INDOSUEZ WEALTH MANAGEMENT

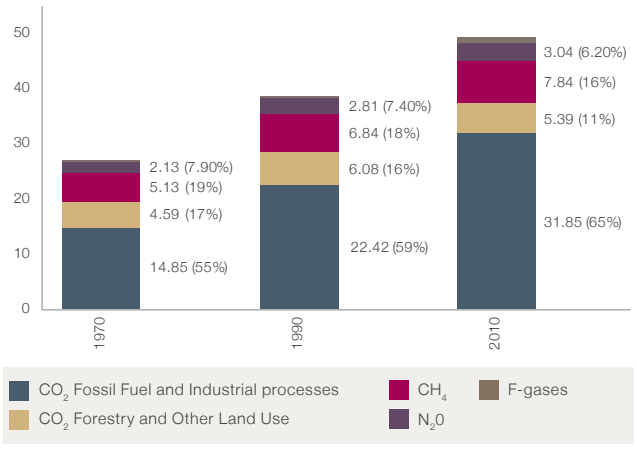
IN 15 MINUTES

MITIGATING CLIMATE CHANGE: THE INVESTABLE UNIVERSE

"Anthropogenic [relating to or resulting from the influence of human beings on nature] greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800'000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century". Intergovernmental Panel on Climate Change (IPCC), 2014.

Total greenhouse gas (GHG) emissions have increased by 2.2% per year between 2000 and 2010 (IPCC). These include CO_2 from fossil fuel and industrial processes (65%), CO_2 from forestry and other land use (11%), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases covered under the Kyoto Protocol (F-gases) (Chart 1).

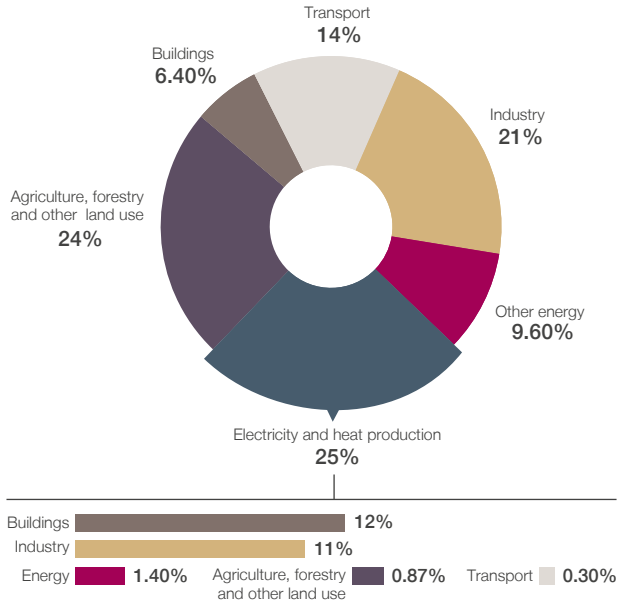
CHART 1: TOTAL ANNUAL ANTHROPOGENIC GHG EMISSIONS BY TYPE OF GAS (1970–2010), GIGATONNE OF CO_2-EQUIVALENT PER YEAR



Source: IPCC, Indosuez Wealth Management

As regards sectors, electricity and heat production are responsible for 25% of all GHG emissions, while agriculture, forestry and other land use make up 24% of emissions, while industry generates 21% (Chart 2).

CHART 2: GREENHOUSE GAS EMISSIONS BY ECONOMIC SECTOR



Source: IPCC, Indosuez Wealth Management

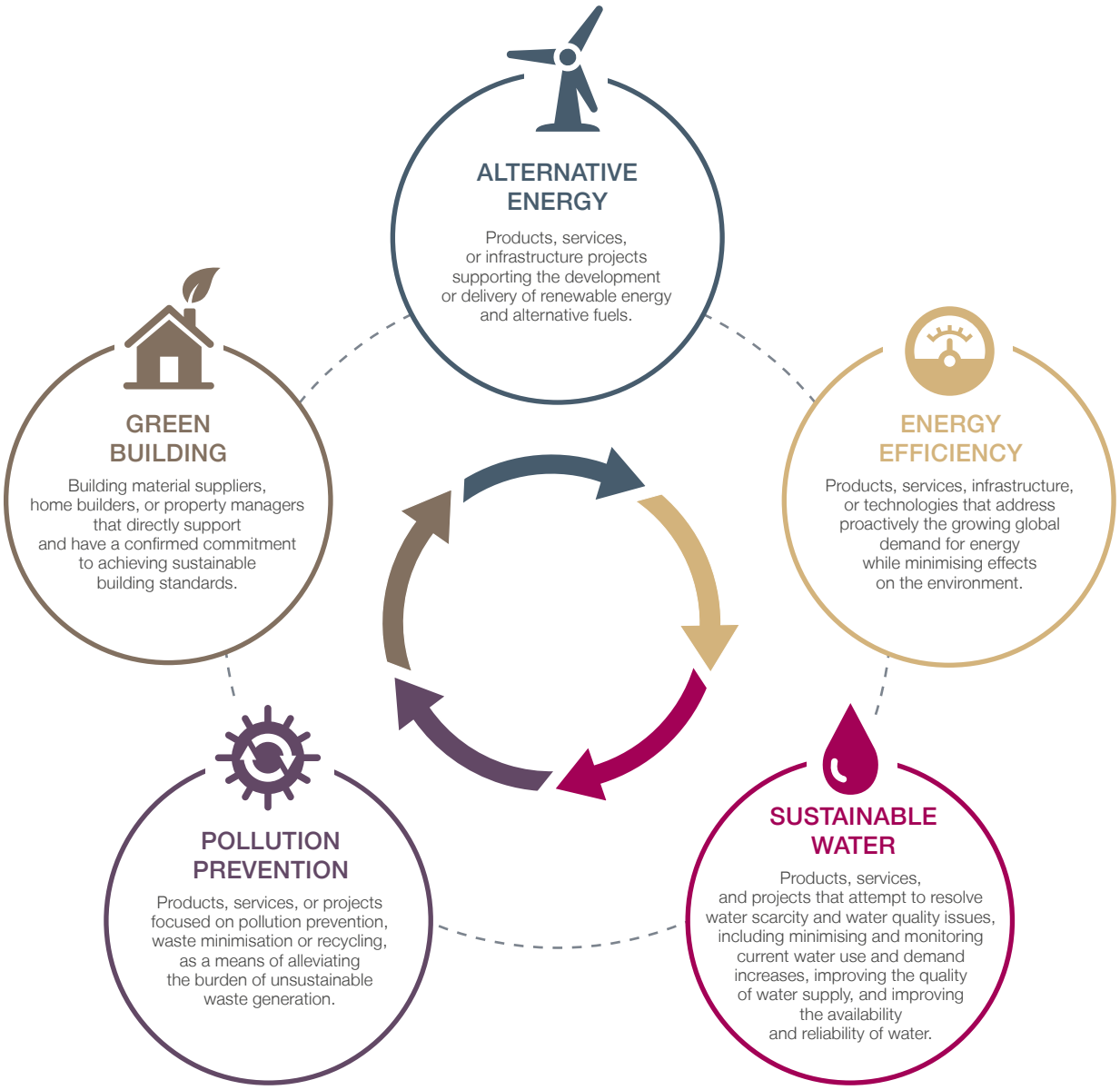
The landmark agreement to combat climate change, reached on 12 December 2015 at the COP 21 in Paris, aims to accelerate and intensify the actions and investments needed for a sustainable low-carbon future. As many as 185 countries and entities have ratified the Paris Agreement.

Indeed, in order to achieve the Agreement's aim of keeping global warming well below 2°C, low carbon investments will need to increase significantly. A recent study led by the International Institute for Applied Systems Analysis (IIASA) showed that in order to contain the global temperature rise to 1.5-2°C, investments in low carbon energy and energy efficiency will likely need to exceed investments in fossil fuels as early as 2025 and then grow far higher[1].

The current investment gaps are striking: to meet countries' Nationally Determined Contributions (NDCs)[2], an additional USD 130 billion of investment per year will be required by 2030, while to achieve the 2°C target the investment gap reaches USD 320 billion per year. To contain the rise to 1.5°C, the number climbs to USD 480 billion. These figures represent more than a quarter of total energy investments foreseen in the baseline scenario, and up to half in some economies such as China and India[3].

Here we examine how investors can gain exposure to the actors in the transition towards a low-carbon economy, by identifying the relevant technologies, services, and products that help in climate-change mitigation. We use MSCI's methodology to identify five key areas[4].

DIAGRAM 1: FIVE KEY AREAS TO MITIGATE CLIMATE CHANGE



Source: MSCI, Indosuez Wealth Management

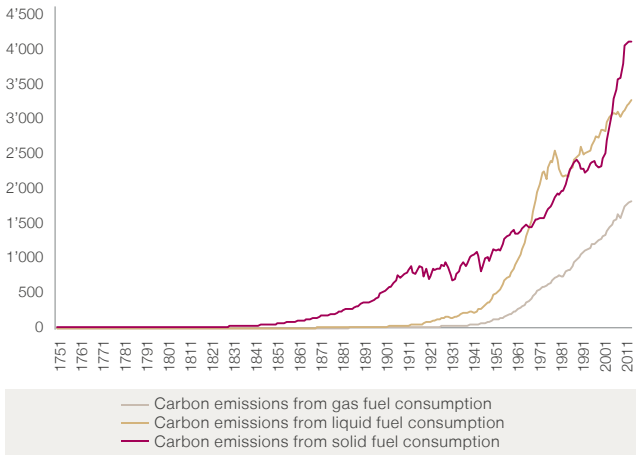
1 - David L. McCollum et al., Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable Development Goals. Nature Energy, 2018.
2 - From the UNFCCC: "The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions".
3 - See (1).
4 - Methodology of the MSCI Global Environment Index.

ALTERNATIVE ENERGY

The large potential of renewable energy sources to reduce global greenhouse gases emissions (GHG) has been studied extensively. Benefits are wide-ranging, and when implemented properly, renewable energy sources can help social and economic development, improve energy access and secure a sustainable energy supply, and reduce negative impacts of energy provision on the environment and human health as well[5].

Electricity and heat production represent 25% of global greenhouse emissions, other energy 10%, and transportation 14%[6]. The consumption of fossil fuels therefore accounts for the majority of global anthropogenic GHG emissions – which have surged in the modern era. Chart 3 shows the parabolic increase in carbon emissions from the consumption of gas fuel, liquid, and solid fuel since 1750. Between 2000 and 2014 only, carbon emissions from gas fuel consumption increased by 41%, and emissions from solid fuel consumption (such as coal or wood) increased by 77%[7].

CHART 3: CARBON EMISSIONS FROM FOSSIL FUEL CONSUMPTION



Source: Tom Boden (Oak Ridge National Laboratory), Indosuez Wealth Management

The most well-known renewable energy sources are solar and wind technologies. **Solar power**, for its part, uses the energy of solar irradiance to produce electricity (using photovoltaics and concentrating solar power) and thermal energy (heating or cooling), as well as to meet direct lighting needs and, potentially, to produce fuels that might be used for transport and other purposes.

Wind technology, as the IPCC describes, "harnesses the kinetic energy of moving air", mostly to produce electricity, the primary application of relevance to climate change mitigation. Wind turbines can be located on land ("onshore" – over 90% of cumulated installations) or in sea- or freshwater ("offshore").

Other renewable energy sources include bioenergy, geothermal energy, ocean energy, and hydropower. **Geothermal energy** uses the thermal energy stored in the earth which is extracted from geothermal reservoirs through wells or other means. Fluids of various temperatures can generate electricity or, more directly, thermal energy for both heating and cooling.

Ocean energy, "derives energy from the potential, kinetic, thermal and chemical energy of seawater, which can be transformed to provide electricity, thermal energy, or potable water" (IPCC). The range of technologies is quite wide, from barrages for tidal range to submarine turbines for tidal and ocean currents, heat exchangers for ocean thermal energy conversion, and devices to harness waves' energy.

Bioenergy is used to produce electricity or heat, or can generate gaseous, liquid, or solid fuels. Biomass feedstocks include forest, agricultural, and livestock residues, energy crops, the organic component of municipal solid waste, and other organic waste streams.

Hydrogen fuel cells convert the chemical energy of hydrogen to produce electricity. Fuel cells have a wide range of applications, notably in transportation or backup power systems.

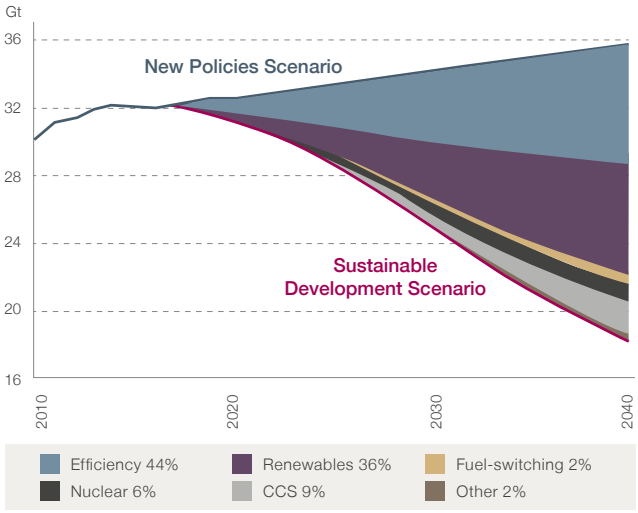
Hydropower as a source of renewable energy (primarily to generate electricity), is controversial given its impact on the environment – its role in modifying the ecology and the physical characteristics of the river where they are implemented has been criticised. Traditionally, other energy sources are favoured in clean energy portfolio.

5 - IPCC (2012).
6 - IPCC (2014). Based on global emissions from 2010.
7 - Boden, T.A., Marland, G., and Andres, R.J. (2017). Global, Regional, and National Fossil-Fuel CO_2 Emissions. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., USA.

ENERGY EFFICIENCY

While alternative energy sources discussed above have great potential to reduce GHG emissions, solutions that promote reduced energy use are just as important. In its "World Energy Outlook 2017", the IEA estimated that efficiency alone will realise over 40% of the carbon emissions reductions required to meet global climate change mitigation goals – the largest single contribution (Chart 4)[8].

CHART 4: GLOBAL CARBON DIOXIDE (CO_2) EMISSIONS REDUCTIONS IN THE WEO 2017 NEW POLICIES AND SUSTAINABLE DEVELOPMENT SCENARIOS



Source: IEA, Indosuez Wealth Management

Global energy demand rose by 1.9% in 2017, the largest annual increase since 2010, driven by strong economic growth. As a result, energy intensity – i.e., primary energy use per unit of gross domestic product (GDP) – fell by just 1.7% in 2017, the slowest rate of improvement since 2010.

Under the Efficient World Scenario of the IEA (i.e. if countries realised all the available cost-effective energy efficiency potential between now and 2040), GHG emissions could peak before 2020.

INCREASING THE EFFICIENCY OF INDUSTRY

An important aspect of reducing energy usage lies in the efficiency of industry. In Germany, for example, the Electrical and Electronic Manufacturers' Association (ZVEI[9]) estimated in 2011 that a total of 88 billion kWh could be saved every year from the modernisation of industrial production systems, commercial sites and public facilities, and from the use of intelligent measuring technology, process automation and electric drive technology. The energy saved in that case would lead to a reduction in CO_2 emissions of 43 million tonnes per year[10] (more than 5% of the country's total CO_2 emissions in 2017). For industrial companies, energy efficiency plays a significant role in reducing energy costs – in Germany, electricity prices are set to increase further with the phasing out of coal. Electricity prices for non-household consumers reached EUR 0.15 kWh in the first half of 2018 (including taxes, without VAT), and, based on this price, the saving in energy costs would amount to around EUR 13 billion a year.

Energy efficient motors, variable speed drives, analysis and measuring devices, controllers, and optimisation software, are interesting products enabling the automation of industry. Companies active in this field are often not "pure plays" in the field of energy transition, but rather active in multiple areas. However, we think the role of these companies is crucial in achieving a reduction in GHG emissions, and argue that such companies should be considered when constructing a portfolio of "green" companies.

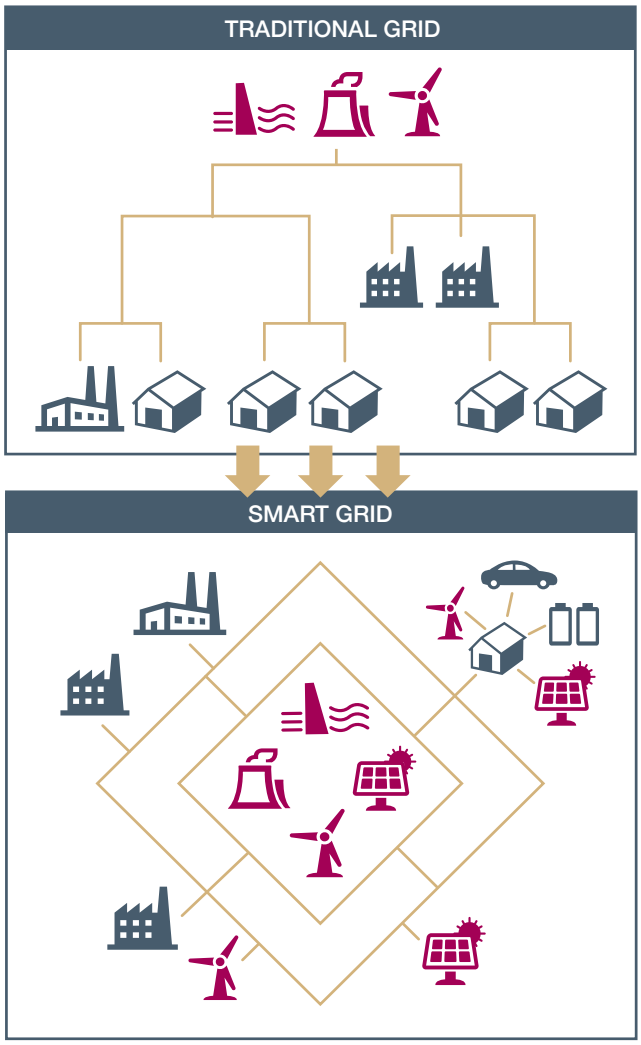
ACHIEVING BETTER POWER MANAGEMENT AT THE UTILITY LEVEL

There are several reasons utilities are engaging in increased efficiency. First, it is faster, easier, and less expensive for utilities to increase energy efficiency than to build new infrastructure to produce electricity. As such, energy efficiency is considered an important "source" of energy for utilities. Second, regulation is becoming more stringent. For example, the European Energy Efficiency Directive 2012 established binding measures to mandate energy efficiency improvements. On 14 June 2018 the EU Commission, Parliament, and Council agreed on a binding energy efficiency savings target of 32.5% by 2030 (the EU had previously set a 20% energy efficiency target by 2020).

An important aspect of energy efficiency at the utility-level is related to the development of smart electric grids. With the traditional electric grid, power only flows one way, from the producer to the consumers. Smart electric grids are more of a network: a number of small and distributed resources serve the entire grid along with large plants, and consumers are both importing and exporting power from and to the grid[11]. This is so because increasing renewable energy generation also means boosting distributed energy generation (where power plants are smaller and closer to the consumer). Furthermore, the development of renewable energy increases the need for storage capacity with battery systems.

8 - International Energy Agency, Energy Efficiency 2018.
9 - Zentralverband Elektrotechnik- und Elektronikindustrie e.V.
10 - ZVEI (2011) Energy efficiency services in automation.
11 - Chendan Li and al. (2017). Grid Architecture for Future Distribution System—A Cyber-Physical System Perspective.

CHART 5: THE TRANSITION FROM TRADITIONAL TO SMART GRID



Source: Chendan Li and al. (2017), Indosuez Wealth Management

Smart grids use wireless sensors that collect and transmit data in order to adjust electricity flows automatically. Through advanced metering infrastructure, smart meters communicate with the utility company. Thus, smart grids are flexible (variations in generation and consumption), reliable (real-time information and remote management of the grid reduce the risk of power failures and incidents), accessible (different sources of energy can be integrated into the grid), and allow for energy savings and reduced costs[12]. For example, customers can make informed choices about energy usage based on the price at the time of use. Smart grids also help reduce transmission and distribution losses which amount to 8.3% of total output on a global level[13].

NEW MOBILITY

Transportation is responsible for 14% of global GHG emissions (IPCC), and demand for transportation is expected to surge in the coming decades: according to the International Transport Forum[14], both freight and passenger volumes will see strong growth from now until at least 2050. More specifically, global passenger demand should more than double between 2015 and 2050, from 50'000 to 120'000 billion passenger-kilometres (i.e. the transport of a passenger for one kilometre). In particular, travel demand by car is expected to increase by 45'000 billion passenger-kilometres over the same period, resulting from rising income levels in developing countries.

To slow the rise in motorisation, public transport is of very good help. The ITC showed that rail, and especially high-speed rail, can be relevant for some inter-city travel, and reduce both travel by plane and by car. Moreover, car-sharing applications could also help limit the number of vehicles on the road without penalising mobility, but the impact is likely to remain marginal for some time. The car rental industry too should benefit from changing consumer habits and the rise in the "sharing economy". The global car rental market is expected to reach approximately USD 124.56 billion by 2022, growing at a CAGR of around 13.55% between 2017 and 2022[15].

Over the past decade, efforts have been made to develop more energy-efficient, hybrid, and electric vehicles. These come with stricter CO_2 emissions regulation. On that front, Europe has set CO_2 targets for 2021, 2025 and 2030. The targets are set for the fleet average, in grammes of CO_2 emitted per kilometre, and are the strictest currently put forward (15% below Chinese targets for 2021 and 20% below the US[16]). The US has put CO_2 regulation in place in two phases (2012-16 and 2017-25), but President Trump is seeking to redefine the 2025 regulation. On the other hand, China's CO_2 targets are "goals" and are not strictly enforceable. These goals are defined by the "Made in China 2025" policy, and the focus for China's complying with the goals in 2019/20 is on "new energy vehicles" (NEVs[17]), where the government has set specific penetration targets.

Globally, few companies focus on the production of electric vehicles, and traditional car manufacturers will have to increase their offering of plug-in hybrid electric vehicles (PHEV) and electric vehicles (EV) if they are to meet their CO_2 emissions targets. Less than 5% of the European model offering have CO_2 emissions below the required 95g/km level, and the bulk of the internal combustion engine (ICE) offering lies between 120-150 g/km[18].

Battery makers will also need to develop more efficient models. In Europe, the European Commission launched the "European Battery Alliance" cooperation in October 2017, a platform with key industrial stakeholders, interested Member States and the European Investment Bank.

12 - Energuide.be.
13 - World Bank (2014).
14 - ITC Transport Outlook (2017).
15 - Zion Market Research (2017). "Car Rental Market by Car Type (Luxury Cars, Executive Cars, Economy Cars, SUV Cars and MUV Cars) for Local Usage, Airport Transport, Outstation, and Others: Global Industry Perspective, Comprehensive Analysis, and Forecast, 2016–2022".
16 - Exane BNP Paribas.
17 - NEVs are battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs) and fuel cell electric vehicles (FCEVs).
18 - Exane BNP Paribas.

As the EU Commission outlined: "The immediate challenge to create a competitive and sustainable battery manufacturing industry in Europe is immense, and Europe has to move fast in this global race". From 2025 onwards, the European market could reach EUR 250 billion a year, with 10 to 20 gigafactories (battery cells mass production facilities) to cover EU demand. However, today, approximately 80% of the world's existing and planned battery production capacity is located in Asia.

The charging infrastructure will also need to be developed substantially. In the EU, for example, there are approximately 135'000 public rechargers in place, but the European Commission estimates the need at 440'000 public rechargers by 2020[19]. There are different models: private charging stations sponsored by carmakers (used exclusively by cars of that brand), 100% private charging stations, or privately-managed stations but commissioned by governments or utilities. There are also public or semi-public networks of charging stations managed and financed by governments or utilities.

IMPROVED LIGHTING EFFICIENCY

The lighting industry is undergoing a significant transition, from conventional lighting products to light-emitting diode (LEDs) products, and the industry is taking the opportunity, stimulated by the Internet of Things, to include smart controls in lighting products, enabling reductions in electricity usage. In the US, widespread use of LEDs could save about 348 terrawatt hour (TWh) of electricity by 2027 – the equivalent of the output of 44 large electric power plants[20].

The LED-lighting market scale could reach USD 33.3 billion in 2019, and market penetration is expected to rise to 63% in 2022, from 22% in 2017[21].

SUSTAINABLE WATER

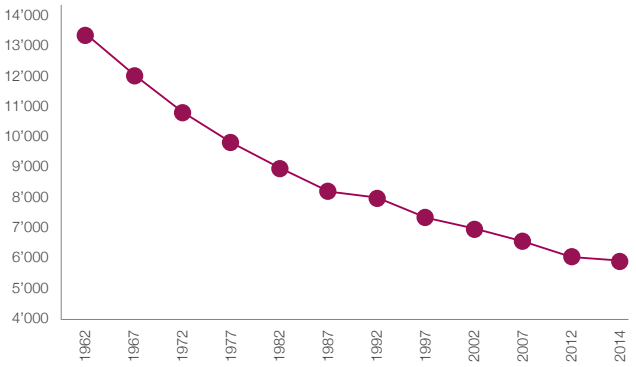
Since the supply of freshwater on earth is limited and demand is growing rapidly, clean water is an increasingly sought-after commodity.

Water withdrawals, defined by the OECD as "freshwater taken from ground or surface water sources, either permanently or temporarily, and conveyed to a place of use", has risen sharply.

Global water withdrawal increased from less than 6'000 m^3/year in 1900 to almost 40'000 m^3/year in 2010, thus rising 1.7 times faster than population over the past century (Aquastat). Population growth, industrial development, and the expansion of irrigated agriculture explain the rapid growth in water demand.

As a result, globally, the volume of renewable freshwater per capita has been divided by two over the past 50 years (Chart 6).

CHART 6: RENEWABLE INTERNAL FRESHWATER RESOURCES PER CAPITA (CUBIC METERS)



Source: Food and Agriculture Organization, AQUASTAT data, Indosuez Wealth Management

DEVELOPING THE RIGHT INFRASTRUCTURE

The priority in developing countries is to build the adequate infrastructure to secure access to freshwater for their populations. In 2015, São Paulo in Brazil experienced its worst water crisis in 80 years. A lack of appropriate infrastructure in addition to significant leakage caused the city to impose rationing of water – despite the fact that the country ranks first in the world in terms of freshwater resources (with approximately 12% of the world's total[22]).

In many developed countries, the infrastructure is ageing and will require significant investment as installations reach the end of their useful lives. In the US, investment needs in drinking water network and wastewater management amount to USD 1 trillion during the next 25 years in order to avoid the risk of a water crisis[23]. The problem of ageing infrastructure also touches Europe, where leakage leads to significant clean water losses.

Investors should look for companies that are involved in monitoring, measuring, and repairing – all crucial to reduce leakage and loss of clean water. It is also essential to develop controls to prevent pollution and contamination. Last but not least, waste management is a critical area: improper solid-waste disposal led China's Ministry of Land and Resources to report that nearly 60% of China's underground water is "unsafe for human contact". The Chinese government announced an ambitious action plan in 2015 to clean up water pollution, the "Water Ten Plan".

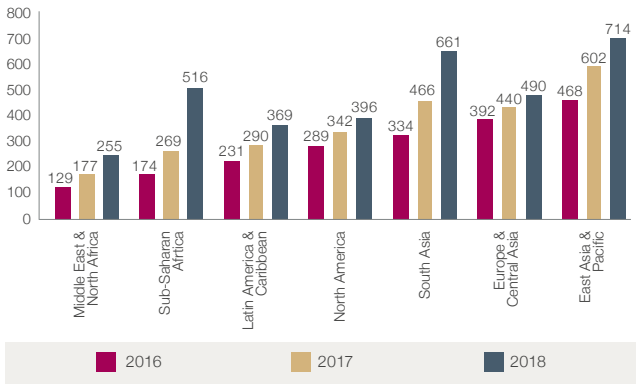
19 - http://europa.eu/rapid/press-release_MEMO-18-6113_en.htm
20 - https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/led-lighting
21 - LEDinside.
22 - Worldatlas.com
23 - Calculations by the National Water Resources Association and the American Water Works Association.

POLLUTION PREVENTION

Pollution involves all types of deterioration in the quality of water, air, or soil caused by humans and their activities. Pollution prevention refers to waste management, recycling, and other technologies and services that aim to limit pollution and its consequences.

Indeed, the global waste situation is alarming. The World Bank found that without urgent action, global annual waste generation will increase by 70 percent from current levels by 2050 or from 2.01 billion tonnes in 2016 to 3.4 billion tonnes in 2050[24]. High-income countries[25] are currently generating more than one-third of the world's waste, while only accounting for 16% of the world's population. However, as shown in Chart 7, urbanisation and growing populations, in particular in Sub-Saharan Africa, South Asia, East Asia and Pacific, will drive rapid growth in waste generation in these regions. By 2050, the World Bank expects waste generation to triple from current levels in Sub-Saharan Africa, and to double in South Asia.

CHART 7: PROJECTED WASTE GENERATION BY REGION



Source: World Bank, Indosuez Wealth Management

Improper waste management also severely affects the environment. Studies have shown that landfill sites, for example, may cause air, water, and soil pollution, and incineration is known to result in emissions of air pollutants. Overall, air pollution kills an estimated 7 million people per year[26]. Moreover, 9 out of 10 people breathe air that contains high levels of pollutants, including greenhouse gases (GHG), according to the World Health Organisation.

The good news is that solutions do exist. GHG emissions for landfill for the EU 28 countries decreased from 180 million tonnes to 100 million tonnes between 1990 and 2011. The adoption of the 1999 Landfill Directive helped reduce the amount of biodegradable municipal waste (the type of waste that is responsible for methane emissions) going to landfill.

While more than one-third of waste in high-income countries is recovered through recycling and composting, only 4% of waste in low-income countries is recycled, according to the World Bank.

In particular, plastics – 12% of all solid waste in 2016[27] – are very problematic. With no action, by 2050, there will be more plastics than fish in the ocean, by weight[28].

The potential investable universe is made up of companies involved in waste management, air pollution reduction, and, in a broader sense, that offer services and products to "salvage, use, reuse, and recycle post-consumer waste products"[29]. One could also include environmental remediation. This is when pollution cannot be eliminated earlier in the production process, and later environmental remediation projects can take the form of land treatment and brownfield clean-up, soil washing, chemical oxidation, and bioremediation – all essential to prevent the negative effects from pollution on the environment.

GREEN BUILDINGS

Buildings are responsible for 6.4% of global GHG emissions. Moreover, of the 25% of GHG emissions attributed to the production of electricity and heating, buildings account for 12%[30]. Most of these emissions come from fossil fuel-combusted heating, cooling, and lighting, and from powering appliances and electrical equipment. When the manufacture and transport of building construction- and demolition- materials are considered in addition to the transportation associated with urban sprawl, this percentage is higher[31]. The impact of buildings on the environment happens during the construction phase, occupancy, renovation, repurposing, and demolition. Indeed, buildings use energy, water, and raw materials, and also generate waste[32]. They are therefore an important contributor to climate change and the use of resources.

A "green" building is a building that reduces the negative impacts and creates positive impacts on our climate and natural environment.

24 - World Bank (2018), What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050.
25 - Defined by the World Bank as countries with a gross national income (GNI) per capita exceeding USD 12'476.
26 - World Health Organization, 2018.
27 - World Bank, 2016.
(28). World Economic Forum, Ellen MacArthur (2016). The New Plastics Economy - Rethinking the future of plastics.
(29). MSCI Global Environment Index.
(30). IPCC (2014). Based on global emissions from 2010.
(31). USGBC.
(32). WGBC.

GREEN BUILDING CERTIFICATIONS

There are multiple areas to which the concept of standards and certifications can be applied. As described by the World Green Building Council (WGBC), they include:

- Use of energy, water, and other resources;
- Pollution, and the enabling of re-use and recycling;
- Good indoor environmental air quality;
- Use of materials that are non-toxic, ethical, and sustainable;
- Consideration of the environment in design, construction, and operation;
- Consideration of the quality of life of occupants in design, construction, and operation;
- A design that enables adaptation to a changing environment.

In the 1990s the Building Research Establishment's Environmental Assessment Method (BREEAM) emerged as the first green building rating system in the UK. In 2000, the US Green Building Council (USGBC) followed suit and developed and releases criteria aimed at improving the environmental performance of buildings through its Leadership in Energy and Environmental Design (LEED) rating system for new construction (later developed for existing buildings and entire neighbourhoods). Standards, ratings, and certification programmes in the marketplace help guide, demonstrate, and document efforts to deliver sustainable, high-performance buildings. It is estimated that there are nearly 600 green product certifications in the world with nearly 100 in use in the US[33].

To assess the level of sustainability of Real Estate Investment Trusts (REITs), one can rely on the Global Real Estate Sustainability Index's (GRESB) methodology. The scoring evaluates performance against seven sustainability aspects (including environmental, social and governance matters) and contains approximately fifty indicators. The method allows for standardised data applicable to the wide variety of property companies and funds. Energy consumption, GHG emissions, water consumption, and waste are the most important performance indicators. Moreover, it allows for comparison across different regions, investment vehicles, and property types.

IMPROVING THE EFFICIENCY OF BUILDINGS

In 2016, less than 10% of the USD 4.6 trillion invested globally in the construction and renovation of buildings were spent on energy efficiency improvements[34]. However, the regulatory pressure is increasing, and measures have been taken to accelerate the transition towards energy-efficient buildings. Europe targets that all new buildings be "'nearly zero-energy" by 2020. On 9 July 2018, the revised Energy Performance of Buildings Directive (2018/844/EU) entered into force. Revisions aim to accelerate the cost-effective renovation of existing buildings in order to move towards a decarbonised building stock by 2050 thanks to greater mobilisation of investments[35]. Since 2011, the US Department of Energy's (DOE) Better Buildings Initiative seeks to hasten the pace of energy-efficiency adoption in buildings by developing solutions with market leaders and by facilitating energy-efficient investments.

With regards to the investment universe, apart from REITs and real estate operating companies, one can look at home builders which focus on improving the environmental footprint of buildings, as well as companies producing sustainable alternative building materials.

Regarding building materials, stone wool insulation, for instance, features an average of 75% post-industrial recycled content and does not require additional chemical treatment to make it resistant to fire, while traditional fiberglass insulation typically contains between 40 to 60% recycled glass content[36]. Another interesting material is acetylated wood. We know that wood construction reduces GHG emissions, notably thanks to avoided emissions from building with concrete and steel[37]. Acetylation, a non-toxic wood modification, increases the performance of sustainably sourced non-durable temperate wood species and thus allows for a reduction in the use of tropical hardwood. Some companies offer energy-efficient technologies for buildings in the area of climate control, heating, and ventilation. Better measurement improves reactivity and precision regarding the reduction in the consumption of energy inside buildings.

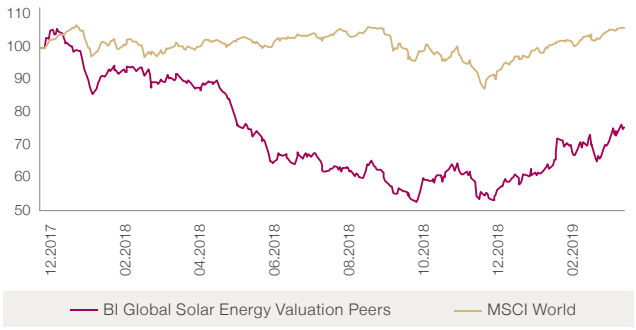
CURRENT TRENDS: FOCUS ON THE WIND AND SOLAR MARKETS

Solar and onshore wind are currently the most mature alternative energy technologies. What are the current trends?

Regarding solar, stocks in the solar industry have benefitted from renewed investor interest since the beginning of the year. The observed uptick comes after a particularly testing year for the segment as global solar stocks significantly underperformed the MSCI World Index in 2018 (-46.7% against -8.19%, TR – Chart 8).

(33). BuildingGreen.
(34). GABC 2017 Global Status Report based on IEA Energy Efficiency Market Report 2017.
(35). European Commission. https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-performance-of-buildings
(36). US Department of Energy. https://www.energy.gov/energysaver/weatherize/insulation/insulation-materials
(37). Oliver, Nassar, Lippke & McCarter (2014). Carbon, Fossil Fuel, and Biodiversity Mitigation With Wood and Forests, Journal of Sustainable Forestry, 33:248–275.

CHART 8: SOLAR PEERS VERSUS MSCI WORLD INDEX (100=DEC. 2017)



Source: Bloomberg, Indosuez Wealth Management

In order to assess the sustainability of the recovery in solar-related stock prices, we look at what impacted markets last year.

TRUMP TARIFFS

On 22 January 2018, President Trump issued a 30% year-one tariff, both on imported solar cells (a key input in the manufacturing of solar panels) and panels (also called modules). The tariff is set to decline by 5 percentage points annually over a four-year period, dropping to 15% in 2021. This decision was indeed negative for solar-panel exporters from South Korea, Japan, and China.

CHINA'S POLICY SHIFT

On 1 June 2018, China announced a halt to approvals for new subsidised utility-scale PV projects and introduced a 10 GW annual cap on smaller-scale projects (distributed generation). Moreover, the country reduced its feed-in-tariff by RMB 0.05 per kilowatt-hour, and mandated that utility-scale projects go through auctions to set power prices. The reduced government support was unexpected and should prove negative for the margins of solar-product manufacturers. Past experience has showed that competitive-auction processes tend to introduce new-equipment price pressure, at least in the beginning.

Unfavourable policy moves, along with long-term oversupply, has led to lower prices for solar products. Since April 2017, the average price of solar panels has halved. Despite solid demand for solar world-wide (BNEF forecasts new installations to reach 133 GW in 2019, up from 109 GW in 2018 and 99 GW in 2017), pricing pressure is likely to persist in 2019 since oversupply remains a problem and industry consolidation is still insufficient. Over the longer-term, however, solar companies will be forced to seek cost reductions, increase their efficiency, and the industry should see further consolidation. Moreover, cheaper solar panels could spur additional demand and further support volume growth. Solar energy is a major renewable energy source, and is of crucial importance in the challenge towards reducing world greenhouse gas emissions.

Turning to wind power, companies involved in this sector also suffered in 2018: BI Global Wind Energy Valuation Peers were down 41.8% in total return terms last year (against -8.2% for the MSCI World Index). The transition from feed-in-tariffs (long-term contracts that subsidise wind power generation) to reverse auctions (where the lowest bidder usually wins orders) for new wind-power capacity continued around the world.

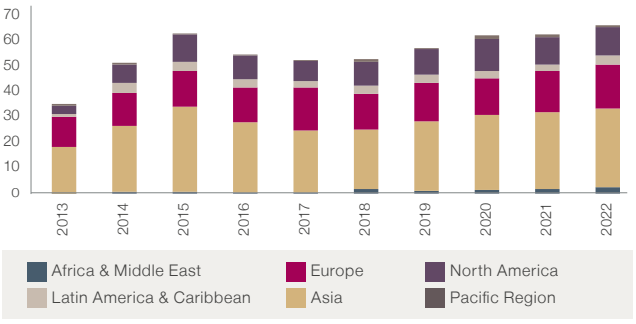
More than a third, 35%, of cumulative global wind turbine installations are located in China (2017, Global Wind Energy Council, GWEC). In May 2018, Chinese authorities confirmed that reverse auctions would replace the feed-in-tariff scheme. A similar decision was taken in India (6% of world installations) which has been holding such auctions since February 2017, and in Germany (10% of world installations) where the transition to auctions took place in 2016. This has resulted in lower government subsidies, and distressed margins for wind equipment suppliers and wind project developers. Prices for wind turbines have decreased by 35% over the past 10 years.

In 2019, the GWEC forecasts that new wind installations should reach 57.5 gigawatts (GW), up from 52.9 GW in 2018 (Chart 9). The US, in particular, should see more activity in 2019 as turbine suppliers and developers rush to capitalise on the Production Tax Credit (PTC) that is set to expire at the end of this year. The PTC is an inflation-adjusted per-kilowatt-hour (kWh) tax credit for the first ten years of a facility's operation.

With elevated fixed costs in relation to total costs, wind turbine suppliers tend to demonstrate high operating leverage. This means that a change in sales leads to a more than proportional change in operating income. As such, companies with increased backlogs should see better margins in 2019.

Wind, like solar, is currently in a phase of transformation, moving away from government support to an open market model. As a result, lower prices have increased the competitiveness of renewables versus fossil-fuel and nuclear power plants. While the road ahead is still long, we think that fundamentals look better in the short-term for wind turbine suppliers than for solar panel manufacturers. In both sectors, investors should focus on best-in-class companies in terms of lower leverage, higher innovation, and geographical diversification.

CHART 9: WIND TURBINES – ANNUAL NEW BUILD (GWEC FORECASTS), GW



Source: Bloomberg, Indosuez Wealth Management

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