# Six Areas Entrepreneurs' Sustainable Innovations are Disrupting "Old-School" Systems

**By Mark Peters, CFA, *Managing Director*, and Jude Erondu, *Associate***

Entrepreneur's sustainable innovations extend far beyond technology, incorporating insights into consumers' preferences and consumers' behavior. Entrepreneurs are evaluating a diverse range of issues, such as the carbon intensity of products and services, the toxicity of the materials, and the equitable treatment of a wide array of stakeholders. Sustainable solutions thrive when they are more efficient and more scalable, effectively lowering their cost and their carbon footprint. Entrepreneurs do well by keeping an open mind, an ear to the ground, and a flexible approach. By constantly scanning the landscape, they are better able to pivot accordingly.

Innovation transforms an idea into tangible and intangible assets. The transformation process includes creating, developing, and implementing the new product or service to improve efficiency, competitive advantage, or effectiveness. Entrepreneurs see product and services inefficiencies and lack of effectiveness in many industries, including healthcare, finance, transportation, agriculture, education, energy, and utilities, and they translate these into an opportunity to innovate.

**1. Healthcare**

Before the global lockdown, the healthcare industry was ripe for disruption. The current healthcare delivery system has long been viewed as expensive, convoluted, and not robust enough to meet future health challenges. Entrepreneurs see healthcare challenges as an opportunity to develop innovative ideas that create new markets, disrupt existing markets, and displace legacy technologies. Such innovative healthcare technologies have emerged in telemedicine and telesurgery.

***Telemedicine:*** Many transformations have been accelerated by COVID-19, and the healthcare sector has been forced to embrace new ways of addressing health problems impacting millions worldwide. During this global lockdown, entrepreneurs have improved healthcare access through telemedicine and telehealth. Telemedicine is made available to the patient in an online and remote capacity, regardless of their geography. These virtual visits have helped relieve the colossal burden facing the healthcare system during the global lockdown. Doctor On Demand ("D.D.") is a good example of this cutting-edge innovation. D.D. is a video telemedicine company that offers the patient the opportunity to schedule a visit with a U.S. licensed healthcare provider via any smartphone, computer, or tablet.

***Telesurgery:*** Telesurgery has emerged as an effective tool within the global pandemic environment, where pathogens are potentially deadly to those nearby. A robot can physically interact with a patient, even with the doctor a great distance away, as a tool that delivers a health solution. Robotic telesurgery solutions may power healthcare innovations for years to come. By offering increased efficiency and clear advantages within an infectious environment, entrepreneurs and doctors may be better enabled to deliver exceptional care while increasing the number of patients that are treated.

**2. Finance**

Disruptive innovations are changing the finance service industry. The past decade has ushered in unprecedented innovation around financial technology, including services such as mobile payment, ESG data metrics, the rise of Green Bonds, and the use of Carbon Offsets.

***FinTechs:*** Innovative financial technologies (FinTech") have broken down barriers that engulf the traditional banking system, which in turn helps governments, individuals, and institutional investors meet their goals. Entrepreneurs may see FinTech as an opportunity to dismantle barriers surrounding the traditional banking system, barriers that restrict capital flow from individuals into the financial marketplace.

The global pandemic accelerated the use of online payments and e-commerce, and it is expected that fintech companies will expand new services even after the COVID-19 virus is contained. In addition to the much-vaunted rise of digital currencies, such as Bitcoin and Ethereum, a number of applications such as Venmo have gained traction by tapping into conventional financial plumbing to facilitate payments. Venmo, which is owned by PayPal, recently announced that it will not only facilitate conventional financial transactions via mobile devices but will also facilitate the purchase of cryptocurrencies.

Conventional investment firms have not shied away from innovation. Fidelity Investments' trading app makes it easier for smaller investors to own a fractional piece of a company's stock and to invest in ETFs using a mobile phone or tablet. Fractional shares allow stock investors to anchor their perspective in dollars, rather than shares, which is arguably more economically relevant from a portfolio perspective.

***ESG Data Metrics:*** Data firm MSCI noted in their earnings call in late January that "in ESG, new clients represented over 50% of new subscription sales this year." Within wealth management, MSCI's ESG research expanded at a run rate of more than 70%.
They also noted that they "will be reporting ESG and Climate as a standalone reporting segment starting in the first quarter of this year", providing additional transparency into this key growth segment of the company.

***Green Bonds:*** According to Climate Bonds Initiative, bond issuers are increasingly turning to Certified Green Bonds when financing climate-related solutions. Many new issuers have chosen to utilize "Programmatic Certification", which certifies a large pool of assets that may be used as collateral, streamlining the issuance of multiple green bond offerings. Climate Bonds Initiative notes that Société du Grand Paris and the New York MTA both issued large green bond offerings during the year 2020 by using the Programmatic Certification process.

***Carbon Offsets:*** The Financial Times reports that more companies have offset their carbon emissions, without being required to do so. Part of the growth in the voluntary carbon offset market may be linked to the global task force that Bank of England governor Mark Carney established to scale up this area. Voluntary offsets often feature conservation projects in less developed countries.

**3. Energy and Utilities**
Fossil fuels continue to play a large role in powering everyday household activities. When burned, fossil fuels release a large amount of carbon dioxide, a greenhouse gas, into the atmosphere. The concern for climate change has inspired entrepreneurs to embrace new ways of thinking and innovation within the energy and utility industry.

Over the past decade, there has been a large inflow of capital into alternative energy power sources, including solar, wind, geothermal, hydrogen, and biomass. Investor interest is driven by both environmental and economic benefits. Solar wind are no longer "alternative" technologies, they are now the preferred choice. The U.S. Energy Information Administration (EIA) anticipates that 39.7 gigawatts (GW) of new electricity generating capacity will be added in 2021, and solar will have the largest slice of the pie, with 39% of this capacity, with wind close behind at 31%. Only 16% of new generating capacity is planned to come from natural gas. The increasing demand for renewable energy is tied to remarkable cost declines as technology has improved, combined with substantial technological gains in battery storage.

SolarEdge and SolarAid are examples of two companies using cutting edge technologies to disrupt the energy and utility industries.

***Solar Power Optimization:*** SolarEdge was founded by a group of environmentally conscious entrepreneurs who believe that renewable energy can help address climate change, a growing concern to businesses and the global community. SolarEdge provides solar power optimization and photovoltaic monitoring systems that can be used to manage a home's power mix, which may include electric vehicles, solar panels, and batteries. Looking forward, it is within the realm of possibility that power inverters may be key components in systems that allow electric vehicles to meet load requirements of the broader power grid, extending the EV battery's usefulness beyond the household. These expanded EV battery uses have been referred to as "vehicle-to-grid (V2G) capabilities".

***Solar Lights:*** According to the World Health Organization, about 4 million people die prematurely from illness attributable to household air pollution each year because they use inefficient candles, lanterns, and stoves that are powered by solid fuels and kerosene. Mirriam Phaninga is one of 170 solar entrepreneurs in Zambia and Malawi that has started a business venture that sells solar lights. Supported with training and resources from the company SolarAid and its SunnyMoney teams, they are changing lives by lowering costs and supplying healthier light and electricity, while at the same time generating sustainable income and new business opportunities. As noted by Phaninga, "My plan is to help more customers. Solar is saving money. Before we were using solar lamps, we had to buy candles every day, it was costing a lot of money."

**4. Transportation**

The transportation sector has evolved rapidly in recent years, with electrification of the industry in the spotlight. Not to be ignored, hydrogen power is in the wings as another potential disruptive fuel. We have advanced from the days of the horse and buggy in the late 1800s when major cities were said to be "drowning in horse manure". The discovery of oil and the invention of the first gasoline-powered automobile by Gottlieb Daimler and Karl Benz facilitated the rapid shift away from horses. Nowadays it might be said that the globe is "drowning" in carbon emissions resulting from fossil fuels since carbon emissions from these fuels are powering climate change by adding moisture to the atmosphere. It is also important to consider that electric automobiles, trucks, and scooters offer maintenance and reliability advantages over conventional combustion engines, with fewer moving parts. The transportation industry is transforming as the economics of electric batteries improve dramatically, and as concerns regarding climate change move to the forefront.

***Electric Vehicles:*** Led by entrepreneur Elon Musk, Tesla was founded by a group of engineers with the common goal of accelerating the world's transition to sustainable energy. Tesla's automotive segment includes the design, development, manufacturing, sales, and leasing of electric vehicles, as well as the sales of automotive regulatory credits. Electric vehicles such as Tesla are expected to become cheaper than gas-driven cars in the foreseeable future and offer the opportunity to reduce carbon emissions by replacing cars powered by fossil fuels.

***Hydrogen Vehicles:*** Despite their lower emissions, electric vehicles are not without their faults. Electric car batteries are heavy, have a limited mileage range, and their batteries are often comprised of rare earth minerals. Some of the rare earth minerals, such as cobalt, are mined in developing countries where child labor and other criminal activities may be part of the production process. The social costs, limited range, and heavier weight disadvantages of electric batteries can be viewed as potential advantages of another storage approach – using electricity to create hydrogen from water, and then using that hydrogen as a clean fuel to power a vehicle. Toyota Motor Corp. recently showcased a new version of its hydrogen-powered car Mirai. The Mirai can travel as far as a gas car, can refuel in less than five minutes, has no heavy battery weight, and only emits water vapor. The water vapor results from hydrogen combining with oxygen. Even with its potential advantages, sales of hydrogen cars are currently at low levels, in large part since hydrogen fuel is not yet widely available to drivers.

**5. Agriculture**

Entrepreneurs within the food and agriculture industry are meeting challenges with innovation as the world addresses large and complex problems. Climate change is delivering prolonged droughts, less healthy soil, and water scarcity, all of which compound the daily challenges faced by farmers. To address these challenges, the food and agriculture industry has attracted a new generation of innovative farmers. These entrepreneurs in the agriculture space, who have been referred to as "agriprenuers", actively engage in sustainable farming practices such as organic and vertical farming, develop plant-based alternative proteins, and produce lab-grown meat.

***Alternative proteins and lab-grown meat:*** Consumer interest in non-meat and lab-grown meat has grown dramatically in recent years. Emerging entrepreneurs are competing with traditional farmers and ranchers to capture market opportunities. For instance, meat has been the main source of protein in developed markets, and there has been an increased appetite for traditional meat as a protein in developing markets in recent decades. However, consumer behavior is changing, and interest in alternative-protein sources is growing as consumers become better informed of the health advantages of the new offerings. Additionally, environmental concerns have grown regarding how animals' methane contributes to global warming, as well as the higher level of carbon intensity of traditional meat when compared with plant-based proteins. Finally, animal welfare concerns have also been highlighted as a material concern for companies within this industry.

Concerns regarding conventional meat as a protein have paved the way for growth in the alternative-proteins market. Beyond Meat provides an example of an entrepreneur that has been successful in selling an alternative protein that shifts the concept of meat from an animal source to a plant-based "meat". In doing so, the company claims to achieve a positive impact in four global issue areas: human health, climate change, constraints on natural resources, and animal welfare.

Within the area of lab-grown meat, Aleph Farms is using disruptive technology to produce real meat cuts from cow-cells, providing the same meat, experience, and taste - but without killing animals, and without the use of antibiotics. Aleph Farms produces "real" meat, but without harming an animal, while also holding the potential to have a lower impact on the environment.

***Vertical Farming:*** Vertical farming involves the growth of crops in a controlled environment. Entrepreneurs see vertical farming as an opportunity to address the challenges presented by the need for large-scale cultivation of crops, the threat presented by prolonged droughts, and an arid environment that results in unhealthy soil. AeroFarms is an example of a company that builds and operates an environmentally responsible farm by employing an aeroponic system that does not need soil or sun to grow crops. In addition, they can do so within dense urban locations.

**6. Education**

Educational systems are faced with challenges, many of which are perceived to increase inequality. Communities with less wealth typically have larger class sizes, more difficulty accessing digital content over the internet, and higher longer-term financial insecurity resulting from large amounts of student loan debt. As a result, many students with an appetite to learn do not have the means to access traditional in-person education.

These students can benefit from less expensive online virtual schools that offer similar certificates and course content. For those able to access the internet, disruptive online learning platforms provided by firms such as Coursera and MITx have made it easier for students, regardless of their educational background, to gain certificates and the skills needed for job readiness. Coursera and MITx both offer online courses that provide specialized degrees and professional certificates to students at an affordable price anywhere around the world.

Entrepreneurs are using technology to rapidly disrupt "old school" systems across a wide range of industries. These individuals and innovative firms see the challenges that are weighing on the old systems as an opportunity to innovate, gain market share, and profit from the successful introduction of sustainable solutions. In addition to potential profits for investors, these technological innovations have the power to address a wide range of social, economic, and environmental challenges across the world.

## About the Authors

### Mark Peters, CFA, *Managing Director*

Mark brings more than twenty-five years of experience to his work designing, implementing and managing investment portfolios for high net worth individuals and their families, and for investment committees of charitable foundation clients. He is a voting member of Pathstone's Investment Committee and a partner of the firm. Mark is also the Chair of the Impact Committee and a member of the Alternatives and Strategy Investment Subcommittees.

### Jude Erondu, *Associate*

Jude is an Associate on the Client Advisory team with a primary focus on ESG and Impact solutions. Based out of our Boston office, Jude supports the Impact Committee with investment and impact research and analysis, client meetings and relevant deliverables. Jude is also responsible for assisting with thought leadership programs with relation to Impact and ESG, including helping craft white papers, Pathstone's quarterly Sustainable Investing Highlights, as well as the firm's Annual Impact Report.

## Disclosure