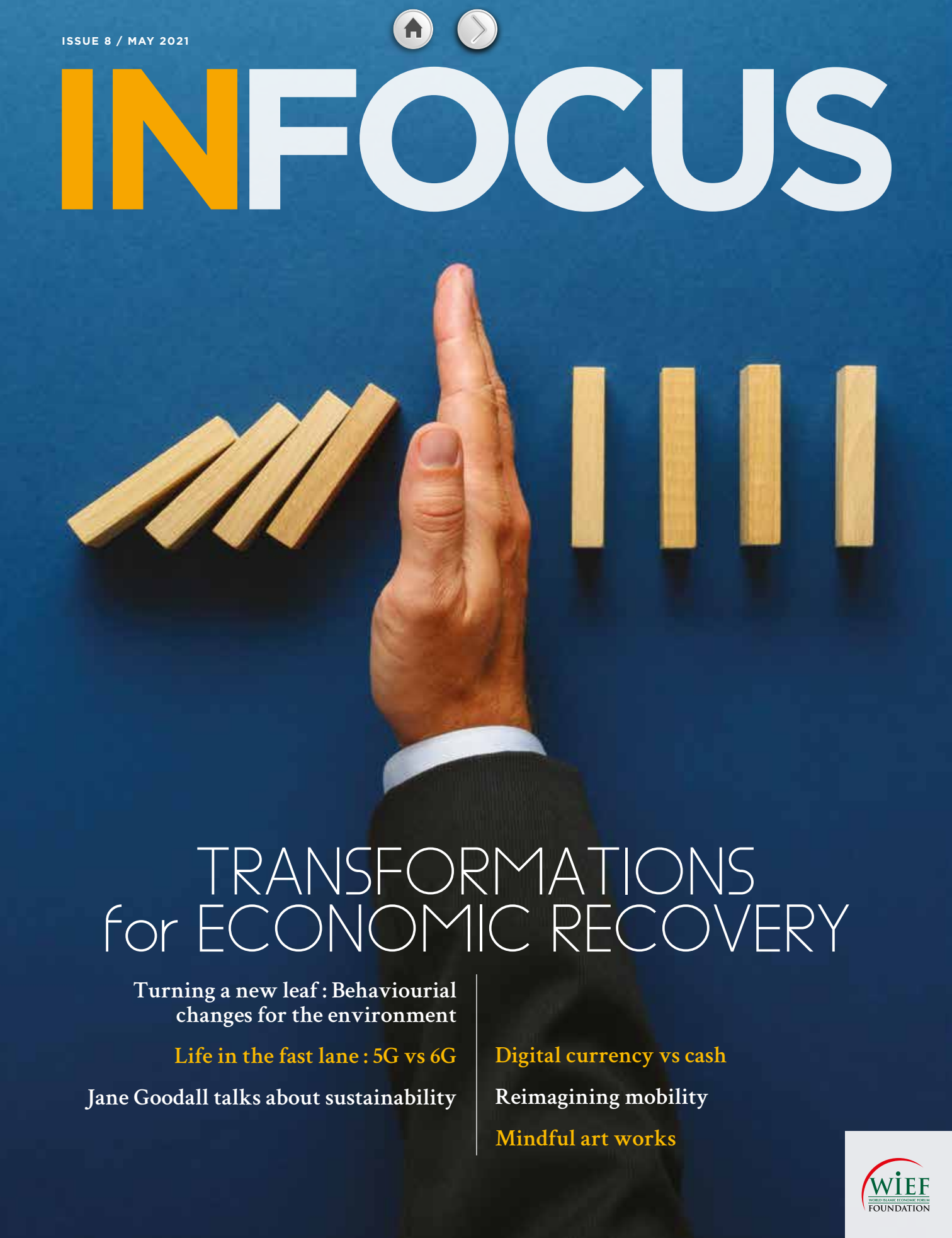
ISSUE 8 / MAY 2021

INFOCUS



TRANSFORMATIONS for ECONOMIC RECOVERY

Turning a new leaf : Behaviourial changes for the environment

Life in the fast lane : 5G vs 6G

Jane Goodall talks about sustainability

Digital currency vs cash

Reimagining mobility

Mindful art works

WIEF
WORLD ISLAMIC ECONOMIC FORUM
FOUNDATION

WIEF FOUNDATION

WIEF POWERTALK WEBINAR 2021

DIVING INTO THE DEEP BLUE:

POSSIBILITIES *For* ISLAMIC FINTECH

30 NOVEMBER 2021 (TUESDAY)
3.00PM (UTC +8)

www.wief.org

#WIEFDIGITALISATION2021

LIVE ON zoom

Organised By

WIEF
FOUNDATION

WIEF HIGH LEVEL DIALOGUE

REVITALISATION AND REFORM: CATALYSING GROWTH

14 - 15 JULY 2021 | VIRTUAL EVENT | LIVE STREAMING

www.wief.org

CONTENTS

About *IN FOCUS*

It is a complimentary bi-annual publication. Its inaugural issue was published in November 2017 and it's an extension of WIEF Foundation's online bank of articles that is constantly growing to cater to the reading pleasure of the global business community. Do drop us a line if you'd like to subscribe or tell us what economic and business-related matters you think we should report on.

Editorial Information

***IN FOCUS* online**
Web: infocus.wief.org
Email: infocus@wief.org
Digital version: infocus.wief.org/digital-version

***IN FOCUS* editorial**
Editor: Su Aziz, su@wief.org
Design: Amphibia Digital Sdn Bhd

Publisher
WIEF Foundation
157 Hampshire Office Place,
1 Jalan Mayang Sari,
50450 Kuala Lumpur, Malaysia.
Tel: +603 2163 5500

ON THE COVER OF ISSUE 8
Transformations for Economic Recovery
Image by Gajus

Transformations for Economic Recovery

I read that now, today, is as good a time as any to determine the basis for businesses and make that more sustainable. While that is true, I'd prefer to tweak it a little and think that the basis for businesses is resilience. I feel that resilience is the core ingredient for a recovery recipe. This is because only when a business is resilient, will it have the dexterity to rebound, pivot, reap profits and be sustainable.

2021 is a period to think outside the box, to do things that have never been thought of before and to action innovative transformations afforded by digitalisation. We live in extraordinary times that present opportunities never known before through the likes of 5G, self-aware AI, borderless finance without banks and autonomous vehicles, to name a few. In this era in which we live, technology is equivalent to oxygen. It has evolved to follow human behaviour and it catalogues our habitual patterns in forms of algorithm, from which computers derive data.

Now, the question foremost in everyone's mind would be: How will we live in the near future, at a time of post-pandemic? Well, more sustainably, I hope. All organisations and individuals alike, need to readjust to an eco-friendly mindset and business plan. This is not only to meet SDGs, but also for the sake of the planet's longevity. Now is also the time to draw up a sustainability checklist for accelerating economic recovery. I believe this list should include, among others, actions toward a zero carbon footprint, encouraging agribusiness among youths and eco-mindfulness.

What's more, for businesses, global cooperation is key to ensure economic recovery. The message is clear, stand alone and risk economic stagnation or decline. No man, nor woman, is an island - a common fact during this age of populism in which we live, where a collective decision or choice of the people is ordinarily represented by one leader. Thus, a concept of unity, (somewhat) occurs.

Ultimately, an economic recovery goal should aim for reducing inequality, creating employment and opportunity across all industries, decreasing negative environmental impact and decarbonisation. These are goals which must be achieved together. Why? Because economic recovery will be a complex process that will inevitably include issues too big for one organisation to solve alone. The solutions to these issues will require combined efforts of everyone across a number of sectors to exploit a multitude of strengths and knowledge that can help identify and contribute towards an outcome that can result in a significant impact.

These factors have inspired the theme as well as topics for the Foundation's bi-annual magazine and the first issue for 2021. You'll find, and will be able to learn, through essential points from various entrepreneurs as well as experts just how much of a colossal impact the pandemic has had on every aspect of living. You'll find a positive undertone within challenges faced during the pandemic through these articles. Most of all, you'll find useful nuggets of information to motivate transformation for a resilient economic recovery, be it for business or the bigger picture. *Insyaallah.*

Have a good read. ■

Tun Musa Hitam
Chairman, WIEF Foundation

Transforming for ECONOMIC RECOVERY

COVID-19 has brought about a range of challenges that have tested collective and individual resilience, agility and, indeed, innovation. ***Reyana Nacerodien*** and ***Su Aziz*** ask thought leaders how they innovated to transform for economic recovery.

Dr Andrew L. Fanning
Data and Analysis lead
Doughnut Economics Action Lab (DEAL)
Area of expertise: Doughnut economics

The COVID-19 pandemic is a public health crisis with unprecedented economic and social impacts, which are being felt disproportionately by age, race, gender, wealth, in the global North and the global South. At the same time, all crises offer an opportunity to chart a new path. We at DEAL are seeing some cities and nations in the global South choose to use Doughnut Economics as a tool for framing their recovery plans - from Cali and Costa Rica to Barbados and Malaysia. Others have expressed interest in Bangladesh, India, Zambia, and more.

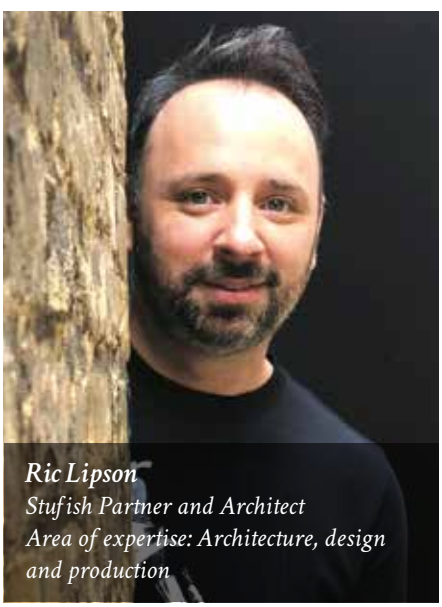
We couldn't have anticipated the challenges COVID would bring when we identified our fintech priorities. But now they look more relevant than ever as innovation and fintech helps the economy respond, and then recover, from the shock of COVID. The Bank can play a supportive role in helping fintech and innovators drive the recovery. Naturally, central bank digital currency (CBDC) is a focus, but we also consider that other payment options also offer significant potential, including 'bank to bank' payments. We'll continue to explore the pros and cons of CBDC, and fully support Her Majesty's Treasury's Payments Landscape Review. Innovation will be essential to our economic recovery. But if innovation isn't responsible, risks will quickly emerge and its benefits will not endure.

Tom Mutton
Director of Fintech, Bank of England
Area of expertise: Fintech

Anna Breman
Deputy Governor, Riksbank
Area of expertise: Economics

The pandemic and its economic consequences have made it perfectly clear that we cannot predict what the next economic crisis will look like - neither when it comes to what will trigger it nor what type of monetary policy response it may need. This means that innovation and new thinking will be required in monetary policy for us to be able to continue to fulfil our task of maintaining price stability in Sweden. We therefore need to constantly adapt to a changing world and improve our analysis so that we can achieve the inflation target and contribute to healthy economic development otherwise.

We're constantly looking at ways of innovating and finding new ways to use our skills to diversify into a wider scope in entertainment architecture. The Vertical Theatre was one way of helping the economic recovery of the entertainment industry. By offering this new kind of space that's more pandemic friendly, while creating a new kind of venue that's temporary and pop up. Thus, offering something new to cities that maybe don't have performance venues or to offer something to cities that want to expand their culture offering when performance is allowed again. The audience sensibility might prefer this open-air environment for their comfort level. We've been exploring the new worlds of augmented as well as extended reality technologies and how they can be layered into future live experiences while being one of the current methods for events to happen. Along with looking and creating new immersive experiences that in the future will expand the offering to the live entertainment world. All these things help with not only the wider picture of economic recovery and reigniting of content for an audience, but also help our company find new avenues of exploration. We've also been looking at new ways of approaching our work in more sustainable ways. This will help in the long term to make the industry less wasteful and ultimately economically more viable.



Ric Lipson
Stufish Partner and Architect
Area of expertise: Architecture, design and production

Eva Bachtiar
Co-founder, Garda Pangan
Area of expertise: Food waste

COVID-19 shifted our operation significantly since most of the food industry and businesses that become our partners as well as source of food surplus had to close or reduce their production. We tweaked our daily operation to become a weekly food aid distribution and developed a new strict SOP especially during food distribution in the field. We also found that many disadvantaged groups become much more food insecure since they're the ones who are impacted the most during these hard times. We changed our food redistribution method to a food donation method, where we work with a broad range of donors from companies, individuals and local businesses, to be able to provide most-needed food aids to the most vulnerable communities. Slower operation during COVID-19 has however provided us the time to implement ideas that were previously put on hold. We rolled out a new business line that turns unsold ugly produce into healthy and delicious products that generate profit to fund our operation. We also hold gleaning trips, where we rescue edible fruits and vegetables being left on the farmers' fields and sell it with much more affordable price to the communities.

Roberto Verdone
Professor, University of Bologna
Director, Wireless Communications Laboratory (WiLab)
Area of expertise: Telecommunications and research

We're collaborating with relevant stakeholders to improve the way we can predict massive gatherings of people. Moreover, WiLab has established in Bologna a Joint Innovation Centre with Huawei, dedicated to the intelligent IoT for 6G. Its scope is, among others, to study those technology improvements that can push the industry towards more efficient production processes, fostering economy.

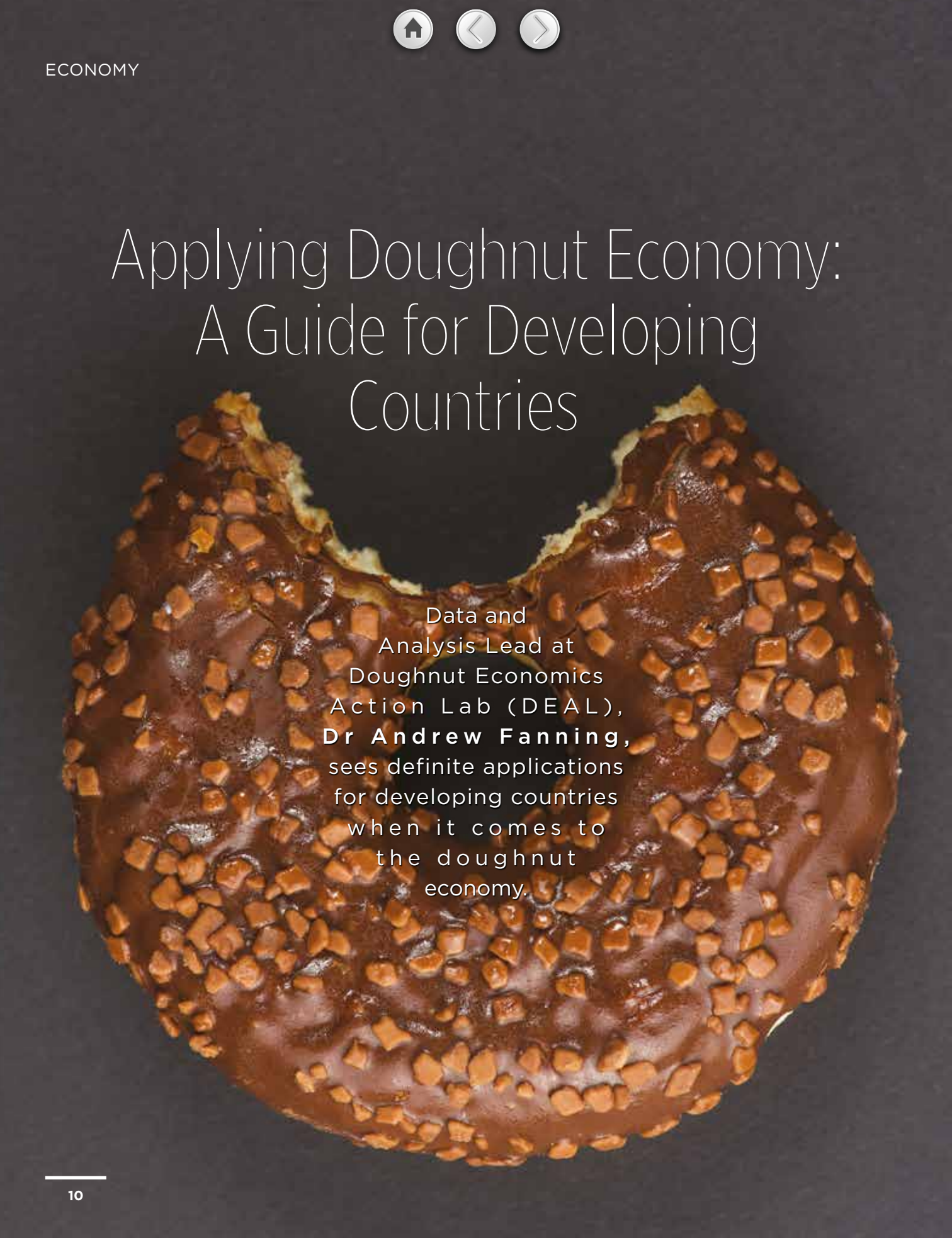
As with all industries across the globe, the automotive industry has been severely affected by the COVID-19 pandemic. Our showrooms, factories and offices were temporarily shut down for a period to adhere to the government guidelines, and it has in some part, contributed to lower vehicle sales and less new models being launched in 2020. The pandemic also raised question marks about the impact of future mobility such as autonomous and electric vehicles as well as shared mobility. While extensive work is continuing to be undertaken in rolling out autonomous vehicles and shared mobility in the future, the way it functions and how it serves will differ accordingly to people's behaviours to health and safety, following the pandemic.

Hyundai Motor Company
Area of expertise: Mobility

Maciej Golubiewski
Head of Cabinet of Commissioner for Agriculture, European Commission (EC)
Area of expertise: EU and foreign policy

In the post-pandemic period, we need to ensure green recovery in line with the Farm to Fork (F2F) Strategy to stimulate economic recovery. It sets ambitious targets for farmers to be achieved within the next nine growing seasons. To step up efforts, the EC, will further invest around EUR9 billion into research and innovation to agriculture, food, bioeconomy and environment for 2021 - 2027. EU programmes for the post-2020 period will promote the establishment of an environment enabling farmers to take up and deploy new technologies. The EC, under its financial instrument EAFRD as well as CAP (policy) will further support investment and innovative projects on technological developments and digitalisation. Also, under the forthcoming Horizon Europe, a portfolio of instruments will be available in the field of digitalisation and data technologies in agriculture. ■

Applying Doughnut Economy: A Guide for Developing Countries



Data and Analysis Lead at Doughnut Economics Action Lab (DEAL), **Dr Andrew Fanning,** sees definite applications for developing countries when it comes to the doughnut economy.

Kate Raworth
Doughnut Economics

Doughnut economy theorists have used the sweet pastry's shape to offer a vision of what it means for humanity to thrive in the 21st century. With applied test cases in countries like Belgium and Amsterdam, it's believed that similar positive results can be attained in more developing geographies.

What's Up with the Doughnut?

First published in 2012 in an Oxfam report by Kate Raworth, doughnut economics has gained traction over the years because of its view of bringing humanity together into the Doughnut in a way that reimagines economic success. The doughnut is the core concept at the heart of doughnut economics. Doughnut economics proposes an economic mindset that's fit for the 21st century context and challenges. It's not a set of policies and institutions but rather a way of thinking that brings about the regenerative and distributive dynamics that this century calls for.

Drawing on insights from diverse schools of economic thought including ecological, feminist, institutional, behavioural and complexity economics, it sets out seven ways to think like a 21st century economist in order to bring the world's economies into the safe and just space for humanity. The thinking is focused on meeting the needs of all people within the means of the living planet.

'Imagine a doughnut with a whole in the middle and imagine humanities use of resources radiating out. So, the hole in the middle is the place where people are falling short on the essentials of life, without the food, water, healthcare, education, housing that every person needs,' says Kate. The graphically represented doughnut illustrates a means to achieve a very complex goal. The doughnut consists of two concentric rings. The inner ring or, social foundation, considers basics Kate mentions like food, water and housing to ensure that no one is left falling short on life's essentials.

'We want to get everybody out of that hole but we simultaneously can't overshoot the outer ring where we put so much pressure on this extraordinary living planet, we begin to kick it out of balance,' Kate adds. The outer ring or ecological ceiling, considers boundaries such as those of our planet including biodiversity and climate. To ensure that humanity doesn't collectively overshoot the planetary boundaries that protect Earth's life-supporting systems. Between these two sets of boundaries lies a doughnut-shaped space that's both ecologically safe and socially just. A space in which humanity can thrive. According to the model, no one should fall into the hole in the centre of the doughnut.

'In essence, the aim of the of the doughnut is to meet the needs of all people within the means of the planet and I see this as humanity's 21st century challenge. It's the direction of progress that we need to make this century,' says Kate. The Doughnut's holistic scope and visual simplicity, coupled with its scientific grounding, has turned it into a convening space for big conversations about reimagining and remaking the future. It's now being discussed, debated and put into practice in education and in communities, in business and in government, in towns, cities and nations worldwide.

The Doughnut in Use

Amsterdam's adopting the doughnut model to lead it's post-pandemic recovery while aiming for a greener future. The radical shift was announced during the region's first wave of COVID-19 as a means to, not only recover from the current crisis, but avoid future crises. The model signals a rethinking of what economic success looks like for the city considering metrics beyond traditional financial measures.

The city has a vision to be a thriving, regenerative and inclusive city for all citizens, while respecting the planetary boundaries. In order to achieve this, the need for systemic transformation has been identified. To partner on the much-needed work to be done, the City of Amsterdam has joined Thriving Cities Initiative (TCI), Circle Economy, Biomimicry 3.8 and C40, as well as DEAL.

The DEAL Team has collaborated with Biomimicry 3.8, C40 Cities and Circle Economy, through the TCI, to create the City Portrait methodology, and pilot the approach in Philadelphia, Portland as well as Amsterdam. The City Portrait methodology is the best response that they've come up with so far, and it can be distilled down to a single core question for a city: How can our city be a home to thriving people, in a thriving place, while respecting the wellbeing of all people and the health of the whole planet?

A City Portrait for Amsterdam has been developed based on the Doughnut of social and planetary boundaries. It's a holistic snapshot of the city and one that serves as a starting point for big-picture thinking, co-creative innovation and systemic transformation, rather than as a comprehensive assessment of the city. It presents city life and its impacts through four 'lenses' - social, ecological, local, and global - which together provide a new perspective on what it means for a city to thrive. The city already has ambitious environmental goals, including a plan to become carbon neutral and to transition to a circular economy. The portrait further adds social goals thereby creating a holistic vision for future progress.

Similarly, the Brussels Donut applies Doughnut Economics to the Brussels-Capital Region. The initiative's main aim is to have a framework for reflection adapted to the reality of Brussels in order to consider, guide and inform decision making towards a sustainable society. The Brussels Donut team is made up of the non-profit organisation Confluences, ICHEC high school and DEAL. The project is developed with the support of the Regional Public Service Brussels Economy and Employment in collaboration with the office of the Brussels Minister for Economic Transition. In addition, local administrations, grassroots organisations, companies, schools, universities and citizen movements have also gotten involved

Dr Andrew L. Fanning
Data and Analysis Lead

in various ways to ensure holistic representation and associated action.

Housing inequality, for example, is being addressed by the Community Land Trust Brussels, who are applying doughnut economics in support of communities owning their own homes and the land those homes are built on. In turn, the homes themselves are being designed with modularity and circularity as common themes to promote sustainability. Another local example is the Masoe project. The project sees the renovation of six buildings with ecological with social rejuvenation in mind. Local residents are trained in building by recycling, reusing and reviving whatever is on hand. The renovation embraces the reuse of building materials, fixtures, etc. that would have ended up in landfills.

Lessons for Developing Countries

While each reality is different, an necessitates new ways of thinking, doing and acting, specific to each context, Dr Andrew Fanning, Data and Analysis Lead at DEAL says there are definite applications for developing countries. Andrew is closely involved in the efforts to translate the global Doughnut down to smaller scales and contexts, from neighbourhoods to nations. He sees definite potential for the

developing world.

'We see there's benefit for all countries in becoming regenerative and distributive by design, with each country taking its own route towards meeting the needs of its residents within the means of the living planet,' says Andrew. 'In terms of applications, we at DEAL are now co-creating a methodology with a range of partners across the global South to adapt the approach applied in Amsterdam and other global North cities, so that it reflects their context, interests, and needs.'

Andrew led the development of a National Doughnuts Data Explorer where people can explore the results of a major study that quantifies the sustainability of national resource use associated with meeting basic needs in more than 150 countries.

The Doughnut Principles of Practice

In order to ensure the integrity of the ideas as they are put into practice, the DEAL team have turned the Seven Ways to Think, and the five key design traits of organisations, into the Doughnut Principles of Practice. DEAL requests that all projects and initiatives using the Doughnut as a foundational concept be designed and implemented in ways that aim to embody the core principles of Doughnut Economics as set out in these principles.

Embrace the 21st century goal.
Aim to meet the needs of all people within the means of the living planet. Seek to align your organisation's purpose, networks, governance, ownership and finance with this goal. Expect the work to be challenging, innovative and transformative.

See the big picture.
Recognise the potential roles of the household, the commons, the market and the state - and their many synergies - in transforming economies. Ensure that finance serves the work rather than drives it.

Nurture human nature.
Promote diversity, participation, collaboration and reciprocity. Strengthen community networks and work with a spirit of high trust. Care for the wellbeing of the team.

Think in systems.
Experiment, learn, adapt, evolve and aim for continuous improvement. Be alert to dynamic effects, feedback loops and tipping points.

Be distributive.
Work in the spirit of open design and share the value created with all who co-create it. Be aware of power and seek to redistribute it to improve equity amongst stakeholders.

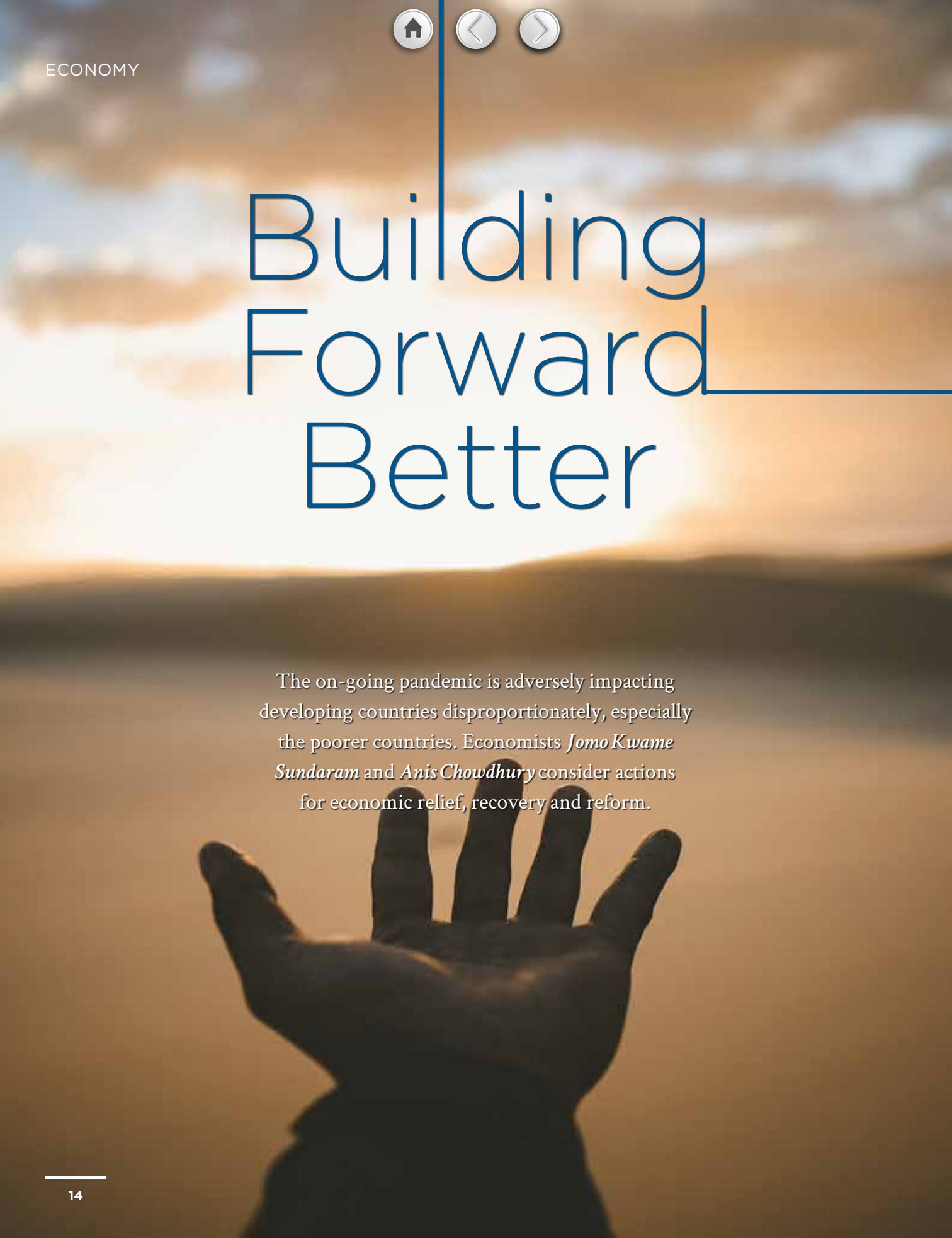
Be regenerative.
Aim to work with and within the cycles of the living world. Be a sharer, repairer, regenerator, steward. Reduce travel, minimize flights, be climate and energy smart.

Aim to thrive rather than to grow.
Don't let growth become a goal in itself. Know when to let the work spread out via others rather than scale up in size.

Saturday, 13th February 2021 marked nine years since the Doughnut was first published in an Oxfam Discussion Paper entitled *A Safe and Just Space for Humanity: Can We Live within the Doughnut?* Written by then-Oxfam researcher, Kate, the paper's opening question asked: Can we live inside the Doughnut? The same question remains just as relevant today and possibly more so as the world looks towards recovery from COVID-19. The holistic scope and visual simplicity of the doughnut, coupled with its scientific grounding, has turned it into a convening space for big conversations about reimagining and remaking the future. ■

Building Forward Better

The on-going pandemic is adversely impacting developing countries disproportionately, especially the poorer countries. Economists ***Jomo Kwame Sundaram*** and ***Anis Chowdhury*** consider actions for economic relief, recovery and reform.



The COVID-19 crisis clearly threatens both health and livelihoods. What's more, the adverse effects of the crisis also spread, through trade as well as credit, to other countries, firms and households.

Almost 2.7 billion workers, which is over four-fifths of the world's workforce, now work and earn less due to the recession, with those in lower middle-income countries prone to bigger losses.

Saving Lives and Livelihoods

Globally, almost 1.6 billion in the informal economy - including the worst-off 'casual' labourers and petty, mainly family businesses, using unpaid family labour - have been hardest hit by the 'stay in shelter' lockdown measures. The axiom is, the longer the lockdowns, the greater the economic catastrophe. Both the pandemic and contagion containment efforts have threatened business operations and decision making. The design of measures matters, crucially affecting likely effects.

Early stimulus packages assumed that the 'pandemic shock' would be short-lived and easily reversible. In the past year, governments have adopted various monetary and fiscal measures to sustain as well as revive economic activity. These measures include extending social protection, cash transfers to households, temporarily deferring tax payments and lending more to businesses. While postponing tax payments may help, it tends to benefit the better-off who are generally liable for more tax, rather than those most adversely affected or in need.

In short, to counter this, governments of developing countries must do much more to help revive and sustain economies and livelihoods to prevent COVID-19 recessions from becoming protracted depressions. The government effort must extend to addressing the unsustainability, inequality, instability and other problems of extant economic, social as well as ecological arrangements.

Livelihoods Disrupted

The thing to remember is, business disruption has broader implications. It threatens the entire economy with long-term costs. Furthermore, if relations - such as trust among entrepreneurs, workers and customers - are disrupted, they'll need to be rebuilt, and this requires time as well as expense.

Conventional economics ignores 'transactions costs' incurred in recruiting workers, seeking as well as keeping clients and customers, obtaining credit and investing capital, building trust as well as other relations, and thus, is a poor guide to policy. Ideally, the adverse effects of livelihood disruption should be minimised and income maintenance policies need to help fired workers as well as those whose livelihoods have been greatly diminished. In fact, even novel social protection measures are needed. For example, idle workers should immediately receive special social protection, while staying formally employed.

Here's where direct and simple payment systems help. Without question, protecting livelihoods and helping businesses survive, along with enforced suspension due to lockdown measures, are both needed. Businesses, especially smaller ones with fewer reserves, need help to avoid liquidating and continue paying their employees. Taking such measures minimises rehiring costs when work resumes, but shouldn't excessively burden employers with debt. However, this is easier said than done. The challenge will be to implement fairly, with minimal abuse and within the means available to governments.

Needed Interventions

Interventions, such as governments helping absorb the costs of public health measures to contain the contagion, are needed. This will not only help alleviate economic hardship faced by households and businesses, it'll also minimise lasting damage to the economy while contributing to economic recovery. Without appropriate government measures, output will collapse due to enforced business disruptions leading to massive layoffs. Therefore, timely government interventions can

Jomo Kwame Sundaram
Economists

Anis Chowdhury
Economists

prevent unavoidable recessions from becoming longer lasting depressions.

Since there's no likelihood of simply returning to the status quo ante, government support for recovery also enables guidance for needed reforms to enhance prospects for sustainable development. Rather than 'build back better', governments must strive to 'build forward better'.

Even when no longer operating, business maintenance and employee welfare need to be prioritised. There are a few, mainly developed countries which have acted promptly to minimise layoffs, avoidable business destruction and worker welfare losses. Governments should also adapt to emulate how American bankruptcy law enables businesses to continue operating to work themselves out of temporary predicaments.

A Last Resort?

In March 2020, Berkeley economists Emmanuel Saez and Gabriel Zucman proposed governments help ease pain and disruption with 'payer-of-last-resort' programmes. The proposal required adversely affected businesses to report unavoidable monthly overheads, maintenance and wage costs to qualify for government aid. Therefore, a government 'payer-of-last-resort' can help 'suspended' businesses to continue paying unavoidable bills to avoid insolvency, on condition of keeping their involuntarily idle workers, instead of firing them.

'Payer-of-last-resort' programmes can be effective if well complemented by effective contagion containment measures, enabling early resumption of business operations. Such a programme would not only reduce hardship, but also help businesses to temporarily suspend or scale down operations, limit haemorrhage as well as avoid insolvency and pick up quickly as conditions improve. What's more, it would maintain cash flow for families and businesses, minimising the shocks' adverse impacts on demand, such as due to fired workers spending less on consumption, while enabling rapid recovery as demand resumes.

Government spending, while unavoidably high due to the pandemic, can be financed by greater domestic borrowing enabled by central banks. This can be managed, especially with international economic solidarity and support for poor countries through existing multilateral institutions.

One Size Cannot Fit All

One thing's for sure, economies aren't homogenous, monolithic or unchanging. No single inflexible policy can possibly be suitable for all. As recessions are uneven in impact, various sectors, industries, services and businesses are affected differently. COVID-19 slowdowns are also unlike other past recessions. Many businesses may not be able to survive enforced stoppages and protracted demand collapses, even if temporary. Such businesses could go bankrupt, severely affecting related enterprises as well as all those directly and indirectly employed.

Much has to be learnt quickly 'by doing' and from other experiences, both positive and negative. Although, some businesses and sectors may not be able to survive, survival options should include business redeployment, infrastructure and facility repurposing as well as staff retraining. Conditions should be strict enough to deter abuse, but not participation. Strict verification and correction can wait, even until after the worse is over. For example, government grants or subsidies, later found to be excessive, can be converted into low interest loans that governments recover later, rather than treated as criminal fraud.

Inadequate Support

Clearly, many businesses need help to survive in these troubled times. Governments have provided liquidity, usually by offering low-interest or interest-free loans, to help businesses and workers survive crises. However, such measures only 'smoothen' debt burdens over longer periods, delaying or postponing 'pain', without ameliorating victims' economic losses.

Temporary partial compensation for income losses based on need can enable businesses to quickly resume operations after lockdowns end, rather than contend with greater debt burdens. Aid is typically provided conditionally, for example, to avoid or minimise employee retrenchments. But little would be gained from deploying scarce resources to businesses unlikely to ever recover.

Although policymakers typically insist on means-testing for anti-poverty programmes, they rarely demand targeting for businesses, reducing the efficacy of government relief. All too often, without some 'easy' targeting of needy businesses, inevitably benefiting some who are not needy, too little is available for those in greatest need. A developed social protection system can help retrenched workers, but this is rarely available in developing countries.

The reality is, the most vulnerable are more likely to be displaced by lockdowns and less able to earn a living from home. To help, government unemployment benefits can be made progressive, with a higher fraction of previous earnings for the more needy.

Fiscal Space Crucial for Recovery

The fact is, almost half of low-income countries were already debt-distressed or at high risk before March 2020 when the WHO declared the COVID-19 pandemic. Limited fiscal space has constrained developing countries' relief, recovery and reform measures, rendering them far more modest than those of wealthier developed countries. Nevertheless, their government debt ratios rose faster in 2020. Many emerging markets have taken on more debt, largely on non-concessional terms from private lenders and non-Paris Club members. Government debt in these developing countries has thus surged to levels not seen in over half a century.

From January to October 2020, the average debt burden of developing countries increased by 26 per cent as tax revenues declined sharply. The International Monetary Fund (IMF) projects their average debt ratios will rise significantly in 2021. But debt burdens limit available fiscal resources as well as policy space needed to better address the pandemic health and economic crises. Such debt is particularly debilitating in the least developed countries, where healthcare services were bare, even before the pandemic.

Relief, Recovery, Reform

Regrettably, we now face avoidable delays in vaccinating the world as intellectual property profits and vaccine imperialism block achieving 'herd immunity', especially in the poorer developing countries. As countries prepare for recovery, they should ask what recovery can and should mean. Recovery should not mean a return to business as usual. The unsustainable, financialised and grossly unequal pre-COVID-19 economy needs to be fundamentally transformed for sustainable development to be achieved.

COVID-19 policy responses have rarely addressed deeper prior malaises, such as stagnant or falling productivity growth and declining labour remuneration, not to speak of sustainable industrial policy measures to address global warming, resource exhaustion and other sustainability problems. ■

Digital Currency vs Cash

Central bank digital currencies or CBDC, are on the rise and financial institutions need to respond. *Reyana Nacerodien* asks how some key financial players are taking action.

Digital is the order of the day. The pace of digitalisation of the economy has quickened and our money has undergone a rapid evolution that hasn't stopped. Customer behaviour and associated transactions remain dynamic in the wake of COVID-19 and banks are responding by incorporating new technologies into their operations. Global financial players share their view.

Timothy Lane
Deputy Governor, Bank of Canada

Bank of Canada

Current Trends

Timothy Lane, Deputy Governor at the Bank of Canada affirms the uptake of digitalisation. 'We're particularly interested in how the pandemic has changed the way that Canadians purchase goods and services. And we're keenly aware of the need to seize the opportunities that lie before us to give Canadians even better, cheaper and faster payment methods.'

Timothy recalls, 'In a speech in Montréal a year ago, I gave our preliminary view: we didn't see a need for a central bank digital currency at that time, but we could imagine scenarios that could make a central bank digital currency beneficial in Canada. I concluded that we'd move forward to develop such a digital currency as a contingency plan, given how quickly the world is changing and the time required to develop a viable product.'

Two weeks after his speech, the first lockdown was imposed, which accelerated the evolution of the digital economy. 'So, our work to prepare for the day when Canada might want to launch a digital loonie - backed by the Bank - has also accelerated. We're not alone,' says Timothy. In a recent survey, almost 60 per cent of central banks reported the possibility that they'll issue a central bank digital currency (CBDC) within six years. This is up from less than 40 per cent only a year ago.

'The other scenario I raised in my speech last year is the increasing use of digital currencies created by the private sector, including cryptocurrencies and so-called stablecoins. While these products have existed for several years, some could see a boost from the acceleration of digitalisation in the midst of the pandemic,' Timothy adds.

Cryptocurrency

According to Timothy, in this increasingly digital economy, cryptocurrencies such as bitcoin don't have a plausible claim to become the money of the future. They're deeply flawed as methods of payment, except for illicit transactions like money laundering, where anonymity trumps all other features, because they rely on costly verification methods and their purchasing power is wildly unstable. The recent spike in their prices looks less like a trend and more like a speculative mania - an atmosphere in which one high-profile tweet is enough to trigger a sudden jump in price.

'In contrast, widespread adoption of stablecoins for everyday transactions is possible, although none is near that point yet. Because in most cases, they're partly or fully backed by safe assets, their purchasing power is designed to be more stable,' says Timothy. 'But many issues need to be addressed before we can be confident that stablecoins can be used safely by the general public. The Financial Stability Board is examining these issues at the global level and I'm chairing the international working group that's taking this work forward. Here in Canada, we still have work to do to ensure that our regulatory framework covers these new products.'

The Future Stance

Timothy says that, amid all of these developments, two fundamental questions need to be addressed: Are there benefits to issuing a digital form of money? And if yes, who should do so?

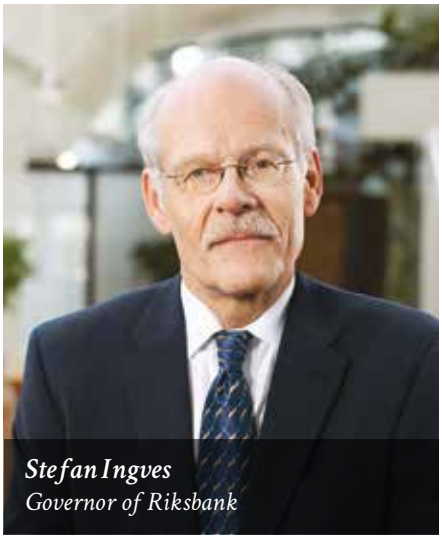
In response to the first question, there's no knowledge on whether Canadians will actually want to use a stablecoin or any other kind of digital currency when they have alternatives available such as cash, debit, credit and electronic transfer. Would the addition of a digital form of cash to the existing suite of digital payment methods meet a real demand and enhance the

evolution of a competitive, vibrant digital economy?

'More work is clearly needed to identify the potential benefits to users, compared with other alternatives. And, of course, we also need to study potential risks,' Timothy adds. Furthermore, if the public does want a digital cash-like currency, some good reasons illustrate why a central bank - a trusted public institution - should issue it. 'Currency is a core part of the Bank's mandate and the integrity of our currency is a public good that all Canadians benefit from. Only a central bank can guarantee complete safety as well as universal access and with public interest, not profits, as the top priority.'

As part of their advancing work, Timothy explains, the Bank has been researching and experimenting with different technologies. In addition, they've recently engaged three university project teams to independently develop proposals for what a digital currency ecosystem could look like. 'This blue-sky thinking will help inform our research going forward. We've come a long way, but more work remains. And this work takes on greater urgency as we find ourselves in an environment where the current system's shortcomings could limit the ability of consumers and businesses to pursue the opportunities created by the digital economy.'

Thankfully, Canadians can look forward to significant improvements in the speed, convenience, efficiency and choice of digital payments in the near future. 'This is an important part of the Bank's responsibility to promote safe, sound and efficient financial systems. The Bank will continue to explore the possibilities of a digital currency that would be an electronic version of the bank notes that Canadians trust and rely on. We'll issue such a currency only if and when the time is right, with the support of Canadians as well as the federal government, and with the best evidence in hand.'



Stefan Ingves
Governor of Riksbank

Riksbank, Sweden

Current Trends

Stefan Ingves, Governor of the Riksbank affirms what fellow financial institutions have been seeing: the use of banknotes and coins is declining in society. At the same time, technological advances with electronic money and payment methods are proceeding rapidly. The Riksbank sees potential problems with the marginalisation of cash and has therefore initiated a pilot project to develop a proposal for a technical solution for Swedish krona in electronic form.

Stefan has publicly reiterated in a number of discussion forums and Riksbank platforms, 'The Riksbank has the task of ensuring that payments can be made safely and efficiently, and that the krona retains its value. For this to be possible, cash needs to be both protected and supplemented with a digital alternative. We must also create the conditions required for digital payments to become more efficient. The Riksbank is already well underway in this work.'

Cryptocurrency

'The Riksbank is investigating whether it's possible, and desirable, to issue a digital complement to cash, a so-called e-krona. The e-krona could ensure that we retain several of the functions of cash in a future where cash is no longer used,' says Stefan and concurs that new types of cryptocurrency may affect the payment market and the financial system. The shared view on cryptocurrencies, such as bitcoin, is that they vary considerably in value and are difficult to use for payments. The Riksbank has a different view of potential e-krona. 'Sometimes, I hear that an e-krona would fundamentally change the payments market. But I don't think this is the case. As I see it, the e-krona would be a continuation of the system we're used to, where the Riksbank offers safe state money as a complement to private money.'

The Future Stance

'The Riksbank has not yet taken a formal decision on whether or not to issue an e-krona. A decision to issue an e-krona requires a legal basis and political support. To be able to, at this stage, test how an e-krona might look and function, the Riksbank is running a pilot project with Accenture. Together, we're constructing a technical platform for the e-krona. The aim is to create, in an isolated test environment, a digital krona that's simple and user-friendly. At the same time, complies with stringent requirements regarding security and performance.'

Stefan has a vision for the future of money and payments in which it'll be possible to make instant payments in Swedish krona, using state money and making instant payments between currencies across borders will further be possible 24 hours a day. 'I believe that a similar vision can work in most countries and my views are similar in many ways to those now being expressed internationally.' Investigation is ongoing in terms of the need for and effects of an e-krona on the Swedish economy. The Riksbank continues to explore whether an e-krona would affect Swedish legislation and the Riksbank's mandate, and how.

Tom Mutton
Director of Fintech, Bank of England

Bank of England
Current Trends

The Bank of England published a discussion paper on CBDC last year in order to generate discussion and feedback to inform and progress developments. The bank concurs that CBDC could present a number of opportunities for the way that the bank achieves its objectives of maintaining monetary and financial stability, but the bank remains cautious. 'CBDC must have a clear use case. Our explorations initially focus on a CBDC with a payment use case, using a platform model, where the central bank operates the core ledger and private players the customer interface,' explains Tom Mutton, the Bank's Fintech Director.

In his speech given at the Bund Summit on digital currency, fintech and inclusive finance, Tom affirmed, 'Our approach is to embrace fintech and enable innovation. We started with an award winning fintech accelerator that experimented with technologies such as AI and distributed ledger. We then created a fintech hub to lead our strategy, in partnership with colleagues across the organisation. And our Future of Finance review last year put forward a roadmap for how the Bank will support a more digital, innovative and greener financial system.'

Cryptocurrency

At the start of last year, the Bank identified three priorities for its fintech work - payments for a digital age particularly CBDC, safe adoption of new technologies in finance with a particular focus on AI and influencing the interaction between the digital economy and finance with open data for small business finance as well as digital identity front of mind. 'We couldn't have anticipated the challenges COVID-19 would bring when we identified those priorities. But now they look more relevant than ever as innovation and fintech helps the economy respond, and then recover, from the shock of COVID-19,' says Tom.

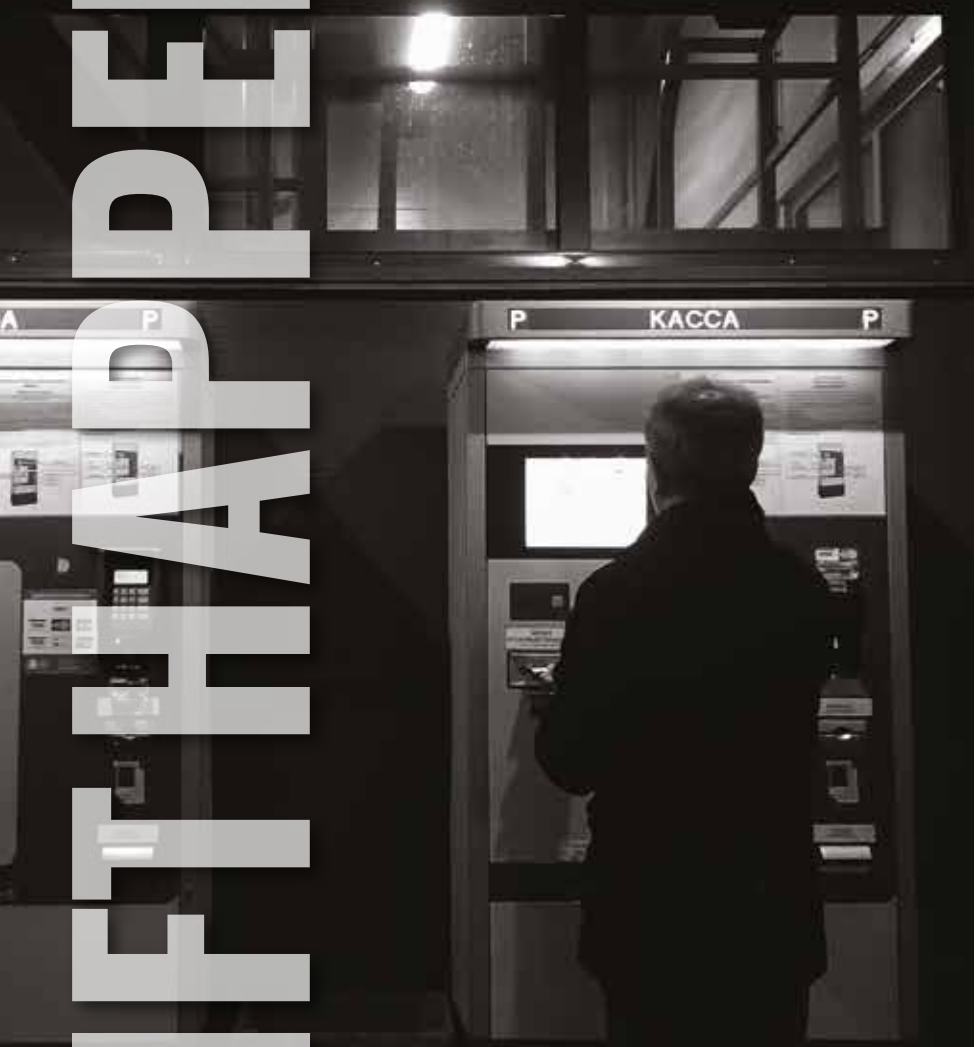
'Indeed, just imagine the impact had the COVID-19 crisis occurred in 2000, not 2020. Back then, only 25 per cent of British households had access to the internet. iPhone1 and Satoshi's white paper were both eight years away, Alibaba was less than a year old. Jeff Bezos was predicting a day when 15 per cent of retail sales were online. In fact, 32.8 per cent of the United Kingdom's retail sales were online in August 2020 and have consistently been above 15 per cent since 2016,' adds Tom.

The Future Stance

The Bank can play a supportive role in helping fintech and innovators drive the recovery. 'Innovation will be essential to our economic recovery. But if innovation isn't responsible, risks will quickly emerge and its benefits will not endure. That's why the right regulation is so important. On this, our mantra is same risk - same regulation. Meaning that where an innovation is deployed in a systemic payment chain, it must deliver the same protections as, and have equivalent regulation to, existing forms of money and payments, irrespective of the technology used,' Tom concludes. ■

SHIFT HAPPENS

Here, ***Su Aziz*** chats with the United Kingdom's largest cash machine network to find out benefits of shifting to a cashless society and central banks to produce their own digital currency.



As they say, shift happens and within the monetary realm, many are fast becoming cashless societies. While the pandemic has accelerated the shift from physical to digital currency rather aggressively due to necessity, digitalisation has made the transition a smooth process.

So, what's next? Well, there seems to be many answers and several sharp speculations, or observations. These include central banks jumping onto the cryptocurrency bandwagon and produce their own digital currency, as well as the shift to a cashless society.

LINK runs the network that connects all 60,000 automated teller machines (ATM) in the United Kingdom. 90 per cent of the United Kingdom's cash comes from LINK ATMs, effectively making it the largest cash machine network there. Cash remains a vital form of payment for British consumers and even during current COVID-19 lockdowns up to GBP1.4 billion of cash is dispensed every week from ATMs.

'I was born in the 1960s when cash and cheques were the main means of payment, but now cheques are virtually non-existent in the United Kingdom and cash is only used for around one in 10 payments,' says CEO of LINK, John Howells. 'London, where I live, was leading the United Kingdom in the decline in cash usage and the rise of digital but the coronavirus pandemic has seen reductions in cash withdrawals of 50 per cent right across the United Kingdom.' This change, according to John, has been very fast and cash still accounted for six in 10 payments just a decade ago, which was around the time he became LINK's CEO.

Here, on behalf of LINK, John answers some questions on the shift to a cashless society and digital currency.

Should the shift to digital currency happen?

LINK supports payments choice for all. We aren't for or against cash versus digital and the reality is that consumers are choosing to move to digital at pace. The issue in the United Kingdom is doing that in an inclusive way. It would be unacceptable for some of the five million consumers here who rely on cash, to be left behind as the country goes to digital. That's why an inclusive approach to developing digital, including central bank digital currency (CBDC), while maintaining cash access and acceptance for as long as is needed, is LINK's strategy.

John Howells
CEO of LINK

Why should CBDC be regulated?

Currency is a vital tool in how individual governments run their countries and therefore as physical currency declines, LINK expects most central banks to launch CBDCs. Individual countries or blocks will manage regulation of their key policy tools such as CBDCs but there are strong incentives for coordination on some common standards. This is because broad global acceptance of your CBDC and improving efficiency in cross-border payments are some of the benefits that CBDC will bring. Physical and digital central bank currency will be full fungible, and so the value of a physical note or a digital unit will be identical.

What do you predict to be the benefits of digital currency for a population, especially for the United Kingdom?

The key benefit will be to enable all consumers in the United Kingdom to access digital means of payment and value storage which combines the benefits of physical cash as well as digital. This in turn will support a more sustainable and greener economy, easier access to broad digital products and services, and a resilient and safe payments infrastructure in the face of growing fraud as well as operational resilience risks.

How will LINK adapt to a cashless society?

LINK's job is to maintain a broad access to cash network so that no consumer is forced off cash before they wish, while supporting the development and rollout of an inclusive and innovative approach to digital. CBDC implementation will be a key enabler of inclusive and innovative digital payments. ■

5G LIFE IN THE FAST LANE: Going On 6G

CAN YOU IMAGINE AN EVEN MORE CONNECTED WORLD? THOSE IN THE KNOW SAY THAT WE'RE IN FOR A HUGE LEAP WITH 6G. REYANA NACERODIEN REPORTS.

5G has only just been introduced in various parts of the globe and already the hype around 6G has begun. It's a foregone conclusion that 6G will further introduce several newly disruptive technologies. What can we expect as we accelerate from 5 to 6?

Thanks to 5G, industries are going digitally developing at a faster pace which has been a blessing amid COVID-19 challenges. Applications developed on the basis of 5G, AI, cloud and big data have played a significant role during the outbreak. Geographic disparities do exist as reflected in the speed of 5G rollout even in markets where coverage is the most advanced such as the United States, South Korea and China. While 5G is rolling out faster than 4G did, some markets will need to play catch up as 6G is already all the rage.

Roberto Verdone
Professor

Jukka Riekki
Strategic Research

Marja Matinmikko-Blue
Research Coordinator

The 6G Hype

6G has been discussed in various forums for some time, most notably at the 6G Wireless Summit which is already in its third year of existence. The platform offers the 6G community experts' views in order to generate wide interest and discussion on visions, challenges and requirements for 6G at a time when 5G is quite literally still kicking in.

Wireless Communications Laboratory, or WiLab for short, is the Italian laboratory of wireless communications and it's directed by Professor Roberto Verdone of the University of Bologna. Founded in January 2020 under the auspices of the Italian Inter-University Consortium for Telecommunications (CNIT), WiLab boasts about 50 researchers and professors of different Italian universities. Among its competencies, WiLab counts on deep knowledge of people tracing technologies using mobile radio networks.

Roberto says that there are two reasons why the hype of 6G is already dominating discussions. The first reason lies in the normal process of development of a new Generation of mobile radio networks. The five years before its deployment are dedicated to standardisation. Before this phase starts, in the previous five years research is conducted by the major stakeholder, to gather competence and patents on the new technologies, candidate for inclusion in the standard. With the advent of 6G expected for 2030, 3rd Generation Partnership Project (3GPP) will initiate standardisation efforts at the end of 2024 and the beginning of 2025. So, the research phase has already started.

The second reason is more related, specifically, to 6G. During the phase of standardisation of 5G, relevant associations of main global industry stakeholders have identified the needs of sectors like manufacturing and automotive applications. While 5G can address some of them, it's already clear that many applications such as fully autonomous cars and digital twins in industry plants have requirements that cannot be met by 5G. Digital Twins, as the name suggests, are the digital or software equivalent to real-world objects such as industry machines. These real-time software options evolve with time exactly as the true real-world objects would. They require a precise model of the physical object and real-time information captured from the physical object through sensors.

The final goal of a digital twin is to act as a tool to implement predictive maintenance, because the model, synchronised to the object, allows to predict if failures are going to happen – a solution for which 5G falls short. So, while 5G implementation is underway, limitations and shortcomings have already been identified. In October 2020, WiLab established a decennial agreement with Huawei, to pursue fundamental research in the field of the intelligent Internet of Things (IoT) for 6G. Looking to the future, Roberto says, 'As much as 5G has opened doors in the technological space and the rollout is in play, gaps are already being identified. So, we need a new Generation to satisfy these needs.' Various platforms and groups have responded to this call.

What can we expect with the Advent of 6G?

In Finland, the 6G Flagship is a research venture with firm goals for 2030 driving its progress. The Finnish 6G Flagship is a vigorous research and co-creation ecosystem for 5G adoption and 6G innovation led by the University of Oulu and appointed by the Academy of Finland, a governmental funding agency for high-quality scientific research. The team at the research program concur with the sentiments of WiLab.

'The 6G Flagship envisions a future society towards 2030, which is data-driven and enabled by near instant, unlimited wireless connectivity,' explains Jukka Riekki, a strategic research area leader in distributed computing at 6G Flagship. 'Our 6G experts seek major scientific breakthroughs in four interrelated strategic research areas which are wireless connectivity, device and circuit technologies, distributed intelligent computing, novel vertical applications and services.'

6G Flagship's experts foresee the main future uses of 6G in specific verticals including health, industry 4.0, automotive and energy, which are already present in the ongoing 5G rollout. Technology, sustainability and business are recurring themes in the research conducted and platforms presented. In this regard, an even more holistic and integrated

approach is taken to the future possibilities of technological development with 6G.

'The telecommunication community is usually good at technology development, but the inclusion of sustainability at the level discussed in the 6G Flagship white papers produced and presented is something totally new and goes beyond the approach in the prior generations of networks,' notes Dr Marja Matinmikko-Blue, a research coordinator of 6G Flagship. In her research work, Marja takes an interdisciplinary approach bringing together technical, business and regulatory domains of wireless communications, and focuses especially on spectrum management and sustainable development of 6G. The business environment will undergo a drastic change when digitalisation is gradually introduced to all aspects of society.

'Looking at different continuums, for instance humans-machines, the needs of the different types of users must be addressed, with the goal of sustainability at all levels,' Marja says. 'The role of ICT in meeting SDGs is critical. It's not enough to treat 6G development and UN SDGs separately. The UN SDG framework will also need to evolve with the technology development.' Thought leaders like Marja concur that it's these possibilities that require more work to be done right now. 'Technology-centric versus a business focused continuum, on the other hand, is a good reminder for us telecom experts. The potential we see for wireless in verticals is only realised when the vertical businesses can harness the benefits.'

The young people of today will be the developers and users of the new 6G systems in the next decade and we must invest in offering them a solid knowledge base with tools to achieve the best possible outcomes that transform societies. From his vantage point with the work that WiLab are engaged in, Roberto too sees two major trends unfolding.

'On the one hand, the industry requires a system offering performance, trust and reliability larger than 5G. On the other, the evolution from 5G towards 6G will revolutionise the way humans will use mobile technologies; the advent of new human-device interfaces, for example, based on 3D holograms, and tactile technologies will make much deeper the sense of communication with other people. We'll not only rely on visual or audio perception. All senses will be involved, to make it possible to live a full experience when communicating remotely,' says Roberto. He agrees that progress in all fields and sectors is a given, but hopes for a human-centric society. 'Something that we need to tackle and we still do not address enough is a greener way to achieve progress and wellbeing.'

Preparing for the Future

In the meantime, exciting projects are underway to further generation networks. The Minimisation of Drive Tests (MDT) project at WiLab, for example sees the scientific collaboration between Telecom Italia, Italy's telecommunications giant, better known as TIM and WiLab. The partnership aims at the production of scientific material and joint research related to the issues of network optimisation and development of Self-Organising-Networks (SON) algorithms for future generation networks 5G and Beyond 5G (B5G), starting from big data MDT analysis.

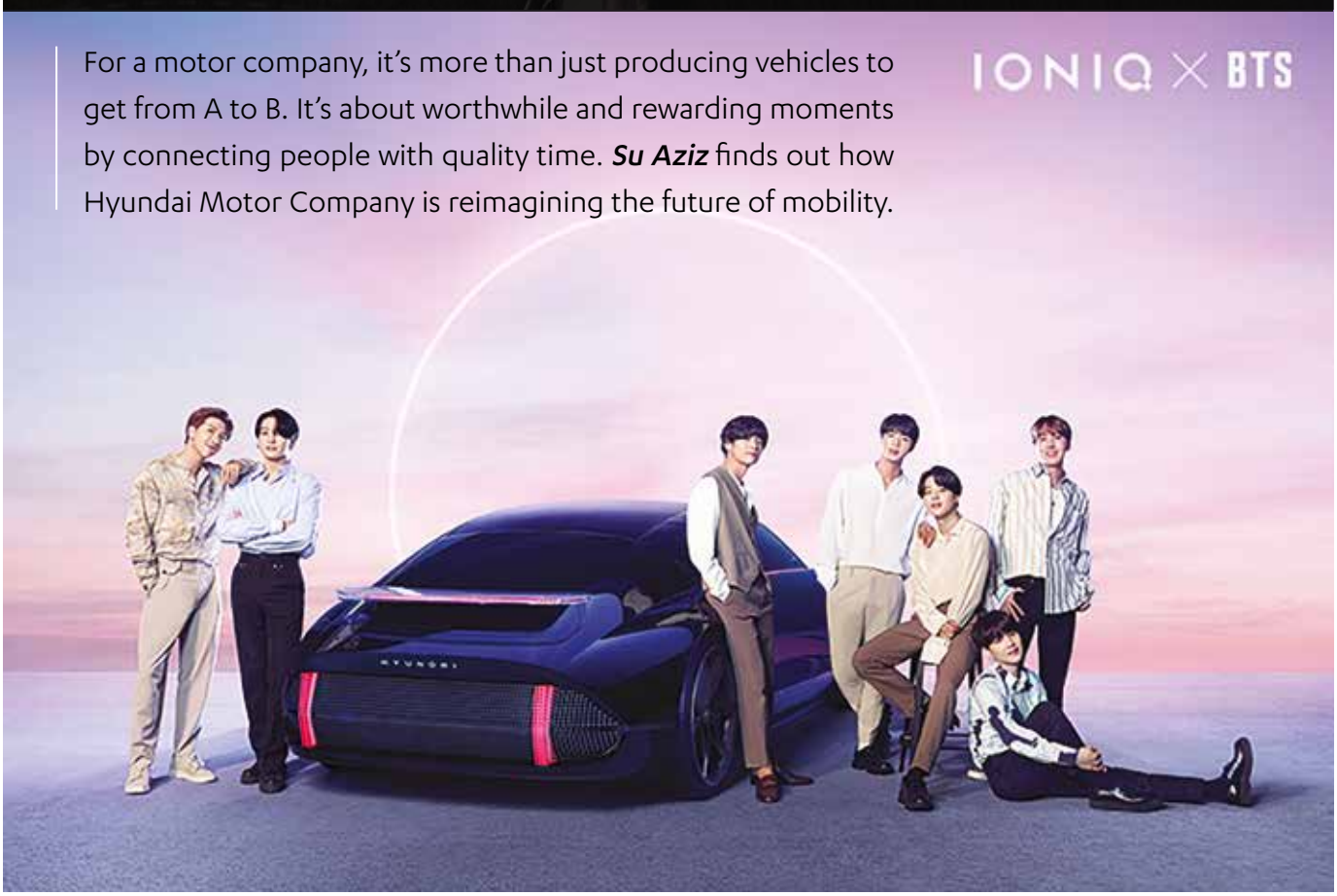
According to WiLab, the spatial and temporal granularity offered by these data can in fact be exploited as an excellent source of statistical channel state information and lends itself to an analysis by machine learning techniques. The work that Wilab will carry out with TIM on this data will focus on the study and application of artificial intelligence techniques in order to propose new methodologies of radio resource management according to the three paradigms of SON networks which are self-configuration, self-optimisation and self-healing. Network optimisation is one of the potential outcomes.

Further, WiLab's work with holographic radio using intelligent surfaces aims to study the benefits of intelligent surfaces made of meta-materials in the optimisation of wireless communication and localisation systems. The introduction of intelligent surfaces changes the design paradigm of wireless systems from systems that adapt to the environment, to systems that are jointly optimised with the environment. One of the applications of this technology is certainly in the Industrial IoT sector, where thousands of radio sensors are connected in harsh environments characterised by metallic obstacles and people on the move, with the additional advantage in mitigating electromagnetic pollution.

The current experimental environment and expert service at work are intended to deepen the pioneering research on next generation wireless systems. Already, there are companies making use of the diverse experimental environment and knowledge being generated in the early stages of 6G research. More developments will undoubtedly, rapidly unfold with the potential for even more visibility, application, new opportunities and future markets offered by emerging technologies. ■

REIMAGINING MOBILITY

For a motor company, it's more than just producing vehicles to get from A to B. It's about worthwhile and rewarding moments by connecting people with quality time. ***Su Aziz*** finds out how Hyundai Motor Company is reimagining the future of mobility.



South Koreans are certainly making phenomenal waves globally through their music, TV series, beauty products, food and even as a travel destination. Each industry has become a big hit and each one is louder than the next in terms of popularity as well as its contribution to Korea's economy.

Enter Hyundai. The motor company that doesn't want to be defined solely as a car manufacturer. Knowing that people are expecting more, Hyundai Motor Company is now transitioning itself into a Smart Mobility Solution Provider.

Driving a Vision

The company's manifesto is connecting people with quality time. Their focus on humanity means understanding what people want in life and to get the most out of the time they have. Their purpose is to reinvent the 24 hours that are equally given into quality time, making every moment truly worthwhile and rewarding.

In this day and age, mobility is more than just a car and Hyundai isn't just looking at combustion engines, electric motors or hydrogen fuel cells to move around. The wide array of technologies that they have at their disposal means journeys will be taken to the next level that nobody has experienced before. Therefore, the way people travel in the future won't be the same as today. Shared transport and autonomous vehicles have been widely discussed as the preferred options for how people will move around in the next few years.

There's a lot of potential for autonomous vehicles and Hyundai Motor Group is leveraging cutting-edge autonomous vehicle and mobility technologies to introduce a new, safe and convenient form of transportation. Its motor company offers solutions that not only take people from point A to point B, but also liberate them from constraints of time and space.

At Hyundai Motor Company, work on these emerging trends is already well underway. For example, Hyundai Motor Group and Aptiv's joint venture Motional began testing fully driverless systems in 2021 and have a production-ready autonomous driving platform available for robotaxi providers, fleet operators and automotive manufacturers in 2022. More is in the pipeline for 2022 such as focusing on making the environment cleaner by accelerating vehicle electrification. Last year, they launched IONIQ which opened a new chapter as a leader in the era of electrified mobility.

Hyundai Motor Company will leverage its industry-leading manufacturing expertise in EVs to introduce three new dedicated models over the next four years with more innovative models to follow. The creation of the IONIQ brand is in

response to fast-growing market demand and accelerates Hyundai Motor Company's plan to lead the global electric vehicle (EV) market. This is a step forward in achieving their 'Strategy 2025' of positioning themselves as the world's third-largest automaker of eco-friendly vehicles.

Enabling Innovation

Hyundai Motor Company is the global leader in the development, mass production and export of hydrogen fuel cell systems for electric vehicles and beyond. Hyundai Motor Company introduced its first fuel cell EV (FCEV), Santa Fe FCEV, in 2000. It was followed by the world's first mass-produced FCEV, ix35 in 2013 and the second-generation fuel cell SUV, NEXO in 2018. As part of its 'Fuel Cell Vision 2030', Hyundai Motor Group aims to secure a 700,000-units-a-year production capacity of fuel cell systems for automobiles as well as for non-automotive sectors, such as vessels, rail cars, drones and power generators, by 2030.

Hyundai Motor Company's roadmap for connected vehicles includes the mid-to-long-term development of a range of key features, including smart remote maintenance services, autonomous driving, smart traffic and a connected mobility hub that provides security and data

management for all elements of the connected vehicles.

There has been a lot of interest in building an efficient and sustainable smart transport system and it will be a matter of time before some of these transport options are rolled out across different parts of the world. For example, in the Middle East and Africa markets, Dubai is among the cities that are already taking measures to ensure its city can welcome autonomous vehicles with plans of 25 percent of all car trips being driverless by 2030 while they are also working on plans to roll out air flying taxis in the foreseeable future.

A Construction of Future Mobility

There are some significant Hyundai Motor Group's transport concepts to look out for in the future. While there are many factors that would affect the price of products, affordability is one of the four priorities of their design philosophy. Plans have already been drawn up for three interconnected mobility solutions to help vitalise human-centred future cities. These are:

Urban Air Mobility (UAM)

a collaboration with Uber to adopt flying Personal Air Vehicles (PAV), making air taxis an option for urban transportation which can dramatically reduce transit time.

Purpose-Built Vehicles (PBVs)

connects passengers to the Hub via a docking station on the ground floor and uses real-time data to chart optimal travel routes. While passengers can take advantage of a wide range of tailored services, these vehicles can also function as a restaurant, coffee shop, hotel and even a clinic.

Hub

a mobility connection point that links air-based and ground-based vehicles and their passengers as well as creating new communities by combining multiple PBVs.

Solutions to Challenges

The future of mobility will present different types of challenges, but Hyundai has chosen to view them as opportunities.

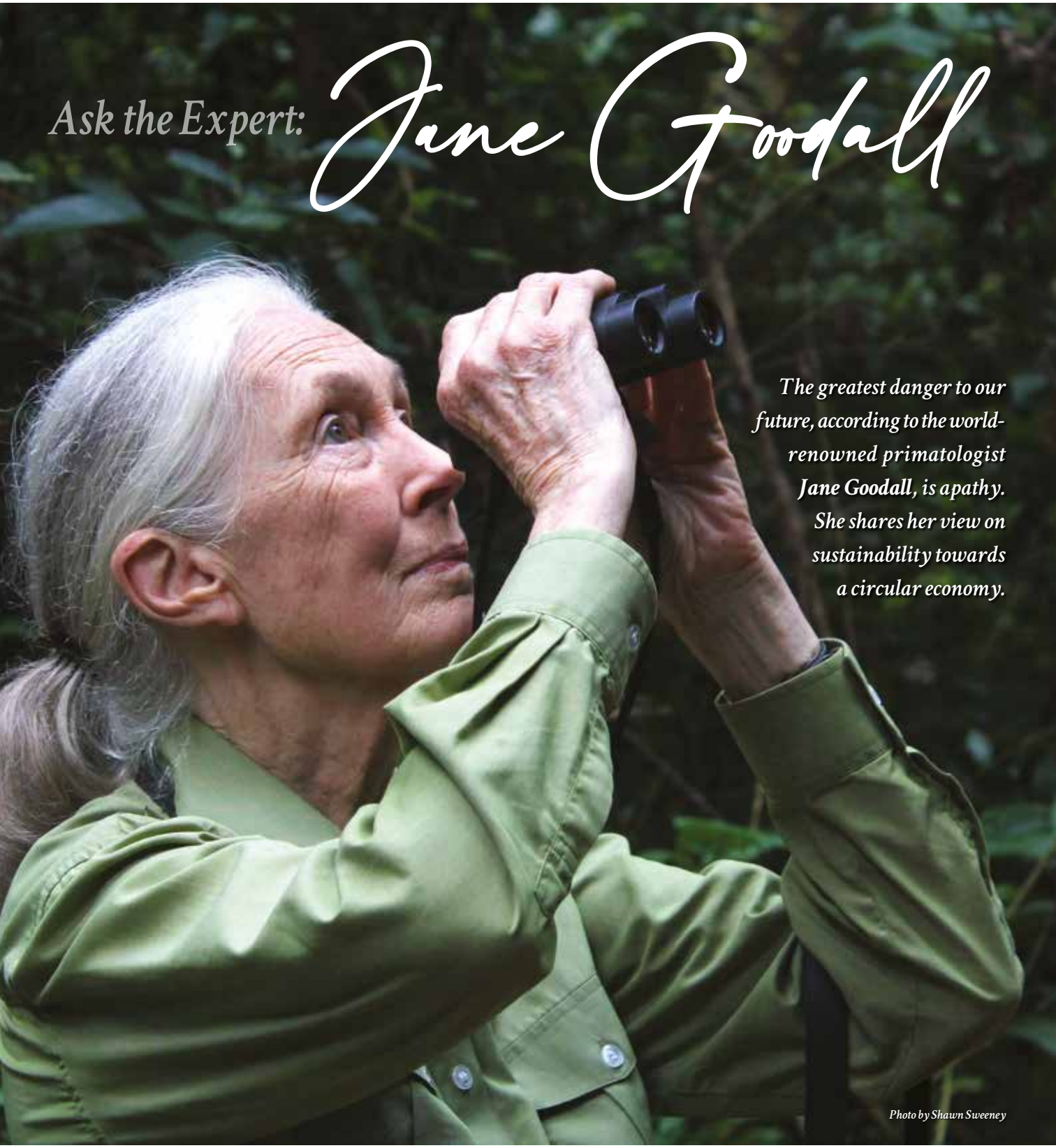
Challenge: To ensure there's a sustainable ecosystem in place for the introduction of autonomous cars and shared transport as well as UAM and PBV concepts.

Solution: It requires a collective effort to make these concepts work as Hyundai Motor Company can't do this alone. This means governments and organisations in the public and private sectors of different industries coming together to give their expertise in drawing up road safety policies and frameworks, planning and delivering services and understanding what longer term technological trends are expected in the future so that all modes of transport can be integrated.

Challenge: Selecting the right type of technologies. Digitalisation and connectivity are playing a fundamental role in our everyday journeys and future concepts of mobility will be no different.

Solution: With the emergence of technologies, there has been a rise of companies that specialise in creating technologies. The trick is to choose the right type of companies to work with and what their technologies can offer, how sustainable it is and how they can make everyday lives easier for customers. ■

Ask the Expert: Jane Goodall



The greatest danger to our future, according to the world-renowned primatologist ***Jane Goodall****, is apathy. She shares her view on sustainability towards a circular economy.*

Photo by Shawn Sweeney

Dr Jane Goodall, a renowned primatologist, ethologist, anthropologist and conservationist, was just 26 years old when, in July 1960, she travelled from England to what is now Tanzania and ventured into the unknown world of wild chimpanzees. That was the start and began a remarkable history of ground breaking work.

Not only has she given us a fascinating picture of the life of our closest living 'relatives', but initiated a holistic program to protect chimpanzees and their habitat by working with has redefined species conservation to include the needs of local people and the environment.

Today, at 87, she travels the world, speaking about environmental crises, urging each of us to take action on behalf of all living things and the planet we share. We tracked her down to hear her thoughts on sustainability and the circular economy.

Do you agree that the idea of the circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources, is an effective one?

Jane: It is the only approach that makes sense. To continue with 'business as usual' would ultimately lead to our own extinction. The resources of Planet Earth are finite, yet for a very long time, humans have been exploiting them as though the supply was infinite. Clearly it makes no sense to think there can be unlimited economic growth on a planet with finite natural resources, that in some places are already being used up faster than nature can replenish them.

In addition, there's a growing human population and a growing population of our livestock. With over seven billion of us on the planet today and estimates suggesting it'll be closer to 10 billion by 2050, what will happen unless we make changes? Changes in the unsustainable life styles of so many of us for one thing. We must realise that we're not separate from the natural world but part of it. We depend on it for clean air, water, food, clothing, shelter and so much more.

The one silver lining of this pandemic, that has caused so much suffering, hardship and economic chaos everywhere, is that many people are now aware that it's our disrespect of animals and nature that has led to this pandemic by creating situations – wildlife markets, factory farms. Habitat destruction, incursion ever deeper into the remaining really wild places – which makes it relatively easy for a pathogen, such as the virus that spilled over from a wild animal to a human which resulted in a new zoonotic disease: COVID-19. Unfortunately for us, this disease is very infectious and was able to travel remarkably quickly around the world. More people are also aware that it's the same disrespect for the natural world that has led to the two greatest threats to our future – climate change and biodiversity loss.

Fortunately, humans have evolved an extraordinary brain. Indeed, we haven't always used it wisely but as the reality of those two threats sink in, people are beginning to work out innovative ways in which we can do things differently. Renewable energy derived from the sun, wind or tide. Regenerative agriculture, permaculture, vertical farming, small scale family farming, agro forestry, if we embrace these methods of growing food and phase out industrial agriculture with its monocultures and reliance on chemical pesticides as well as herbicides. Also, phase out factory farms for domestic animals which aren't only unbelievably cruel but are also devastating the environment as more and more habitats are destroyed to grow grain or provide grazing. What's more, much water is wasted to turn vegetable to animal protein and huge amounts of methane are produced.

We've realised the importance of alleviating poverty – the really poor will cut down the last trees to grow food to feed their families or make money from charcoal. Muhammed Yunus introduced microcredit with his Grameen bank that enables people to take out tiny loans to start their own small businesses which often include imaginative recycling and reuse of materials that would otherwise be thrown into landfills. Finally, we must protect and restore forests and plant trees and protect and clean up oceans.

Over the years you've developed similar thinking in your holistic approach to people and planet. Can you share some learnings with us?

Jane: During the many years I was observing chimpanzees I was able to spend hours in the rainforest. There I learned about the interconnection of all things and how each species has a role to play in the complex web of life, the biodiversity of a given ecosystem. We're in the midst of the sixth great extinction. Every time we lose a species, locally or totally, a hole is torn in that web. When too many holes are torn, the web will be left in tatters and this can lead to the collapse of an ecosystem. It's healthy ecosystems that we depend on for our survival.

It was when I was trying to learn more about the threats to chimpanzees that I also learned about the threats faced by so many people: crippling poverty, lack of good health and education facilities and degradation of the land. It came to a head when I flew over the Gombe national park in the late 1980s. What had originally been part of the equatorial forest belt that stretched to the west coast had become a tiny island of forest surrounded by bare hills. More people living there than the land could support and too poor to buy food from elsewhere. That's when I realised that unless they could find ways of making a living without destroying their environment there could be no way of protecting the chimpanzees.

So, in the early 1990s the Jane Goodall Institute began TACARE. It's our method of community-based conservation. From the start it was very holistic and based on what the villagers told us would most help them. Restoration of fertility to over used farm land (no chemicals), improved schools and clinics, water management programs, microcredit programs especially for women, scholarships for girls to enable them to acquire secondary education and family planning information.

Photo by Roots & Shoots Malaysia

Finally, we introduced GIS, GPS as well as satellite imagery that enabled the villagers to make land use management plans and volunteers from the villages learned to use smart phones to monitor the health of their village forest reserves, where most of Tanzania's remaining wild chimpanzees live, unprotected. We also introduced our program for youth, Roots & Shoots, into all the village schools.

TACARE started in the 12 villages around Gombe and is now in 104 villages throughout the chimpanzees' range. It has been introduced to six other African countries where JGI is working to study and conserve chimpanzees. Because the people understand that protecting the environment is for their own future and not just for wildlife, they have become our partners in conservation.

Sustainability benefits from innovation and development. How has increased access and technology helped in your reality?

Jane: As mentioned JGI uses science and technology in our Tacare program. Recent developments in remote sensing and cloud computing are making it possible for us to use satellite imagery to provide a detailed overview of all the chimpanzee habitats in Africa while also recording the impact of human activity. We share this information not only with local communities, but also with government agencies and conservation NGOs and are thus able to work together to develop and implement conservation action plans.

We're now working with scientists and veterinarians to study transmission of diseases between wild and domestic animals and humans in order to better predict the emergence of a new zoonotic disease. Another project works with indigenous knowledge of medicinal plants. Sometimes local people use the same plants for the same kind of ailments as do the chimpanzees.

Any advice the future?

Jane: Perhaps the most important thing is education along with alleviation of poverty. I began our program for youth, Roots & Shoots, in 1991 after meeting so many young people who had lost hope. They were angry, depressed or apathetic. They said more or less the same from all continents, 'We feel this way because you have compromised our future and there's nothing we can do about it.' We have compromised the future of our youth. We have been stealing it from them for years. But it isn't true that they can do nothing about it.

Roots & Shoots has one main message: Every individual matters and has a role to play. Every one of us makes an impact every day and we get to choose what kind of impact we make. Because I understood how everything is interconnected, I suggested that every group should get together and choose three projects to benefit people, animals and the environment. Now in more than 60 countries and growing, Roots & Shoots members are changing the world.

So, my advice for the future is follow your heart, and remember you make a difference. Every day. ■

Photo by Jane Goodall Institute

Buildings are major contributors to climate change. Key players in the built environment are doing their bit to mitigate this, quite literally, one brick at a time.

Reyana Nacerodien writes

BUILDING TRANSFORMATIONS

COVID-19 offered the example of global economic shutdowns as attempts to curb the virus traversed countries. Recent figures show that a similar shutdown is needed if we are to achieve a global warming limit of 1.5 degrees Celsius by the end of this century. Green building advocates belief that the industry offers one of the most cost-effective solutions to climate change and can lead to significant environmental, economic and social benefits around the world.

The Role of the Built Environment

The building sector and buildings themselves have, in recent years, been identified as a climate change contributor. At CNN's Climate Change Forum held in 2019, American senator Elizabeth Warren illustrated this to delegates. 'I want to think about the three areas where we get the most carbon pollution in America right now. And what are they,' she said. 'They're in our buildings and homes, what we're burning. It's our cars and light-duty trucks that we drive. And it's the generation of electricity where we're still using a lot of carbon-based fuel to make that happen.'

According to the UN environment program, buildings and their construction together account for 36 per cent of global energy use and 39 per cent of energy-related carbon dioxide emissions annually and the numbers keep growing. The American Energy Information Administration states that residential and commercial buildings account for 40 per cent of energy consumption of the region. Globally, building operations account for about 28 percent of emissions each year.

Buildings basically contribute to climate conditions in two ways. One, lies in the day-to-day operations of the building typically defined by lighting, heating and cooling the building environment. Two, is through the manufacturing of the building. Building materials, transporting materials to construction sites and the actual construction process is said to account for an estimated one quarter of a building's total lifecycle carbon emissions.

Enter green buildings.

A 'green' building is a building that, in its design, construction or operation, reduces or eliminates the negative impacts mentioned, and can actually create positive impacts, on our climate and the natural environment. Green buildings preserve precious natural resources and improve our quality of life. According to the World Green Building Council, any building can be a green building, whether it's a home, an office, a school, a hospital, a community centre, or any other type of structure, provided it includes features listed below:

- efficient use of energy, water and other resources

- use of renewable energy such as solar energy
- pollution and waste reduction measures - enabling of reuse and recycling mechanisms
- 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 the design, construction and operation
- a design that enables adaptation to a changing environment

The World Green Building Council (WorldGBC)

The WorldGBC works towards catalysing the uptake of sustainable buildings for everyone, everywhere. The WorldGBC global network is comprised of 70 Green Building Councils and their 36,000 members to deliver impact across three strategic areas of climate action, health and wellbeing as well as resources and circularity. It works with businesses, organisations and governments to drive the ambitions of the Paris Agreement and UN Global Goals for Sustainable Development. Through a systems change approach, this network tries to deliver a net zero carbon, healthy, resilient and equitable built environment.

Cristina Gamboa, CEO of World Green Building Council says, 'I believe that there's a big for traditional sectors and sometimes very conservative sectors like the construction industry to do their part in terms of contributing to mitigating climate change, but also, contributing to social development and the provision of basic services and infrastructure that make people have better lives.' In September last year, WorldGBC launched Sustainable Buildings for Everyone, Everywhere. It's a new strategy to accelerate and mainstream the transformation of built environments around the world.

Based on climate science and the SDGs, the strategy tackles global warming, health and wellbeing and resource impacts to deliver quality infrastructure which is a critical need for our planet, communities and economies in the context of the pandemic. 'To tackle the world's most pressing issues such as climate change and the COVID-19 pandemic, WorldGBC's new strategy establishes three North Star Goals for our sector: climate action, health and wellbeing, and resources and circularity. To reach these goals, our network has outlined key milestones for 2030 and 2050 as well as seven impact pathways to achieve them,' explains Cristina.

Making a Change

The *2020 Global Status Report for Buildings and Construction* by Global Alliance for Buildings and Construction (GlobalABC), found that while global building energy consumption remained steady year-on-year, energy-related CO2 emissions increased to 9.95 GtCO2 in 2019. This increase was due to a shift away from the direct use of coal, oil and traditional biomass towards electricity, which had a higher carbon content due to the high proportion of fossil fuels used in generation.

The Paris Climate Agreement aims to limit global temperature rise to 1.5 degrees Celsius. According to UN Environment, in this vein, the built environment's energy intensity which measures how much energy buildings use will need to improve by 30 per cent by 2030. The 2020 Global Status Report for Buildings and Construction showed that the rate of annual improvement is decreasing and moving the sector away from achieving decarbonisation. Results show that spending for energy efficient buildings increased in 2019 for the first time in the past three years, but remains outpaced by investment in conventional buildings and construction.

Globally, the energy intensity of the building sector is improving but development ensures that the number of buildings is on the rise which then offset energy intensity improvements. Carbon emissions related to buildings are expected to double by 2050 if large-scale action isn't taken. The World Resources Institute published a paper in 2019 about ways the building sector and related policy at the local, regional, and federal levels can address emissions. 'Although all buildings must be net zero carbon by 2050 to meet the goals of the Paris Agreement, not even one per cent of buildings are considered net zero carbon today,' the report states.

It's such data that fuels the WorldGBC's drive for change. In a position paper on the Energy Efficiency Directive (EED), currently under review by the European Commission, ways in which the EU can achieve climate neutrality by 2050 are proposed. WorldGBC's official statement on the matter affirms, 'Buildings have a huge role to play in delivering on European climate goals, and the EED should clarify or set out a target for the contribution that the buildings sector plays in delivering on 2030 energy efficiency target. Our response urges the European Commission to seize the opportunity to tackle energy efficiency in buildings by making changes to Articles 5 and 6 of the Directive.' Article 5 addresses

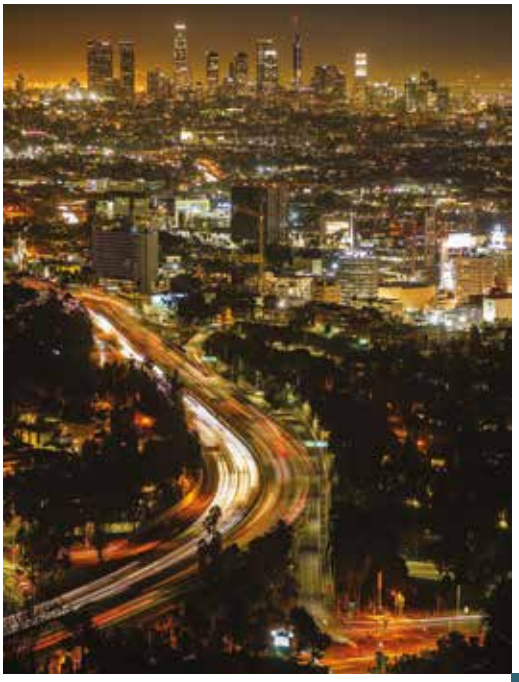
the exemplary roles that public entities' buildings should play while Article 6 addresses buildings bought by public bodies.

WorldGBC's position is that the operational carbon footprint must be addressed first as we move towards a life cycle approach to the built environment. They assert that reporting on lifecycle emissions, should also be made mandatory where it makes sense for all new public buildings. In this way, public office leads the charge in mitigating the impact of public buildings.

Finance institutions and property companies are realising the strong growth potential and investment opportunities of sustainable buildings' investment. WorldGBC network members actively seek to educate themselves on the latest green building technology, refine their existing and new building plans to include green principles and have such work certified according to green building assessment frameworks. Certification provides credible and objective measurement for green buildings aligned to global best practice.

Companies have been joining the cause in committing to net zero carbon emissions by joining the WorldGBC Net Zero Carbon Buildings Commitment. The Net Zero Carbon Buildings Commitment comes from Advancing Net Zero, WorldGBC's global project to accelerate uptake of net zero carbon buildings to 100 per cent by 2050. By joining, organisations commit to global industry leadership to decarbonise the built environment and combat climate change. The Commitment now has a total of 132 signatories, with 98 businesses and organisations, 28 cities and six states as well as regions. Big names include Goldman Sachs, Siemens AG, Arup, Commonwealth Banks of Australia and Salesforce.

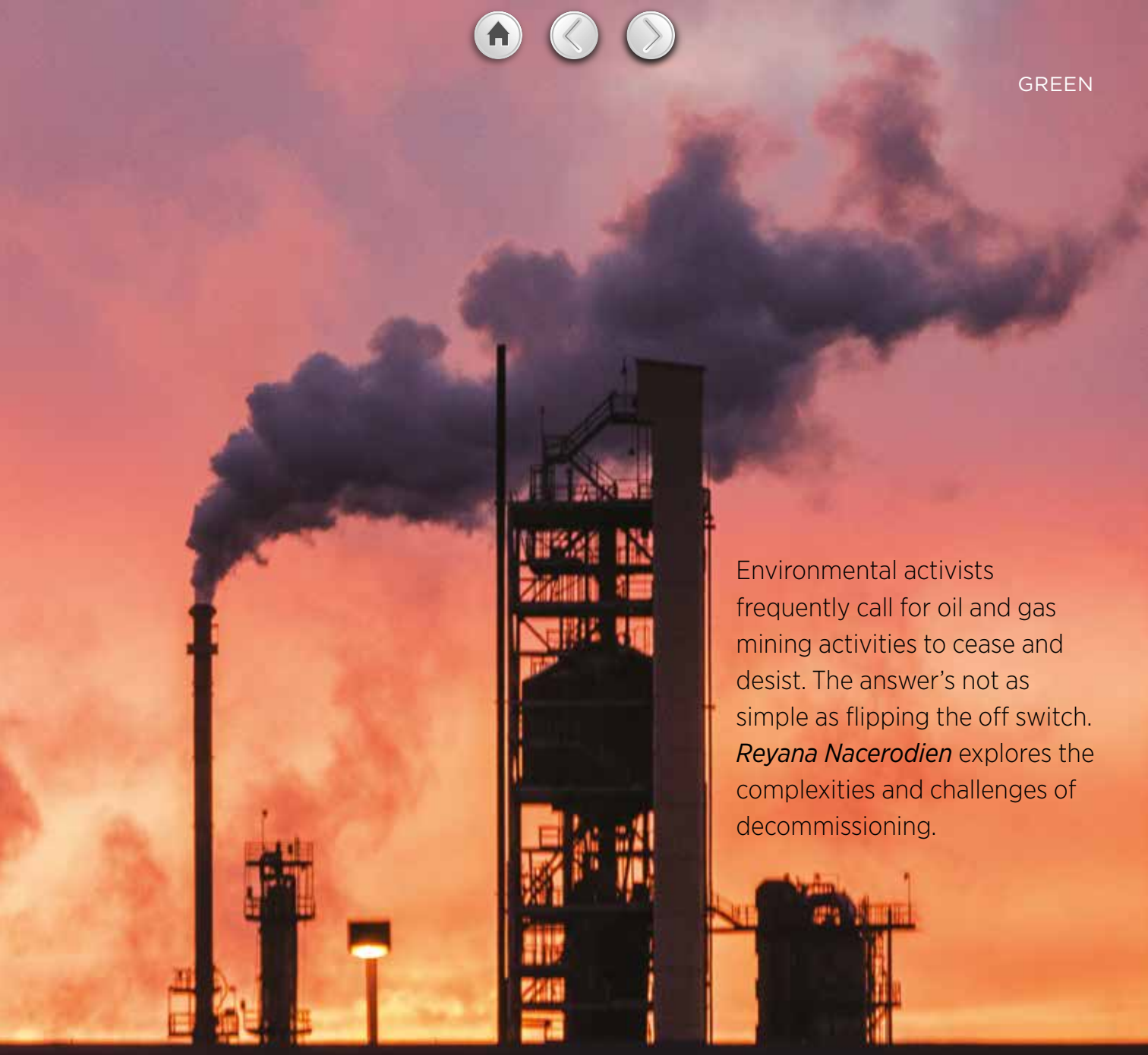
'In recognition of their pioneering market leadership and dedication to net zero, these organisations demonstrate the radical collaboration we need to secure a sustainable and more equitable future. The next step is to show how these targets are applied in practice to build resilience towards the impacts of the climate crisis,' Cristina says. The businesses and organisations signed up to the Commitment now account for over five million (tCO2e) of portfolio emissions.



Conclusion

According to WorldGBC, buildings are responsible for almost 40 per cent of global carbon emissions, 50 per cent of global material use and 91 per cent of people and their families live where air pollution levels exceed WHO limits. People spend 90 per cent of their time indoors, so the quality of the indoor environment is critical in fighting infectious disease transmission. By 2050, the global population will increase to 9.8 billion and the world's building stock will double, accelerating devastating environmental, social and economic impacts of the built environment.

In many ways, the COVID-19 pandemic recovery can help transform the building sector, as it offers a chance to reset and re-align commitments to higher levels of sustainability going forward. The time to act is now and it seems imperative for everyone to get on the road to zero. Cristina affirms, 'A sustainable future is the only future and history will judge us tomorrow on what we do today. Together with our network's leadership and solutions, we will continue to scale up collective action for net zero carbon, healthy and sustainable built environments. In the face of COVID-19, these efforts will enable the much-needed green and equitable economic recovery all around the world.' ■



Environmental activists frequently call for oil and gas mining activities to cease and desist. The answer's not as simple as flipping the off switch. *Reyana Nacerodien* explores the complexities and challenges of decommissioning.

THE DECOMMISSIONING DILEMMA

Oil and gas (O&G) companies have been subject to pressure from environmentalists for years. Companies have, in some instances, refined their approach to weigh their environmental impact. Such refinement is further needed when considering decommissioning of assets given the challenges that arise during the exercise.

The Market

World-renowned Deloitte with its audit, consulting, financial advisory and risk management thought-leadership says that the next decade could see a vast change in the O&G market given the expected long-term decline of demand for petroleum. Deloitte's 2021 Oil and Gas Industry Outlook says that oil demand is expected to recover strongly post COVID-19, but remain lower than it was at pre-COVID-19 levels relating this to what's termed the 'great compression' of the industry.

The report says that changing market dynamics have altered the financial outlook and portfolio options for US shale operators, for example. The US shale industry will likely look different in the next few years, perhaps smaller and dominated by a high-graded or integrated portfolio of data-driven operators. Additionally, the future of US shale could also hinge on how successfully it can insert itself into a greener future. Deloitte affirms that O&G companies will need to affirm their stance on clean energy and respond to the rise of environmental, socially responsible, and impact-focused investing and changing consumer demand.

Operationally, changes are further informed by certain industry realities. Over the next few decades the Gulf of Mexico, Asia Pacific and the North Sea will witness the large-scale decommissioning of mature oil rigs which have either passed or are approaching the end of their operational lives. Added to the operational reality, worsening economics, deteriorating infrastructure, technical limits on further recovery and regulatory pressure will make change inevitable. This poses an expensive and technically complex challenge, to decommission the rigs in a way that is safe, environmental sound and cost effective.

Agreeing with the Deloitte stance, fellow audit firm, KPMG's Global Energy Institute says, 'In our view, the decommissioning era has now dawned in mature oil and gas provinces such as the North Sea – worsening economics, deteriorating infrastructure, technical limits on further recovery and regulatory pressure will make change inevitable. Industry forecasts suggest an unprecedented scale and pace of decommissioning activity in the years ahead.'

For O&G companies, market competition and ever-increasing environmental regulations and concerns are some of the issues that introduce new nuances and difficulties into business decisions. KPMG proposes defined decommissioning strategies as a necessity for exploration & production (E&P) divisions of the O&G industry.

Decommissioning

According to KPMG, decommissioning choices that companies will make are as important and as complex as the choices that they make about major development projects and exploration. But all too often, the industry has treated decommissioning solely as a technical and cost challenge, with much of the discussion to date revolving around supplier capacity, tax relief, safety and environmental issues. KPMG believes that treating decommissioning as a strategic question will improve company decision-making and create a new opportunity for the most agile and flexible players to gain competitive advantage.

The Shell United Kingdom case offers a point of illustration. The location in question is Brent field, an oil and gas field a joint venture between Shell as the operator and Esso Exploration and

Production of the United Kingdom. The field lies 186km northeast of the Shetland Islands in the North Sea. It's one of the largest fields in the North Sea and is served by four large platforms of Alpha, Bravo, Charlie and Delta. Each platform has a 'topside' which is visible above the waterline and houses the accommodation block, helipad, as well as drilling and other operational areas. The topsides sit on much taller supporting structures, or 'legs', which stand in 140 metres of water and serve to anchor the topsides to the seabed.

Through its operational life, the Brent field produced around three billion barrels of oil equivalent. At its peak in 1982, the field was producing more than half a million barrels per day. Its production that year would have met the annual energy needs of around half of all homes in the United Kingdom. After 40 years of service, the offshore area is no longer economically viable given that all the economically recoverable reserves of oil and gas have been extracted, and so, the company started planning the process a decommissioning in 2006. This has been and will continue to be a complex, major engineering project and was estimated to take in excess of 10 years to complete.

Shell continues to carefully plan and monitor the Brent field's decommissioning process following tightly defined regulation and consideration for the safety of people working on the project, the environment impact, the impact on affected communities, and the economics of it all. The company has made detailed recommendations on how best to decommission the Brent O&G field and are confident that these proposals are safe, technically achievable, environmentally sound and financially responsible.

Shell has been preparing for, and executing, various decommissioning activities including plugging and making safe the 146 wells across the Brent field,

removing to shore and recycling the platform's topsides, cutting the upper portion of the Brent Alpha steel jacket and removing to shore for recycling, removing the oil known as 'attic oil' trapped at the top of some of the subsea storage cells and recovering O&G debris from the seabed across the Brent field. Plans have been questioned throughout the progress of the project.

In 2017, Shell submitted its plans to the United Kingdom government to leave the huge concrete legs of three of the Brent field platforms in the sea despite countries raising concerns about the contents of oil storage cells. A decision is yet to be made. Ospar, the body established to protect the marine environment of the north-east Atlantic, stipulates that installations must be removed in their entirety once they reach the end of their production cycle. Exceptions are made if companies can prove the removal of a piece of infrastructure would be more damaging to the environment than leaving it in place.

In October 2019, Greenpeace activists scaled the legs of the Brent Bravo platform, but Shell later won a court order preventing environmentalists from

boarding unmanned North Sea installations. More recently, Greenpeace today accused the energy giant of trying to abandon 11,000 tonnes of oil and the seabed. Despite COVID-19 challenges in 2020, the Brent Decommissioning Team successfully delivered major project milestones, including the removal of the Brent Alpha topside and upper jacket, completion of Brent Bravo topside dismantling and recycling and the Brent Bravo Attic Oil Recovery programme. This year will see the final Cessation of Production (CoP) on Brent Charlie, the last of the four massive Brent platforms. CoP will not only mark the end of production on Charlie, but the final closure of the Brent field.

Final Words

In one respect, industry observers are united in that the scale of the decommissioning challenge is enormous and there are complex, industry-wide barriers to success. Given the scale of the decommissioning challenge and the impact of falling hydrocarbon prices, companies will need to make fundamental decisions about their late-life assets in the not-too-distant future.

KPMG asserts that, as assets reach the end of their useful lives, company resources will become increasingly drawn into the expensive and, at times, technically complex activities required to safely cease production. There are, however, wider options for approaching late-life management and decommissioning. There could be potential advantages to early movers in decommissioning and if O&G firms, suppliers and regulators do not act together, events could put the goal of maximising economic recovery (MER) in the North Sea and other mature regions at risk. This means that O&G companies should be asking hard questions right now about their choices, decommissioning capabilities and approach to cooperation with others. ■

Thoughtful Consumerism:

Food for thought is a common phrase suggesting points that warrant time for consideration. In today's society, ***Reyana Nacerodien*** *explores why there should instead be thought given to our food.*

The food industry is a multi-faceted one, but a vital one nonetheless. The population and environmental concerns of our time make food production and the food lifecycle of paramount importance. We explore the status quo and how it's rapidly changing.

Food Tech: Institute of Food Technologists

Technology has impacted all facets of life, including our food. From addressing the operational and environmental efficiency of farming practices, through to the exploration or antimicrobial packaging to extend shelf life, developments have been impacting what we eat in myriad ways.

The Institute of Food Technologists (IFT) is a non-profit scientific society committed to advancing the science of food and its application across the global food system. Founded in 1938, their vision is a world where science and innovation are universally accepted as essential to a safe, nutritious, and sustainable food supply for everyone. IFT's Science and Policy Initiatives department plays an active role in government policy activities at global, national, state and local levels and acts as a thought leader in the science of food.

Robotics on the rise

IFT has explored the current usage of robotics in the food industry. Today the use of robotics in food processing is common. The International Federation of Robots states that 240,000 units were sold worldwide in 2015 representing an eight per cent increase in annual growth globally. Growth is highest in Brazil where sales are increasing by 33 per cent annually. Benefits include reduced requirements for intensive human labour, reductions in on-the-job injuries, the ability to perform operations that are highly undesirable for humans, increases in final product quality, the ability to perform operations that are very difficult to perform manually by humans, increases in productivity, enhancements in flexibility, improvements in safety, increases in order fulfilment speed and accuracy, increases in uptime and reductions in costs.

Data driven

Increasing complexity feeds demand for data technology and companies have already made use of this for the benefit of their customers. Consumers are, indeed, receptive to more information. Associate professor Dr Winai Dahlan, who is the founding director of The Halal Science Center in Chulalongkorn university, referred to the algorithmic touch of halal through the addition of AI and blockchain technology to reduce the cost of halal accreditation, for example, and in the production of a product with higher competitive capability with the lower expenses.

'Obviously, in halal industries, there are challenges like traceability issues, cross contamination issues and we need technology today to mitigate these challenges in two ways – for managing the halal business and in quality testing.

So, whether the product has non-halal product like cross contamination with alcohol or cross contamination with pork product, we can check by ELISA test, by DNA technology, by other technology HPLC and so forth,' says Winai. All important data can be used in a number of ways.

Product quality

New processing techniques and associated technological developments ensure that strides have been made in producing and maintaining food quality to meet consumer demand. Ardo has an integrated network of cultivation areas, freezer units, storage centres, packaging equipment, appropriate logistics, thorough quality control and a personal approach to each customer. The company has 21 production, packaging and distribution sites in nine countries with a turnover of over EUR1 billion. The business' experience notes that market demand for fresh frozen vegetables, fruit and spices is shifting from quantity to quality. At its 21 production sites, Ardo's response includes camera technology for sorting products and robotisation for cutting products.

Sustainability

IFT's research shows leaders in the food packaging industry are looking for ways to move away from plastics that harm the environment, and new technologies are in development to help achieve this. France-based Carbios, for example, is developing the first biological technology to transform the end-of-life of plastics. The company has developed a novel enzyme that can biologically depolymerise all polyethylene terephthalate (PET) plastic waste so that it can be efficiently recycled into new bottles. Any kind of PET post-consumer waste, is used as a raw material to make any kind of PET product, with the same quality and specifications original PET. Carbios' technology offers food and beverage companies a means to meet their goals for using recycled plastics approved for use with food and beverages.

Food Waste Addressed: Garda Pangan

Food waste comes with other consequences like enormous economic losses and serious environmental impact. The economic cost includes vast quantities of land, water, and fertiliser, labour, fuel and energy used to produce food that is never eaten. Not to mention that when food waste breaks down in landfill, it produces methane, greenhouse emissions contributing to global warming.

In Indonesia, every citizen disposes of 300kg of food per year while 19.4 millions of people still struggle for food every day. That's the gap that the young founders of local Garda Pangan try to fill. The organisation was started by some entrepid young locals who saw the dire need. They aim to realise a hunger free Indonesia through the distribution of excess food. Garda Pangan is based in Surabaya, the capital of the second largest city in Indonesia and currently opening a branch in Malang, East Java. The social enterprise focuses on food wastage, with two main goals – food waste eradication and hunger relief.

CEO and co-founder of Garda Pangan, Eva Bachtiar, an industrial engineering alumni from the Bandung Institute of Technology explains, 'There's a lot of experience that we've met in the field that makes us even more convinced, that the food that we take for granted and we throw away easily may be something that other people crave. We work with broad range of stakeholders, such as restaurants, hotels, cafes, bakeries, produce markets, fruit distributors and farmers groups. We have thousands of beneficiaries and 800+ of volunteers. At the same time, we're creating an ambitious movement among the youth to spread the awareness about the severity of food waste in Indonesia.'

The main beneficiaries of the Garda Pangan food distribution are underprivileged communities in Surabaya, which have been carefully selected and surveyed, so that the assistance provided is right on target. The process of food distribution is also done carefully to avoid the emergence of dependency among the community. Currently, there are a total record of 110 locations and areas of poverty which are 25 pre-prosperous villages, two street children shelters, two pre-prosperous flats, three patient shelters, five social cottage environment, 73 orphanages and nursing homes. Another activity carried out by the Garda Pangan is gleaning, which collects crop yields on agricultural land or plantations that are wasted because of their appearance that does not meet market cosmetic standards.

'We're rescuing and gleaning edible food that would otherwise go to waste from our clients from hospitality industries such as hotels, restaurants, produce markets, bakeries and caterings, in which food waste is often considered as necessary evil to serve those who are food insecure,' says Eva. Though comparatively small, the organisation is doing some big things. 'As at the end of August 2020, we rescued 155,274 portions of food and served thousands of undernourished beneficiaries. Garda Pangan has also rescued 31 tons of potential food waste, which is equal to reducing 58,900kg of carbon emissions.'

Understandably, the Indonesian experience of the global pandemic created a precarious situation for local communities in need. The entrepreneurial spirit of the organisation rang through the pandemic, with the team using the opportunity to implement further ideas that had previously been on hold such as a new business line that turns unsold produce into healthy and delicious products that generates profits to fund operations.

'COVID-19 shifted our operation significantly since most of the food industries and businesses that become our partners and source of food surplus had to close or reduce their production. We tweaked our daily operation to weekly food aid distribution, and we developed a new strict standard operating procedure especially during food distribution in the field,' says Eva. 'We also found that many disadvantaged groups become much more food insecure since they are the ones who are impacted the most during these hard times. We changed our food redistribution method to be a food donation method, where we work with a broad range of donors from companies, individuals, and local businesses, to be able to provide much-needed food aid to the most vulnerable communities.'

For their efforts, the organisation was awarded as Startup with Best Social Impact, Heroes of Surabaya as well as won the Go Startup Indonesia and NextDev Startup competition. They were listed in Top 20 ASEAN Youth Sociopreneurship Program 2017 and the Top 25 Sociodigileaders Telkom 2017. ■

Garda Pangan sees three negative impacts of food waste:

1 **ECONOMIC IMPACT:**
When we dispose of food, what is actually wasted is not only the food but also all the resources used to produce the food, including land, electricity, fuel, labour and transportation.

2 **ENVIRONMENTAL IMPACT:**
Food waste that's piled up in landfills emits methane gas which is 23 times more dangerous than carbon dioxide and is one of the contributing gases to greenhouse emissions.

3 **SOCIAL IMPACT:**
The ironic reality is that food is wasted in large quantities, while there are still many people who are starving.

Garda Pangan's advice and tips for managing leftovers:

> Plan your meals for the next few days or a week to buy and prepare the right amount of ingredients.

> Store food according to optimal settings in the refrigerator that can make food last longer. If there's excess food, save it for later enjoyment.

> Pay attention to the label 'best before' and 'expiration dates'.

> When eating out, ask for portions that you can finish.

> Don't avoid eating fruits or vegetables that may not look perfect. They have the same nutrients.

However, if there is still excess food, you can:

> Donate the food to your family, neighbours or people in need around you.

> If food is no longer suitable or stale, you can use it for animal feed.

> It can be used for processing into compost.

Talking About GOOD Disruptions

On 30 March 2021, WIEF Young Leaders Network (WYN) held a one-hour virtual session on Disruptive Innovations Impacting SMEs. The session which falls under WYN's thinkTALK series serves as a recovery guide for small businesses through online discussions with experts. Its first session for 2021 featured speaker Joel Shen who is the vice chairman of Singapore Chamber of Commerce in Indonesia and partner in the corporate team at Withers KhattarWong. The moderator of the session was Charlotte Kan, London-based international print and broadcast journalist specialising in finance, tech, disruption, lifestyle and travel.

Digitalisation is not a trend but a necessary tool for digital transformation. Through it, businesses are able to create opportunities such as new revenue streams and thrive in a post-pandemic economy. Through it too, businesses can adapt to changing consumer behaviour and be resilient toward an evolving business environment. The attitude businesses have to adopt today is not to wait for recovery to happen. Instead, they should drive their own recovery to survive.

Charlotte Kan
London-based International Print and Broadcast Journalist

Joel Shen
Chairman of Singapore Chamber of Commerce in Indonesia

A Conversation on Creating Solutions through Digitalisation

Charlotte: The COVID-19 crisis has basically served as a call to action for further digitalisation with SMEs, having to capitalise on consumers digital footprint for business engagement. The main insight of this crisis is the fact that digitalisation is a must do.

Joel: The number of internet users in Southeast Asia had increased by 40 million. To put things in perspective for you, it was 360 million in 2019, 400 million in 2020 and last year, 70 per cent of residents in Southeast Asia were connected to the Internet. The pandemic, while it has been an extraordinarily challenging and difficult time for everyone globally, has accelerated the adoption of digital technologies by consumers and businesses alike in a permanent way. And that these changes are expected to last post pandemic, both in Southeast Asia (SEA) and I'd go as far as across the globe, generally.

The proliferation of digital technologies assumes the underlying infrastructure such as smartphones and digital telecommunication networks. There has been an extraordinary amount of private capital pouring in for the development of new and disruptive technologies, notably in the form of venture capital. SEA focused on venture capital investors.

Charlotte: The role of the private sector, whether it's private equity investments, venture funds can't be underplayed here. It's very important, in order to speed up

Digital transformation will help build resilience for businesses badly hit by the pandemic. Bearing this in mind, WYN's thinkTALK for 2021 kicked off with the topic Disruptive Innovations Impacting SMEs that guided SMEs to pivot through useful disruptions. ***Su Aziz*** summarises.

digitalisation, that they should also get involved.

Joel: The venture capitalists (VC) are out in force. They're looking for the next big venture to back. Certainly [is the case] in my part of the world, SEA, given rise to a new generation of digital businesses from ride hailing applications, food delivery to online digital payments. It was quite an opportunity that the advent of the pandemic is at a time when these technologies are already in existence. Can you imagine how things would have panned out if the pandemic had come as recently as 20 years ago where perhaps some of these technologies didn't exist? Students and office workers wouldn't be able to study or work from home, the infirm wouldn't be able to see the doctor via telemedicine or receive prescribed drugs and essential good such as food via delivery apps.

Charlotte: What does digitalisation look like for SMEs? How do you go about it, what should be the first steps?

Joel: An example is, when people ask me what digitalisation looks like, I say, look no further than your favourite food stall in Singapore. My personal favourite is this little stall in a basement of an office building in downtown Singapore. It's run by a Singaporean Chinese lady and it sells fried bee hoon (vermicelli noodles), a favourite breakfast dish of Singaporeans. The stall has been around for a long time, perhaps 15 years or so and operates from early hours to around 10.30am each day. How she operates it, is very traditional. Customers pay by physical currency.

Today, I'm happy to report the stall vendor has leveraged on existing digital platforms and digital technologies. Thus, ensuring the longevity and revenue of her business during the pandemic as well as beyond. Digital payment is one of the bright spots in the economy at the moment. Cities such as London and Singapore are leading financial hubs where the fintech sector is well ahead of the curve. Indonesia, however, is a country of 217 million people and comprises 17,000 islands, many of which wouldn't have even basic infrastructure.

52 per cent of Indonesian adults have no bank account, while the remaining have inadequate access and are under-banked – by which I mean, they have inadequate access to basic financial products and services such as insurance, credit and small business loans. So, fintech is bridging the gap and democratising the world of finance. Thus, ensuring the fat bottom of the demographic pyramid to have access to the basic financial services.

Charlotte: A lot of SMEs are involved in commerce generally trade via e-commerce in particular. The development of fintech solutions appropriate for them is key. However, you need the logistics and the infrastructure behind it, to make it work. So, when we're talking about digitalisation and innovative technologies, let's not forget the supporting infrastructure needed. Now, will fintech eventually replace banks?

Joel: Well, it depends on your view of the world. I don't think banks will ever be totally replaced simply because banks themselves are constantly evolving. I wouldn't see fintech and banks as being on two ends of a competing spectrum. I'd see fintech as new technologies that are eventually either sold to banks or assimilated by banks or indeed developed by banks themselves. Some of the largest banks in SEA today are leading in fintech development. So, don't think of fintech as disruptors but rather as an alternative.

Charlotte: What are the technologies that excite you about their potential to transform SMEs? There's a lot of talk about blockchain and its potential to revolutionise transactions by enhancing traceability visibility and cooperation, what do you make of that, and how can it help SMEs?

Joel: I'd view blockchain as one of the new tools that are used by SMEs. Throughout the pandemic, it's not just one technology responsible for making life comfortable but an accumulation of different technologies deployed in various functions that have led to this happy state of affairs.

Charlotte: There's a lot of that today, indeed. What's interesting is the fact that, like large corporations and big structures it's much easier for SMEs to try new things, change their business models and adopt new technologies. They have that great advantage of agility.

Joel: I'd echo your views there. The Indonesian economy consists of SMEs and they have a distinct advantage in the flexibility their small size accords in terms of adapting to new technologies. Also, it's far easier for these businesses to pivot when they when they come across 'speed bumps'.

Charlotte: There's a shortage of digital skills. A lot of mature economies are attracting talent from developing countries. What can we do to grow local talent, retain it and do it within SMEs?

Joel: There isn't a simple solution. But education is one. However, it takes time to develop talent such as data scientist, for instance and well, the world might be a different place by the time they graduate. I think we do need to adopt new ways of looking at education. It needs to be a process over the productive lifetime of a typical employment. So, we need to constantly renew ourselves, constantly educate ourselves.

Charlotte: How can SMEs afford disruptive innovations in order to thrive? What can they do while operating on a tiny budget? What advice would you give them?

Joel: Consider what the alternative is to adapt. I'd encourage any SME today to really keep a finger on the pulse of new technologies as they become available and consider whether they'd be applicable to them to enhance the efficiency of their business.

Charlotte: Could cryptocurrency be legal payment in Indonesia?

Joel: Today, cryptocurrency is still not legal in Indonesia nor anywhere else. Indonesia regulates cryptocurrency, as they would any other commodity, such as gold, silver, nickel or crude oil. So, you get to invest in cryptocurrency in Indonesia, today, but you wouldn't be able to use it as an instrument of payment.

Charlotte: What does the future of innovation look like and the future of innovation for SMEs?

Joel: Keep an open mind when it comes to the future of innovation for SMEs. I think it would be narrowing the scope of the debate, if we were to say, the future of SMEs is in digital or the future of SMEs isn't blockchain or the future of SMEs is in cryptocurrency. Continue to be receptive to any new technologies that might come along, be ready to adapt to the new technologies when it suits them.

Charlotte: That's a great conclusion. Before we talk about adopting disruptive innovations it's important to have an open-minded agility, try something different and see if it works. I think that's the key and to just explore when it comes to innovative technologies. That's what disruption is all about, trying something new, something that has never been tried by others before and see if it works for you. ■

Artistic action

Works of art have aesthetic appeal, but more recently, artists have offered multi-layered installations that contribute even more. ***Reyana Nacerodien*** *reports.*

Art is often looked at through a very narrow lens. More recently, key decisionmakers and leaders have shared the understanding that the arts can be an important part of a city's economic development and growth strategy. Artists have ventured beyond aesthetics to tell social and cultural, but also, environmental and economic stories that have captivated attention, enthralled the senses and made an enviable contribution to their geographies.

It has long been agreed that art plays a vital role in society. Even more than the aesthetic qualities, more modern-day examples demonstrate social influence by proposing new ideas, changing opinions, translating experiences and instilling values based on our changing realities. The examples shared here demonstrate their contribution to a future reality that's not only a sight to behold, but further has the potential to make a viable contribution to the economic experience of their locations and beyond.

GROWing Innovative Fields

Daan Roosegaarde's latest artwork GROW is an homage to the beauty of agriculture. The 41-year old Dutch artist and his design team drew inspiration from agriscience to create the GROW installation. GROW has transformed a field of leeks in the Netherlands into a 20,000 square metres artwork, drawing attention to the Earth that feeds us and highlighting the importance of innovation in the agriculture system.

Red and blue lights create a ripple effect across the farmland, taking the form of dancing lights that shine with Daan's elegant, poetic approach. The visual spectacle offers a feast for the eyes, while the solid science foundation ensures the optimum growth of a literal feast of leeks. 'GROW is the dreamscape which shows the beauty of light and sustainability. Not as a utopia but as a protopia, improving step by step. It's very futuristic and also very romantic, in a way,' says Daan.

Studio Roosegaarde created GROW with high-density LEDs positioned at different points around the field. Advances in the science of photobiology have been used to create 'light recipes' generated from combinations of blue, red and UV light. These are able to boost plant growth, reduce the use of pesticides by up to 50 per cent and help crops to grow more sustainably. Research suggests that certain combinations of light can not only strengthen plant metabolism but also create resistance to both pests and disease.

The Netherlands provides the perfect backdrop for the work. The country is one of the largest vegetable producers in the world and relies on highly efficient farming techniques. Its comparatively small size, necessitates such efficiency. Although the technology has been used in greenhouses, Studio Roosegaarde saw an opportunity to test its potential at a larger scale. 'I want to design things which make people curious about the future, not sad or mad,' Daan adds. 'Light is my language. Light is not decoration, it's activation and it's communication.' His aim is to help to speed up the application of this science, but also to create a more universal appreciation for the important role of farmers, who he describes as heroes.

GROW was commissioned by Rabobank, for the bank's ongoing artist-in-residence programme. Daan and his team of designers and experts developed GROW over two years. The ambition is for the project to tour all 40 countries where the bank operates. GROW also sends a ray of hope to people, emphasising the innate beauty of technology and science when used to help humankind.

Theatrically Vertical

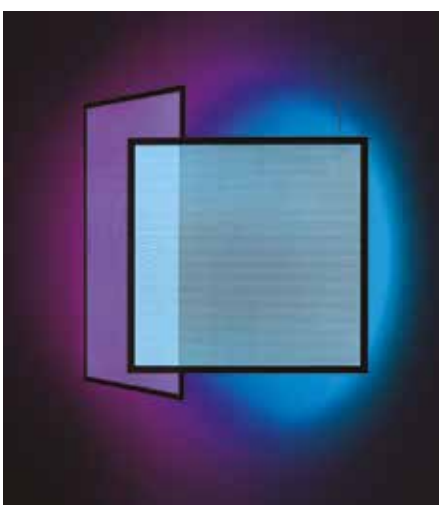
As the world still grapples with COVID-19 and the performing arts have suffered from movement restrictions and gathering prohibitions, architecture studio Stufish, have proposed a solution. The studio recently revealed its concept for a socially-distanced vertical theatre which was created in response to the coronavirus pandemic to allow live performances to continue. UK-based, Stufish, who pride themselves as entertainment architects, joined forces with fellow theatre directors and producers to form The Vertical Theatre Group, providing a vision for a future-proof live performance venue.

'The Vertical Theatre is a new kind of performance space that could be used by all levels of the live entertainment world from theatre and festivals to global artist tours as well as comedy, circus and televised events,' says Ric Lipson, a partner and architect at Stufish since 2006. 'Ensuring that the world of live entertainment can thrive in a world reeling from the unprecedented impact of a global pandemic. This new innovative, tourable, freestanding venue is designed to help guarantee the new future of live entertainment.'

The Vertical Theatre is modular in size and has the capacity for 1,200 - 2,400 people depending on social distancing rules. Conceived with social distancing and decentralisation of audiences in mind, the Vertical Theatre also creates a space that's fully adaptable for when COVID-19 restrictions are a thing of the past.

The freestanding tour-able structure, has a roof to protect the audience and stage from the elements, with optional open sides to allow for optimum airflow and natural ventilation. The audience sits in balconies which can accommodate groups between 4 - 12 people or designated 'social bubbles'. Each audience member has an up-close view of the performance space and enjoys a unique VIP experience, bringing more people closer to the artist unlike any other venue.

The Vertical Theatre Group is optimistic that this venue will be ready to roll-out later this year with the ambition to have multiple Vertical Theatre venues around the world in due course, to give a much-needed boost to the struggling live entertainment industry. The Group have begun initial discussions with potential partners and are open to conversations from further partners to realise this vision.



Dance Biodegradable Personal Protective Equipment (DBPPE)

A pressing environmental issue, food waste, was repurposed in 28 years old material researcher and inventor Alice Potts' forward-thinking take on COVID-19 face masks. The biodegradable shield provides a more environmentally-friendly alternative to the many items of personal protective equipment (PPE) that are made from single-use plastics, and offers the same level of protection. Existing PPE have begun having their own environmental impact as COVID-19 waste increases.

'My main focus as an innovator is to work in collaboration with others to create a new sustainable future, while also educating others. I began creating the masks firstly in response to the stories of lack of PPE from my brother who is a paramedic and volunteers in care homes, before tackling the sustainability side of single-use plastic,' Alice explains. She combined food waste with flowers from London parks to create a series of bioplastic face shields.

The colour and exact structure of each shield is dependent on the food it's made from and the flowers it's dyed with. 'I

usually collect waste from local food markets, butchers and households. Most vegetables can be made into the dyes with fruits acting as a natural sugar for flexibility in the bioplastic, whereas proteins can be used to give strength to the plastic itself. Every colour is completely seasonal depending on what flowers are blooming, what vegetables and fruits are growing and earth that is in and around London.' Alice has even gone so far as to make the bioplastic formula available to everyone as an open-source design. Her face shields are among 30 new works commissioned by Austalia's National Gallery of Victoria Triennial, which features 87 projects by more than 100 artists, designers and collectives from 33 countries.

Integralis®

Integralis® is patented technology that combines sanitising efficacy, luminous performance and design beauty. Developed by Italian lighting brand Artemide which was founded in 1960, the sustainable light platform can be fitted to light fixtures. It's programmed via Artemide app to emit atimicrobial light when rooms are occupied and a stronger dose of 'blu light' or antiviral UV rays when they are empty. While invisible UV light can kill pathogens including viruses, it can be harmful to humans. However, the blue spectrum of visible light can also have an antimicrobial effect.

'In the presence of people, emission frequencies and doses of energy that are not harmful to the eyes and skin can be used, which nonetheless act to inhibit the growth of bacteria, mould and fungi,' explains Artemide CEO, Carlotta de Bevilacqua. 'In the absence of people, higher energy levels or frequencies such as UV rays can be used, which also act on viruses. Integralis adapts to a wide range of our newer products, so as to offer the ideal solution not only for sanitising a space but also for lighting performance in a variety of different environments.'

The technology can disinfect the surfaces and fixtures can be controlled via the Artemide app which adapt the intensity of the sanitising action according to the rhythm of permanence and absence of people in the spaces. In spaces where the presence of people is constant during the day but interrupted in the evening, such as in offices or shops, museum and educational spaces, disinfection with maximum radiation intensity and without occupancy can be carried out during the night.

In the same space, during the day, it's possible to opt for a non-offensive emission of sanitisation maintenance thanks to the special spectral component of the patented Integralis® technology. This approach offers a perfect functional white light which, at the same time, is active against bacteria. In spaces with a limited perimeter such as service areas, elevators, toilets, dressing rooms, halls and waiting rooms, where the permanence of people is temporary, you can choose a punctual 'intermittent' sanitisation. ■

DIGITALISATION

PATHWAYS FOR INNOVATIVE TRANSFORMATION

Digitalisation is not a trend. It is a necessary tool for digital transformation that adapts old ways of doing business onto digital platforms. Thus, businesses are able to create value-producing opportunities such as new revenue and thrive in the 21st century as well as beyond. Current economic climate, as well as pandemic, are catalysts that heightened the urgency for digital transformation. With that in mind, 2021 initiatives by WIEF Foundation are designed to assist and inspire businesses to speed up the process of digitalisation.

#WIEFDIGITALISATION2021

Our Initiatives

WIEF
Communicate With Clarity
POWERTALK

POWERTALK is a platform for renowned influential thinkers to deliberate and share their knowledge, inspiring communities near and far.

WBN
WIEF BUSINESSWOMEN NETWORK

WBN was mooted at the inaugural Forum in 2005 and it organises the annual WIEF Women Entrepreneurs Workshops.

The Roundtable provides an avenue where regional and local business leaders can congregate to leverage on existing business and economic strengths.

WYN
WIEF YOUNG LEADERS NETWORK

The Network holds its Young Leaders events in conjunction with the annual World Islamic Economic Forum.

WET

The WET is aimed at garnering support and resources from the Muslim world to provide education opportunities to the people at large.

14TH WIEF

ECONOMIC REBOUND FOR TRANSFORMATIVE RECOVERY

DOHA , QATAR

COMING SOON IN OCTOBER 2021

WIEF FOUNDATION

www.wief.org