In challenge lies opportunity

Investing for sustainable development

Fourth quarter 2015
Action without vision is only passing time, vision without action is merely daydreaming, but vision with action can change the world.

_Nelson Mandela_, political leader (1918–2013)
Dear readers,

This month marks the adoption by the UN General Assembly of the Sustainable Development Goals (SDGs). They succeed the Millennium Development Goals, which entered into force at the turn of the century and helped to define and drive global development efforts for the last 15 years.

The SDGs have a broader mission than their predecessors, one not limited to improving the economies of developing countries. They address universal priorities of the global community, with a strong focus on sustainability.

We have taken them as the starting point for this second edition of our Sustainable Investing Quarterly series. We highlight them not to introduce economic and social development concepts, which is best left to development experts. Instead, we see relevant investment implications arising from them. Governments worldwide will need to harness private capital to meet the ambitious new objectives. We expect a variety of new initiatives targeting private investment to help countries achieve the SDGs.

This report spotlights a number of actionable, sustainability-themed investment ideas well suited to pursuing the SDGs. It also lays out the types of instruments, within both liquid and private markets, that can be invested in to further the process. Such solutions are becoming increasingly mainstream and easy to incorporate in portfolios for sustainability-minded investors.

Sincerely,

Stephen Freedman
Head of Environmental, Social and Governance (ESG) Investing

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Head of Sustainability-themed Investing

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From Millennium Development Goals to Sustainable Development Goals

The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low, and we reach it.

Michelangelo, artist (1475–1564)
The UN’s Millennium Development Goals (MDGs) have been the focal point of most policy making in international development. Initiated in September 2000 by heads of state at the UN’s Millennium Summit, they were finalized the following year, with all 189 UN member states committing to them. These eight time-bound and quantitative goals replaced prior independent UN initiatives and organized pursuit of global development priorities worldwide. The MDGs have served as the overarching development framework for the world for the past 15 years.

The MDGs were time-bound and supposed to be achieved by December 2015. They were expressed quantitatively through a set of 18 targets and 48 specific indicators. The targets and indicators made it possible to turn the goals into actionable initiatives that the entire development community could rally behind, thereby mobilizing considerable amounts of donor finance.

As their expiration date approaches, the final MDG report card (see Fig. 1) rates them a partial success. While certain goals and targets have been reached since 2000, much remains to be done. For example, extreme poverty has been dramatically reduced but is hardly eradicated. Slow progress has been made on the path toward gender equality. Maternal mortality rates have fallen by one-third but remain unacceptably high. And, finally, while some progress has been made in environmental sustainability, a key environmental challenge of our time, the carbon crisis and the challenges it poses to climate change are still far from being adequately addressed.
From Millennium Development Goals to Sustainable Development Goals

**Fig. 1: Millennium Development Goals and their report card**

<table>
<thead>
<tr>
<th>Goal 1</th>
<th>Eradicate extreme poverty and hunger</th>
<th>Achievements</th>
<th>More progress needed</th>
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<tr>
<td></td>
<td></td>
<td>Number of people living in extreme poverty has fallen from 1.75 billion in 1999 to 836 million in 2015.</td>
<td>About 800 million people still live in extreme poverty and suffer from hunger. Over 160 million children under age five have inadequate height for their age due to malnutrition.</td>
</tr>
</tbody>
</table>

| Goal 2 | Achieve universal primary education | Primary school net enrollment rate in the developing regions has reached 91% in 2015 from 83% in 2000. | Further efforts needed to achieve universal primary education. |

| Goal 3 | Promote gender equality and empower women | The average proportion of women in parliament has increased from 14% to 22% since 2000, but remains low in absolute terms. | Globally, about three-quarters of working-age men participate in the labor force, compared to only half of working-age women. Women earn 24% less than men globally. |

| Goal 4 | Reduce child mortality | The global under-five mortality rate has declined by more than half, dropping from 90 to 43 deaths per 1,000 live births between 1990 and 2015. | More work is needed to improve child survival rates. Every minute around the world, 11 children die before their fifth birthday, mostly from preventable causes. |

| Goal 5 | Improve maternal health | The global maternal mortality ratio has fallen from 330 to 210 deaths per 100,000 live births between 2000 and 2013. | Only half of pregnant women receive the recommended amount of antenatal care. |

| Goal 6 | Combat HIV/AIDS, malaria and other diseases | New HIV infections fell by 40% between 2000 and 2013, from an estimated 3.5 million cases to 2.1 million. | In sub-Saharan Africa, still less than 40% of youth aged 15 to 24 years had correct knowledge of HIV transmission in 2014. |

| Goal 7 | Ensure environmental sustainability | Between 1990 and 2015, the proportion of the global population using an improved sanitation facility has risen from 54% to 68%, and those using an improved drinking water source increased from 76% to 91%. | Emissions of carbon dioxide rose from 23.8 to 33.0 billion metric tons from 2000 to 2012. |

| Goal 8 | Develop a global partnership for development | Official development assistance from developed countries rose 66% in real terms between 2000 and 2014, to USD 135.2bn. | Funding will remain a critical factor for the post-2015 development agenda. |

Source: The Millennium Development Goals Report 2015, UN
Against this backdrop, the UN has developed a new set of goals and targets to take the global development agenda into its post-2015 phase. The new Sustainable Development Goals (SDGs) seek to build on the MDGs and complete what they did not achieve. With 17 goals rather than eight, they also represent a larger set of priorities derived through a broad-based consultative process that formally started in 2012 at the Rio de Janeiro UN Conference on Sustainable Development.

The SDGs differ from the MDGs in key respects. They emphasize sustainability in addition to development needs and apply to all countries, not just the developing world. Their focus is on people, the planet, prosperity, peace and partnership, with these elements considered inextricably integrated. Approved by the UN General Assembly in September, they will come into effect on 1 January 2016 and will guide policy decisions of member states for the next 15 years.

**Box 1: Sustainable Development Goals**

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
10. Reduce inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Ensure sustainable consumption and production patterns.
13. Take urgent action to combat climate change and its impacts.
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Source: UN
While the SDGs (see Box 1) are formulated in general terms, they are accompanied by 169 specific targets that make the agenda actionable and able to be monitored (see a selection of targets in Box 2). The SDGs are intended to steer government development priorities and marshal resources from public and private sources. Many governments are expected to integrate the goals and targets into their national development and budget strategies. Action programs will likely also find their way into regional or even city-level legislation in many advanced economies. The specificity of the targets and the need for the public sector to mobilize private sources of capital also suggest that the SDGs will ultimately create opportunities for investors as discussed in chapters 2 and 3.

Box 2: Examples of specific SDG targets (169 in total)

By 2030, double the agricultural productivity and incomes of small-scale food producers.

By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.

By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.

By 2020, halve the number of global deaths and injuries from road traffic accidents.

By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.

By 2030, improve water quality by [...] halving the proportion of untreated wastewater [...].

By 2030, double the global rate of improvement in energy efficiency.

Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7% gross domestic product growth per annum in the least-developed countries.

Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in the least-developed countries by 2020.

By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains [...].

By 2020, conserve at least 10% of coastal and marine areas [...].

Source: UN
Investment opportunities linked to SDGs

The pessimist sees difficulty in every opportunity; the optimist sees the opportunity in every difficulty.

Sir Winston Churchill, statesman (1874–1965)
Initiatives that support the Sustainable Development Goals (SDGs) will create a number of long-term investment opportunities. The SDGs’ 15-year lifespan is considerable from an investment perspective. UBS CIO sees value in focusing on the long-term drivers of investment performance. This philosophy is central to our “Longer Term Investments” (LTI) series, which focuses on investing in enduring and undisputed structural trends (e.g. population growth, aging, increased urbanization). The SDGs target many of the same challenges – water scarcity, the growing need for waste management, the threats to clean air, etc. – that arise from the trends we identified. We believe that investors willing to commit to such themes over multiple business cycles can benefit from potential mispricing created by the typically shorter-term focus of financial markets. Alternatively, these ideas may serve as a basis to find investments within private markets (equity, debt and real assets), as discussed in chapter 3.

In this chapter, we describe in more detail the links between our published LTIs and the relevant SDGs.

**Fig. 2: Long-term investment themes linked to SDGs**

<table>
<thead>
<tr>
<th>Long-term investment theme</th>
<th>Associated SDGs (See box 1, page 8)</th>
<th>Investment opportunity</th>
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<tbody>
<tr>
<td>Water scarcity</td>
<td>2, 6</td>
<td>Water infrastructure, treatment and management, agricultural technology (e.g. advanced irrigation)</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>7, 12, 13</td>
<td>Building systems, industrial processes, transportation infrastructure, technology/software</td>
</tr>
<tr>
<td>Waste management and recycling</td>
<td>6, 12</td>
<td>Waste management (particularly EM exposure)</td>
</tr>
<tr>
<td>Automation and robotics</td>
<td>12</td>
<td>Industrial automation/robotics, technology/industrial software</td>
</tr>
<tr>
<td>Clean air and carbon reduction</td>
<td>3, 11, 13</td>
<td>Renewable energy, energy efficiency &amp; storage, clean fuel, emission control technology, carbon capture/storage</td>
</tr>
<tr>
<td>Emerging market healthcare</td>
<td>3, 10</td>
<td>Emerging market healthcare</td>
</tr>
<tr>
<td>Obesity</td>
<td>2, 3</td>
<td>Consumer (food, health, wellness), healthcare (treatment of obesity &amp; related diseases)</td>
</tr>
<tr>
<td>Mass transit rail</td>
<td>9, 11, 13</td>
<td>Companies with high exposure to mass transit rail (including contractors, capital equipment suppliers, operators, and property developers)</td>
</tr>
<tr>
<td>Agricultural yield</td>
<td>2, 15</td>
<td>Agricultural equipment, biotech, irrigation technology, fertilizer producers</td>
</tr>
</tbody>
</table>

Source: UBS
Water scarcity

The World Economic Forum has recognized water scarcity as the most critical risk to our planet. An inadequate water supply threatens the viability of the global economy, the environment, and human life. Given the severity of the issue, it is no wonder that ensuring the “availability and sustainable management of water and sanitation for all” is one of the SDGs (#6).

Water scarcity arises from an imbalance of supply and demand. The amount of water suitable for human consumption is limited, and the resource is unevenly distributed around the world. Despite this inflexible supply, demand is constantly growing. The UN estimates that 40% of the world’s population depends on cross-border freshwater resources.

Long-term developments, such as population growth, higher living standards, industrializing emerging markets, a lack of infrastructure and climate change, exacerbate the water supply/demand mismatch. Population growth will increase demand for food, energy and consumer products – all of which require substantial amounts of water to produce. In fact, food production is the second-most water-intensive sector. Higher living standards will also raise water demand. The water consumption of food producers will likely rise as the growing middle classes in the emerging markets adopt more protein-rich diets. One kilogram of beef can be 17 times more water-intensive to produce than the same amount of wheat.

Climate change also influences the global water supply in terms of quality, quantity and timing aspects. Recent developments in California illustrate this point. Due to melting glaciers and polar ice caps, sea levels are rising. Saltwater intrusion will harm freshwater aquifers. We expect an accelerated rate of evaporation from land and sea, which will boost moisture in the atmosphere and likely lead to flooding. Equally likely are droughts in low-precipitation areas. Thus, climate change creates not only water scarcity but water overflow.

Combatting water scarcity creates investment opportunities. We estimate that the current global water market is roughly USD 500–600bn annually. Market studies estimate that the market size could reach USD 1trn by 2020. The longer-term growth outlook is compelling because we expect water demand to exceed supply over the next several decades, requiring additional investment. Companies benefiting from this trend could grow revenues and profits markedly. We see the most potential in three sectors: water infrastructure, water treatment and water management.

To accommodate growing populations, cities will need to invest heavily in water infrastructure. It is already strained and suffers from chronic underinvestment. For example, the US Environmental Protection Agency estimates that 60% of all US water-main pipes, most of which are more than 60–80 years old, will be classified as sub-standard by 2020. Investment in water treatment is also urgently needed. According to the Food and Agriculture Organization only 2.4% of water is recycled today. Industrialization in emerging markets has created a greater need to treat industrial waste water, which is threatening the fresh water supply. Finally, the need for better water management has, once again, become evident with the latest drought in California. Investment in measurement and planning systems to avoid wasting water is necessary, in particular in the agricultural sector. Technologies that improve agricultural water efficiency (e.g. advanced irrigation) should benefit.

Energy efficiency

Improving energy efficiency addresses critical challenges that humanity faces, including its excessive dependence on fossil fuels and the lack of competitive storage technologies that exist for intermittent renewable energies. Saving energy directly at the source lowers costs, conserves resources and reduces emissions. Energy efficiency is related to several SDGs, in particular #7 (affordability, reliability, and sustainability of energy), #13 (combat climate change) and #12 (sustainable consumption and production patterns).

Since 2010, the 50% of the world’s population living in cities has consumed 75% of the energy produced and accounted for 80% of the greenhouse gases emitted. As a rule of thumb, for each US dollar invested in energy-efficiency measures, around two US dollars can be saved in investments in electricity supply, and up to four US dollars in electricity costs over the life-cycle of a product. Although the payback period for most energy-efficiency applications
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ranges from only a few months (e.g. LEDs) to several years (e.g. insulation), a shift toward energy efficiency is often triggered by government incentives and regulations. As a result, it is becoming a key business factor for a growing number of companies.

We see investment opportunities in the following areas. **Buildings** offer the greatest potential for reducing energy consumption; this segment currently accounts for 40% of energy demand and 30% of CO₂ emissions. On average, a building in the US is used for 50 to 75 years: 60% to 85% of overall building costs stem from operations (fuel, maintenance, repair, etc.), compared with just 5% to 10% for design and construction, according to the US National Institute of Building Services. Energy efficiency is a simple way to save on maintenance. Efficiency gains can also be achieved in **industrial processes**. ABB Ltd. estimates that around 80% of energy is lost between resource extraction (of coal, for instance) and its use in producing electricity. Numerous industrial applications are also used to transport the energy and to produce end-products. Finally, in the **transport** sector, responsible for 30% of energy consumption, it is clear that trains and buses are far more energy efficient for passenger transport than cars or aircraft. Rail is the most environmentally friendly form of transport (burning only 0.4 liters of fuel per 100km per person compared to 0.6 to 0.9 liters for a bus and several times that for a car or plane). Yet most people still use cars even for short distances.

These areas represent opportunities to limit the demand growth for energy. We see **information technology** as a key to achieving efficiency gains in these sectors, whether through software applications, cloud computing, modern telecommunication or mobile technology. The International Energy Agency (IEA) expects the demand for energy-efficient products to grow by around 7% to 8% annually. Investments in them could reach USD 530bn annually in 20 years from USD 130bn in 2013.

**Waste management and recycling**

Waste management is specifically addressed in SDGs #12 (sustainable consumption and production) and #6 (water management and sanitation). According to the Waste Atlas, for every USD spent globally, about 47 grams of waste are produced. Worldwide waste volumes are expected to more than double by 2050. Several megatrends are behind this anticipated rise: population growth, rising living standards, industrialization and urbanization in emerging markets, and shorter product life-cycles of electronic devices. Rising volumes are driving the demand for efficient waste management around the world. Today, the total waste market is valued at USD 1.2trn per year. It is likely to grow at a high-single-digit percentage rate and reach USD 2trn by 2020.

The waste sector follows the well-known waste hierarchy (the four R’s) first mentioned in the 1970s: recover, recycle, reuse and reduce. The hierarchy encourages minimizing greenhouse gas (GHG) emissions. The most sustainable form

**Box 3: Did you know?**

The recycling of one ton of aluminum demonstrates how efficient and effective recycling is. It requires 95% less energy than producing it from virgin materials, saves 1.3 tons of bauxite residues, 15 cubic meters of cooling water, 0.86 cubic meters of process water and 37 barrels of oil, while preventing the emission of two tons of carbon dioxide and 11 kilograms of sulfur dioxide.

**Fig. 3: Municipal solid waste generation by country**

2012 estimates

of “treatment” is outright reduction, of course, though other methods also mitigate environmental damage. They include recycling, aerobic composting and anaerobic digesting. The cheapest and fastest method of treatment is disposal, which takes the form of landfills or incineration. In most emerging markets these traditional methods are well established. In the case of China, landfills dominate (72% of capacity). Due to the time pressure to ramp up capacity and a lack of sorting capabilities, we think they will remain the primary way of treating waste in the near future.

Emerging markets offer the clearest opportunity for investment growth in waste management. Rising living standards and urbanization will raise waste volumes. In general, the higher the income level and urbanization rate of a country, the greater the amount of solid waste it produces. This trend is already unfolding in China. In 2004, it overtook the US as the world’s largest waste generator and, according to World Bank forecasts, will produce twice as much municipal solid waste as the US in 2030. Low treatment rates there and in other emerging markets relative to developed countries offer significant catch-up potential that could lead to extraordinary growth rates in coming years. While waste collection rates in developed countries have risen to 98%, they can be as low as 40% in low- and middle-income countries. In 2012, 3.5 billion people had no access to regular waste collection services, according to the UN Environment Programme. Developing efficient waste management systems to collect and treat rising waste volumes in emerging markets should lead to compelling investment opportunities over the next several decades.

Automation and robotics
The main reason most electronics, including premium products like the iPhone, are manufactured in China relates to the huge cost savings its vast pool of cheap labor creates. For instance, Apple’s contract manufacturer, Foxconn, employs more than half a million employees in China to assemble Apple products exclusively. But cheap labor in emerging markets, particularly China with its rising wages and aging population, is unlikely to be a sustainable long-term growth driver. The mass movement of poor agricultural workers to the manufacturing sector is ending. Increasingly, we expect automation to drive global manufacturing output thanks to the substantial productivity gains it can generate.

Automation, if properly relied on, should prove an important solution to SDG #12 (sustainable consumption and production patterns). Smart automation is enabling innovative industrial and IT processes to fuel global manufacturing productivity gains. The opportunity in emerging markets is especially attractive since robotics use here lags that of developed countries, and their aging populations and rising wages underscore the need for productivity gains. Given the relatively large size of the manufacturing sector, there is potential for a sustained expansion in automation equipment.

Rising IT penetration in the manufacturing sector through industrial software should also lead to a new wave of automation investment in developed countries. Its use in manufacturing should lower resource consumption (of water, energy and other commodities). Compared to such industries as office automation and healthcare, software penetration remains lower in the manufacturing automation world, though we are now reaching an inflection point.

To be clear, automation is not a panacea for achieving the SDG agenda across the board. Its use will be helpful on a case-by-case basis, most clearly when the efficiency gains it generates alleviate scarcity in environmental and financial resources. But automation is a double-edged sword. Productivity gains, especially in developing countries, can run counter to employment objectives and hinder equality goals. Automation-based investments should be considered carefully in terms of their overall impact.

Clean air and carbon reduction
Much like safe drinking water, clean air is a basic human need. Population growth and urbanization have greatly worsened air pollution through fossil-fuel use, creating the need for clean-air innovations. The ever-increasing concentration of greenhouse gases and particulates, such as sulfur dioxide and nitrogen oxides, in the atmosphere is degrading air quality. In the past decade, carbon emissions grew substantially, particularly in non-OECD countries. In China alone they grew by more than 150% due to rapid industrialization and higher energy...
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Consumption. No significant multilateral regulations limiting emissions have materialized since the Kyoto Protocol was signed in 1997. Given how long particulates remain in the air, there is a critical need to act. We believe that clean air in its broadest sense is an investable theme aligned with SDG #11 (safe, resilient and sustainable cities), SDG #13 (combat climate change) and even SDG #3 (healthy lives and promote well-being for all at all ages).

The overwhelming scientific consensus on human-made climate change is generating reform momentum. A new multilateral agreement could emerge at the upcoming UN Climate Conference in Paris in December. The US and China, as the top carbon emitters, have stated their intention to reduce carbon emissions by 2020, and announced joint cooperation in November 2014. Moreover, this year the G7 also agreed to a target of zero carbon emissions from fossil fuels by 2100. Electrical power plants generate 14 gigatons, or 42%, of total annual carbon emissions. Coal-based utilities are likely to face the most pressure from stricter regulations. Indeed, the phase-out of inefficient coal plants is the fastest way to cut CO2. In the US, the Environmental Protection Agency introduced its Clean Power Plan in August to reduce CO2 emissions from fossil fuel power plants 32% by 2030.

Clean air solution providers specialized in renewable energy, energy efficiency, energy storage, clean fuel (e.g. biofuels), emissions control technologies, and carbon capture and storage will experience greater demand for their technologies from emission-heavy companies that must comply with changing rules. During the transition phase, the natural gas industry will benefit from a shift away from coal. According to estimates by the International Energy Agency, USD 35.8trn will be cumulatively invested in clean air solutions by 2030 as a base-case scenario.

Emerging market healthcare

Emerging markets (including China, India, Indonesia, Brazil) are home to half the world’s population. But healthcare spending there is less than half that of developed markets. Stepping up public investment in healthcare will require greater urgency in the next 10 years due to rapidly graying populations and rising demand for modern healthcare services from urban middle classes. The 65-year-plus demographic of the emerging market population will rise from 10% to 15% by 2030, according to the UN. The growing healthcare demands of hundreds of millions of senior citizens, coupled with the more expensive costs of treating non-communicable disease, suggest that healthcare investment will need to rise.

Emerging market healthcare investment ties most prominently to SDG #3 (ensuring healthy lives and promoting well-being at all ages). It mitigates inequality in healthcare services between rich and poor countries as well as within countries themselves. This also engages SDG #10, which is concerned with reducing inequality among and within countries. One example of this inequality is the strong link between the quality of healthcare service in a country and its rate of child mortality.

Fig. 4: Examples of GHG emission-reduction commitments ahead of climate conference

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Intended Nationally Determined Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>Reduce EU domestic GHG emissions by at least 40% below 1990 levels by 2030.</td>
</tr>
<tr>
<td>US</td>
<td>Reduce net GHG emissions by 26% to 28% below 2005 levels by 2025.</td>
</tr>
<tr>
<td>Russia</td>
<td>Reduce anthropogenic GHG emissions by 25% to 30% below 1990 levels by 2030 subject to the maximum possible account of absorptive capacity of forests.</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Reduce GHG emissions by 50% below 1990 levels by 2030 (35% below by 2025).</td>
</tr>
<tr>
<td>Norway</td>
<td>Reduce GHG emissions by at least 40% compared with 1990 levels by 2030.</td>
</tr>
<tr>
<td>Mexico</td>
<td>Reduce GHG and short-lived climate pollutant emissions unconditionally by 25% by 2030 with respect to a business-as-usual scenario.</td>
</tr>
</tbody>
</table>

Source: UN Framework Convention on Climate Change; Note: GHG = greenhouse gas

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Discussion of inequality in healthcare services between urban and rural areas also requires addressing sanitation and access to safe drinking water, as well as immunization. For example, safe drinking water inequalities between urban and rural areas remain marked, with 47% of the emerging market population residing in rural areas, where access to water stands at 60% vs. 80% in urban areas. Healthcare investment needs to address prevention as well as treatment of illness. This includes solving water management issues (to control the spread of dengue and malaria) and improving sanitation, as embodied in SDG #6. We expect growth in emerging market healthcare to outpace the global healthcare average over the long term.

Obesity imposes a significant cost on both the individual and society and is expected to raise per-capita healthcare spending in emerging markets. Preventing it involves improving the nutritional content of food, as well as creating greater education and awareness of nutrition, an essential mandate of SDG #2. Treating obese patients earlier and more effectively also helps reduce the co-morbidities that lead to the bulk of associated healthcare costs. Type 2 diabetes, in particular, is the disease most highly correlated with obesity. It is on the rise worldwide, with two-thirds of all cases expected to occur in low- to middle-income countries by 2030, according to the International Diabetes Federation. Better treatment of obesity will also help already stretched healthcare budgets go further, enabling more patients to access adequate healthcare, particularly in the developing world.

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Investing in the battle against obesity offers defensive growth with predictable volume trends, high returns on capital and steady dividend growth, in our view. Investment opportunities in two broad categories – prevention and treatment – stand out. Companies selling healthier food, fitness products and sportswear, as well as the vitamin and supplement industry, should benefit from attempts to curb the epidemic. Also, companies providing drugs, medical products and services to reduce weight or treat obesity-related conditions such as diabetes should be well positioned. We recommend investing in a diversified way across the consumer and healthcare industries to minimize company-specific risks associated with the failure of drugs in development.
Mass transit rail

Asians will continue to migrate from the countryside to city in the next two decades, with the number living in megacities of over 10 million forecast to double by 2025, according to the UN. Meanwhile, as incomes rise, vehicle ownership is doubling every five years, and sharply climbing CO₂ emissions are adding to air-quality problems in Asia’s largest cities. By 2030, Asia will account for 31% of total worldwide transport sector-related CO₂ emissions, almost double the 1990 figure, according to the Emissions Database for Global Atmospheric Research (EDGAR). Indeed, the use of fossil fuels has accounted for a three-fold rise in per capita emissions in China between 1990 and 2012, and a two-fold increase in countries like Thailand, India and Indonesia.

Soaring car ownership has spurred the sharp rise in CO₂ production in Asian emerging markets, with the impact exacerbated by the effect of climate change on air quality. Mass transit rail (MTR) systems have proven highly cost-effective transport solutions for Asia’s densely populated megacities. New governments in India, Indonesia, Thailand and Malaysia are expected to spend over USD 200bn in greenfield MTR systems in the next decade to combat urban congestion. An emphasis on MTR, in particular in Asia, addresses three SDGs: #9 (resilient infrastructure), #11 (safe, resilient and sustainable cities) and #13 (combat climate change and its impacts).

Contractors, property developers, capital equipment suppliers and MTR operators will enjoy high earnings visibility across the public spending cycle, as well as above-GDP earnings growth rates, suggesting that they could be an attractive long-term opportunity.

Agricultural yield

Per capita consumption of calories is increasing as a result of urbanization and rapid income growth in populous developing countries. Rising income, in particular, leads to greater demand for land-intensive food, such as meat, reducing available arable land per capita for food production. Urbanization and the expansion of living and working spaces, driven by the buy-up of farmland by governments and corporations, are also decreasing the amount of arable land, as are erosion and desertification brought about by climate change. The challenge is considerable in light of a 34% rise in the global population by 2050, estimated by the UN, even as global arable land continues to decline.

Feeding a growing and more demanding world population clearly requires raising agricultural yields. Addressing this need is inextricably linked to SDG #2: “End hunger, achieve food security and improved nutrition and promote sustainable agriculture.” A narrow focus on increasing yields may run counter to other SDGs, however. For instance, excessive reliance on fertilizers may affect water quality and availability through run-offs and conflict with SDG #6 (water availability). A large emphasis on monocultures and biotechnology may hurt progress on SDG #15 (prevent loss of biodiversity).

Nonetheless, there are companies that can boost agricultural yields through activities compatible with the SDGs, in our view. They can help meet the enormous challenge of producing more food with less land while achieving attractive earnings growth over the long term. They include select farm-equipment manufacturers, irrigation technology and fertilizer producers, and biotech companies. Investors should bear in mind that, over shorter time horizons, these types of investments are likely to follow the agricultural commodity cycle, which can be highly volatile.
Chapter 3

Investment implementation

The secret of change is to focus all of your energy, not on fighting the old, but on building the new.

Socrates, philosopher (470/469–399 BC)
Portfolio integration of sustainability themes

Sustainability-themed investment ideas such as those identified in chapter 2 can be integrated into portfolios in a variety of ways. Many can be invested in via traditional stocks and bonds. Some are better pursued with more innovative financial instruments. Given the universality of the SDGs, such investments are likely to target developed and developing countries alike.

By directing assets to these and other related themes, investors can pursue return opportunities and express their interests with satellite investments that complement an otherwise well-diversified portfolio. Such thematic ideas can also help populate core portfolio investments. In fact, such themes can be used to guide each of the three main approaches to sustainable investing (SI): exclusion, integration and impact investing (see Box 4). These three approaches are described in greater detail in the third-quarter edition of this series “To integrate or to exclude.”

For example, within impact investing, a private equity fund may invest in typical SI investment themes such as clean tech, healthcare or educational ventures. Within an integration approach, a sustainable fund manager may select companies based on their resource efficiency, gender diversity or supply chain management. Finally, within an exclusion approach, an investor may decide to divest from coal companies based on views about their climate change impact.

To help identify specific investment solutions, the rest of the chapter describes how the public sector is likely to harness private capital; it provides a detailed account of the main investment vehicles available to private investors who want to promote individual SDGs.

Public sector to incentivize private-sector financing

The now-expiring MDGs were associated with a reasonable amount of financial innovation designed to mobilize private capital. For instance, in 2006 the International Finance Facility for Immunization was created by several European countries to issue vaccine bonds on the global capital markets. These instruments accelerate the availability and predictability of funds for immunization. Green bonds (see the following section) are designed to finance environmentally friendly projects and have been expanding rapidly as a

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Box 4: Approaches to Sustainable Investing

**Exclusion**: Investors determine what activities they wish to avoid financing and remove firms engaged in them from portfolios. These choices are largely subjective, i.e. investor-specific. Typical exclusions are alcohol, weapons, tobacco, gambling or adult entertainment.

**Integration**: This approach centers on systematically combining environmental, social and governance (ESG) information with traditional financial considerations to guide investment decisions. Compared to exclusion, integration is more holistic, proactive and involves a higher level of expertise and data availability. It is becoming the state of the art in the SI industry.

**Impact investing**: The objective is to have a positive and measurable impact on society or the environment in addition to achieving a financial return. A variety of structures, including private equity or through lending-based solutions such as microfinance, can be employed.
Investment implementation

market in recent years. Finally, different forms of impact investing aimed at addressing various development and sustainability challenges have been growing at a fast pace.

Achieving the SDGs will require even more innovation and partnership between public actors and private investors. It will necessitate funding far in excess of what is currently available from both public and private sources; specifically, the UN Conference on Trade and Development (UNCTAD) estimates in its World Investment Report 2014 an annual investment gap of USD 2.5trn over the next 15 years. The World Bank, the International Monetary Fund and the multilateral development banks have said they will scale up their financing in support of the SDGs. But given how tight public-sector budgets are today relative to when the MDGs were launched, harnessing private capital will be crucial to closing the funding shortfall, especially in the infrastructure, food security and climate change mitigation sectors.

Appropriate public policy aimed at incentivizing investment in SDG-related initiatives will help maximize the potential of private capital. To this end, UNCTAD proposed a framework for attracting private investment in SDGs. The first component is **leadership**, which encompasses agreeing to a global set of guiding principles for investment policymaking. Next is the **mobilization** of funds through improved-pricing mechanisms, exchanges and reform. These funds are then **channeled** to relevant sectors through incentive schemes and partnerships. Finally, **impact** must be maximized by using technology and entrepreneurship paired with effective regulation and risk-minimization measures.

Putting this framework into practice is not straightforward. Significant barriers impede the marshaling and channeling of capital into markets most starved for funds. Most notably, expected returns are not always proportionate with the level of perceived risk associated with investments in development initiatives. In particular, investments in developing nations face hurdles as their markets are often inefficient and less understood, and lack strong, transparent local regulatory and legal systems.

The key to overcoming these obstacles is new forms of public-private partnerships and innovative financing methods often labeled as blended finance. They seek to align public and private interests through incentive schemes and risk-sharing approaches, including grants, guarantees and first-loss provisions designed to draw private investors.

**Available and prospective investment vehicles**

**Listed equities**

Listed equities are an easily accessible way to support sustainable development objectives, in particular through investment themes such as those outlined in chapter 2. The focus lies on finding listed companies whose activities and business profile further sustainability. This can occur in one of two ways.

First, the company’s output, i.e. its goods and services, may directly reduce a social or environmental problem. The company may offer renewable-energy solutions, provide improved water infrastructure or promote a healthy lifestyle through its food products. This approach has drawbacks because listed companies with sufficient liquidity and of a sufficient size often do not limit their output to one specific product or service. Investors often have to accept investments that are not pure plays on addressing specific sustainability challenges. A certain threshold is usually chosen, such as a minimum of 25% of revenues arising from a sustainability-themed activity. Smaller companies may often allow for a more targeted investment in a theme. But investing in them also comes with risks, such as lower liquidity and less available research on them to enable a considered investment decision.
Investment implementation

Pursuing such strategies is often best delegated to professional money management.

A second angle is to focus on companies that contribute to sustainability goals by fostering good corporate practices and systematically minimizing their environmental and social footprint, i.e. the negative effects their activities may have on environment and society. This can be achieved through strong processes, e.g. superior supply chain management, active stakeholder relations, and/or a sustainability-minded corporate culture. This perspective is in line with the integration approach to sustainable investing presented in the first section of this chapter.

Bonds
Investing to promote sustainable development through the fixed income market offers more options than it does with equities. For investors focused on corporate issuers, the same principles discussed for equities above can readily be applied to bonds. But bonds can be structured in a way that enables better targeting of specific projects either through earmarking or asset securitization. These features have been instrumentalized by the rapidly expanding market for green bonds.

Green bonds are issued to raise funds for environmental projects. Their emergence was originally spearheaded by the World Bank in 2008 to support lending for eligible projects that sought to mitigate climate change or help affected people adapt to it. While multilateral institutions remain active issuers, corporations over the last two to three years have started issuing green bonds as well, using the earmarked proceeds to finance environmentally friendly projects. According to the Climate Bond Initiative, a non-profit organization, green bonds issuance reached nearly USD 36.6bn last year, while total issuance in 2013 amounted to USD 11bn. Issuance through August of this year has totaled USD 23.3bn. The need to fund environmental projects and the desire of issuers to diversify their funding sources have boosted green bond issuance in the last two years, especially out of Europe. A pickup in issuance activity by US state and local governments, a market segment largely targeted at individual investors, is a recent phenomenon. It corresponds with a broadening investor base for green bonds, which were originally a focus of institutional investors.

Generally speaking, green bonds gather funding for environmental projects associated with climate change or sustainability. Since early last year, the Green Bond Principles have been providing guidance on what qualifies as a green bond. But they are voluntary and only certain green bonds issued have been reviewed and audited by independent agencies like Cicero, Vigeo or DNV-GL. The most commonly used structure is a regular senior unsecured bond, with the issuer promising to use the proceeds for “green” purposes. The investor does not directly participate in the revenues and risk of the funded projects, however. In this case, the risk of an investment is identical to that of a regular bond of this issuer, and the green bonds should trade at similar valuations, which they usually do. Alternative types of green bonds include structures in which there is a direct exposure to the funded projects. This includes “use of proceeds revenue bonds,” in which investors have a claim on the cash flows of the funded projects but no recourse to the issuer. “Green project bonds” also have direct exposure to the project risk, but may provide recourse to the issuer. The most complex version is “green securitized bonds,” which can be structured like asset-backed securities or covered bonds.

We think green bonds have plenty of social value and enhance awareness about environmental issues and the projects undertaken to mitigate them. There are also reputational benefits to issuers of and investors in them. The economic value mainly comes from supporting companies and development institutions in gathering funding for large environmental projects. Looking at the asset class from a pure risk/return angle, we see no additional benefit to investing in them versus other bonds at this stage, but there is also no

Fig. 8: Green bond market expanding fast
Annual and cumulative issuance in USD billions

Source: The Climate Bonds Initiative, as of 25 August 2015
disadvantage besides the potentially somewhat lower secondary market liquidity. We consider them a viable addition to a well-diversified portfolio, and recommend either focusing on issuers of sound credit quality (at least investment grade rated) to mitigate the adverse consequences of lower market liquidity or choosing diversified investment solutions like mutual funds.

Pay-for-success contractual structures

Social Impact Bonds (SIBs) are a relatively new funding mechanism for putting private capital to work on behalf of social issues as an alternative to traditional government funding. They differ from regular bonds in terms of their structure and their payoff to the lender. Their specific structure varies, but generally they are financial contracts for private investors to lend money to a third-party social services provider charged with completing a public service project specified by a government agency. Unlike regular bonds, which typically earn a fixed rate, SIBs are unique in that the financial returns to the lenders depend on achieving specific social outcomes set forth when the bond is issued. The government only pays the service provider for verified outcomes, and the financial return to private investors is commensurate with the level of success of the social project (pay for success). Simply put, investors are only paid back if predefined objectives are met. This feature of the contract can incentivize service providers to focus more on outcomes than on process and can achieve net savings for governments over time. These instruments can be structured with a first-loss guarantee feature, with either philanthropic capital or a development aid institution standing ready to absorb loss up to a certain threshold. This serves as a form of credit enhancement and catalyst to attract private investors. As returns vary according to the level of social impact, discretion must be used to identify bonds associated with effective service providers.

SIBs have achieved varying degrees of success since inception. The first one, called the Peterborough Social Impact Bond, was issued in the UK in 2010. It was launched by Social Finance, a not-for-profit organization that addresses social issues through public-private partnerships. The goal of the program was to rehabilitate 3,000 short-term male prisoners at Peterborough prison. Its success would be measured by a set reduction (at least 7.5%) in the 12-month reconviction rate over a seven-year term, with greater upside for reductions above the threshold. According to the G8’s Social Impact Investment Taskforce, the program has met its objective, with the first cohort of 1,000 prisoners demonstrating an 8.4% reduction in reconviction events relative to the comparable national baseline. Similar success was achieved in Australia: its first SIB returned 7.5% to investors. But the initial SIB in the US disappointed. The goal of the program was to reduce youth recidivism rates at Riker’s Island jail through cognitive therapy. Unfortunately, it did not achieve the threshold rate needed to trigger returns, and as a result was discontinued.

Development Impact Bonds (DIBs) are a specific type of SIB that has emerged more recently and is applied to the development context. The outcome payer is some entity other than a local/national government – for example, an aid agency, foreign development aid ministries, multilateral institutions or a philanthropist. While SIBs typically focus on providing social services in developed economies, DIBs focus on economic and social development in developing countries, whose governments may not have the resources to pay for the projects in question on their own.

SIBs and DIBs carry a unique set of risks, since repayment is contingent on a successful social outcome and significant losses are possible in the case of failure. They also offer an attractive net return potential should the project succeed, as well as low correlation with the rate of local economic growth, equity markets and interest rates.

Fig. 9: Active social impact bonds by sector

Source: Gustafsson-Wright et al. (2015)
Despite their uneven track record, SIBs and DIBs are likely to continue to gain in popularity. SIBs today fund over 40 programs globally, providing quality preschool education, reducing prison recidivism and increasing youth employment. Though still in their infancy, DIBs have been launched in areas such as healthcare and education.

The learning curve is steep, as these deals involve public and private stakeholder collaboration in an often unchartered, complex area. Success has been best in fields with complex inputs but simple outcomes that can be easily quantified, though impact bonds will likely come to include a wider range of objectives, including those related to childhood development, health, housing, and water and sanitation, according to a recent study by the Brookings Institution. As the market grows, the difficulties faced in the first five years of deal development should lessen, opening up more opportunities. In fact, the US Congress is currently considering the bipartisan Social Impact Bond Act, legislation that would enable the US federal government to allocate USD 300m to SIBs.

Sustainable private market investments
Because finding listed equity investments focused exclusively on specific sustainable activities is difficult, sustainability-minded investors are increasingly turning to private markets. Funds engaged in private equity, private debt and private real assets (such as real estate and infrastructure) have emerged as effective structures to invest in while targeting certain sustainability objectives.

Private equity impact funds aim to provide equity financing (such as venture and growth capital) to non-listed companies. Private debt impact funds operate through a wide range of debt instruments (from senior secured to unsecured subordinated), which are adapted to the profile and needs of borrowers. Private real asset funds finance projects (such as social housing or educational infrastructure) through a mix of equity and debt injection. Impact investing through private market funds targets a broad range of non-financial outcomes, such as job creation in underprivileged communities and regions and improved access to education, healthcare and capital.

Microfinance provides financial services to individuals and small business entrepreneurs – typically in a developing country – who would otherwise lack access to them. While it also includes microsavings and microinsurance, it was popularized through microcredit. Microcredit institutions lend small amounts of money usually to impoverished individuals without requiring collateral from them, such as assets or a secure job. The most famous modern microcredit institution is the Grameen Bank, which emerged in 1983 in Bangladesh. It provides microloans to women by relying on a group lending system. Its success has led to widespread adoption of variations of this model across the developing world.

Investors can invest in microfinance either through private equity participations in microfinance institutions, investments in microfinance funds or direct lending to such institutions. Funds enable investors to diversify their exposure by region, type of recipient and financing strategy.
Outlook and conclusion

I alone can’t change the world, but I can cast a stone across the water to create many ripples.
Mother Theresa, missionary (1910–1997)

Achieving the UN’s Sustainable Development Goals (SDGs) is unfeasible with public funds alone. The funding gap can only be bridged if the private sector steps up its contribution significantly. National governments and multilateral institutions are set to adopt policies and programs aimed at mobilizing private capital through regulations, incentive structures and public-private partnerships.

The challenges underlying the SDGs create a range of opportunities for private investors, among them thematically driven investments of traditional stocks and bonds that can feature in portfolios in a mainstream fashion. They can focus on energy efficiency, climate change mitigation, water and food availability, or infrastructure construction in developing economies, to name just a few areas.

In addition, innovative investments aimed at solving specific problems have emerged in recent years and will continue to grow in popularity, in our view. They include green bonds aimed at financing environmentally friendly projects, as well as social impact bonds and development impact bonds that finance social services and development projects with payoffs accruing to investors only when the projects succeed. Finally, within private markets, dedicated private equity, private debt and real asset funds that finance targeted, high-impact projects are also likely to garner greater investor attention.

Today, investors so inclined can already streamline a sustainable investing approach across their portfolios. Developments in coming years will make it even more straightforward.
Glossary

EM Emerging markets
EU European Union
GHG Greenhouse gas
LED Light-emitting diode
MDGs Millennium Development Goals
OECD Organisation for Economic Cooperation and Development
SDGs Sustainable Development Goals
SI Sustainable Investing
UN United Nations
UNCTAD United Nations Conference on Trade and Development

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