
EXPERT COMMENTARY

*Infrastructure is central to climate change mitigation and adaptation, writes **Gregory Smith**, CEO of InstarAGF Asset Management, and can forge a more sustainable path to long-term prosperity*



Pathway to the next level

According to the US National Aeronautics and Space Administration, one of the world's leading climate research agencies, 18 of the 19 warmest years on record have all occurred since 2001. While the issue of whether climate change is occurring has largely been settled, the debate around what to do about it continues against the backdrop of the massive storms, heatwaves, drought and record wildfires produced by global warming.

In the past three years alone, the US has experienced 45 separate billion-dollar weather-related disasters, with the total cost of such occurrences reaching \$500 billion dollars in the last five years, according to the National Centers for Environmental Information. While this cost is staggering, it is a fraction of the many ways in which climate change causes damage.

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It is estimated by the Global Commission on the Economy and Climate that the world's existing stock and use of infrastructure is associated with more than 60 percent of global greenhouse gas emissions, making climate-smart infrastructure investment central to the sustainability imperative – and opportunity – now before us. This imperative is even more pronounced given the current infrastructure deficit and the negative cascading effect of deteriorating infrastructure on a nation's economy and competitiveness.

With emissions at a record high in 2018 and continuing to rise, it is widely agreed that 'innovation' is required to accelerate mitigation and adaptation to changing

climate conditions and achieve a cleaner, low-carbon economy. Unfortunately, economic models of climate change still tend to overlook the role of innovation, and how failing to promote and pay for it today will dramatically increase the eventual costs of climate change. Indeed, the biggest economic questions and challenges in our future will relate to just how extreme global warming will be, what parts of the world will be most affected, and whether we are at risk of permanently losing productive capacity within the global economy.

These challenges are further complicated by the profound shifts already underway in geography, demographics, technology and infrastructure, which are interdependent and extremely hard to predict. There is also the phenomenon of path dependency, where history, expectations and vested in-

terests tend to matter greatly in determining eventual outcomes, creating obstacles to innovation in all its forms.

Innovation is often considered synonymous with technological progress, with many believing that high-tech breakthroughs such as carbon dioxide air capture are the best hope to slow global warming. While technology is a key enabler for a greener, more efficient economy, innovation can and should be defined more broadly: it is about turning any idea into a solution that adds value from a stakeholder's perspective. In applying this lens, it seems likely that even the best technologies, many of which have yet to be proven or even invented, will fall far short of the mark in the absence of a shared will and community engagement to change, act and transform.

Fundamentally, a major shift in economic planning is required to promote lower carbon systems and investments. Infrastructure uniquely resides at the nexus of our economic potential and the climate-change imperative, and is the key determinant of our ability to thrive and prosper. A better approach to economic planning necessarily includes a better approach to infrastructure planning: a larger-scale, up-front undertaking that more fully identifies environmental sensitivities, and other systems and values to help avoid, minimise and mitigate impacts while adapting to current and future climate risks.

Whereas poorly conceived or sited infrastructure is a major part of economic and climate management challenges, when executed properly, it can be a major part of the solution. Over the next 15 years, more than \$90 trillion in infrastructure investment will be needed worldwide according to the Global Commission on the Economy and Climate, which also estimates that bold climate action in this area could deliver at least \$26 trillion in economic benefits through 2030. How we build our infrastructure will clearly be a major determinant of our future economic potential and the very health of our planet.

Rising to the green challenge

Innovation in sustainable infrastructure design and delivery should encompass the inclusion of 'natural' infrastructure systems within our built environment.

Natural systems are those that occur organically or are constructed and actively managed by humans to direct and amplify

A tale of two green cities

Toronto and Chicago lead the way in innovative sustainable initiatives

In 2009, Toronto was the first city in North America to adopt a bylaw to require and govern the construction of green roofs for new developments with the goal of enhancing biodiversity and lowering energy costs. Today the city has 1.2 million square feet of new green roof area, which has saved 1.5 million kilowatt hours of energy while offsetting greenhouse gas emissions and diverting 11 million litres of storm water from sewers annually.

In Chicago, urban planners built in climate change resilience by creating permeable, high-albedo pavements to replace 3,500 acres of impermeable paved alleyways in the city to allow stormwater to filter through catch basins to capture water and funnel it into the ground, and to reflect sunlight to reduce the 'heat island' effect. These measures will improve the environment by mitigating flooding and saving the city money over the longer term.



impact. While 'grey' infrastructure can be made more resilient by better incorporating environmental, social and governance considerations into design and delivery, natural 'green' infrastructure is an important complement to our built environment that offers the potential for more flexible, cost-effective solutions with myriad economic and social benefits.

Green infrastructure initiatives can include urban forests and woodlots, bioswales, engineered wetlands and stormwater ponds,

wetlands, ravines and riparian zones, green roofs and walls, porous surfaces and reflective pavements, and urban agriculture.

Combining such elements addresses a specific infrastructure need while tangibly enhancing air and water quality, improving biodiversity, elevating the overall appeal of a city's urban architecture and creating new economic opportunities.

Technology also plays an essential role in the greening effort. Plans for New York's Lowline, intended to be an underground

park in an historic trolley terminal on the Lower East Side, would make it the first underground park using fibre optics to create remote skylights, effectively bringing sunlight underground.

This project will reclaim unused space in a dense city while creating a green respite and cultural attraction. From an infrastructure perspective, this project may encourage other cities and developers to think more broadly about alternative approaches to enhancing urban biodiversity and how to balance green and grey.

According to the report *Delivering Urban Resilience*, city leaders, planners and infrastructure developers often lack the data and tools needed to understand and quantify the costs and benefits of technologies such as green roofs and porous pavements, resulting in mismanagement, costs and decreased liveability and resilience.

Although there is no overall agreed model yet to address the complexity of this task, efforts are underway to assign economic value to sustainable infrastructure benefits and to instil this awareness into decision-making. More broadly, there are also steps that should be taken by policymakers to create a financing and regulatory environment that entices more private sector capital flows to sustainable infrastructure, including allowing for a wider array of financial instruments and funding models to improve risk-return profiles for private investors.

A vital part of sustainable infrastructure planning includes more fully engaging communities in infrastructure design and grassroots green innovation to meet local and regional needs. Infrastructure development that represents the values, history, culture, commerce and geography of a community is key to supporting a strong economy, vibrant neighbourhoods and a distinct sense of place.

Green infrastructure is often more visible than grey infrastructure, at once improving sustainability while creating the potential for creative design elements, such as fountains fed by rain water or artist-designed stormwater infrastructure, to beautify the urban landscape and educate citizens on environmental protection.

Investing as a force for change

The private sector is a critical partner with governments and stakeholders in addressing climate change and collaborating on environmental issues, including mobilising

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green investment and finance, and harnessing skills and knowledge for green growth.

Infrastructure investors in particular have a distinct opportunity to shape and accomplish sustainability goals given the long duration and essential nature of infrastructure assets.

According to Preqin, nearly half of alternative fund managers will consider ESG principles in every investment they make by 2023. In private markets, the UN-backed Principles for Responsible Investment reports that two out of every three limited partners consider responsible investment in their selection of fund managers.

Simply, ensuring that infrastructure investments are sustainable is critical to the future of our planet. This includes identifying, assessing, pricing, managing and monitoring material ESG risks with a best practice mindset. It relates to preserving and enhancing the value of an asset throughout the investment process starting from origination to execution, asset management and divestment. And it relates to making a concerted effort to design and deliver infrastructure that promotes inclusive economic growth, poverty reduction and a better quality of life.

With the global capital allocated to infrastructure expected to more than double by 2023, infrastructure investors can exercise greater influence and foster more transparency on sustainability matters, and accordingly, actively add value to an investment and the surrounding community.

Over the past 15 years, growing awareness of climate change has helped to spur the conversation on sustainability in the infrastructure sector away from a tick-box exercise to a process of influencing tangible change for the better. All infrastructure assets by their nature have a profound ESG footprint with both positive and negative impacts across the environmental and social spectrum, whether the asset is a renewable power facility or an airport or energy infrastructure.

Investing for a more sustainable future means that we must each strive to better manage the panoply of ESG risks and opportunities before us with a best practice mindset and commitment to responsible stewardship that creates value for future generations. Stepping up to a new level of sustainable infrastructure investment demands we focus on the possibilities and remember that the environment is the one asset we all share. ■