Social Innovation

Whitepaper

I. MEGA TRENDS DEFINING FUTURE SOCIETIES

A. INTRODUCTION TO OUR FUTURE

In a world riddled with economic uncertainty, increasing geopolitical asymmetry, and new business models that threaten to disrupt or even collapse individual companies or even entire industries, leaders find it increasingly challenging to plot a forward course.

Challenges and monumental questions abound across virtually every industry. In Healthcare, how will we provide quality care in a world of aging populations for every patient globally in a sustainably affordable way? In Energy, will we satisfy the growing energy requirements of a highly connected and power-hungry global population increasingly concentrated in urban environments entirely dependent on vulnerable power grids? In Transport, will we empower our increasingly urbanised global population with door-to-door, multi-modal transport solutions that will be affordable for all our citizens? In ICT, how will we manage the security and privacy of personal data with global digital content doubling every eighteen months, to harvest the potential of Big Data?

To meet these challenges, innovation is no longer a simple strategic option, it is a global imperative. But how will we innovate to meet these growing human and society challenges, with new business models, products and services that make sense for corporations and benefit each global citizen?

B. TOP 12 GLOBAL MEGA TRENDS

The best way to plot the course for this future innovation need is to start at the top: The global mega trends that are defining the future challenges and opportunities for society as a whole.

Top 12 Global Mega Trends

Urbanization—City as a Customer	Bricks and Clicks	Future Infrastructure Development
Smart Is the New Green	Innovating to Zero	Health, Wellness, and Wellbeing
Social Trends: Gen Y, Middle Bulge, She-conomy, Geosocialization	New Business Models: Value for Many	Future of Mobility
Connectivity and Convergence	Economy: Beyond BRICS: The Next Game Changers	Future of Energy

BRICS = Brazil, Russia, India, China, and South Africa; Gen Y = Generation Y

Source: Frost & Sullivan

Frost & Sullivan's Visionary Innovation Group is constantly tracking mega trends: The top 12 transformative, global forces that define the future world with their far-reaching impacts on businesses, societies, economies, cultures, and personal lives.
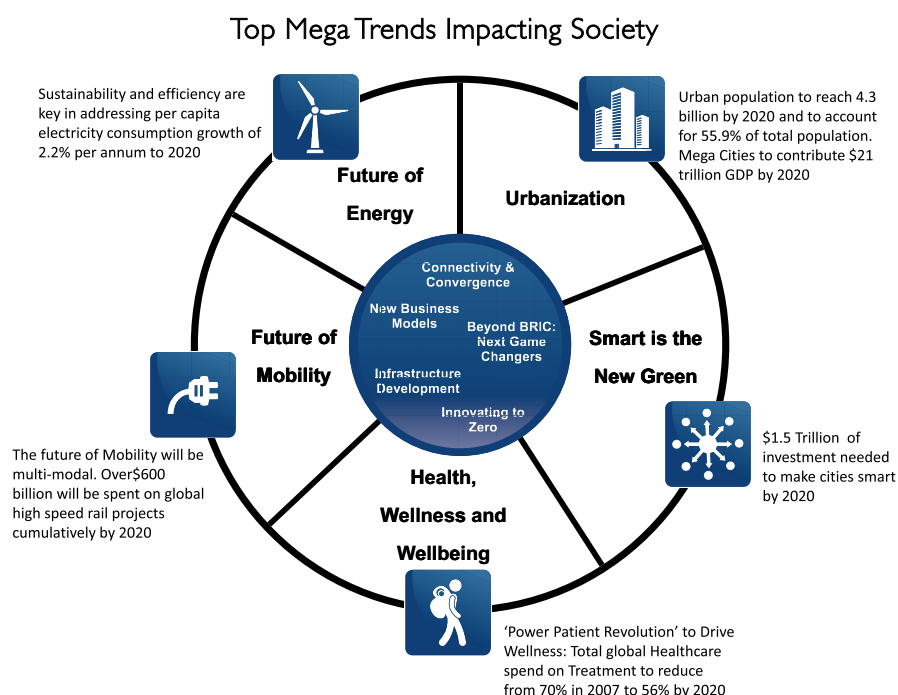
Mega Trend	Impact on Society
Urbanisation – City as a Customer	Cities are expanding and urban populations are growing. By 2020, 30 Mega Cities will exist globally, and 75% will be from the developing world. There will be 21 Mega Corridors globally and the city infrastructure market will provide a $2.2 trillion opportunity in 2020.
Bricks and Clicks	In the US alone, on-line retail sales will rise from 4% in 2011 to 18% by 2020. In future a retail channel strategy will involve mobile apps, internet retail, virtual stores and interactive kiosks to name a few. By 2020, the online channel will become integrated from being an independent silo and new forms of payments such as m-payments will soar.
Future Infrastructure Development	Emerging transportation corridors—for example, the Trans-Siberian Rail and high-speed rail corridors in the United States—will lead to the mushrooming of economic and technology clusters along these corridors. These will be the future centres of innovation, R&D and technical excellence, attracting massive investment and government support.
Smart is the New Green	Smart products with intelligent sensing technology are being integrated with internet technologies to allow systems to react and communicate to changing environments, optimizing operations, and improving efficiency. We will see over 15 smart global cities in 2020 and 26 by 2025.
Innovating to Zero	Innovating to Zero is a Mega Vision of a "Zero Concept" world with zero emissions, zero accidents, zero fatalities, zero defects, and zero breaches of security. This will also lead to many "Zero" initiatives like zero emails, zero time business incubation, zero-design-to-shelf (retail) to name a few.
Health, Wellness and Wellbeing	Wellness and wellbeing will become the next value proposition for companies that include aspects of body, mind and soul. With smarter drugs, virtual hospitals, and cyber documents, the healthcare industry is poised for a radical change with information technology taking the forefront in research and development, diagnostics, and monitoring.
Social Trends	Generation Y, rise of middle class, reverse brain drain, and women's empowerment will usher in new opportunities, signalling the advent of customized applications and innovative technologies. Geo socialization will result in new trends in networking, digital marketing, and innovative ways of socializing.
New Business Models: Value for Many	Next-generation business models are reshaping the landscape of the business environment. The "Value for Many" concept implies producing and selling to mass markets in developing countries or leveraging the market globally for maximum value delivery.
Future of Mobility	e-Mobility will redefine personal mobility in the future. Over 40 million electric vehicles, including electric pedal cycles, scooters, four-wheelers and buses will be sold annually around the globe in 2020.
Connectivity and Convergence	Innovative technologies of the future, coupled with satellite development and artificial intelligence, will open new business models and opportunities for growth. Future convergence will be defined as convergence of products (Eg. electric car), industries (Eg. Healthcare IT) and technologies (Eg. Smart Home Hub).
Beyond BRICS: The Next Game Changers	The next big Game Changers will be the future economic engines of growth – Argentina, Poland, Egypt, South Africa, Turkey, Indonesia, Philippines, and Vietnam. Companies will now look at new economies "Beyond BRIC" and new hotspots for their business operations.
Future of Energy	The global energy future will not be entirely dominated by traditional fuels. The need for sustainability and efficiency means massive innovation opportunities are opening for the deployment of smart technology for energy management.

C. TOP 5 TRENDS SHAPING SOCIETY AND THE NEED FOR SOCIAL INNOVATION

Starting from these 12 mega trends and asking simple questions about society's biggest challenges in terms of demographics, technology, lifestyle expectations and basic needs, we can quickly see huge opportunities for innovation to meet these societal challenges. In fact you could say many of these trends have been driving innovation for many years. However, while the past decade has been categorised by perhaps the highest levels of technology innovation in history, the years ahead will be categorised by the need for business model innovation and - in particular - the need to harmonise multiple types of innovation to address complex and interlinked global societal challenges.

To build a better future for society, we will need to see the convergence of business innovation with the enhancement and improvement of social infrastructure to address these global mega trends. This is what Frost & Sullivan defines as Social Innovation and in this Whitepaper we will explore the definition and quantification in more detail, as well as identifying the key success factors for the future.

We will do this by taking a deeper look at the 5 mega trends that rise to the surface in terms of social issues being faced by the world. These 5 prioritised mega trends form the basis of this Whitepaper on Social Innovation: Urbanisation; Smart is the New Green; Future of Energy; Future of Mobility; and Health, Wellness & Wellbeing.

Top Mega Trends Impacting Society

Sustainability and efficiency are key in addressing per capita electricity consumption growth of 2.2% per annum to 2020

Urban population to reach 4.3 billion by 2020 and to account for 55.9% of total population. Mega Cities to contribute $21 trillion GDP by 2020

$1.5 Trillion of investment needed to make cities smart by 2020

The future of Mobility will be multi-modal. Over$600 billion will be spent on global high speed rail projects cumulatively by 2020

'Power Patient Revolution' to Drive Wellness: Total global Healthcare spend on Treatment to reduce from 70% in 2007 to 56% by 2020
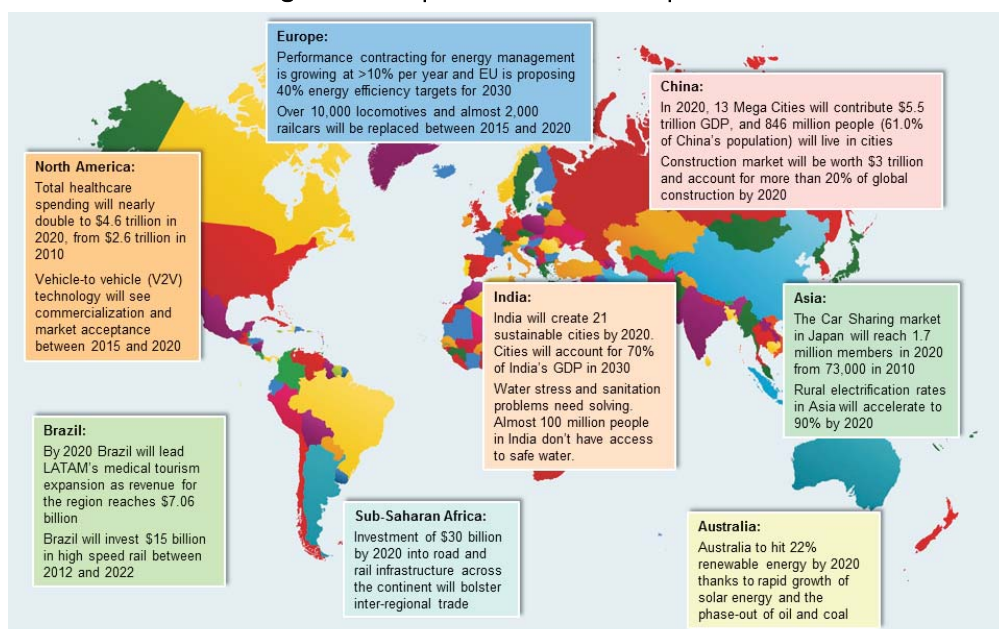
Source: Frost & Sullivan

In the sections below, we present and discuss the most dynamic elements of these 5 key mega trends and their converging impact on society.

I. URBANISATION: CITY AS A CUSTOMER

For the first time in history, 50% of the world's population lives in urban areas. This will increase to around 56% by 2020, accounting for 4.3 billion people. This mass migration to urban areas is transforming cities into enormous economic hubs creating the phenomenon of 'Mega Cities'. This extraordinary growth will lead to core city centres or downtowns merging and combining with suburbs and daughter cities, thereby resulting in the further expansion of city limits to form Mega Regions, Mega Corridors and - sadly - even Mega Slums. Beyond 2020, more than 35 cities globally will grow to become Mega Cities by 2025 with Asia contributing nearly 18 Mega Cities. China alone will account for 72% of the Mega Cities in Asia.

Mega Trend Impact – Global Hot Spots

Europe:
Performance contracting for energy management is growing at >10% per year and EU is proposing 40% energy efficiency targets for 2030
Over 10,000 locomotives and almost 2,000 railcars will be replaced between 2015 and 2020

China:
In 2020, 13 Mega Cities will contribute $5.5 trillion GDP, and 846 million people (61.0% of China's population) will live in cities
Construction market will be worth $3 trillion and account for more than 20% of global construction by 2020

North America:
Total healthcare spending will nearly double to $4.6 trillion in 2020, from $2.6 trillion in 2010
Vehicle-to vehicle (V2V) technology will see commercialization and market acceptance between 2015 and 2020

India:
India will create 21 sustainable cities by 2020. Cities will account for 70% of India's GDP in 2030
Water stress and sanitation problems need solving. Almost 100 million people in India don't have access to safe water.

Asia:
The Car Sharing market in Japan will reach 1.7 million members in 2020 from 73,000 in 2010
Rural electrification rates in Asia will accelerate to 90% by 2020

Brazil:
By 2020 Brazil will lead LATAM's medical tourism expansion as revenue for the region reaches $7.06 billion
Brazil will invest $15 billion in high speed rail between 2012 and 2022

Sub-Saharan Africa:
Investment of $30 billion by 2020 into road and rail infrastructure across the continent will bolster inter-regional trade

Australia:
Australia to hit 22% renewable energy by 2020 thanks to rapid growth of solar energy and the phase-out of oil and coal

Source: Frost & Sullivan

China will have one of the largest urban populaces with over 200 cities with populations of more than one million. An estimated 921 million people or 65.4 per cent of China's population is expected to live in cities, which is about 2.6 times the United States' total population.

This is expected to result in the emergence of 13 Mega Cities[1], four Mega Regions, and 7 Mega Corridors in 2030 in China. These Mega Cities are expected to contribute nearly US$6.24 trillion to China's GDP in 2025.

Cities of the future will also have multiple downtowns and witness transit-oriented development. While less than 70% of New York's population lives within a half-mile of mass transit, 80% of the housing unit capacity created since 2000 is transit-accessible.

1. Mega Cities are defined as cities with a minimum population of 8 million and a GDP of $250 billion in 2025

> "56% of the world's population will live in cities by 2020"

Mega Cities will also witness a re-distribution of wealth which will create significant economic divides within cities. By 2020, the top 10 US cities will have about 90.2 million people, mostly concentrated in the East Coast and representing 26.4% of the country's population. By 2020, the country will have 3 Mega Regions with about 70 million people and generating more than $3.89 trillion in GDP.

Mega Cities will account for $21 trillion of global GDP (nominal) by 2020. Meanwhile, developing economies will contribute around 65% to 70% of global growth in the next 10 years and the 40 largest urban Mega Regions will account for 66% of global economic activity and about 85% of global technological and scientific innovation.

Eventually cities, rather than countries, will be targeted as hubs of investment with each city becoming a unique customer with untapped opportunities in key industries such as mobility. Partnerships between city governments, solution providers (businesses), and academia will become the working model for most future city projects. Convergence between industries, players, technology and products is inevitable as the world itself converges into urban clusters.
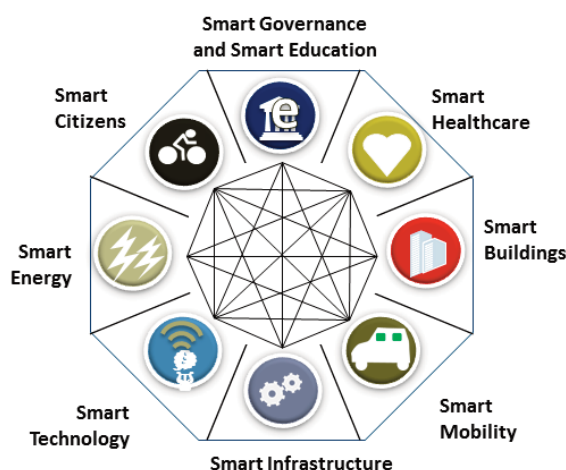
II. SMART IS THE NEW GREEN

Green products and services will be increasingly enhanced or even replaced by smart products and services, with intelligent sensing technology and internet connectivity driving better optimisation. Enabled by the internet of things (IoT), machine to machine (M2M) communication and over 80 billion connected devices globally, digital intelligence will be the key driver of efficiency and sustainability across a vast array of applications.

We will also see smart concepts leading to the growth in development of smart and sustainable cities with some cities even built from scratch, using the latest intelligent and green initiatives to reduce energy consumption and improve efficiencies in all facets of human life. These smart cities will be built on the 8 parameters of Smart Energy, Smart Mobility, Smart Healthcare, Smart Technology, Smart Infrastructure, Smart Governance, Smart Buildings and Smart Citizens. We will see 26 such smart cities globally by 2025.

> "Internet of things (IoT) and over 80 billion connected devices globally will drive efficiency and sustainability through digital intelligence"

Key Components of a Smart City

Smart cities in the future will be measured on the level of intelligence and integration of infrastructure that connects the healthcare, energy, building, transportation, and governance sectors. The market for smart cities will reach a phenomenal value of $1.57 trillion by 2020[2] , with sectors such as Smart Governance, Transportation and Smart Energy driving investment growth in this space.

The pace of smart city market development will depend on how quickly companies converge and tap into each other's industry value chains. Smart city market participants will assume 1 or more of the 4 main roles in the ecosystem: integrators (the end-to-end service provider); network operators (the machine to machine - M2M - and connectivity providers); product vendors (hardware and asset providers); and managed service providers (overseeing management/operation).

Smart technology is also at the heart of the emerging concept of Industry 4.0, the so-called 4th industrial revolution based on integration of virtual and physical production systems. Huge opportunities will exist for sustainable and efficient manufacturing by 2020 and beyond.

III. THE FUTURE OF ENERGY

Powering the global economic growth, urbanisation and expanding populations in a sustainable manner is one of the biggest challenges and opportunities of the 21st century. Urbanisation will lead to cities consuming over 3/4 of energy globally. Combined with an increasing desire for energy security at a country level, this has triggered a global dash to find the energy sources and business models for the future, including resurgence in nuclear power, newly exploited fuels such as shale gas and ongoing growth in renewable energy.

2. From Frost & Sullivan ongoing research. Includes the entire smart solutions ecosystem in energy, infrastructure, transportation, buildings, security, governance, education and healthcare.

Gas has become a game changer for the world's energy demands and has increased the outlook for production across a wide variety of industries from railroads, shipping, local economies, and farming. In the US for example, shale gas will increase from 22.8% in 2010 to 46% in 2035 in the total gas production supply. Meanwhile Australia is achieving one of the fastest departures from fossil-fuel dependence and will have passed 22% generation from renewable energy by 2020.

Meanwhile nuclear power has faced a number of challenges recently but will remain as a critical element of global power production and will account for 12% of the global fuel mix in 2020. Driven by its ability to provide low carbon energy at high efficiency, nuclear power will continue to present significant opportunities for players that can successfully address the dominant issues of safety and security.

However, the global energy future will not be entirely dominated by fuel choices. Rising energy costs and an increasing focus on environmental performance has triggered innovations to manage energy efficiently through technologies such as smart grids. This has increased the world's capacity in handling energy challenges as energy through smart grids offers more control and visibility to integrate distributed generation (solar panels, wind turbines, waste-to-energy etc.) and manage demand more effectively, which results in cleaner, reliable and smarter energy.

"The EU is considering a 40% energy efficiency target for Europe by 2030"

With these possibilities in mind, the European Union (EU) is currently considering a 40% energy efficiency target for Europe by 2030.

With smarter energy services, smart buildings and homes will become a mainstream reality in 2 to 3 years, driven by the convergence of green and smart technology and the deployment of service-based business models based on energy savings.

The creation of such smart buildings with energy management systems has also paved the way to innovative approaches to saving energy such as the Vehicle to home (V2H) system that can supply electricity from a car battery to a residence for backup or peak power. The power is controlled through data communication processes between the vehicle, an EV charging stand and the home energy management (HEM) system. With the technology now fully available, this type of digitally enabled solution to home energy management is poised to make a massive impact on the way we manage our homes in the next few years.

IV. THE FUTURE OF MOBILITY

Trends like connectivity and urbanisation will have a profound impact on personal and freight mobility and on the car/truck and transportation models of the future which will lead to new mobility business models and some exciting new products and solutions. In mobility, new and upcoming services such as multi-modal mobility are already available in an effort to tackle the urbanisation challenges of congestion and pollution.

Therefore, companies that look at cities as customers and position themselves as partners and solution providers to cities will benefit from new business and investment opportunities. Concepts like bike and car sharing, integrated door-to-door transport solutions, inter-modality, smart phone-based urban mobility solutions and automotive app store based connectivity applications will become a common site on our roads of the future, and even parking spaces. By 2020, it is expected that nearly 1 million parking spaces will deliver real-time parking information with the help of sensors.

The role of technology will increase in delivering smart mobility services, as we see more intelligent transport networks, integrated fare structures moving towards personal credit cards and even mobile phones, to make the future of connected living as seamless as possible. Future intelligent platforms will connect the car to numerous functions and devices at home and the office: For example, built-in mobile hotspots will enable services such as internet radio, video streaming, web browsing and access to content to be downloaded in all connected devices under the same network. Car infotainment systems embedded with 4G LTE and wireless hotspots will be more seamlessly integrated with home monitoring cameras and will give clearer visuals on the house while driving.

In the longer term autonomous vehicles or pods will serve our cities, such as the Personal Rapid Transit (PRT) systems seen in Masdar City (UAE) and Heathrow Airport (London). The Amritsar PRT system in India will become the first commercially developed PRT scheme in the world, charging passengers to travel to the Golden Temple, which has been chosen so as to avoid polluting modes of transport, and due to it's lightweight, cost effective construction in an area with little space for alternative modes of transport; this could prove to be a viable sustainable future mobility solution in several cities globally. These sustainable mobility solutions would also include electric vehicles. Globally, total electrified vehicles will reach over 12 million units by 2020.

"Over $600 billion to be spent on high speed rail between 2010 and 2020"

In the near future, high speed rail will connect not only cities and countries but also continents. In about 15 to 20 years from now, one could travel seamlessly from London to Beijing using the global high speed rail network. In the period 2010 - 2020, globally over $600 billion will be spent on high speed rail projects with over 70,000 km of high speed rail track in use.

High speed rail, in addition to serving as a key connecting node, will also be a driver of economic growth. In fact, investments in high speed rail have been estimated to have potential to add 2 to 3% to countries' GDP growth through wealth and job creation. It will also augment growth in multi-modal freight logistics offering what is essentially a more sustainable alternative to road transportation and a faster delivery time than the typical air-road mix. This would be additionally driven by global urban logistics spending which is expected to set itself to reach $5.980 trillion by 2020, accounting for 46% of the total logistics spend. Road freight transport will also dominate – logistics will account for over 35% of urban traffic in 2020.

Overall, with the evolution of connectivity and convergence, mobility in 2020 will be more intelligent, interoperable, and more integrated compared to what we see today. The framework of transportation solutions within the city and innovations within and outside the car in the next decade will be primarily driven by a huge spectrum of factors right from customer's changing needs to even the geographical spatial pattern of the city. For an average commuter in 2020, mobility will be completely driven by connectivity - making his/ her connected living within the home, work, city and even in the car completely seamless.

V. HEALTH, WELLNESS & WELLBEING

The world is aging rapidly and most countries are not prepared to support their growing numbers of elderly people. In 2010, people above the age of 65 accounted for 8% of the total population which is expected to reach 10% (840 million people) by 2025. Although the surge seems negligible, the two-percentage-point increase implies a key shift in demographic composition for a few countries. Close to about 580 million or 70% of this above-65 age group will be concentrated in about 15 countries, mostly in North America, Europe, Japan and South Korea.

This demographic data implies a shift in healthcare spending and policy reform – the two main areas that will he hugely impacted by this trend. According to OECD, the above-65 age group represents 40-50% of total healthcare spending and incurs three to five times the per capita healthcare costs than those under 65.

Access to healthcare, insurance coverage, pension reforms, retirement policies and adequate income for people above the ages of 65 will form the premise of future policies. Within Healthcare, the focus will shift from treatment to prevention with emphasis on predictive diagnostics and constant wellness.

Total global healthcare spend on treatment will reduce from 70% in 2007 to 56% by 2020, through growth in spend on prevention, early diagnosis and monitoring. With smarter drugs, virtual hospitals, and cyber documents, the Healthcare industry is poised for a radical change, with information technology (IT) taking the forefront in research and development (R&D), diagnostics, and monitoring.

Various innovations in the Healthcare industry are expected to revolutionise the medicine arena, with spending on healthcare segments- medical imaging, pharmaceuticals, medical devices, and life sciences-to grow at 6.4%, reaching $2.10 trillion in 2020. Nanobots, combination devices, electroceuticals, and genome sequencing are poised to transform the global patient care arena by enabling complex tasks on a microscopic scale and providing tailored treatments to patients' needs.

The key to this healthcare paradigm shift will be innovation targeted toward individual power patients[3] . While patients in the developed world grow increasingly impatient with slow moving regulatory and healthcare provision environments, the developing regions will drive new business models tailored to meeting specific patient needs in novel and cost-effective ways. For example, an eye care clinic in the impoverished Aravind province in India is driving a new, high-throughput surgical model for cataract surgery where the one third of patients who can afford to pay for procedures cover the costs for all procedures, thereby making a significant dent in blindness from cataracts in the region.

D. WHAT THIS MEANS FOR SOCIETY

These 5 mega trends will define our global societies in the future. That means defining both the opportunities for future advancement, and also the social challenges they will present.

For example Urbanisation is creating a need for sustainable cities where water stress and sanitation need solving; Smart technology will create an opportunity for our growing cities to operate far more efficiently than they do today using inter-connected sensors and data analytics; Health, Wellness and Wellbeing is bringing mind, body and soul to the centre of connected healthcare; the Future of Mobility will see e-mobility redefine personal transportation; and the Future of Energy is bringing innovations such as smart grids and demand response to tackle our need to use energy more efficiently.

Put simply, the Social Innovators will be those that can directly address the challenges posed by these mega trends and deliver value to all of the stakeholders in our global future.

In the second half of this Whitepaper we will go on to define Social Innovation in more detail. We will also tackle the crucial questions surrounding the size of the Social Innovation opportunity, what it takes to deliver it successfully, the business models of the future, the stakeholders, and the areas and sectors that are poised for the highest growth.

3 Power Patients proactively make use of Google and other search engines to self-diagnose and arm themselves with the best available healthcare information online in order to exercise a more self-deterministic voice in therapy path.

> "Global spend on treatment will reduce from 70% to 56% by 2020, through growth in prevention, early diagnosis and monitoring"

2. THE SOCIAL INNOVATION OPPORTUNITY

A. SO WHAT IS SOCIAL INNOVATION?

The global imperative to innovate and address the local challenges of the fast-moving modern world is effectively what creates the concept of Social Innovation.

> " .... bringing innovation to deliver life-changing outcomes for society and individuals"

At Frost & Sullivan, we believe it's about bringing innovation to deliver life-changing outcomes for society and individuals. It's about bringing together technological and human capabilities from various sectors, with technology convergence and IT as the glue that binds them together, in order to address society's core challenges arising from the mega trends.

The last few years have seen the term Social Innovation being used increasingly widely and our research has found many great examples of it in action, with different firms often coming from slightly different angles.

On the one hand, Social Innovation has strong links to the concept of creating shared value (CSV). CSV has a major role to play in society and has many stakeholders – companies, social enterprises, governments, NGOs, charities and public sector organisations to name but a few. Several companies have embraced and defined Social Innovation to drive their CSV strategies and this will no doubt continue.

For example, Hewlett Packard (HP) talks about using its "broad portfolio, technology and expertise to help tackle some of the world's major social challenges.... through collaboration with businesses, governments, nongovernmental organizations (NGOs), thought leaders, social entrepreneurs, and academics"[4]. The guiding principle is to drive economic benefits while improving social and environmental conditions. HP has a particular focus on education, entrepreneurship and health.

> "That means convergence of technologies, industries, products and business models, including finance."

Meanwhile other interpretations focus more on the business value of innovation to deliver advancements for society by opening untapped markets with profitable business models. A number of companies have developed multiple products and solutions around this theme of growth while supporting societal and community initiatives.

An example is the Tata Group, which talks about "leveraging innovation for community development"[5]. Tata has developed multiple products and solutions driven by the 'value-for-many' business model to bring affordable essentials to parts of society that would traditionally not be able to afford them. Examples include the 'Glasses for Masses' spectacles and the Tata Nano – the world's cheapest car.

4 Source: http://www.hp.com/hpinfo/globalcitizenship/society/social.html
*5 Source: Tata Council for Community Initiatives*

1. Live Example: Convergence in Action

"JUMPSmartMaui initiative creates smart communities in Hawaii"

The JUMPSmartMaui initiative addresses the need to tackle Hawaii's high dependence on oil for energy and transportation. The State has relied on fossil fuels for over 90% of its energy and has increasingly suffered from rising prices.

Through the collaboration of multiple stakeholders, the initiative focuses on energy and transportation infrastructure and the application of autonomous, decentralised IT systems for energy control.

JUMPSmartMaui will deliver 25% renewable energy by 2020 and 40% by 2030, as well as maximising electric vehicle (EV) penetration, stabilising grid infrastructure and improving community ICT to enhance the quality of life of residents.
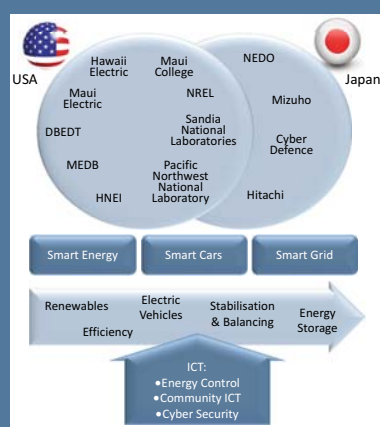
Meanwhile other companies operate at the intersection of CSV and business value creation. An example here is Hitachi which focuses on realising a sustainable society by understanding global social and environmental expectations. This is done through communication with stakeholders and integrating those expectations into its management and business value creation with a strong focus on technology deployment and innovation to answer the challenges of society. It is committed to sustainable and profitable growth while delivering solutions that address the needs and concerns of a diverse customer base through innovation.

But perhaps most interestingly of all, in spite of slight differences and interpretations of Social Innovation, there is one common theme: Convergence. That means convergence of technologies, industries, products and business models, including finance. Sectors that were seen as separated in the past are converging into new products and services to provide innovations that will help provide breakthrough changes for society.

In our definition of Social Innovation, Frost & Sullivan believes it is this key element of convergence that is absolutely central. We believe convergence will define the level of Social Innovation in the future, as well as maximising the benefits to society.

Based on this and addressing the 5 mega trends outlined earlier, Frost & Sullivan defines Social Innovation as the deployment of technology and new business models to bring about real positive change to the lives of individuals and societies, delivering shared value, be it through CSV, profitable business or somewhere in between.

B. HOW BIG IS THE OPPORTUNITY?

Many observers are reluctant to put a financial value to the Social Innovation opportunity, which is of course understandable given the relative 'newness' of the term and the fact that different organisations address Social Innovation in different ways.

However, one fact is clear: Global GDP is continuing to grow and will move from $76.4 trillion in 2014 to $105.5 trillion in 2020. And as we have seen in the past, these levels of growth bring both huge opportunities and multiple challenges for society. The mega trends we discussed above will make sure of that.

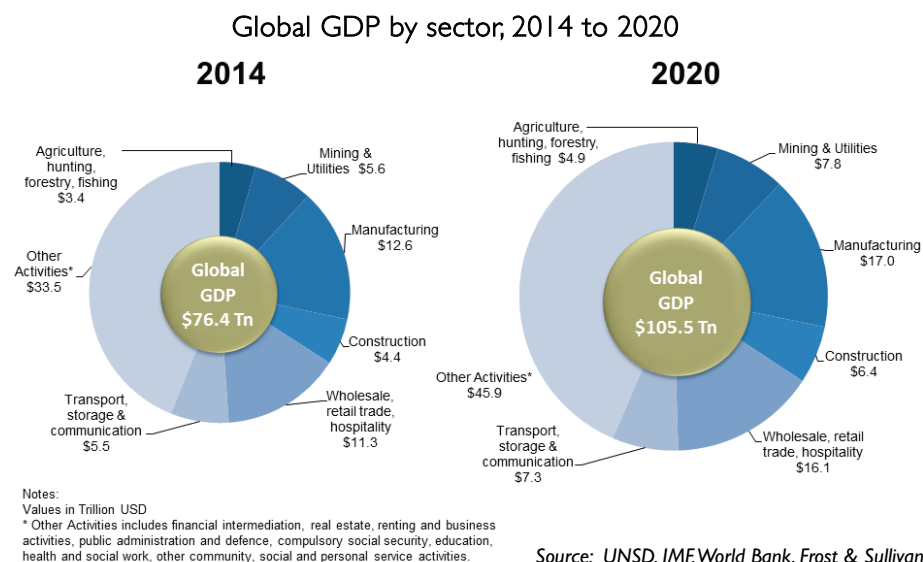## 2. Live Example: New Business Models in Traditional Industries

"Hitachi brings the service based Train concept to drive business model innovation in the rail industry"

Hitachi has won a landmark project in the UK to deliver rolling stock and maintenance services to the Intercity Express Programme (IEP) for 27.5 years. The vision is to transform a rolling stock business into a solution business with a new business model. The concept is built around a service-based model whereby Hitachi maintains ownership of the rolling stock. The contract is a pay for use scheme where the client pays for on-time delivery of passengers for the life of the contract, thereby changing traditional fixed costs to a variable cost model and massively diminishing upfront investment.

The project includes a total of 866 railway cars (electric and bi-mode) using proven technology and local design. Leveraging Hitachi's traffic management and train control systems, the TaaS model will deliver increased capacity, reliability and redundancy; faster & seamless journeys; an enhanced passenger environment; less energy use and track damage; greater safety; and TSI (and RGS) compliance.

To drive its UK and international rail business, Hitachi is also building a new factory in the UK that will open in 2016 for manufacture, assembly and testing facilities with increasing scope including R&D. It will create 730 new jobs.

By 2020, with the global GDP figure standing at $105.5 trillion, the sectors that Frost & Sullivan define as having the greatest need for Social Innovation (Energy, Water, Transportation, Healthcare, Manufacturing, Construction and Natural Resources) will make up close to 40% of that $105.5 trillion, equating to around $40 trillion of annual GDP.

Global GDP by sector, 2014 to 2020

2014

- Agriculture, hunting, forestry, fishing $3.4
- Mining & Utilities $5.6
- Manufacturing $12.6
- Construction $4.4
- Wholesale, retail trade, hospitality $11.3
- Transport, storage & communication $5.5
- Other Activities* $33.5
- Global GDP $76.4 Tn

2020

- Agriculture, hunting, forestry, fishing $4.9
- Mining & Utilities $7.8
- Manufacturing $17.0
- Construction $6.4
- Wholesale, retail trade, hospitality $16.1
- Transport, storage & communication $7.3
- Other Activities* $45.9
- Global GDP $105.5 Tn

Notes:
Values in Trillion USD
* Other Activities includes financial intermediation, real estate, renting and business activities, public administration and defence, compulsory social security, education, health and social work, other community, social and personal service activities.

Source: UNSD, IMF, World Bank, Frost & Sullivan

These are massive industries with huge challenges and therefore significant innovation opportunities. For Social Innovation to deliver on its opportunity to drive growth, transformation and societal impact in these industries, the success will be driven by technology deployment, information analytics, new business models and integrated service-oriented solutions.

In our research to size the global Social Innovation opportunity, Frost & Sullivan has quantified Social Innovation as accounting for around 5% of the $40 trillion that these industries contribute to GDP in 2020. We even believe that to be a conservative estimate, but it still presents a Social Innovation investment need of over $2 trillion in 2020 alone – a significant economic opportunity from even a conservative angle.

But new challenges require new measurements, and the future will require new ways of quantifying Social Innovation in addition to measuring market sizes if the full impact of Social Innovation is to be monitored. The true value for Social Innovation will need to be measured through its impact on society and on individual people's lives. By the time it reaches the individual, Social Innovation has a tremendous impact in terms of bringing comfort, happiness, convenience, choice, better quality of life, a cleaner environment, more time, less stress, and more safety to the end-user. This is what will really tip the scales in favour of Social Innovation – when innovation truly answers individual citizen's deep felt problems.

"Over $2 trillion of global Social Innovation opportunity by 2020"

3. Live Example: Innovative Delivery Models

"The Coca-Cola Approach to Delivering Essential Medicine through the ColaLife Project" The ColaLife project is an initiative which began in 2012 in South Africa to utilise innovative delivery models for essential medicine. ColaLife uses Coca-Cola's existing distribution network to deliver medical care to rural communities, often called the "last mile". It enabled children to be treated for diarrhoea using the "Kit Yamayo," or "Kit of Life" which contains oral re-hydration solutions, zinc soap and educational materials inside Coke crates. In one year, almost 45 percent of the children who needed the kits got access to them.

The aim of Coca-Cola's distribution structure is to help create the same demand and value that consumers wanted from Coca-Cola. By collaborating with local pharmaceutical companies and local private retail channels to distribute the product through retailers, it has shifted the responsibility and onus onto the existing frameworks and distribution structure and empowered them to become more self-sufficient. The goal for ColaLife is to have global impact and extend to other states in Africa and the emerging world. Coca-Cola demonstrates innovation with integrity though a B2S (Business to Society) business model.

Understanding these benefits and impacts is where Social Innovation starts to pay back for those corporations, governments and societies that have invested in it. If people truly see the improvements to their lives, environment and society, they will see the value of investing in it.

This is where the profitable growth will come for those companies that can innovate to maximise the welfare of society with the right balance of information, infrastructure, technology and new business models. And this is all with the backdrop of a $2 trillion Social Innovation opportunity.

C. WHAT DOES IT TAKE TO DELIVER IT?

Under the definition that Social Innovation aims to achieve a sustainable society in which environmental and economic needs are addressed in a balanced way, companies which succeed will utilise unique and innovative delivery methods which have not necessarily been used in specific industries but have shown success elsewhere. As social issues are the core component of innovation it requires the creation of new relationships in the decision making and delivery process.

Challenges in today's society require innovative ways of applying new technology along with new forms of organisation and network processes to build human and social capital. The key characteristics of delivering Social Innovation include the co-ordination and mediation between the different groups of stakeholders involved. There is also increased involvement from the society (users, patients, citizens etc.) in the process of co-development which needs to be considered.

It takes many elements of strategy to come together to make Social Innovation happen successfully. Profitability that is sustainable to the company and society is the core component of successful Social Innovation, with various other strategic factors that contribute to its success.

The most dynamic elements of these success factors are outlined below.

Key Success Factors for Social Innovation
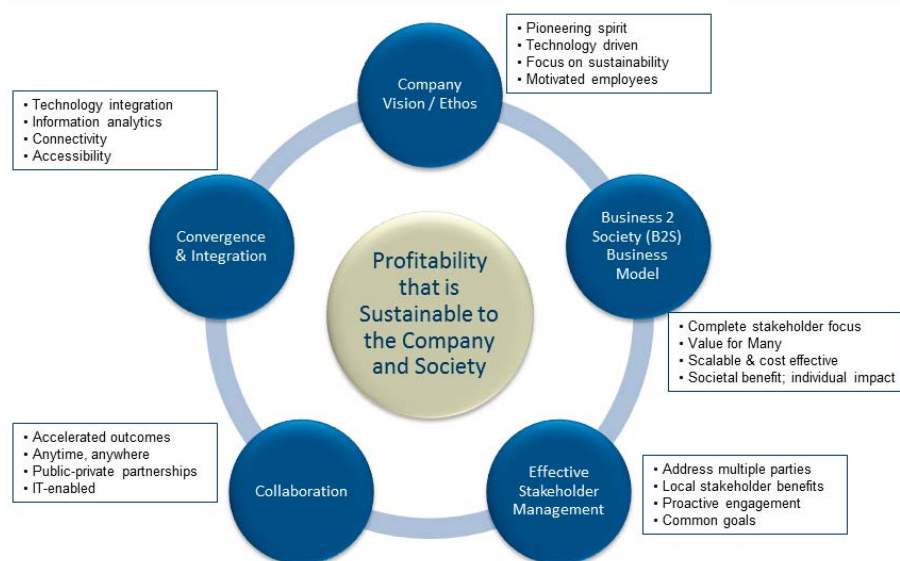
Source: Frost & Sullivan

> "Future-thinking companies are going to orient themselves towards the B2S model"

I. COMPANY VISION / ETHOS

Those companies taking on the challenge of delivering Social Innovation and succeeding have a clearly defined company vision which demonstrates sincerity and pioneering spirit. In addition, profitability that is sustainable to the company and society is their core ethos.

The companies' overall vision should be dynamic, success generating with an entrepreneurial ethos. This stems from creative, innovative, entrepreneurial, productive, successful and aspiring employees who have a full belief in the vision.

II. BUSINESS 2 SOCIETY (B2S) MODEL

The B2S perspective is created by a complete stakeholder focus and is a core element of Social Innovation. It is a mixture of B2B and B2C models, focussing to a higher degree on a number of social parameters (environment, business ethics, etc.), more than the traditional factors such as purely maximising profit, benefits and experience. Future-thinking companies are going to orient themselves more towards the B2S model.

Business models which are scalable, replicable and cost effective because of existing distribution network and structures are also advantageous in creating successful B2S outcomes. Likewise the focus on 'value for many', whereby the benefits are clear at a societal level, but the impact is also clearly felt and appreciated at an individual level.

4. Live Example: Value for Money Business Models in Action

"Value for many" is replacing "Value for Money".

In recent years the concept of sharing and collaborative consumption has gained prominence creating what has been clustered as "value for many" business models, which in turn play a significant role in the emerging Business to Society (B2S) model. Groupon's collaborative business model is an excellent example of this, which uses collective bargaining over the internet to bring down the prices of services, thereby offering unmatched discount deals in the market for everyone.

Another popular 'value for many' business model is that of sharing and renting. Car sharing schemes such as Zipcar and other sharing business models such as Parkatmyhouse.com help people find and rent cars and assets at an affordable rate. Here again, they are able to offer competitive rates only because they have a large number of members. Thereby, with the idea of 'consumer communities', these 'value for many' business models are increasingly encouraging individuals to radically prioritise access over ownership, and choose sharing, renting, swapping, and bartering instead. This transition toward sharing everything and not owning assets is creating a new circular economy where there is no wastage and every product and service is reusable.

III. EFFECTIVE STAKEHOLDER MANAGEMENT

The long-term success of Social Innovation lies with the proactive engagement of local stakeholders and beneficiaries. Crucial to this success is the ability to understand the local impact of global mega trends and hence adapt global vision to local strategy to address local needs. B2S models tend to involve multiple stakeholder groups and the successful social innovators will be those that can bring integrated solutions to deliver clear value and benefits to the multiple interconnected local stakeholders.

Successful Social Innovations tend to occur within a cross sector context, where different stakeholders from different sectors of society, government or industry work together towards common goals and hence share common benefits.

IV. COLLABORATION

Ensuring the successful implementation of Social Innovation activities in different countries requires the coordination and integration of these activities in national and regional socio-economic planning. It also requires collaborative working between the multiple stakeholders. Projects are often large and complex, meaning that smooth delivery of innovative integrated solutions will always require high levels of collaboration.

Public-private partnerships can also play an important role in supporting Social Innovation, for both collaborative working and collaborative project financing. Strengthening these global partnerships and platforms will become increasingly effective for understanding and fostering Social Innovation worldwide.

Meanwhile, the growth of social media (Facebook, Twitter and many others) has helped simplify the collaboration between people, communities and countries encouraging successful innovation.

There are also many emerging opportunities for IT and mobile services (m-services) to play a role in collaboration by enabling stakeholders to work competently, effectively and efficiently, with partners, anytime and anywhere. The trend is towards a business environment in which communications – both real-time and non-real time – are integrated to optimise stakeholder processes and increase productivity.

One example is Cisco and Schlumberger who have worked together to develop a 'First Mile Wireless for Drilling (FMWD')' solution for the oil and gas industry to enable full collaboration and data sharing to deliver joint service. Another is 'NemID' – a unique digital identity developed for Danish citizens to access government services and private services such as internet banking and postal services.

> "Ability to deliver integrated, converged and connected solutions is a critical success factor"
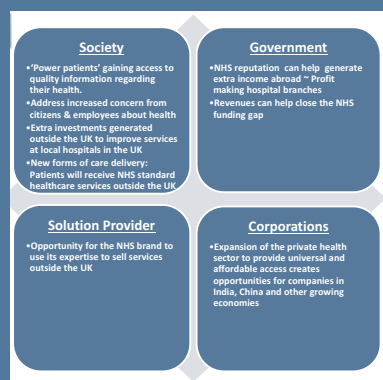
5. Live Example: Collaboration & Multi-Stakeholder Models

"Clinics Set up Overseas Using NHS Brand"

The Department of Health (DH) and the UK Trade and Investment department (UKTI) have put together a scheme where the NHS establishes overseas clinics.

Moorfields Eye Hospital already profits from running clinics in the Middle East, an example the government thinks the NHS could follow. A cross-government unit, Healthcare UK, was set up in 2012 to link UK health providers with possible clients overseas.

20 NHS trusts are planning to go into business with healthcare providers in India, to leverage the NHS brand. These initiatives are currently under review and if successful then potential agreements could be in place in 2015.

Society
- 'Power patients' gaining access to quality information regarding their health.
- Address increased concern from citizens & employees about health
- Extra investments generated outside the UK to improve services at local hospitals in the UK
- New forms of care delivery: Patients will receive NHS standard healthcare services outside the UK

Government
- NHS reputation can help generate extra income abroad ~ Profit making hospital branches
- Revenues can help close the NHS funding gap

Solution Provider
- Opportunity for the NHS brand to use its expertise to sell services outside the UK

Corporations
- Expansion of the private health sector to provide universal and affordable access creates opportunities for companies in India, China and other growing economies

V. CONVERGENCE AND INTEGRATION

We've already identified convergence and integration as important drivers and enablers of Social Innovation. This means the ability to deliver integrated, converged and connected solutions is a critical success factor, particularly through leverage of technology and information analytics.

Mobile devices and social media have been an important driving force for example in the Healthcare industry, particularly around the power patient enabling faster and more informed decisions to be made. This includes information analytics; the sharing, review and analysis of information in real time.
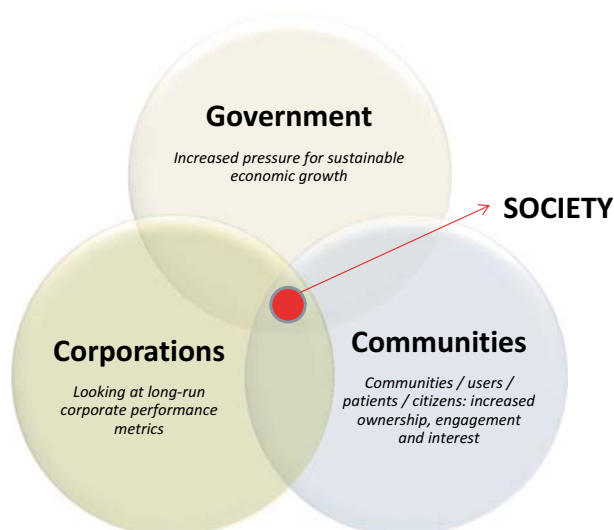
With the "internet of things" (IoT), web connected products with smartphone apps or access to social networks are increasingly becoming important drivers for Social Innovation as they offer new solutions and accessibility to society.

D. WHO ARE THE STAKEHOLDERS?

Social Innovation at its best delivers value to the full spectrum of stakeholders: Positive transformational change to communities; accelerated advancement for Governments; enhanced efficiency and sustainability to corporations; significant advances to personal quality of life to society and individual citizens.

For social innovators themselves – or the solution providers – the key element is profitable and sustainable growth. The solution providers are also expanding their Social Innovation initiatives by partnering with corporations not necessarily in their own industries to provide solutions and innovations around processes, analytics and operations.

Key Stakeholders for Social Innovation

Government
Increased pressure for sustainable economic growth

SOCIETY

Corporations
Looking at long-run corporate performance metrics

Communities
Communities / users / patients / citizens: increased ownership, engagement and interest

Source: Frost & Sullivan

6. Live Example: Sustainability, Industrial Growth & Urban Development

"Dahej desalination plant to support industrial growth and urban development in India"

The Delhi-Mumbai industrial corridor in India has experienced huge industrial growth, population expansion and urbanisation in the past two decades. This development is placing huge stress on water resources and has created a significant opportunity for innovative solutions to support industrial growth while improving the quality of life for citizens. In 2013, a consortium comprising Hitachi and the Singaporean company Hyflux Ltd signed a Water Purchase Agreement ("WPA") covering water supply volume, price and other details with Dahej SEZ Ltd, the management company of the Dahej Special Economic Zone in Gujarat, India.

The WPA business model allows the consortium to own, operate and maintain all water infrastructure and allows Dahej to receive secure, low cost water without needing to own assets. The Project will see the Consortium construct a 336,000 m3/day seawater desalination plant and provide a stable supply of industrial water over a period of 30 years. The Project is being promoted jointly by the Japanese and Indian governments, involving the construction of industrial parks between Delhi and Mumbai (approximately 1,500 km) utilising private sector capital.

Examples of Government Initiatives in Specific Regions & Countries

Country / Region	Government Initiative
United States	President Barack Obama launched the Social Innovation Fund, which makes grants to intermediaries that then seek out and fund promising programs
South Korea	Seoul Mayor Park Won-Soon is integrating Social Innovation approaches into city government
Europe	European Commission issued recommendations for fostering social innovations and expanding them across the continent
United Kingdom	Initiatives such as Big Society are designed to find and scale up the best Social Innovations
Japan	Social Innovation is rapidly taking root in the rebuilding efforts following the 2011 tsunami and nuclear disaster, which left immeasurable destruction on the country's physical, cultural, and socio-political landscape
Finland	The government's main advisory body on science, innovation, and research (SITRA) has recommended that innovativeness should be made a criterion for competitive bidding in public procurement. They also recommended that a portion of funding for government departments should be clearly designated for innovation and development activities, which are widely interpreted to include innovation in services

Source: Stanford Social Innovation Review

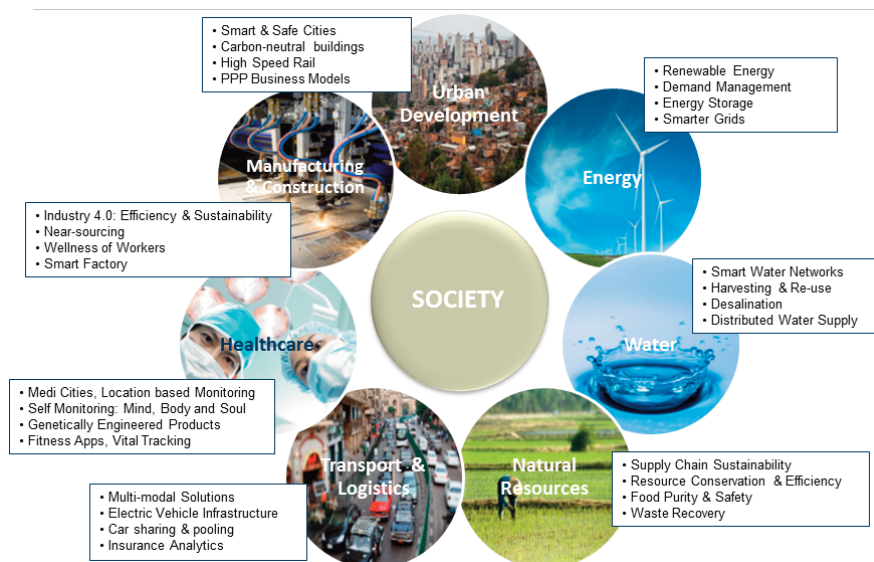## 3. THE AREAS THAT ARE POISED FOR GROWTH

So where is the need – and hence the opportunity – most compelling? The simple answer is wherever society's challenges are converging and can be best addressed through innovation. That means situations where:

o There is a clear need for efficiency (such as in electricity transmission and distribution and the growth in smart grids; or in manufacturing where the emergence of Industry 4.0 will drive efficiency and sustainability)

o There is support for sustainable development (such as energy, water, waste recovery and natural resource usage, including innovations in renewable energy, recycling, wastewater treatment, environmental food processing and eco-friendly packaging)

o There are emerging paradigm shifts (such as the global shift in investment from cure to prevention and diagnostics in healthcare)

o There is a need to deliver value for many through new business models (such as mobility solutions like car sharing that prioritise access over ownership; or XaaS – anything as a service – models that are increasingly appearing in sectors such as public transport and energy management)

o There is a government or city vision looking to the future (such as in smart or sustainable cities where leaders are looking to deploy technology to reduce environmental impact, improve urban infrastructure and increase sustainability, while also competing with one another for investment and business)

o There is an opportunity for technology convergence (such as digital intelligence, internet of everything and data analytics in buildings, homes, grids, water networks, hospitals, cities, factories and transport systems)

And perhaps most importantly, with convergence inevitably accelerating, we believe the future opportunities will be greatest for the companies that can bring together total solutions to address these multiple needs in a coherent, integrated manner.

High Growth Opportunity Areas for Social Innovation

- Smart & Safe Cities
- Carbon-neutral buildings
- High Speed Rail
- PPP Business Models

Urban Development

Manufacturing & Construction

- Industry 4.0: Efficiency & Sustainability
- Near-sourcing
- Wellness of Workers
- Smart Factory

Energy

- Renewable Energy
- Demand Management
- Energy Storage
- Smarter Grids

SOCIETY

Water

- Smart Water Networks
- Harvesting & Re-use
- Desalination
- Distributed Water Supply

Healthcare

- Medi Cities, Location based Monitoring
- Self Monitoring: Mind, Body and Soul
- Genetically Engineered Products
- Fitness Apps, Vital Tracking

Transport & Logistics

- Multi-modal Solutions
- Electric Vehicle Infrastructure
- Car sharing & pooling
- Insurance Analytics

Natural Resources

- Supply Chain Sustainability
- Resource Conservation & Efficiency
- Food Purity & Safety
- Waste Recovery

Source: Frost & Sullivan

"Opportunities will be greatest for companies that can bring together total solutions"

4. CONCLUSION

At the outset of this Whitepaper, we asked how we could innovate to meet growing human challenges, with new business models, products and services that make sense for corporations and benefit each global citizen? In this paper, we have explored how Social Innovation answers this question across the massive industries such as Healthcare, Energy, Transportation, and ICT, through new business models, superior products and novel services aligned with the key mega trends driving the future. We have explored how Social Innovation is ideally positioned to meet the rapidly changing core needs of both individual citizens and whole societies wherever they may be found: across continents, within countries, increasingly in cities, and in connected homes and communities.

Beyond doubt, the future will be determined by those who innovate. Successful innovators in the next few years will deploy a spectrum of new business models, integrating superior products and creative services into total solutions as a service. This new breed of innovators will also strike a balance between profit for stakeholders and improved lives for individual citizens, focusing on progress both for business and our global society. In sum, the future belongs to those who innovate with the mind and the heart through Social Innovation – a $2 trillion opportunity by 2020.

In our next paper, we will explore the future of Social Innovation with greater rigour and detail, incorporating in-depth analyses of where the need for Social Innovation is greatest, based on the numbers. We will also introduce Hitachi as a visionary global company with a thought leading position in the sphere of Social Innovation and share some examples of ground-breaking projects being delivered. We will incorporate detailed case studies to demonstrate concretely how Social Innovation is driving an enriched and exciting future for individuals, cities, countries, continents and our connected world.

RESEARCH METHODOLOGY

Frost & Sullivan has employed a multi-faceted methodology leveraging its unparalleled global database covering more industry verticals across more metrics of measurement in more geographies than any other firm globally. Leveraging this content base, derived from primary research and enriched with secondary research across a host of both external and internal data sources, Frost & Sullivan deployed its unique, bottom-up approach to identifying global mega trends cutting across industry verticals, carefully analysing and quantifying these mega trends through both standard and extreme scenario analysis. This scenario analysis in this case also included an in-depth, primary research-based approach to identifying and validating which key mega trends would both drive and derive value from Social Innovation.

Once the key mega trends were identified, Frost & Sullivan leveraged its relevant industry vertical trend analysis to reflect both on the perceived impact of Social Innovation within each vertical, but also across verticals through integrated total solutions and solutions as a service that addressed end-to-end customer needs from both a personal and societal level. Frost & Sullivan then employed its rigorous, data-driven approach to market quantification and forecasting through triangulated data inputs to derive its initial quantification of the global market potential represented by Social Innovation.

This Whitepaper has been developed by Frost & Sullivan in conjunction with Hitachi, Ltd.

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Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, delivers innovations that answer society's challenges with our talented team and proven experience in global markets. The company's consolidated revenues for fiscal 2013 (ended March 31, 2014) totaled 9,616 billion yen ($93.4 billion). Hitachi is focusing more than ever on the Social Innovation Business, which includes infrastructure systems, information & telecommunication systems, power systems, construction machinery, high functional materials & components, automotive systems, healthcare and others. For more information on Hitachi, please visit the company's website at *http://www.hitachi.com*.

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