



Sustainable Infrastructure Defined

At Sonen, we consider infrastructure to be divided into two main categories:



Traditional Infrastructure, which includes power generation, transportation, buildings, water, sanitation and telecommunications; and



Natural Infrastructure, which includes forests, wetlands, waterways and working landscapes.

To help create long-term, lasting positive impacts, Sonen invests in Sustainable Infrastructure. Sustainability in this context means¹:



Socially Sustainable

- » Infrastructure that is inclusive and expands essential services to enhance livelihoods and wellbeing.
- » Reduces vulnerability to climate change and improving quality of life, for example, by limiting air and water pollution.



Economically Sustainable

- » Infrastructure that is affordable to end users and avoids burdening governments with excessive debt.
- » Creates jobs and boosts economic activity, for example, by expanding basic services such as transportation and extending opportunities to more people.



Environmentally Sustainable

- » Infrastructure that supports the conservation and sustainable use of natural resources.
- » Increases resiliency to climate risks such as sea-level rise and extreme weather events, for instance, by utilizing zero-emission energy and containing coastal erosion.

UN Sustainable Development Goal 9

Sonen evaluates the extent to which its investment strategies align with the United Nations' Sustainable Development Goals. Among the 17 goals, SDG 9 calls for investing in resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation².

Underlying targets for each goal identify specific ways in which the Goals' success will be measured and evaluated. Sonen tests its infrastructure investments' alignment with these targets to assess our own contribution to reaching SDG 9. Targets include:



- » Develop quality reliable, sustainable and resilient infrastructure with a focus on affordable and equitable access for all,
- » Upgrade infrastructure and industry to greater sustainability, increased resource-use efficiency and use of environmentally sound technologies,
- » Facilitate sustainable and resilient infrastructure development in developing countries, and
- » Increase access to information and communications technology.

Impact Drivers	THE MACRO, SOCIAL & ENVIRONMENTAL CASE FOR SUSTAINABLE INFRASTRUCTURE
Global	<ul style="list-style-type: none"> » Annual global demand for infrastructure development is \$3.7 trillion. Currently only \$2.7 trillion is invested each year³. » Globally, through 2030 over \$90 trillion will need to be invested in infrastructure, more than the entire value of all current global infrastructure⁴. » Urban infrastructure decisions made over the next five years are likely to consume up to one-third of the remaining global carbon budget⁵.
Climate Change	<ul style="list-style-type: none"> » Existing stock and use of current infrastructure is associated with more than 60% of global GHG emissions. Our immediate investment choices can target a climate-smart, inclusive growth pathway (vs. high carbon, inefficient and unsustainable path)⁶. » 80% of the projected carbon emissions from the power sector in 2020 are inevitable, as they come from power plants that are already in place or are being built today⁷.
Natural Infrastructure	<ul style="list-style-type: none"> » Forests, watersheds and wetlands are rapidly being lost to urban sprawl, farmland expansion and are otherwise degraded, resulting in water shortages, excessive pollution and decreased resiliency to extreme weather events⁸. » Natural, ecosystem-based infrastructure is an important complement to human-made infrastructure (e.g. absorbing emissions through forests and soils, or mitigating the impact of floods on human-made systems). Increasing tree cover by 10% reduces heating and cooling requirements by 5-10%⁹.
Urbanization	<ul style="list-style-type: none"> » By 2050, the population will grow by 2.5B, with 2/3 of the world population in urban areas¹⁰. » Over 70% of the global demand for infrastructure through 2030 will be from urban areas¹¹. » Municipal sewer systems are the US's biggest violators of the Clean Water Act: more than 1/3 have violated pollution laws since 2006¹². » In 2012, 87 million tons of municipal solid waste was recycled and composted in the US, saving enough energy to power 10 million households for a year¹³.
Smart Cities	<ul style="list-style-type: none"> » Information technology and digitization offer significant opportunities to enhance infrastructure's sustainability performance, including reducing energy and water consumption and optimizing transportation patterns. » Internet-enabled infrastructure can also provide municipalities significant cost savings through optimizing resource use, particularly energy and water¹⁴.
Aging Infrastructure	<ul style="list-style-type: none"> » The American Society of Civil Engineers' latest grade on American infrastructure is only a D due to delayed maintenance and underinvestment¹⁵. The US ranked 3rd globally in 2016 in the World Economic Forum Global Competitiveness Index, but 11th in Infrastructure¹⁶. » The additional up front costs to make new infrastructure compatible with climate goals can be fully offset by efficiency gains and fuel savings over the infrastructure lifecycle¹⁷.
Emerging Markets	<ul style="list-style-type: none"> » 2.6 Billion people in developing countries do not have full time access to electricity; 2.5 billion do not have access to sanitation; 1.5 billion are without access to phone services¹⁸. » The global south will account for roughly 2/3 of all infrastructure spending through 2030, creating an opportunity to leapfrog inefficient and polluting systems of the past¹⁹.




Sustainable Infrastructure Sectors at Sonen Capital

Sonen broadly defines infrastructure to be comprised of six key sub-sectors: Energy, Water, Transportation, Waste/Sanitation, Telecommunications and Natural Infrastructure. Sonen identifies specific investment objectives related to each infrastructure sub-sector, based on how positive impact can most readily result from impact investment in that sub-sector.

For three infrastructure sub-sectors (Energy, Water and Natural Infrastructure), Sonen's existing impact investment frameworks articulate intended social and environmental impact outcomes and investment strategies. Any future investment in infrastructure may fall into any of these six sub-sectors.

Sector	 Transit	 Sanitation	 Telecom
Infrastructure Sub-Sectors	<ul style="list-style-type: none"> » Roads » Rails » Ports » Airports 	<ul style="list-style-type: none"> » Waste Materials » Sewerage 	<ul style="list-style-type: none"> » Mobile » Internet
Sub-Sector Investment Objectives	<ul style="list-style-type: none"> » Expand availability and reach of low-carbon mass transit, focused on urban geographies » Focus on geographies where infrastructure is lacking to expand inclusive economic growth 	<ul style="list-style-type: none"> » Expand waste management infrastructure to include greater rates of recycling, bio-digestion, composting, energy recovery » Investment in sewer infrastructure should incorporate climate risk to reduce sewerage overflows into waterways during extreme weather » Boost investment in natural infrastructure, protection of wetlands and coastal ecosystems to protect and supplement wastewater treatment systems. 	<ul style="list-style-type: none"> » Promote more inclusive growth and improve delivery of other critical services (health, education, finance, banking) through increased coverage and use of Information and Communications Technology (ICT) services among populations where such services are insufficient » Embed principles of smart technology that can optimize resources in master urban planning

Investment Objectives Addressed in Other Sonen Impact Frameworks

Sector	 Energy	 Water	 Natural Infrastructure
Infrastructure Sub-Sectors	<ul style="list-style-type: none"> » Power Generation » Transport » Storage 	<ul style="list-style-type: none"> » Treatment » Delivery 	<ul style="list-style-type: none"> » Forests » Watersheds » Wetlands/Waterway
Sub-Sector Investment Objectives	<ul style="list-style-type: none"> » Expansion of the low-carbon energy grid and alternative energy power generation » Facilitate transition from higher-carbon sources » Improve energy infrastructure with focus on renewables 	<ul style="list-style-type: none"> » Modernize and rehabilitate infrastructure to improve efficiency » Strengthen utilities that conserve water use at scale » Concentrate where population and urbanization trends are greatest and water resources are most stressed 	<ul style="list-style-type: none"> » Integrate water, wastewater and storm water in design and long-term planning » Protect and restore land with high conservation value; conserve freshwater bodies and systems » Invest in drought resiliency and flood protection

Sustainable Infrastructure Target Impact Outcomes

Our collective decisions about near- and long-term investment in infrastructure carry enormous ramifications on the health and well-being of our planet. We believe that the investments we make in large-scale power generation, transportation, and waste management, among many other choices, will have lasting consequences on the social, economic and environmental sustainability for generations to come.

Our research suggests that climate considerations must be a first order concern in determining what infrastructure investments we will make. Further, we must continue to provide a focus in geographies where few services exist or where basic infrastructure is lacking or poorly performing. Investments in new infrastructure of all kinds, as well as refurbishing and improving the current stock, must include greater resource efficiency – using fewer inputs, and creating less waste. Last, the role of natural infrastructure is central to meeting our planet’s environmental needs and providing essential services for our growing population.

Sonen’s investments in sustainable infrastructure will be oriented to achieving three specific impact outcomes over time:

Impact Outcomes and Supporting Objectives

1 Social Impact

Increased social equity through improved access and affordability of modern infrastructure.

- A. Target geographies where need is greatest (developing countries)
- B. Improve sustainability performance of infrastructure in the urban environment, where growth will be greatest

2 Climate Impact

Low-carbon development strategies for new and existing infrastructure implemented at scale.

- A. Promote clean energy generation and energy storage capabilities
- B. Expand efficient waste management practices
- C. Expand availability of low-carbon transport

3 Environmental Impact

Increased conservation of natural resources and lower-cost infrastructure development.

- A. Capture financial savings from investment in natural infrastructure
- B. Harness ecological benefits of natural infrastructure

Outcome 1: Social Impact



Increased social equity through improved access and affordability of modern infrastructure.

Supporting Impact Objectives

- A. Target geographies where need is greatest (developing countries)
- B. Improve sustainability performance of infrastructure in the urban environment, where growth will be greatest

Investment Strategies

- » Expand access to basic infrastructure services (water, energy, transport) focusing on reliability and affordability
- » Concentrate where population and urbanization trends are largest and where natural resources are most stressed

Investment Examples

- » Power grid extension and expansion, including distributed energy solutions, focused on regions where power sources are currently “dirty” or carbon intensive
- » Expand waste and sanitation services
- » Municipal water and wastewater systems
- » Expand reach and accessibility of telecommunications services

Infrastructure Impact Outcomes and Supporting Objectives

Outcome 2: Climate Impact



Low carbon development strategies through new and existing infrastructure implemented at scale.

Supporting Impact Objectives

- A. Promote clean energy generation and energy storage capabilities
- B. Expand efficient waste management practices
- C. Expand availability of low-carbon transportation

Investment Strategies

- » Invest in the expansion of the low-carbon energy grid and alternative energy sources and technologies
- » Transform waste into resources
- » Improve sustainability performance of transportation sector at large
- » Invest in low-carbon transportation infrastructure

Investment Examples

- » Large-scale renewables-based physical infrastructure, especially that displaces investment on dirtier alternatives
- » Technology and innovation for waste recycling and processing, waste prevention, waste-to-energy
- » Finance low-carbon mass transit infrastructure and services
- » Technology and innovation that reduces carbon intensity within transportation sector (e.g. high efficiency motors, Geographic Information Systems (GIS))

Outcome 3: Environmental Impact



Increased conservation of natural resource and lower-cost infrastructure development.

Supporting Impact Objectives

- A. Capture financial savings from investment in natural infrastructure
- B. Harness ecological benefits of natural infrastructure

Investment Strategies

- » Harness natural systems' inherent capability to provide critical ecosystem services through restoration and increased natural infrastructure
- » Integrate water, wastewater and storm water in design, management and long-term planning

Investment Examples

- » Green bonds providing resources for climate change adaptation and mitigation, with particular emphasis on restoring ecological function of water
- » Acquire, protect and restore lands, watersheds and ecosystems with high conservation value
- » Restoration of critical ecosystems near coastal areas and in urban geographies
- » Municipal bonds that integrate natural infrastructure into urban design and planning

Below are Sonen's abbreviated impact investing guidelines with regard to sustainable infrastructure:

Issue	Exclusion	Support Best Practices	Sonen's Position
Power Generation		✓	Target renewable sources. Minimal nuclear power generation and no direct investing in nuclear. Emphasis on maintaining human rights and avoiding land grabs, through regular social and environmental reporting among power generators.
Power Transmission and Distribution		✓	Electricity transmission where sources are renewable power generation facilities. Emphasis on protecting landowner's rights or cultural issues, minimizing environmental impact and avoiding major ecosystem disruption.
Energy Storage		✓	Energy storage infrastructure that helps reduce the need for additional power generation sources and results in improved resource conservation. Environmental cost/benefit for different types of storage projects will be evaluated.
Water Storage		✓	Sonen will not invest in the construction of dams or large-scale water storage schemes. Instead, it will support investments in water storage that restores natural waterways and enhances ecological health and natural function of wetlands.
Desalination		✓	Conservation and improved utilization are investment options that are significantly more sustainable than desalination. As such, direct investment in desalination operations will be limited and will be considered where energy requirements are at least partly powered by renewable energy.
Airports	✓		Because airports expand a mode of transportation with significant climate impacts, Sonen prefers related investments that enhance the sustainability performance of existing buildings rather than new builds.
Mass Transit		✓	Consistent with SDG 9, Sonen's transit related investments will focus on affordable, low-carbon transportation solutions that build a more inclusive economy.
Roads, Bridges, Tunnels		✓	Sonen supports upgrading and renewing infrastructure where it can be made demonstrably more resource efficient and provide significant energy savings. Sonen will avoid investing in creating and maintaining roadways unless they are located in geographies where such infrastructure is greatly lacking.
Car Parking	✓		Greater emphasis on directing investment resources to low-carbon mass transit, although minimal exposure may be permitted on a case-by-case basis, such as where it facilitates mass transit.
Maritime Transportation		✓	Limited exposure. Container shipping is one of the lowest-carbon forms of moving products across the globe. Focus on environmentally beneficial and/or carbon reducing assets.
Smart Cities		✓	Pursue investments that integrate principles of smart cities through ICT: smart utilities/grids; lighting; traffic optimization; smart buildings; and data collection that permits local governments to monitor conditions in real time.

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