and low-emission zones should be clearly communicated.

Empowering Local Producers and Buyers of Renewable Electricity. Cities will be more energy secure if their power is locally and renewably sourced—and even more so if it is decentralized. By creating the capacity to store that energy throughout the city, leaders can add resilience to infrastructure. A city no longer needs to be reliant on a centralized power plant, the way many cities were reliant on large coal or gas-fired power plants. Such older, larger systems make cities less energy secure. Rolling out this game changer across developing cities represents not only the democratization of energy—where all communities can

harness clean renewable energy for heating, cooking, cooling and more—but a health opportunity (the reduction of polluting cook stoves) and a socio-economic development opportunity (independence from autocratic, government-run energy utilities).

Setting a Climate Budget to Drive Decarbonization. Using a climate budget to achieve decarbonization goals represents a whole-systems approach because every city department calculates climate impacts—from labor and health departments, to energy, waste, and transportation. Every department has a role in making systems more efficient and sustainable, less carbon-intensive and more renewable. By developing carbon budgets for every department, the city can better measure its environmental impact and spend its carbon wisely and within budget. A climate budget "establishes a maximum greenhouse gas emissions level for the budget year, based on the city's emissions goal," and "details the city's proposed short-term emissions-reduction actions to stay within the maximum amount, their projected impact, and cost".[33] As Oslo's vice mayor noted when the city rolled out the world's first climate budget, a climate budget allows them to "count carbon dioxide the same way as we count money",[34] a helpful way to understand climate budgeting locally and its role within the emissions reduction agenda.

All seven game changers do two things. First, they make a substantial contribution to the decarbonization of a city, irrespective of a national government's real or perceived inaction on climate change. Second, they send a message to the public that the city is serious about climate action. This, in turn, helps motivate and mobilize constituencies to take action and change behavior.

There are more game changers that cities can pursue, including the less technical and narratively focused climate emergency declarations. Over 1700 local governments in 30 countries, representing over 800 million citizens, have declared a climate emergency.[35] While this is not a structural game changer, this discourse elevates the way in which the climate crisis is discussed by sub-national actors. These emergency narratives by cities send an important message to the public. It notifies them of an escalating threat and encourages a behavioral response that is commensurate with that threat. That cities are resorting to emergency declarations indicates a lesson-learned from similar threat situations (e.g., health pandemics, natural disasters, or terrorism attacks). This is a new focus within the climate movement, and it moves away from simpler behavior change asks, such as changing lightbulbs, recycling, or walking, and doubles down

on bigger systems-level changes that are necessary to combat the emergency declarations—e.g., what is eaten, shipped, flown, driven, heated, commuted, worn, or powered. Now, almost every individual climate action is up for discussion. This new and often uncomfortable territory for cities is one they are being encouraged to embrace quickly.

Sub-national Case Study: Individual Responses to Climate Change

While there is a reluctance among some cities to move toward a focus on individual actions, industries will continue lobbying against systems-wide change unless consumers also demand a shift, which is why a simultaneous focus on individual actions is so critical.

As part of this effort to localize action, the climate movement has made the climate crisis more personal by focusing on what individuals can do to save the planet (e.g., buying hybrid or electric vehicles, purchasing renewable energy, reducing waste, etc.). Yet, many of the most substantive choices to reduce one's contribution to climate change—having fewer kids, living car-free, avoiding transatlantic flights, and eating a plant-based diet—are rarely discussed.[36] Plant-based diets are finally becoming more mainstream, and fast fashion's impact is just entering the discussion. But smaller families rarely make it onto environmental to-do lists despite their superior carbon reducing capacity.[37]

There was and still is an expectation that national governments are primarily responsible for making these choices and systems more sustainable. But with national governments failing to decarbonize whole systems and failing to push back on carbon-heavy industries (e.g., fossil fuel, meat, dairy, and apparel industries) there is an increasing appetite for what people can do to create demand for more sustainable options.

That is why cities are promoting individual action, and going beyond the traditional low-hanging fruit when it comes to environmental messaging on single-use plastics, lightbulbs, recycling, or public transit. They are adopting food pledges and promoting circular economy platforms. While uncharted territory for many, it is necessary for the emergence of transformative climate policy. Cities are signing the Cool Food Pledge, for example, which helps food service facilities cut food-related greenhouse gas emissions 25 percent by 2030. As the pledge states, "food production accounts for nearly a quarter of all greenhouse gas emissions, and helping people increase the share of plant-based foods in their diet is a critical step in reducing agriculture's pressure on the climate."[38] This

would be a game changer, then, in terms of emissions reductions, if cities encouraged individuals to pursue plant-based diets and stimulate the industries that will serve these diets and demand.

Cities are also promoting circularly economies, which includes waste minimization, closed-loop systems, regenerative use of resources, and sustainable fashion. Cities like Amsterdam are focused on individual actions and carbon-heavy consumption. In Amsterdam's circular economy messaging from their latest report titled "*Building Blocks for the New Strategy: Amsterdam Circular 2020–2025, Directions for a thriving city within the planetary boundaries*," the promotion of a fundamental mind shift is explicit:

> Fast-moving consumer goods are cheap, highly abundant products, such as clothing. As a result of their relatively low price, these products are easily sold and quickly thrown away. The increasing availability of these low-cost products contributes to a fast-paced consumerist and throw-away society. To prevent resource overconsumption, a fundamental (mind)shift is needed, not only in the way products are produced and consumed, but also in how consumer goods are valued. Innovative circular business models, materials and designs can help to reshape unsustainable production and consumption and maximize lifespans of consumer goods.[39]

Motivating individual action is not easy, as cities realize. People do not often deviate from their status quo, but they will need to in order to shift industry practices and encourage new sustainable markets. Consumer demand has the capacity to shift industries even when entrenched carbon-heavy corporate interests—in the fossil fuel sector, for example, or apparel, meat and dairy industries—seem immovable and bent on preventing a price on pollution. If consumer demand moves in a more sustainable direction, industries will respond. Similarly, the more technical game changers in climate-leading communities will not be possible unless public and political will is mustered, mobilized, and maintained.

Ultimately, political will is shaped by individual and collective behavior changes, which cities can influence and inspire given their proximity to the public. Thus, the next section explores: (1) the social science behind behavior change, (2) examples of how people might change their climate-impacting behaviors, and (3) ways in which cities can motivate citizens to do more to decarbonize behaviors.

The Science Behind Behavior Change

As sub-national actors complement their systems-changing focus with a more socially minded behavior change focus, there are many ways to build public will. This section explores the potential for leaders to employ social science research in an effort to make cities more sustainable.

The following twelve behavioral science-based principles are relevant to sustainability initiatives in cities of any size. These principles, compiled by the social scientists at Ideas42.org, are helpful in thinking through how cities can apply them to their work in building consensus around, and communicating out, game-changing policy.

Choice Overload. Whether it is building retrofits, green energy installs, public transit improvements, waste management, bike lanes, or household weatherization, there are myriad climate policies that need to be pursued. But is there a way to deliver this to individuals that does not cause choice overload in terms of what policy to support? Is there a way to deliver it, as Ideas42.org put it, that decreases the number of choices presented and increases the meaningful differences between them? For example, a city's climate webpage could feature one action each month and individuals could be encouraged to take that one action for 30 days. All communications would center on that one action, and then, the next month, a new action would be rolled out. This may sound basic but given the myriad climate actions needed across the sub-national space, recruitment needs to be carefully curated, especially given the propensity of individuals to feel choice overload.

Cognitive Depletion and Decision Fatigue. There is plenty of social research on how fatigue makes for bad decision-making. Considering this, when cities reach out to the community to build public will, are they cognizant of when individuals might be fatigued and less equipped to support climate initiatives? Mindful of food desert prevalence, how are cities managing food insecurity and working with other departments to ensure communities have what they need? This is a great example of how social and environmental sustainability are interconnected and how city departments can work together to ensure communities have the resources they need to make the healthiest decisions possible.

Hassle Factors. How can cities make green choices easier for individuals? If cities want residents to ride the bus more, bike more, eat more plant-based foods, waste less, weatherize, and buy heat pumps and solar power, how do they make it hassle-free or close to hassle-free? Can

they make it more enjoyable, affordable, or accessible? People might be willing to undertake the effort and expense if they are doing it in friendly company, with free food, while having fun.

Identity. Since not everyone considers themselves an environmentalist, how do cities resonate with other identities that might be attracted to climate policies? There are myriad ways in which communities self-identify; what are the principles that matter to them? Parents would have, as part of their guardian identity, a desire to keep their children safe from harm and to provide for their household. That identity covers health, security, and economics. Are cities mindful of this when messaging and mobilizing on climate initiatives? In words of Ideas42.org, how can cities "prime positive identities to encourage socially beneficial actions"[40]?

Limited Attention. When communities do not immediately respond to city-level climate requests, it is not because they are disinterested. Perhaps they heard it once or perhaps other priorities took their attention. Mindful of limited attention spans, and cognizant of all that takes priority in residents' lives, how can cities make it easy for individuals by repeating and reiterating the work through every possible channel? Are cities using radio, television, billboards, community newspapers and newsletters, local associations and advocacy organizations, religious halls, phone and email, text and other ways to communicate with the public? If not, they should.

Loss Aversion. People have an intrinsic disdain for loss. They get attached. How can cities communicate their climate work mindful of the public's proclivity for loss avoidance? Think about what people care about: quality of life, money, health, and physical security. Are cities articulating their work mindful of what individuals do not want to lose? Habitat or species loss translates here, as does the quality of life lost, the money lost, the health lost, and the security lost from fossil fuels, global heating, and extreme weather. But it is important to build new attachment to the kind of reality cities are trying to build. For example, after a city turns road-trafficked blocks into a pedestrian-only zone, full of beautiful park amenities, and encourages active engagement in that space, it is much more likely that the public will become attached to this new reality and want to replicate the experience. How do cities show that life is better in this greener world? There is intrinsic fear in letting go of the fossil-fueled experience. One way to offset this fear is to provide opportunities for people to build new attachment to the world that cities are creating. People that have a personal bond with something that is impacted by global heating are more likely to protect it. In sub-national climate

messaging and mobilizing, it is critical to give individuals something to avoid losing.

Primacy Bias. There is a bias toward information that is presented first, versus information less visible. How does that impact how cities message on climate? Is it presented in highly visible ways on city websites and do cities have social media channels specifically devoted to climate and sustainability work? Are city staff leading with the climate message or are they placing it last on a list? This may seem like subtle nuance, but the ordering of a simple list sends a strong message.

Procrastination. Everyone procrastinates at some point, which is why any far off "2050" framing for climate initiatives is potentially problematic. Even 2040 and 2030 seem far off. People will often wait until the last minute to do whatever is asked. When cities talk about future impacts, it can reinforce the proclivity to procrastinate. Talking about impacts happening here and now, and offering easy, bite-sized steps that anyone can take, counters procrastination. The same goes with implementing short-term climate goals instead of long-term ones. People are more likely to take action if it is easy *now*, they can see the difference *now*, and the goals are relevant *now*. There is a need to refocus public engagement on the 2020 and 2025 realities so that people's penchant for procrastination is countered by near-term possibilities.

Social Norms. Social norming is powerful. If one's neighbor has solar panels, one is more likely[41] to get them. If one's neighbor is saving money on a utility bill, due to energy efficiency measures, one is more likely[42] to pursue similar savings. Given this, how are cities reflecting back community actions so that residents and building owners see peers taking action and get motivated to do what others are doing? Reflecting back the green actions happening within the community not only works from a social norming perspective, but in the field of climate action, where people can feel like actions make little difference, this mirroring back can lift people up emotionally, provide inspiration and hope, and counteract defeatism.

Status Quo Bias. Default settings are powerful. People like routine. How does this impact climate-focused behavior change work, reaching people within their routine? One option: By setting up default settings to be more sustainable, with greener opt-out versus opt-in options (since opt-out produces significantly higher participation rates than opt-in), a new status quo can be made more sustainable.

The Availability Heuristic. People may think they never experienced a climate impact. This occurs when press and policymakers fail to contextualize extreme weather events within global warming realities. As Ideas42.org put it, "we judge probabilities based on how easily examples come to mind."[43] How are cities chronicling, then, climate impacts so that recent examples are more readily available? Can cities better use media channels to document climate impacts so that people have a better understanding of climate trends? And how are cities showcasing solutions so that people have examples of the behavior change needed? So that when individuals think of going green, there are plenty of examples that come to mind. The more cities message this—featuring city staff going green, too, in what they eat, drive, fly, wear, heat and power—the more the public has available examples.

The Planning Fallacy. Individuals are often optimistic about how much time it will take to accomplish tasks. This has implications for sustainability targets and timelines for 2030, 2040, and 2050. It is important to be very clear about how much time these tasks will take (or reorient deadlines with easier estimable planning periods). Since systems-level game-changing takes time, cities will want to be clear about the necessary planning, and be positive about their ability to accomplish tasks. By giving examples of similar time requirements associated with other behaviors in residents' lives, a climate action request has a salient comparison. By helping communities know how much planning is required to make necessary shifts, cities can set expectations. By doing it in shorter increments (versus 2050 timeframes), it helps ensure expectations are realistic, short-term planning is reported and made public, and everyone is witnessing what is involved. Additionally, allowing for time to assess progress, and adapt, helps maintain the public's faith throughout the process.

These 12 principles offer useful guidance in the rolling out previously mentioned systems-wide, game-changing strategies for cities engaged in climate change mitigation. The final section explores additional ingredients that are helpful to sub-nationals in their efforts to motivate individual behavior change.

Ingredients for Behavior Change

Messages and Messengers. Cities that want to experiment further with behavioral change might consider what marketing professionals understand: Appeal to basic human needs—i.e., how will life be better? The climate community often leads with some kind of normative, ethical message regarding doing the right thing for future generations, rather than selling the health, economic, security, quality of life benefits that come with taking action on climate. Identifying those benefits, however, won't be enough. When marketing these benefits, the use of economists, medical doctors, security officials, and cultural influencers will be helpful.

It can appear disingenuous when climate leaders claim green economy job numbers without maintaining sector-specific credibility or industry background to back up the assertion. It is a stronger message when the messenger is an authority on the matter and maintains trust with the audience, which is why finding the right messenger for the appropriate message is critical.

Cities are not recruiting the right surrogates frequently enough to message on the city's behalf. As a result, city policies get dismissed or watered down because the city failed to tee up industry-specific surrogates (on health, economy, security, cultural influence, etc.) to prepare the hearts and minds for the expected behavior change.

Mainstream Media and Memes. After finding the right messages and messengers, making a policy palatable to the mainstream majority also requires: (1) accessible messages, i.e., language that the mainstream majority is using (not terms like decarbonization, carbon neutrality, net zero, or retrofit accelerators); (2) repeated messages, since residents will need to hear it a half-dozen times for it to stick (known in marketing as effective frequency); and (3) readily available messages, in the media spaces that the majority uses (which means social media and community newspapers and news stations).

This is a stretch for cities because they tend to rely on their own city websites, which they hope the public will access, and tend to produce heavy reports, which may be useful in providing accountability on city mandates but which few citizens read. Another good exercise for city staff is to create memes for their climate and sustainability work (a meme is a shareable concept, image, video, or text for social media). Failure to do so misses a large swath of social-media-consuming society. Everything can be made into a meme; it just requires creativity.

This is often outside the comfort zone of city staff since many received professional training in the hard sciences necessary for running city climate, sustainability, and resilience offices. This social science work was not likely part of the sustainability training, but the ways in which cities now need to win the hearts and minds of their carbon-consuming publics are increasingly on their agenda.

Movements and Mobilization. This is a new priority among cities and an important development since people often feel alone or impotent in the fight against global warming. Eco-anxiety is emerging, where climate change is held responsible for generating post-traumatic stress disorder, anxiety, and depression. Cities, consequently, are exploring new and socio-economically sensitive ways to mirror back the movement happening in their communities so that residents realize two things: first, that they are not alone and there is a movement in their community, and second, that the city is positively reaffirming and featuring the sustainable behavior needed.

As cities lead this movement building, officials are realizing the importance of leading by example and serving as change agents within their contexts. Walking the sustainability talk is now more critical than ever as citizens look to their leaders on more than just basic environmental behaviors—recycling, changing lightbulbs, riding mass transit, etc.—and expect leaders to walk the talk in all aspects of life including flying less and going carless, scaling-up solar and heat pumps, pursuing sustainable diets and slow fashion and even talking about having smaller families.

This walking of the talk is essential in leading local movements as people are drawn to leaders, their stories and their journeys. A failure to walk the talk in the climate space runs the risk of derailing a city's climate initiative as critics often look for holes to poke and inconsistencies to call out when attempting to undermine climate action.

Moment-Making. Other work that is helpful when building a movement is to stay nimble and respond to news moments when they occur. A bushfire in Australia, a flood in New York City, a heat wave in Europe, or the Amazon burning in South America. All of these events are moments in the news cycle that city leaders should take advantage of when messaging on climate change. Miss these moments and the city loses an opportunity to contextualize the news within a climate frame. Every time extreme weather emerges, provided it has a global warming connection, cities have an opportunity to frame for the public this connection. The more the public sees the climate connection reiterated, the more familiar the science will become.

One way of seizing the extreme weather news cycle is for cities to show, not tell, what is happening. For example, a mayor could host a press conference from within the flood zone, with fishing waders on, requiring the press to follow the mayor throughout the impacted area. The optics here are important. It places the climate message in the middle of the extreme weather impact zone. This goes for heat waves, wildfire, droughts, floods, and more. Reporters are tired of traditional press releases and sterile press conferences. They are looking for a story to tell, for something surprising to hook readers. It is up to local leaders to help the press tell that story and provide that visual.

Mirroring and Mimicry. When capturing the public's attention, keep in mind they are consuming content that is primarily visual, fast paced, light on text, and entertaining. The most shared social media content generates feelings of happiness, surprise, and admiration, so cities will want to rethink how they engage the public on climate impacts and solutions. Too often a city's website is text-heavy and plan-heavy for good reason: to establish targets and timelines for a city, to be accountable to a city council, and to be transparent that a plan exists and is on track.

This is not what the public is eager to consume. By mirroring the kind of content that the public is sharing on social networks, it will move cities toward visual and video storytelling and require cities to integrate content that conjures feelings of happiness, surprise, and/or admiration. It takes creativity, but it is possible. When the Maldives government's cabinet ministers held an underwater press conference to raise awareness on how sea level rise will consume their country, it got the world's attention. It was an excellent example of creative climate messaging that evoked surprise and admiration.

Moreover, if cities want to mimic how the public talks with each other and takes action within their communities, it will require that cities meet the community where they are at, listen, and be mindful of preferred modes of communication and action. Appreciative inquiry is helpful here. When mirroring back and mimicking the kinds of climate behaviors cities want to scale up, this work should be done carefully, mindful of power structures and cultural representation, and equitably co-created with the community.

This focus on individual behavior change is a much more involved role that is now being asked of city leaders. But if climate policy is going to transform quickly enough to save humanity from climate chaos, then cities need to expand their portfolio to include behavior change. Given

increasing national government recalcitrance on climate action, this may be the most tractable way forward.

Conclusion

This chapter assumes a transformation in how climate action evolves over the next few decades, discontinuing a reliance on national actions—given the inadequate action to avert climate destruction—toward a more diversified and disruptive portfolio of sub-national actions, with an increasing reliance on cities as change agents in local communities.

Climate action will benefit from an application of the behavioral science principles identified above, as individual action offers substantial opportunities to reduce greenhouse gas emissions. If every car-driving individual in the United States, for example, switched immediately to an electric car, the country's emissions would drop by over 8 percent.[44] That is a sizable reduction for one of the biggest emitters globally. And while national government support for charging infrastructure will be critical in furthering this kind of behavior change, social science is equally useful in understanding the attitudes that will expedite this shift and disrupt the status quo.

Cities in the global north and south offer a meaningful opportunity to message more local behavior change, since the majority of the world's population, energy use, carbon emissions, and climate impacts are in metropolitan areas. Cities are where the climate story should be told, by local leaders and within local communities. Since cities around the world are already leading on systems-wide game changers in the climate space, it is now up to these same cities to lead on the behavioral game change front.

Questions for Discussion

1. What are sub-national leaders in your community/city doing to avert climate destruction and disrupt the fossil-fueled status quo and how are you supporting their efforts?
2. When is the last time you significantly changed your behavior and what inspired or motivated you to do so? What would it take for you to change your behavior—what you're powering, transporting, heating, eating, and wearing—so that it's even more sustainable and climate-friendly?

3. How would you design your community/city to be more sustainable and climate-friendly and how would you build the political and public will to make it happen?
4. What's the most inspiring sub-national climate action happening in your community and how might it be scaled up further so that its impact might be felt in neighboring communities, states, and provinces?

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