

Think:Act

Leading thoughts, shaping vision

BONUS POSTER
Our original *board game*
to play out the new world
challenges

GEOPOLITICS 2.0: MAPPING THE NEW WORLD

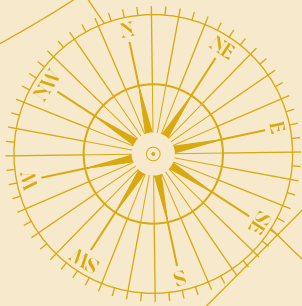
How to keep pace
in a changing global
environment



The cost of Covid
How a virus cost the
world trillions of dollars

Space race rerun
The rush for rockets
and power in the skies

Roland
Berger 



GEOPOLITICS 2.0

*Mapping the new world and
keeping pace with change*

FROM THE FALL of the Berlin Wall to the 2008 financial crisis, the last four decades have seen a tsunami of disruptions. Now a war in Europe, a pandemic, climate change, unpredictable politics and natural disasters present a fresh set of major challenges.

In this issue, we take a deep look at the geopolitical landscape. Alongside questions of how to expand into emerging, but unstable, markets, where to situate your headquarters and whether supply chains are stable, we also look at the impact of a raging war, political shocks, insecure borders, cybercrime, misinformation and tech dominance. International affairs expert Gideon Rachman addresses some of these concerns in our cover story.

But in addition to offering analysis and reporting, we have a more playful way to get to grips with this era of unpredictability: a board game called *Think:Risk*. For countries, expansion has been about conquest. There are strategy games that explore and play with how to do that and some CEOs – including Facebook's Mark Zuckerberg – enjoyed playing them before they took their seats on the board. *Think:Risk* lets you play with strategic challenges. The pull-out poster is the board for the game – the playing field on which you manage supply chain risks and aggressive competitors ... sorry, players ... all with a roll of the dice. Just as in real life.

Think:Risk THE GAME

CREATED BY
Detlef Gürtler

DESIGNED BY
Rodolfo França & LaTigre

Contents

To play you will need:



TWO DICE

As well as the following:



MATCHSTICKS

These represent your land and sea supply routes – or links.



SMALL COINS

One coin stands for an office after two staff are in one place.



PAPER CLIPS

Use these as staff. Two in one country lets you build an office.



STICKY NOTES

These denote your HQ and your starting position.



DON'T HAVE DICE?
Use the QR code to access some digital dice online.

Game setup

How to play the global economy

THE POSTER BOARD shows a world map with 23 different regions: 16 regions belonging to the game's four continents America, Africa, Europe and Asia, four oceans (Atlantic, Pacific, Indian and Arctic) and three hinges that connect (and separate) continents and influence spheres. Your task is to expand your company's reach, mastering crises and competition.

How to start

EACH PLAYER chooses one home continent. You put one sticky note on one of your continent's regions: your headquarters (HQ). Connections to other regions are established with links (the matchsticks): To connect land to land or sea to sea, you need one link. To connect land and sea, you need two. Connections can only be at the truck, port and water symbols.

The links



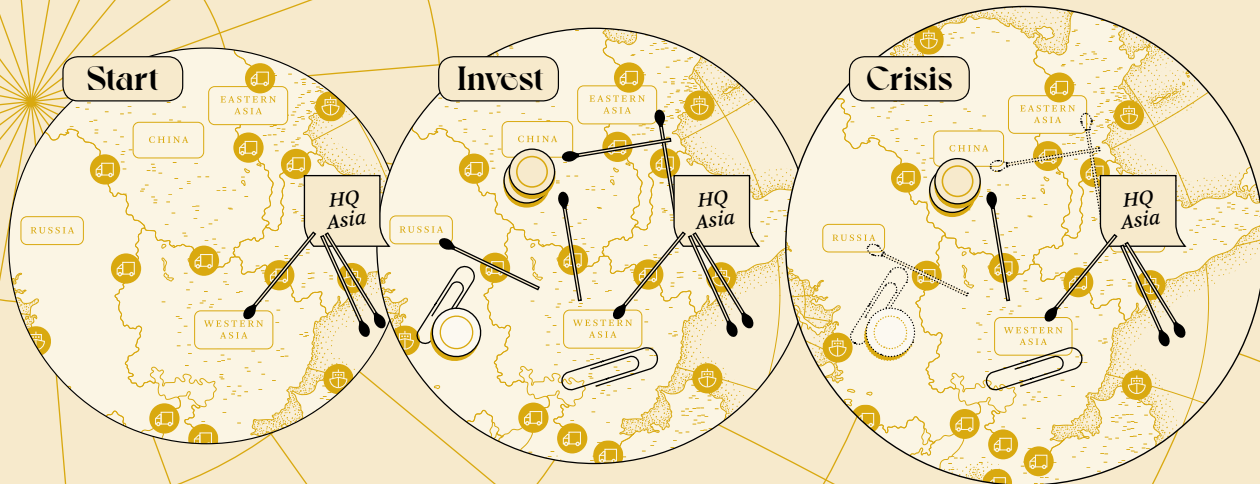
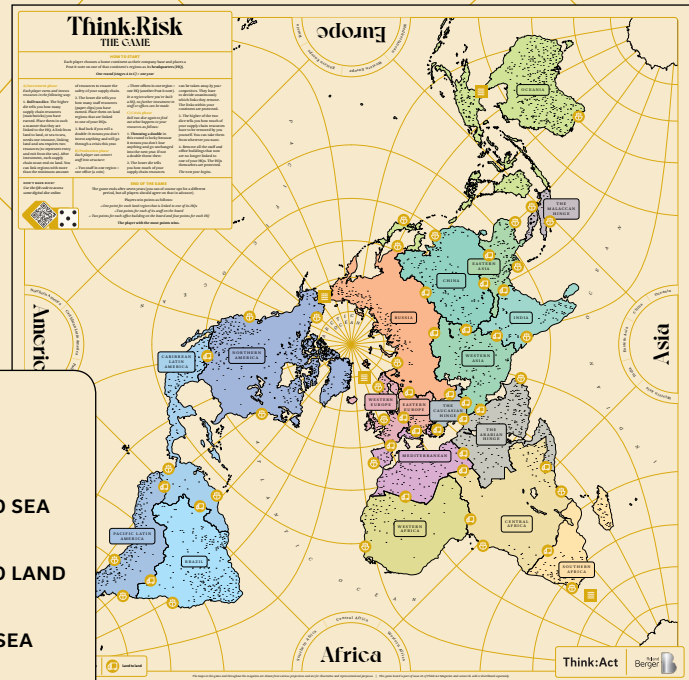
LAND TO SEA



LAND TO LAND



SEA TO SEA



How to invest

ROLLING THE DICE wins you resources. The higher number tells you how many links you can invest. Place them so that they link to your HQ. The lower number tells you how many staff (paperclips) you can invest. Place them only in regions linked to your HQ. Rolling a double throws you into crisis (see right). After all players have invested, you can convert staff into structure: **2 staff = 1 office** (the coins), **3 offices = 1 new HQ**.

DICE IN INVESTMENT



High die = links: Place five so that they are linked to your HQ.
Low die = staff: Place two of them in regions linked to your HQ.



Double = trouble: No investment this round. After all other players have invested and produced, you must deal with a crisis.

How to deal with crisis

WHEN YOU'RE IN CRISIS, one roll of the dice tells you how to deal with it. Rolling a double once more leads out of crisis – no further losses this round. Otherwise, the numbers tell how many of your links have to be removed from the board by your competitors (the lower die) and by you (higher die). After removing the links, you also have to remove all the staff and offices that now are no longer linked to one of your HQs.

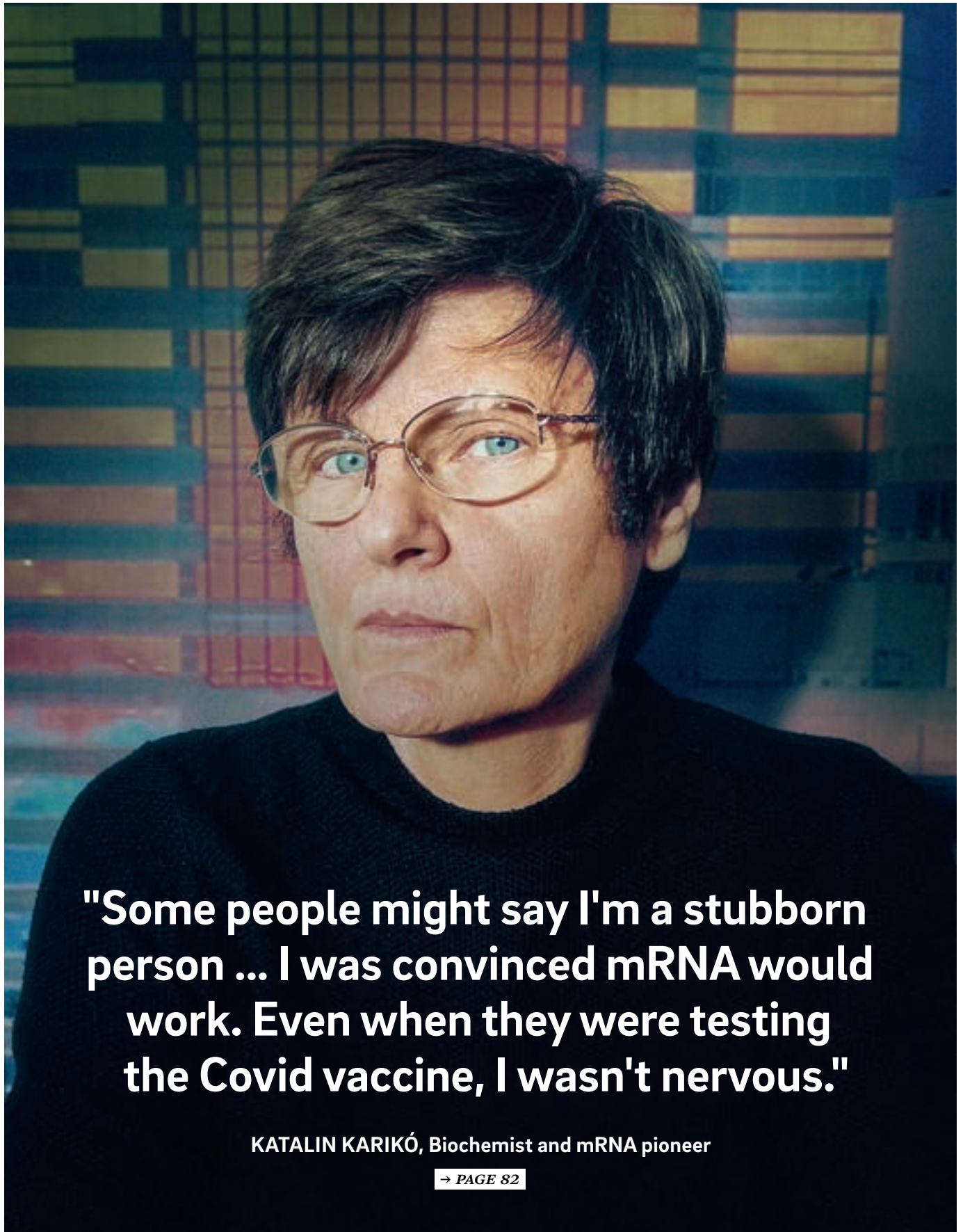
DICE IN CRISIS



Double = lucky: Escape from trouble. You don't lose any of your resources and go into the next round without any changes.



Low die = competition: The other players remove two of your links.
High die = You decide which four further links you must remove.



"Some people might say I'm a stubborn person ... I was convinced mRNA would work. Even when they were testing the Covid vaccine, I wasn't nervous."

KATALIN KARIKÓ, Biochemist and mRNA pioneer

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"To the extent that we have sustained challenges and want to create sustained behavior change, we should have sustained solutions."

KATY MILKMAN

Behavioral economist and
author of *How to Change*

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GEOPOLITICS 2.0

MAPPING THE NEW WORLD

GEOPOLITICS

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Resources aren't all that's at stake as big players and smaller countries alike rush to claim their place in space.



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Setting standards and open source software may offer a solution to the growing brawl over the infrastructure of tech.



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The Russian invasion of Ukraine has exposed the fragility of the commodities market and an urgent need to help stem rising costs.

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Nikita Teryoshin looks behind the curtain at arms trade fairs with photos that reveal the commercialization of conflict.

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Global business is a language of its own, but these seven steps will help ensure that you won't be misunderstood.

ONLINE EXCLUSIVE

When the future goes viral

Eminent thinkers Bruno Maçães and Shivshankar Menon weigh in on where to focus in the post-Covid world.

rolandberger.com/en/businessstinkers



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Geopolitics 2.0

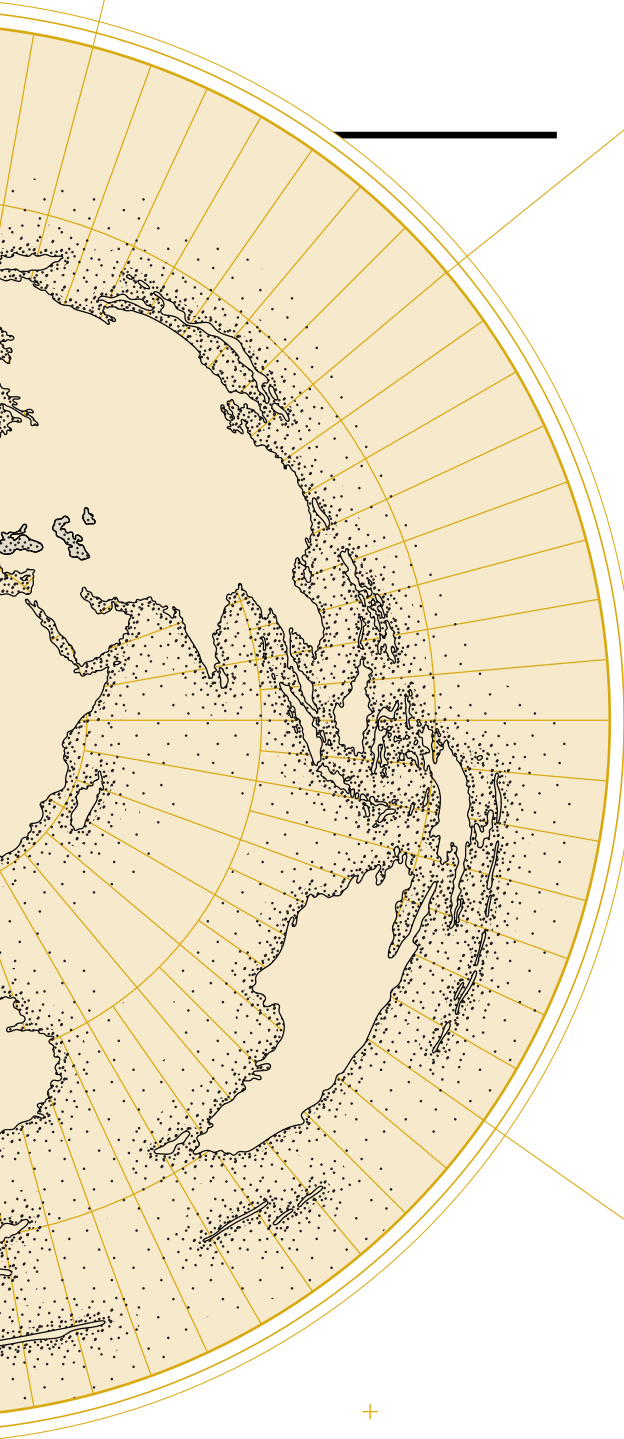
A new era of rapidly shifting dynamics and unpredictable politics is posing a threat to the prosperity we have grown used to.

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Climate change's closing window

The looming climate crisis requires global solidarity, but some may see a benefit to watching time run out.





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The blockage of the Suez Canal exposed how shipping chokepoints can threaten fragile supply chains.

COVER ILLUSTRATION: LATIGRE | PHOTOS: GETTY IMAGES/GREG BAKER, LAIF/EYEVINE/GARY DOAK, GETTY IMAGES/AFP/JOHN WESSELS, GETTY IMAGES/DIGITALGLOBE/SCAPEWARE3D, PICTURE ALLIANCE/PATRICK PLEUL | ILLUSTRATIONS: LATIGRE

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Take a long view into the business-shaping trends that lie ahead and immerse yourself in the latest ideas changing the travel industry, blockchain and the steel industry.

Think:Act Ideas for Action

Download and read how to turn liabilities into opportunities with Next Generation Manufacturing.
rolandberger.com/rethinkingmanufacturing



Think in numbers

Putting a figure on ...
SPACE JUNK

0.02%

TRACKED

The percentage of space junk pieces large enough to be reliably tracked from Earth, around 29,000 of an estimated 129,000,000 pieces in orbit.

7

MILLION

The mass, in kilograms, of space junk that has accumulated in Earth's orbit since the launch of Sputnik in 1957.

50x

INCREASE

The worst-case scenario factor by which the amount of space junk orbiting Earth could rise by 2100, driven by increased CO₂ levels lowering the density of the atmosphere, hindering reentry incineration.

\$135

MILLION

The amount the European Space Agency is paying Swiss startup ClearSpace for the first ever space cleanup mission, the target of which is a 112-kilogram rocket fragment discarded in a 2013 satellite launch.

SOURCE: WORLD ECONOMIC FORUM;
NATURE; EUROPEAN CONFERENCE
ON SPACE DEBRIS;
EUROPEAN SPACE AGENCY

Food for thought

Have the rules of distraction changed and do they need a new weapon to take them on?

by Nir Eyal

AS TECHNOLOGY has become more pervasive, it has also become more persuasive. That means that distractions of all sorts are easier than ever to find. The skill of the century will be the power to be "indistractable" – having control over how you spend your time and attention. I spent five years researching how anyone can become indistractable and learned it starts by first mastering the emotions that lead us toward distraction. Distraction is not a character flaw, it's primarily an inability to deal with discomfort. Then, we must plan our time. If you don't, someone will plan it for you. Next, we have to "hack back" all the time-wasting triggers like superfluous

emails, meetings and notifications. Finally, we can commit ourselves by using pacts. These four strategies are how we win the war against the onslaught of distraction and become indistractable.



NIR EYAL

Is the author of *Indistractable* and *Hooked*. He writes, consults and teaches about the intersection of psychology, tech and business.

Thin

AT A GLANCE

Thoughts
to live by

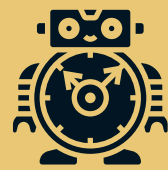
"Nothing
is less
productive
than to
make more
efficient
what
should not
be done
at all."

— Peter F. Drucker

Father of modern management

Re-
thinking
buzzwords

*Get to grips with new
industry lingo in a flash
with our stripped-down
explanations of the
latest jargon.*



"996"

China's answer to the West's
protestant work ethic and
vaunted by Alibaba's Jack
Ma. It stands for working
from 9am to 9pm, six days a
week: A punishing schedule
by any measure and one
that China's labor laws do
not agree with – regardless
of who is boasting that they
work such hours.

Think:Act

The
redacted
read



Chain
Reaction

Why you should unlearn everything you think you know

Bestselling Wharton School organizational psychologist Adam Grant argues that learning how to rethink is an invaluable, but often neglected, skill.

SCIENCE MAKES PROGRESS because scientists are trained to challenge their preconceptions. As the facts they know change, they change their theories. Outside of science? Not so much. People frequently resist new ideas that may require them to admit they were wrong or somehow threaten their sense of identity. The good news is that individuals and organizations that learn to treat all ideas as work in progress gain a powerful advantage.

How can you train yourself to rethink?

- Define your identity in terms of values rather than opinions.
- Remember that statistically speaking, the better you think you are, the greater the risk you are overestimating your expertise.
- Invite others to challenge your thinking by trying to learn something new from every person you meet, building a challenge network.
- Train yourself to not shy away from constructive arguments.
- Seek out information at odds with your own views, so you can create more room for rethinking.
- Ask more and better questions. Questions that spur thoughts change minds more often than lectures.

→ **Think Again: The Power of Knowing What You Don't Know**

by Adam Grant. 320 pages.
Viking, 2021. \$28.

HACKING THE HACKERS

From the gas and meat supply to IT management software, 2021 raised fresh questions about network vulnerability as ransomware gang REvil made headlines for the Colonial Pipeline, JBS and Kaseya attacks. In 2020, US cyberattack victims alone paid out nearly \$350 million – up 311% over 2019. But while attacks grow more sophisticated, so do the countermeasures. Here's how cybersecurity evolved in tandem with the most notorious attacks in internet history.



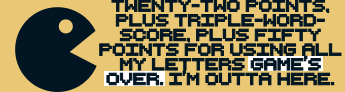
1988: The first major attack on the internet, the **Morris worm** hit 10% of the then 60,000 connected computers within 24 hours with damage estimates between \$100,000 and \$1 million. As a result, the US government launched a computer emergency response team within days and the antivirus software industry was born.



LOOKING AHEAD: Global cybercrime was up 151% over the first half of 2021, with damages estimated to reach \$6 trillion by the end of the year. In October 2021, a multi-country operation hacked REvil and forced the group offline following a US government call for a 30-country meeting to address the ongoing threat of ransomware and the role the illicit use of cryptocurrency plays in these crimes.



2013-14: With **three billion hacked accounts**, Yahoo's data breach was the largest of multiple instances of stolen user information in a two-year period. Had the EU's General Data Protection Regulation (GDPR) – enacted as a response – been in effect at the time, the company could have owed \$160 million in fines.



1999: Built to evade antivirus software by operating through an email attachment that targeted Microsoft Word, the **Melissa virus** was not intended to steal money or data but still cost \$80 million in global cleanup costs. It also created virus awareness and changed mainstream internet user behavior.



2010: Deemed the world's first real cyberweapon, the **Stuxnet worm** caused substantial damage to Iran's nuclear program. The first virus known to cripple hardware, it forced antivirus detection to adapt, using big data and taking a holistic view of user behavior, network traffic and activity.

*Best
practice*



How to ... stop email spying

HOW WOULD YOU FEEL if your email told the sender how often you opened it, your location, what links you clicked and a whole host of other info?

The bad news is, it happens and it works like this: They embed a tiny picture – just a pixel big – which acts as a tracking device. Fortunately there's a quick fix to this "pixel tracking."

Just go to your email settings and disable "the open images by default" function. That's level one protection, but you can go further. If you are using a browser-based email install an extension such as as PixelBlock, Trocker or Ugly Email – but be warned, once you do you might get a shock at just how much email tracking is going on. It's enough to make you consider snail mail again.

SOURCE:
MASHABLE.COM

*Economic
impact*

When the chips are down

IT'S BEEN A SQUEEZE for manufacturers with the global semiconductor shortage curtailing production of everything from home appliances to advanced electronics. The pandemic sent global PC sales soaring: Q3 2020 saw the largest surge in a decade (12.7%) while Q1 2021 sales were up 55% over the previous year. In May 2021, the Semiconductor Industry Association reported year-on-year sales were up 26.2% and, by September, wait times had reached a record 21 weeks. But automotive may be feeling the tightest squeeze of all – lean inventories and canceled orders at the start of the pandemic cut access to semiconductors when demand returned for new cars, resulting in estimated global industry losses of \$210 billion for 2021. And with 75% of semiconductor production currently in Asia, geopolitical tensions threaten disruption beyond the Covid era. The US is now offering \$52 billion in subsidies for chipmakers to manufacture on US soil while the EU has stated it is ready to pledge "significant" funds. Taiwan's TSMC, which produces 24% of all the world's chips, is also investing \$100 billion over the next three years to ramp up production – including an advanced facility in Phoenix, Arizona. Building a new semiconductor plant, however, takes at least two years and \$10 billion. In the meantime, TSMC is reportedly raising prices as much as 20%.

Act

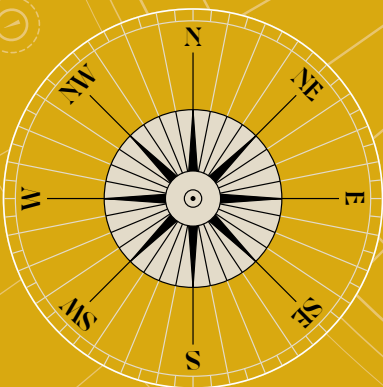
AT A GLANCE

In focus



*In this issue
we investigate the
major shifts that are
changing our world
and how to navigate
the new reality.*

GEOPOLITICS



The maps in this feature and throughout the magazine are drawn from various projections and are for illustrative and representational purposes.

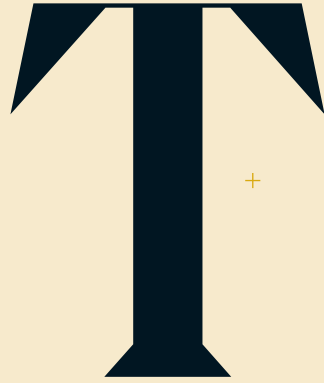


IT WASN'T SIMPLY
ECONOMIC EXPEDIENCE
THAT MADE GLOBAL TRADE
RAPIDLY EXPAND IN
THE 1980s AND 1990s – IT WAS
GEOPOLITICAL CHANGE.

NOW, A NEW ERA OF
SHIFTING DYNAMICS AND
UNPREDICTABLE POLITICS
POSES A THREAT
TO THE PROSPERITY
WE HAVE GROWN USED TO.

GET READY FOR
GEOPOLITICS 2.0

WORDS BY GIDEON RACHMAN
CARTOGRAPHY BY LATIGRE



THE FALL OF THE BERLIN WALL and the collapse of the Soviet Union signaled the end of an era in geopolitics – and the beginning of a new era in international business. From 1989 onward, new markets opened to Western multinational companies in the former Soviet bloc and Russia. Now, after Vladimir Putin's decision to invade Ukraine, Russia is suddenly off-limits again for much of international business – with hundreds of firms pulling out of the country almost overnight.

The Russia debacle is a reminder of something that should have been obvious for decades: Globalization was the product of geopolitical change – and business opportunities created by geopolitics can also be destroyed by geopolitics. That lesson applies well beyond Russia. It should certainly be concerning the many Western businesses who have based their future strategies on engagement with China.

Globalization, it seemed, was an unstoppable force. Forty years ago, businesses would not have looked much beyond the US, Western Europe and

Japan. Now many have expanded all over the world – fascinated by the opportunities of China, Russia, India and other emerging markets. Supply chains and markets have become global. A potent symbol of the era of globalization is the Apple iPhone, which boasted that it is "designed in California, assembled in China" – and used by a billion people all over the world.

The word "globalization" began to be used frequently by economists in the 1980s. Some credit Theodore Levitt with coining the term in a 1983 essay for *Harvard Business Review* on "The globalization of markets." By 1989, Kenichi Ohmae, the management guru, was promoting the idea of a "borderless world." Thinkers like Ohmae and Levitt often focused on the economic, demographic and technological forces that were opening up new international business opportunities. But the economic and technological explanations for the emergence of the era of globalization miss the thing that really made

it possible. It was geopolitical change that truly unleashed globalization. And it is geopolitical change that is now the biggest threat to the continuation of the era of globalization.

It is no coincidence that the term "globalization" was popularized in the 1980s. That was a decade in which world politics altered fundamentally – allowing for the creation of a global market. In late 1978, Deng Xiaoping came to power in China – and reversed the inward-looking policies of Maoism. By the early 1980s, "reform and opening up" had taken hold in China – a process that was to transform the country and global markets over the coming decades.

The transformation of China was the single most important driver of globalization. But there were other vital political developments elsewhere in the world. In 1989, the Berlin Wall fell – and in 1991, the Soviet Union collapsed. The division of Europe was over. In 1992, the EU's single market came into force, dismantling barriers to trade and investment across the continent.

In Latin America, the debt crisis of 1982 led to the fall of military regimes – and the rise of new, more market-friendly democracies such as Brazil and Argentina. Observing that shift, India changed course in 1991 – adopting its own version of "reform and opening" that encouraged the rise of a globally competitive domestic tech sector. And crucially, the US – the sole superpower after 1989 – threw its political weight behind globalization and embraced the rise of China.

T

HE US establishment was in a confident mood after the end of the Cold War. It was widely believed in Washington that globalization would

be a "win-win" process, making the world richer and freer – creating new markets for America and changing China and Russia for the better. US presidents believed free markets →



"Our people expect better education, more stable jobs, better income."

→ Xi Jinping

in his first speech as the newly elected General Secretary of the Chinese Communist Party in 2012.

2001

China joins the WTO

With Bill Clinton's encouragement and support, China joins the global trade rule-setting institution.

China's economy is 11 times larger today than it was in 2001.

2001

2020

Asia

1978

Deng Xiaoping leads China

Deng overthrows Hua Guofeng to assume control as Paramount Leader. He is made *Time* Person of the Year and earns the reputation of being the

"ARCHITECT OF MODERN CHINA."

1991

India begins reform process

The private sector is placed at the center of India's economic reforms. The surge of new demand is transformational and leads to massive change.

7%

How much India's GDP growth moved up per annum (pre-Covid).

2014

Narendra Modi elected in India

Modi ran on a manifesto to simplify taxes, prevent corruption and encourage traditional employment such as agriculture: The election was the largest ever in the world at that time. His party won **171,660,230** votes - that's **31%** - and won 282 seats, up 166 from the previous election.

1979

Prime Minister
Margaret Thatcher

The UK elects its first female Prime Minister who steers a country which some were calling the "sick man of Europe" toward improved relations with its neighbors.

"I can't bear
Britain in
decline. I
just can't."



1989

Fall of the
Berlin Wall

The symbol of a divided country and divided Europe is toppled – and with it came the fall of Soviet bloc states and the advance of capitalism.



"The old
system
collapsed
before the
new one
had time
to begin
working."

→ Mikhail Gorbachev

Final leader of the Soviet Union,
which collapsed in 1991

2004

The EU expands by ten

Ten new countries join the trading bloc. They are Poland, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Slovakia and Slovenia. It has grown from six founding states – Belgium, France, West Germany, Italy, Luxembourg and the Netherlands – to

27 MEMBERS.

2002

Euro money
begins to flow

Euro notes and coins come into circulation in what is known as the eurozone. As of 2019, its equivalent circulation is more than \$1.45 trillion. It is now the official **currency of 19** of the 27 member states of the EU.



Europe



THE FUTURE OF THE GLOBAL ECONOMY WILL BE CLOSELY CONNECTED TO WHICH COUNTRIES CONTROL THE TECHNOLOGIES OF THE FUTURE.

GEOPOLITICS

were inseparable from free societies. Embracing capitalism, the argument went, would ultimately require Moscow and Beijing to embrace democracy. President Bush summed this up when he said: "Trade freely with China and time is on our side." Around the same time, the US president said that he had met Putin, stared into his eyes and got a sense of his soul. Evidently, he liked what he saw.

A single generation on, and the US consensus has shifted. China has certainly become richer and more powerful, but not more democratic. On the contrary, under Xi Jinping – who came to power in 2012 – the central role of the Communist Party has been reinforced. The Chinese government has enforced security measures which has seen protest leaders in Hong Kong imprisoned. Xi has been explicit in warning against Western liberal ideas – such as a free media or Western courts.

Xi's China has also embraced Putin's Russia. On February 4, 2022, just a couple of weeks before the Russian invasion of Ukraine, the Russian and Chinese leaders met in Beijing and announced a partnership "without limits." Putin's invasion of Ukraine swiftly led to the imposition of unprecedented economic sanctions on Russia. But the sanctions campaign also has implications for China. The Americans were swift to warn Beijing that China could be subjected to secondary sanctions if it allowed Russia to evade Western punitive measures.

RUSSIA'S use of military force has decisively shifted Western attitudes to the Kremlin. And a crucial factor in shifting American attitudes toward China has been Beijing's growing willingness to flex its own military and economic muscle. During the Obama period, the construction of Chinese military bases across the South China Sea shocked the Washington establishment. Recently,

China has made use of trade sanctions to pursue its own interests. That, in turn, has made some sanctioned governments, such as Australia, look again at the implications of depending too much on trade with China.

The fact that China became richer and more assertive – but showed no sign of moving toward democracy – undermined the globalization consensus in the US. It was the iconoclastic Donald Trump who broke decisively with the idea that trade between China and America was a "win-win" for both sides. Trump asserted that, on the contrary, China had been "raping" the US – and unleashed a trade war on Beijing.

Trump made it acceptable for even right-wing politicians to argue that globalization has undermined the wages of Western workers. It seems that Trump's ultimate goal was to reach a trade deal with Xi that he could proclaim as a victory ahead of the 2020 US presidential election. But the Covid pandemic intervened. Facing electoral defeat and in need of a

scapegoat, Trump latched onto the fact that the pandemic had started in Wuhan and called Covid-19 the "China virus." The ensuing downturn in US-China relations meant there was no Xi-Trump deal. On the contrary, as Thomas Wright of the Brookings Institution argues, the China hawks in Trump's entourage used the opportunity to push through new hardline measures, tightening controls on the export of key technologies.

Trump's defeat did not end the deterioration in US-Chinese relations. Counselor of the State Department for the Biden administration Derek Chollet recently acknowledged to me that there are indeed strong continuities between the Trump and Biden approaches to China. As Chollet put it: "In many ways the outlook on China is one of the rare instances of bipartisan consensus [between Republicans and Democrats] in the US."

Instead of ending the confrontation with Beijing, the Biden administration has broadened it. While Trump →

was focused single-mindedly on the trade deficit between the US and China, Biden has added a much more explicitly ideological element – arguing that the two nations are engaged in a struggle over whether the 21st century will be defined by freedom or autocracy.

W

ASHINGTON is now single-mindedly focused on the need to contain Chinese power and influence, meaning the political consensus

that underpinned globalization has been effectively destroyed. Inevitably, that has begun to seriously affect the environment in which international businesses can operate.

The business sector most gravely affected by the deterioration in US-Chinese relations has been technology. China and the US both understand that the future of the global economy – and, therefore, national wealth and

power – will be very closely connected to which countries control the technologies of the future, from AI to mobile communications and biotech. The fact that many commercial technologies are dual-use in nature and have clear military or intelligence applications has intensified the struggle.

The most prominent battle is coming over the future of Huawei, the Chinese telecom firm. As one of the first Chinese tech brands to go global, Huawei was a source of pride and hope in Beijing. For many of the same reasons, it excited considerable suspicion in Washington – where Trump and Biden administration officials argued that the global expansion of Huawei would give China dangerous surveillance capabilities.

The American assault on Huawei led to controls on the export of vital technologies – in particular US-designed computer chips – to the company. These have had a devastating effect on the Chinese firm – with its revenues falling 30% over the course of a year, and its smartphone

sales falling by 47%. The American government also waged an international campaign to persuade US allies not to adopt the company's 5G technology. The UK was one of the countries that scrapped its plans to work with Huawei.

The Huawei case is just the most high-profile part of a larger economic and technological struggle between the US and China. The US is making it harder for all Chinese firms to buy advanced microchips. This, in turn, has prompted the Chinese to accelerate the domestic development of key technological capacities – in an effort to lessen its vulnerability. The beginnings of a tech cold war between the US and China have led to talk of the "decoupling" of the world's two largest economies.

So, is this the beginning of the end of globalization? Not quite. Businesses that are involved in less strategically sensitive areas, such as hospitality or food and drink, are scoffing at talk of decoupling between the US and China. One senior executive at a Western wine and spirits company told me recently that, for him, China remains easily the most dynamic market in the world. And even countries that are quite hostile to each other are often prepared to continue to trade in sectors of vital national interest. The Soviet Union continued to supply Western Europe with gas throughout the Cold War. And Russia seems prepared to keep selling energy to the Europeans even as relations plummet over Ukraine. For now, the pressure to end energy trade with Russia is coming from the European side, not from Moscow. Although that could change.

That war can lead to a sudden rupture in trade has been demonstrated by the Ukraine conflict. If China were ever to make good on its threat to invade Taiwan, trade between China and the West might be similarly affected. Disengagement from China – the world's leading exporter and manufacturer – would be much more difficult and disruptive than ending commercial relations with Russia. But the political pressures to take radical action might still be →

IT IS A MISTAKE TO BELIEVE THAT THE TROUBLE WILL BE CONFINED TO A BILATERAL DISPUTE BETWEEN CHINA AND THE US.

2001 9/11 attacks

An Al Qaeda terrorist attack on the World Trade Center, Pentagon and US Capitol on September 11, 2001 in the US provoked the US invasion of Afghanistan and Iraq.

2971
KILLED

25,000
INJURED

1994

NAFTA gets started

The North American Free Trade Area (NAFTA) – one of the largest trade blocs in the world by GDP – comes into force.



Population

490
MILLION



Area

27
MILLION KM²



GDP

\$24.8
TRILLION

Americas

"I wasn't a great communicator, but I communicated great things."

→ Ronald Reagan

Elected US President in 1980, he beat Jimmy Carter on a pledge to lower taxes and interfere less in people's lives by pursuing policies rooted in a belief in individual freedom.



1983-85

Brazil's and Argentina's armies step down

Military rule in Brazil and Argentina came to an end within two years of each other. Brazil had seen a military takeover of government in 1964; Argentina's military end was hastened by the Falkland Islands War of 1982.

2008

The Global Financial Crisis hits

Prior to Covid, it was the most severe economic event since the Great Depression. It led to some countries bailing out their banking systems with taxpayer money.

Between 2008 and 2009

102 BANKS
became insolvent.

Brazil

irresistible. Some Western industries are already taking steps to become less dependent on China. Industries that are affected by the trade tensions are often not abandoning foreign production, but instead shifting it around. Apple, for example, opened its first plant to manufacture the iPhone in India in April 2022 – which is an obvious hedge against turbulence in the US-China relationship. US Secretary of the Treasury Janet Yellen is explicitly encouraging the diversification of supply chains toward nations that are politically allied with the US – a process that she calls "friend-shoring."

Another sector increasingly being sucked into the new cold war is finance. Wall Street is often regarded as the most China-friendly industry in the US. Many investment banks have grown rich by floating Chinese companies in New York – and there are now some \$1.5 trillion worth of Chinese stocks listed on US markets. But, in the new cold war atmosphere, both American and Chinese regulators seem intent on making it much harder to trade Chinese stocks in the US. Tighter accounting and disclosure standards and regulations on both sides may force many Chinese companies to delist in the next two years.

MULTIPLE European businesses (as well as countries) will be keen to sit out a new cold war between China and the US. Some may even spot opportunities. For example, if Chinese companies are unable to float in New York – then perhaps they will choose a European bourse instead? There may be some scope for this kind of arbitrage. But US law and trade sanctions have an international impact – and can force companies to make difficult choices between their Chinese and US interests. European companies that violate US sanctions or export bans aimed at China may find themselves vulnerable to legal action in the US while those that obey sanctions – for example by refusing to

do business with sanctioned Chinese officials – may be targeted by Beijing.

Within Europe, there is a notable hardening of attitudes to China as well. Shortly before the Biden administration came to power, the EU and China agreed on a new investment deal. But when China imposed personalized sanctions on some members of the European Parliament who had campaigned on human rights issues in Hong Kong and Xinjiang, the reaction in Brussels was furious. The investment deal is now on indefinite hold.

Angela Merkel was energetic in her support for the China investment deal. But the manifestos of the Greens and the Free Democrats – both of whom now play an important role in the new German government – suggest that Germany's approach to China may become a bit tougher in the coming

years. The growing role of the state within China itself – and recent tightening of regulations on sectors such as private tutoring and computer games – has also increased nervousness among many Western multinationals about their futures in China.

Beyond the war in Ukraine, the growing and dangerous rivalry between the US and China is the central geopolitical factor undermining globalization. But there are other forces also pushing in the same direction – the pandemic, climate change and rising populism in particular. The Covid-19 pandemic forced the sudden closure of many international borders as well as causing a collapse in international travel. It also revealed how vulnerable international supply chains are to sudden and disruptive events. As Western governments scrambled to secure

"This is our historic moment of crisis and challenge, and unity is the path forward."

→ Joe Biden

2020: In a clear victory Joe Biden takes the US presidency from Trump, who falsely claims it was stolen from him, leading to civil unrest on January 6, 2021.

2019

Trump trumps China

Donald Trump imposes a 10% tariff on \$300 billion of Chinese imports. China announces a halt on some US agricultural imports four days later.

1%

The amount China's GDP growth rate reduced due to Trump's tariffs.



personal protective equipment in the first stages of the pandemic – many realized just how dependent on China they have become.

Governments are likely to take a much closer look at how supply chains are structured in the post-pandemic world. There will be greater emphasis on national resilience and many national governments will want to build up local production capacities for crucial goods. The drive to localize, rather than globalize, production will also be accentuated by the growing call for effective action on climate change. Carbon emissions generated by international travel are becoming harder to defend. In Europe and the US, there is now increasing talk of the need for "carbon border taxes" – which will price in the environmental costs of international trade.

PROTECTIONISM was a dirty word during the heyday of globalization. But the fight against climate change is giving protectionist tactics a renaissance – in particular tariffs, now redesignated as carbon border taxes. And then there is the rise of populist politics – where nationalism is combined with a preference for simple-sounding solutions which can translate easily into protectionism. Within Europe, the triumph of the Brexit campaign has fractured the European single market – creating new barriers to trade and investment.

Despite all this, there are still some powerful forces working in favor of globalization. Modern technology makes it easier to outsource manufacturing and

services. Getting your phone answered in Manila and your software updated in Bulgaria is now commonplace. Demographics, economics and climate change are also likely to increase the pressures that lead to mass movements of people across borders.

Globalization is clearly not over. But it is entering a new – and more troubled – phase. The rise of populism in the West and nationalism in China has seriously undermined the political consensus that was necessary to make globalization work and the coming decades will be tougher and more complicated for multinational businesses. ■

GIDEON RACHMAN is the chief foreign affairs commentator for *The Financial Times* and the author of *Easternisation – War and Peace in the Asian Century*.

2016

Brexit begins in a referendum

A referendum with a slender majority determines the UK's future as it elects to withdraw from the EU economic bloc. Brexit campaign slogan:

"TAKE BACK CONTROL"

2020

Pandemic shuts down economy

A novel coronavirus spreads through the world causing global GDP to drop by a whopping

↓
3.4%



Cases

261
MILLION



Deaths

5.2
MILLION



Vaccine doses

8
BILLION*

*distributed in over 190 countries worldwide

Figures accurate as of Dec. 1, 2021

2022

Russia invades Ukraine

After annexing Crimea in 2014, leading to suspension from the G8, Russia **mounts a full-scale invasion** in February, provoking international sanctions and censure.

SPACE RACE RERUN

In the 21st century you can't be a superpower without being a space power. But besides the obvious big players, many other smaller countries are keen to have a stake in space to be part of the rush for minerals, resources ... and control.

BY **Geoff Poulton**

GEOPOLITICS



A

APPLE TV'S series *For All Mankind* has a curious and compelling opening. Set in 1969, people pack into public squares, bars, living rooms,

and offices the world over, glued to TV sets and radios. We know – or at least we think we know – what the big event is. But then there's something odd and unfamiliar about the white-suited figure slowly descending the steps of the lunar lander. A flag unfurls, but instead of stars and bars, it's a hammer and sickle.

It's the counterfactual space race story where the US and Soviet Union spur each other on to increasingly impressive achievements throughout the second half of the 20th century. Lunar bases, resource mining, weapons in space: It's science fiction but with more than a hint of reality and a fascinating insight into what may await us in the coming decades.

THE REAL SPACEMAN, Neil Armstrong, took his giant leap in 1969 – the original space race was all but over. The US had won. Space quickly became less about political grandstanding and more about scientific collaboration. This culminated in the International Space Station (ISS), boasting the contributions of 15 nations, including Russia and America.

Space-based technology has indeed become an extremely important part of modern society, from navigation systems to global communications and weather monitoring. "But much of this is of little interest to the public," says Bleddyn Bowen, space policy expert at the University of Leicester in England. "It's boots on the moon and human achievement that really grabs the headlines."

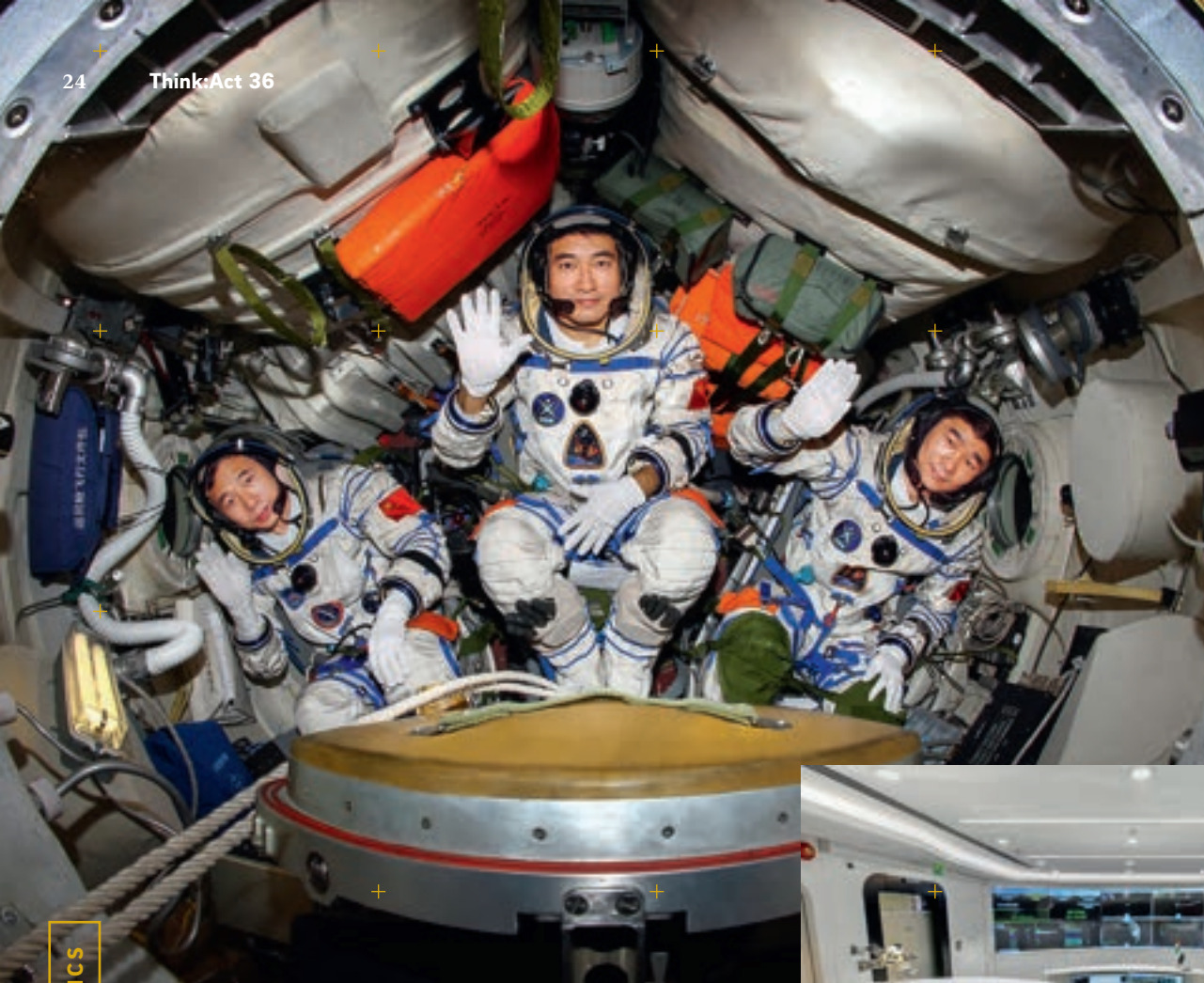
Things are changing now – and fast. Developing countries, private companies, even colleges and high schools can send spacecraft of varying sizes into space. Civilians are now able to travel beyond our atmosphere. China →

POINT OF ENTRY

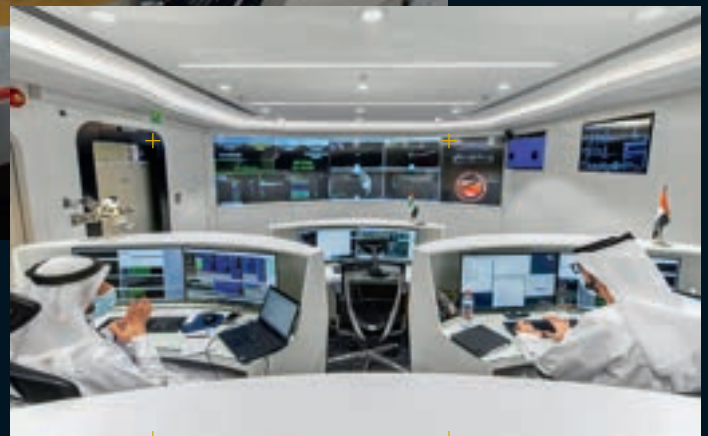
Chinese astronauts undergo wilderness survival training in preparation for the country's Tiangong space station, with missions scheduled for 2022.

GEO POLITICS





*POWERING UP
From China's
Shenzhou-7
mission (top) in
2008 to the United
Arab Emirates' Mars Hope Probe
(bottom) in 2020,
more countries are
seeing their space
presence as a vital
political move.*



PHOTOS: GETTY IMAGES/VCG, BLOOMBERG

will open its own manned space station in 2022 and humans will soon return to the moon. Projects are also underway to mine asteroids, send astronauts to Mars, construct huge global satellite constellations and even beam solar power from space down to Earth.

MORE RUSH THAN RACE, this exciting new space era is one in which fortunes will be made and established space nations, ambitious upstarts and corporations will tussle for territorial and technological superiority. "Space may have become more cooperative but there is still an awful lot of money to be made and political messages to be sent, whether to other countries or to boost domestic prestige," says Greg Autry, professor of space leadership, policy and business with the Thunderbird School of Global Management at Arizona State University. As Josef Aschbacher, director general of the European Space Agency (ESA), said in a recent BBC interview, the equation is simple: "You can't be a superpower without being a space power."

2025

NASA's Artemis III is planned to land a crew at the moon's south polar region and will be the first crewed lunar landing since Apollo 17 in 1972. Two astronauts will spend about one week on the surface of the moon.

That may indeed be true, but the power dynamics and possible collaborations are likely to be unsettled and the space race altered by recent events on the edge of Europe. Russia's invasion of Ukraine has had an instant impact on trade and commodities – and space ambitions. After sanctions were imposed, Russia said cooperation in space projects would only be possible once they were lifted.

The world's number one space nation remains the United States. That's hardly surprising: It accounts for more than half the world's public space exploration spending. Elsewhere, though, the landscape is shifting. Its nearest challenger is no longer Russia, but China, which is now reaping the benefits of decades of careful planning and investment. In May 2021, it launched the main module of the new Tiangong space station, with the remaining modules set to follow in 2022.

Despite being banned from the ISS, China is keen to welcome international research aboard Tiangong, and tens of countries have already expressed an interest. Soon it could be the only space station in orbit: The ISS is expected to cease operations by the end of the decade, leaving the Chinese with a valuable bargaining tool for soft-power alliances, says Namrata Goswami,

an independent space analyst and co-author of *Scramble for the Skies: The Great Power Competition to Control the Resources of Outer Space*.

Even before it invaded Ukraine, Russia was already turning its attention away from collaborating with the US and Europe. Vladimir Putin wanted to work more closely with China instead. In March 2021, the two countries announced plans to build a lunar research station, the latest in a growing list of partnerships. Goswami says that while Russia no longer has the financial resources to dominate in space, "it has a legacy of technical expertise that could still prove highly valuable."

Ukraine also enjoyed a legacy of Soviet-era space know-how. Its space agency has 16,000 employees and a number of sites – and even caught the eye of Elon Musk. However, that enterprise is now threatened with decimation by the war and a hemorrhage of talent and expertise if Russia gains the upper hand over its country.

There are now approximately 70 other countries with active space

programs – from major nations like India and Germany, to ambitious governments in Iran, the UAE and Turkey. Even space minnows such as Peru and Angola are getting in on the act. Only 10 have their own launch capacities, however, leaving the major nations free to select their spacefaring partners to suit their own political goals.

IT'S NOT JUST GOVERNMENTS investing vast sums in reaching space, of course. 2021 was a blockbuster year for the com-

mercial space sector. SpaceX has now flown numerous missions to the ISS, transporting people as well as cargo. It also continues to expand its Starlink fleet of internet-providing satellites. Meanwhile, Blue Origin and Virgin's flights may have been criticized as billionaire jaunts to space, but the two companies also plan to transport scientific payloads.

Crucially, all three businesses, in addition to "a couple of hundred really interesting other companies" are →

"Space may have become more cooperative but there is still an awful lot of money to be made and political messages to be sent."

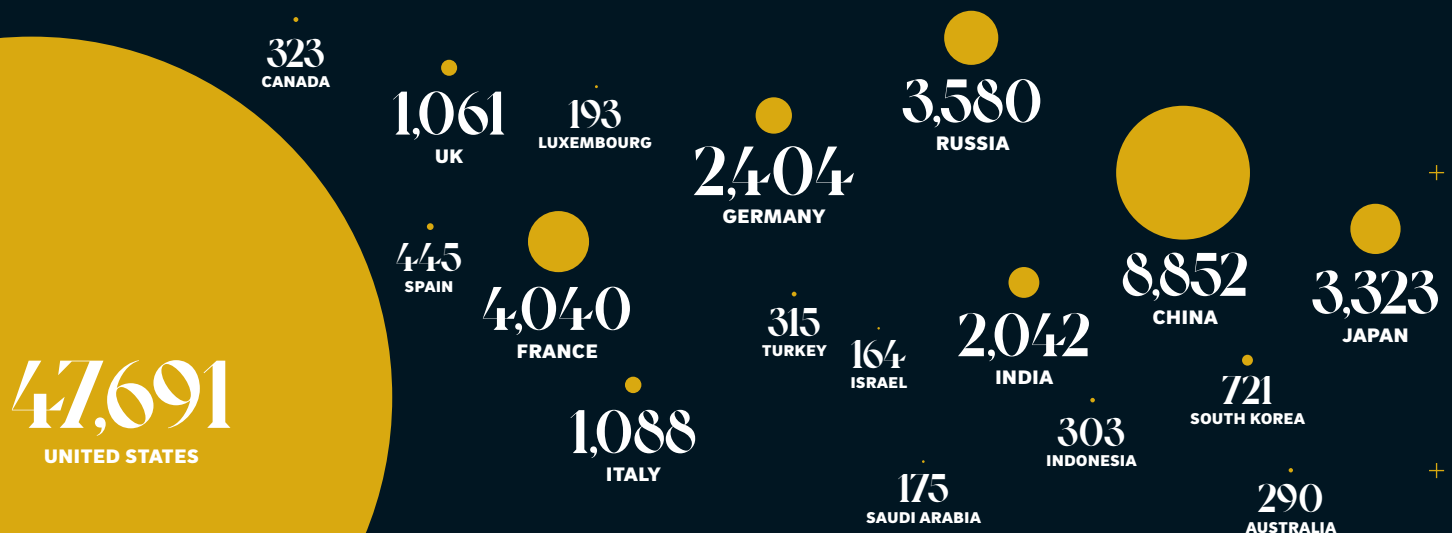
→ Greg Autry, Professor at Arizona State University

GEOPOLITICS

World government expenditures for space programs in 2020

(In millions, currency: US dollar. Budgets for European countries include their contributions to ESA and Eumetsat*)

SOURCE: EUROCONSULT



*The European Organisation for the Exploitation of Meteorological Satellites

driving down the cost of space access through innovations such as miniature satellites and reusable rockets, says Greg Autry. Indeed, in the last 20 years the cost of a launch to the ISS has fallen by a factor of four. Putting a satellite into low Earth orbit is now 20 times cheaper than two decades ago.

THE SPACE ECONOMY is expected to grow rapidly as it becomes more accessible. Currently estimated at around \$400 billion, Bank of America says the global space industry could generate revenues of well over \$1 trillion by the end of this decade. The main driver behind this growth is satellites, which have become a fundamental tool for internet connectivity, communications, Earth observation and navigation. So much so, that they have become an important focus for cybersecurity efforts in the fight to prevent hostile attacks.

There are currently almost 3,500 live satellites orbiting the Earth – a number currently growing by more than 1,000 each year. As countries and companies send cheaper, smaller satellites into space, these will help to drive down the cost of data, just as demand for data continues to mushroom. Internet access will also truly go global, which will change the world, says Autry. "Being able to connect and monitor every point on Earth every minute of the day will change the economy and present some very interesting challenges."

In the longer term, space could help us to solve pressing problems on Earth. Celestial bodies including the moon and asteroids are home to vast reserves of valuable metals and minerals. While the associated financial and technological challenges of then bringing them back to Earth are likely to go unsolved for the next decade or two, Autry continues: "Whoever manages to grab and exploit the resources of the moon will transform life here on Earth."

Unsurprisingly, the United States and China lead the way here. NASA's Artemis program aims to land humans on the moon again in 2025, paving the

"Before we even get to resources, we must establish protocols ... the Global South doesn't want Europe and America telling everyone else what they should be doing."

→ Bleddyn Bowen, Lecturer at the University of Leicester

way for a permanent base camp further down the line. China, meanwhile, has said it will work with Russia on a separate lunar research base to begin operations in the mid-2030s. Resource extraction could start soon afterward, but not all of space's resources need to be mined. Numerous countries, including China, Japan, the US and the UK, are now focusing serious attention on harnessing space-based solar power. This development would see huge, mile-wide

solar panels sent into space to capture constant energy from the sun and transmit it back to Earth via lasers or microwaves. If that sounds fanciful, a recent European report concludes that space-based solar power is not only technologically possible, but the lifetime cost per megawatt hour could be half that of nuclear power.

As innovation races ahead, however, regulations are struggling to keep up. Space is still largely governed by the



(1) SpaceX employees work on the Crew Dragon reusable spacecraft in Hawthorne, California.

(2) Activists from India's Congress Party celebrate the launch of the country's Mars Orbiter Mission in 2013.

(3) A Russian Orthodox priest blesses a Soyuz spacecraft booster rocket in Kazakhstan.



(1)



(2)

(3)



PHOTOS: GETTY IMAGES/AFP (VACHESLAV OSELEDKO, DIBYANGSHU SARKAR, PHILIP PACHECO)

1967 Outer Space Treaty, which was signed by 132 countries including the United States, Russia and China. Its primary aim was to ensure the peaceful use of space, but it fails to address the emerging commercial opportunities.

INDIVIDUAL NATIONS HAVE BEGUN to fill the vacuum with their own rules. The Artemis Accords, for example, are a series of bilateral agreements between the US and partner nations like Japan, the UK and Italy. Their aim is to establish a governing framework for exploring and

mining the moon. As Autry says, it will be very interesting to monitor the race between these nations on the one side and the China-Russia axis on the other.

Establishing rules and regulations for space use must be a priority in the coming decade, says Bledwyn Bowen. "And before we even get to resources, we must establish protocols for routine space activities like traffic management and collision avoidance." This will require buy-in from a lot of countries, not just the major space nations, and could also have significant impacts on the economics of space in future, he says. "The Global South doesn't want Europe and America telling everyone else what they should be doing."

Understandably so. Human history is littered with examples of dispute and conflict over an inability to share land and resources. Might we have learned enough from our experiences on Earth to prevent the same happening in space? "I hope so," says Namrata Goswami. "After all, space is the common province of all mankind."

2036

After signing a memorandum of understanding in March 2021, Russia and China announced their collaborative International Lunar Research Station project. The goal is a long-term human presence at the lunar south pole for 2036-2045.

FIGHT
FOR
DIGIT
SOVER
EIGN
TY



IN

AL

Dominant tech platforms are caught in a growing brawl over what digital sovereignty means. Setting standards and open source software may offer a solution.

BY **Steffan Heuer**

PHOTO: GETTY IMAGES/BLOOMBERG/AKOS STILLER


A

ARTIFICIAL INTELLIGENCE, cloud computing, high-speed wireless connectivity via 5G – or even 6G – satellites in low Earth orbit: Where engineers, programmers and technologists see oceans of opportunity, politicians and

quite a few academics perceive a sea of problems waiting for regulatory framework. And with varying speed, different geographies are developing exactly those rules and laws in an attempt to channel and shape powerful, new technologies to their national, and competitive, interests and advantage.

As the US, China, the EU, the recently brexited UK and others race to develop key competencies, attract and retain talent, commercialize basic research – and scale it up – each has issued proclamations of what they hope to achieve, and to avoid. A "National Artificial Intelligence Strategy" in the UK aims to keep "regulatory intervention to a minimum." China has published "New Generation Artificial Intelligence Ethics Specifications" which prohibit AI activities that endanger national, public or manufacturing security. The EU, meanwhile, followed up its General Data Protection Regulation (GDPR) with a proposal to curtail high-risk AI applications to "guarantee the safety and fundamental rights of people and businesses, while strengthening AI uptake, investment and innovation across the EU." The US, finally, has a National AI Initiative in place which aims to have the country "lead the world in the development and use of trustworthy AI in the public and private sectors."

ALL THOSE BOLD PROCLAMATIONS are the backdrop against which a small set of large tech companies, mostly from Silicon Valley and China, are racing to score with innovative software and hardware that will upend everything from work and government to mobility and private life. But a growing chorus of European policymakers, academics and companies are beginning to push back against the predominance of US tech and what they perceive as the inherent risks of Chinese platforms. As they see it, near-monopolies lead to vendor lock-in, stifle innovation and raise security-related, legal, ethical and competitive concerns.

The overarching term fueling the debate over the geopolitical importance of key technologies is "digital sovereignty," a concept mostly European in origin. Both outgoing German chancellor Angela Merkel and French president Emmanuel 

Macron have repeatedly talked about it. "Digital sovereignty is fundamentally about the ability to control and understand digital processes and data flows. Data security – as in who gets to collect and process data – is only one aspect that still garners most of the attention," says Peter Ganten, CEO of German software company Univention and a strong voice in the pan-European debate around the topic. He considers the second aspect of transparency and agency to be even more important: "To what extent is a government agency or a company able to independently use and modify the digital tools they rely on?"

THAT LATTER ASPECT of digital sovereignty is part and parcel of using proprietary software such as a cloud service to store data or renting computing power and algorithms to crunch numbers. If only a few companies control those chokepoints in a modern, networked economy, they could dictate the terms and prices, be pressured by a government or exert economically driven pressures themselves that might harm customers. What if, for instance, a midsize equipment manufacturer relies on third-party cloud services to augment its computer-controlled machinery and the provider were to change or cut off access? "That's one situation where the business model of that company would suddenly be threatened or destroyed, and there's little they could do about it," says Ganten.

The sentiment of vendor lock-in may in part be sour grapes by European companies which are simply lagging in capabilities and market share and clamor for corrective action. Yet it seems to resonate with the public. When the renowned Munich Security Conference think tank surveyed more than 6,000 Europeans from six countries, half agreed that their nation is too dependent on digital technologies from the US, and 54% thought the same about technology from China. Another MSC report from June 2021 found that "the vast majority of people believe the US and China will be the leading tech powers in 50 years' time, not the European Union."

While politicians wrestle with how to address these worries and channel innovation and business practices into acceptable directions, there is a parallel movement taking shape on the business side that pushes for using open source software. Its proponents do not want to erect new protectionist barriers that would exclude certain vendors, but instead establish a certain base level of standards

54%

The percentage of Europeans who think that their nation is too dependent on digital technologies from China. Around 50% think the same about technology from the US.

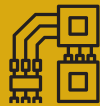
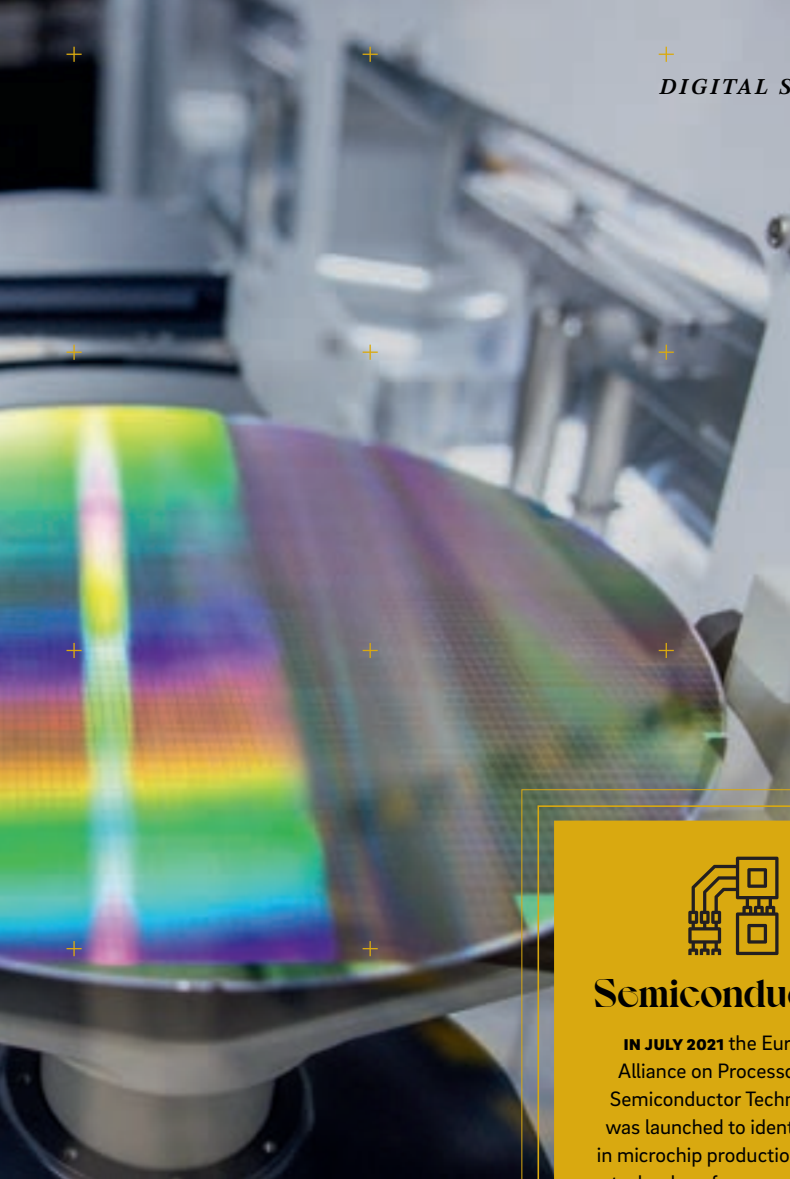
CONDUCTING BUSINESS

The manufacturing of silicon chips at a new factory in Austria is expected to generate billions in revenue.

which would allow any company to compete as long as it adheres to them. In short, no backroom deals, no backdoors in hardware or software.

THE IDEA OF SOFTWARE BEING CHEAP or free isn't what drives this trend, but the goal of having the freedom to make changes, analyze the code and retain more control over one's data and metadata. Lobbying groups that pursue this course are the German Open Source Business Alliance, which Ganten heads, and the recently created European Open Source Business Alliance APELL where he's also playing a leading role.

As the open source community tells it, being able to look under the hood can address multiple problems. Companies can independently inspect and audit software, rather than trusting a black box system where only the vendor is in charge. Additionally, an enterprise can more easily customize things and is no longer at the mercy of a big cloud platform to discontinue a product or service. What's more, having data such as customer information and valuable intellectual property such as



Semiconductors

IN JULY 2021 the European Alliance on Processors and Semiconductor Technologies was launched to identify gaps in microchip production and the technology for companies to thrive. This was followed by the October 2021 proposal of the European Chips Act to secure Europe's supply of microchips and encourage innovation.



+ "To what extent is a government agency or a company able to independently use and modify the digital tools they rely on?"

→ Peter Ganten,
CEO of Univention and open source advocate

design files stored on a locally hosted or own server reduces risks for third parties forcing their way in, be they corporate spies or state actors. And finally, going beyond a small selection of proprietary software broadens and accelerates innovation since more minds can tinker, according to Ganten.

Whether smaller providers can always provide better service and data security, there's a big catch. Inventing and building an alternative offering in a hotly contested technology domain needs sizable public investment. Take Gaia-X, a pan-European project to build an open, federated cloud platform to compete with US incumbents. Its stated goal is to "co-create the future of the digital infrastructure for Europe across dedicated data spaces serving the most critical industries." Since Gaia-X's June 2020 launch, it has worked with an annual budget of \$1.7 million to get it off the ground. It's now a network of more than 400 organizations – including Oracle and Salesforce in the US and Haier Cosmo in Asia – working on more than 60 pilot projects. Yet there is a steep climb ahead. "It's ridiculous to expect that we will take on and pass Google and that's not the goal," Ganten bristles. "It will take a decade until Gaia-X is competitive, but it already sends the message that one can build an open alternative. Open means that the big players can also participate, if they adhere to the standards."

CHANGE IS ALREADY HAPPENING as more localized offerings come online and address individual countries' concerns over digital sovereignty. Take the recent announcement by Deutsche Telekom subsidiary T-Systems and Google to jointly build "sovereign cloud services" for German companies, the public sector and health care organizations – a second trial balloon after a similar venture with Microsoft failed. But beyond these commercial and competitive considerations, digital sovereignty is important for countries as it ensures their agency on the world stage. Take China or Russia, which demand global players like Apple host their user data locally or are suspicious of camera feeds recorded by Tesla vehicles. Then there's the US banning Chinese telco giant Huawei from selling smartphones or participating in building its 5G network.

In some extreme cases, cross-border digital dependency could wreak the same havoc as an authoritarian regime pulling the plug. When the US imposed sanctions on Venezuela in 2019, American companies such as Adobe and Oracle as well as British money transfer service Wise →



"Digital sovereignty is all about managing strategic dependencies and interdependencies."

→ Philippe Lorenz,
Project director at Stiftung Neue Verantwortung

were forced to cut access for users there, even if they were legitimate paying customers.

Tech companies are increasingly becoming pawns in larger geopolitical skirmishes or outright protectionist moves because their products are "dual use." Facial recognition and algorithms for automated decision-making can boost an enterprise's productivity and also be employed for large-scale surveillance or military applications. That's why no large country can afford to not develop its own capabilities in key technologies such as AI and has to define how they should be used. As Philippe Lorenz with Berlin-based think tank Stiftung Neue Verantwortung puts it: "Digital sovereignty is all about managing strategic dependencies and interdependencies. Export controls, foreign direct investments, trading regimes are the traditional instruments for foreign and economic policy. They are now being adjusted to the new competitive setting, especially between the US and China."

GEOPOLITICS

LENDING A HAND
The Italian-led iCub humanoid robot is an open source project for research into human cognition and artificial intelligence.



Artificial intelligence

IN FEBRUARY 2020 the European Commission launched a package of ideas and actions for digital transformation that continue Europe's quest to lead on "human-centric" AI. Further goals included maintaining the ecosystems of competitiveness and risk-based regulation outlined in previous packages.

EUROPE'S MIDLING TECH SCENE is caught between those two big powers and forced to find an innovative path. "The debate over digital sovereignty is a relevant discussion because the continent has been falling behind, and is falling further behind, across a whole range of critical technological capabilities," explains Simon Pfeiffer, a former policy advisor at the Munich Security Conference who co-authored an in-depth report entitled *Upgrade Required*. As he and co-author Randolph Carr point out, failing to build companies with cutting-edge applications in fields such as connectivity, analytics or satellite communications leads to more than just economic loss. "Not keeping pace with technological change can mean there are stronger incentives to work with suppliers outside the Western alliance," Carr says. "That can put the common digital agenda of the transatlantic partnership at risk. In the long term, we see big dangers that Europe is more vulnerable from a security perspective and more dependent on outside partners."

Stressing the commonalities and shared value in how technology is built and, more important, how it's used is the thread that runs through the European debate over digital sovereignty. When the Trade and Technology Council, formed by the EU and the US, held its first meeting in the fall of 2021, the joint statement declared that "we intend to cooperate on the development and deployment of new technologies in ways that reinforce our shared democratic values, including respect for



5G

BY APRIL 2020 several countries had reported measures to comply with the EU's toolbox, a set of policy guidelines for securing 5G networks as critical infrastructure. But few made a final decision regarding "high-risk" vendors, allowing for strategic ambiguity and a line between those focused on foreign and security issues and those focused on the economy.

PUTTING OUT AN ANTENNA

So far, the EU has not explicitly banned Chinese 5G equipment vendors.

GEOPOLITICS

universal human rights, advance our respective efforts to address the climate change crisis and encourage compatible standards and regulations."

AI promises to be the ultimate test of this idea. As former Google CEO Eric Schmidt recently told an interviewer: "There will be a small number of countries that will master this technology. So a reasonable expectation will be that these kinds of systems, when they eventually emerge, will be under the control of large national governments such as the United States and China, and maybe a few others ... The discussions about where the limits and lines should be should start now," he said, comparing its potential impact to the advent of nuclear weapons. AI observer Lorenz shares his sense of urgency. He wrote a report about AI standardization and foreign policy he hopes will jolt European policymakers awake. "Foreign ministries are just beginning to understand that topics like digitization and emerging technologies deserve more

\$1.7 MILLION

The annual budget of the pan-European project Gaia-X to build an open cloud platform to compete with US incumbents.

attention and more budget," he says. It is no longer a story of economic development, but one of pulling your geopolitical weight long before actual products are released.

Agreeing on Bluetooth as a wireless standard might be an easy decision, but standards for algorithms tracking people or goods raise thorny ethical and legal questions depending on where a manufacturer is based and its services will be used. That's why, Lorenz argues, Europe should not be absent from the relevant standards bodies, leaving it to private sector companies from abroad. If governments, local companies and other stakeholders such as human rights organizations don't get a seat at the table, he warns, "standards for the European single market might be set by players from outside the EU." This much is certain: The debate over what digital sovereignty means will have to speed up to match the fast development cycles of the IT world, and significantly. ■

A NEW ROUTE
In May 2022,
Ukrainian goods
such as corn were
being exported via
Romanian ports.

The war in Ukraine has exposed
the fragility of decades-old
systems for trading essential
goods – and sparked a
new urgency to solve the
burden of rising costs.

BY Tom Wilson

FUELING A CRISIS



UNCERTAIN RESERVES
Russian jacks are pumping out barrels of oil with far less clear end destinations.

GEOPOLITICS

WHAT HAPPENS WHEN one of the world's largest exporters of coal, wheat, pig iron, natural gas, oil, palladium, enriched uranium, fertilizer, nickel, platinum and aluminum invades a neighboring country in 2022? The answer, we now know, is soaring prices, the rapid overhaul of decades of energy policy and one of the biggest redirections of commodity flows in history.

Russia's recent invasion of Ukraine has reshaped geopolitics for a generation. Europe and the US have united in the face of a common enemy and other countries have been left with a choice: Russia or the West. But while the political ramifications of the war will be far-reaching, the most profound impact has been in commodity markets. For most of the past three decades, the fuels, metals and agricultural produce we rely on flowed around the planet with increasing ease as protectionism gave way to free trade, globalization and just-in-time supply chains.

Within days of Russian troops crossing the Ukrainian border it was clear this system, already under strain after two years of the coronavirus pandemic, would have to change. The first and most

20%
INCREASE

The amount by which the World Bank reports the price of fertilizer rising between January and March 2022. Russia and Belarus accounted for 38% of potassic fertilizer, 17% of compound fertilizer and 15% of nitrogenous fertilizer exports prior to the Russian invasion of Ukraine.

obvious impact has been on cost. In the days after the invasion, fearing legal and physical disruption to Russian supplies, traders and consumers scrambled to secure raw materials wherever they could and prices soared. Brent crude, the international oil benchmark, touched \$139 a barrel, the highest in 14 years. Natural gas prices, already at historic levels, rose even further and coal hit an all-time high.

THE WORLD BANK'S energy price index, which had already risen by 50% between January 2020 and December 2021 due to resurgent demand as coronavirus restrictions eased, increased by an additional 34% between January and March. Surging gas and coal prices, in turn, resulted in sharp increases in fertilizer prices, while the cost of wheat jumped 30% between December and March. It was the third-largest price spike for food and fertilizers in history.

Conflict has disrupted commodity flows in the past but rarely on this scale. When it has happened, the impact on energy and agricultural policy has been far-reaching. The closest comparison is the 1973 oil price shock, when Middle Eastern oil producers stopped crude exports to the US and its allies over Washington's support for Israel →

"China is careful because they know they are dependent on the US as a consumption hub."

→ Bjarne Schieldrop,
Chief commodities analyst at SEB

during the Yom Kippur War. Gulf members of the Organization of the Petroleum Exporting Countries (OPEC), led by Saudi Arabia, cut production and prices quintupled, pushing up food prices by 70% between 1972 and 1974.

The shock increased living costs around the world and changed Western energy policy forever. The US, UK, Germany, Canada and 13 other large oil importers set up the International Energy Agency (IEA), which introduced requirements for members to hold national oil reserves equivalent to 60 days of imports, later increased to 90 days. The US formed its own energy policy unit, the Energy Information Administration, in 1977, while Japan focused on nuclear power. After the Iranian revolution in 1979

GEOPLITICS



STRAINED RELATIONS
US Secretary of State Henry Kissinger tried and failed to get King Faisal of Saudi Arabia to lift the Saudi embargo on oil shipments.

1973

The first move for change

BEFORE 1973, many consumers in the US, Canada, Western Europe and Australia didn't think about conserving petroleum. After the OPEC embargo proved the economic dangers of reliance on foreign oil, however, the first real movements to push for fossil fuel-saving technologies began to emerge.

and the Iran-Iraq war in 1980 pushed up oil prices again, the IEA reduced demand 5%. "The 1970s gave birth to the IEA, the US Department of Energy, to the Department of Energy in the UK, to the strategic petroleum reserve," says one long-time energy analyst. "The focus on energy security changed policies dramatically that have stuck with us for decades and this time it is even more broad than that."

ATTITUDES TO SOME COMMODITIES had already been shifting before Russia's invasion. Rising tensions between the US and China over the past decade, for example, focused attention on Beijing's control of supplies of rare earth metals that are increasingly required for many types of manufacturing. The disruption created by the Covid-19 pandemic then provided further evidence of the perils of relying on a handful of countries or companies to supply a commodity or product. Now the war in Ukraine has driven home that message.

Prior to the conflict, the EU relied on Russia for 35% of its natural gas, 20% of its crude oil and 40% of its coal. For some countries, the dependence was greater. Hungary, which has said it will block plans for an EU-wide embargo on Russian oil, gets 65% of its oil and 85% of its gas from Russia. In Germany, the Schwedt refinery, which supplies 90% of the fuel in Berlin and surrounding Brandenburg, is fed exclusively with Russian crude from the Soviet-era Druzhba pipeline. Energy security is once again top of the agenda for Western policymakers, as it was after 1973 and 1979, resulting in new forms of pan-European cooperation, relationships with energy suppliers and investment opportunities.

Russia could cease fuel supply to Europe at any time, albeit at significant cost to the Kremlin. As a result, the EU aims to cut its dependency on Russian gas by two-thirds this year and to end its use of Russian fossil fuels completely before 2030. But

given the lack of spare global production capacity, increasing gas imports from elsewhere would only cover about a third of the 155 billion cubic meters Russia delivered to Europe in 2021. Now despite fears that surging prices for oil and gas would stall efforts to transition the global energy system away from hydrocarbons, as a result, it must accelerate it. After oil hit an all-time high of \$147 a barrel in 2008, the EU passed the Renewable Energy Directive in 2009, requiring that 20%

THE WORK AHEAD
Reestablishing
commodity flows
will be crucial
for rebuilding
efforts in Ukraine.

2022

A new push for conservation

THE PRICE OF crude oil rose 15% in a single week following Russia's invasion of Ukraine. Within two weeks, however, the EU announced it would install wind turbines and solar panels faster than previously planned and Germany committed \$210 billion to decarbonize its electricity supply by 2035.

of all energy usage in the EU be produced from renewable sources by 2020. Similar initiatives will follow this time and should help Europe improve energy security and ease prices. The reshaping of global commodity flows, however, is permanent: The unprecedented Western sanctions on Russia's financial, trade, defence, technology and energy sectors will not be easily unwound.

RUSSIA WAS THE WORLD'S BIGGEST energy exporter before the war and could soon be unable to export to Europe, the US or any country that wants to continue regular trading with the West. Even without formal European sanctions on all exports, many companies are boycotting Russian products. Countries in Africa, Asia and Latin America have been reluctant to condemn Russia's actions, perhaps suggesting that Moscow will still find destinations for some commodities. India, for example, significantly increased its imports of heavily discounted Russian crude in April. "The world is going to be divided into good and bad oil," says Bjarne Schieldrop, chief commodities analyst at Swedish bank SEB, predicting the development of a gray market that

1.7 MILLION

The number of barrels of crude oil and refined products that had previously been exported by Russia to Europe each day that could, in the future, be redirected to China instead.

would include crude from Venezuela and Iran, some of which has always found ways around sanctions.

But even China, which has increased its energy cooperation with Russia over recent years, has been cautious of stepping into the gap left by departing Western buyers. "China is still very careful because they know they are extremely dependent on the US as a consumption hub and they are extremely dependent on the US dollar for international trade," adds Schieldrop. Amrita Sen, chief oil analyst at consultancy Energy Aspects, predicts that about half of the 3.4 million barrels a day in crude oil and refined products that Russia exported to Europe last year could flow to the East in the future. But any more would require major investments in new pipelines and terminals to connect the main oil producing regions in western Russia to Asian buyers.

The price spikes of 1973, 1979 and 2008 were narrower in scope but resulted in major changes to what commodities were consumed, how they were regulated and where they were used. Arriving after two years of pandemic-induced disruption and in the midst of the climate-driven overhaul of the world's energy system, the current volatility promises to be even more transformative. ■

Tom Wilson is senior energy correspondent for the Financial Times.

ROCKE MEN

BY **Nikita Teryoshin**

GEOPOLITICS

Conflict can be big business. If geopolitical rifts deepen and trade can't help ease differences between nations, then more destructive commerce has a chance to grow. But how are deals done for weapons and defense? Photographer Nikita Teryoshin looks behind the curtain at the arms trade fairs.

LASER FOCUS

High-tech weaponry using GPS and lasers act as the dividing line between the fair and the meeting rooms at the SITDEF Defense Fair in Peru, May 2019.







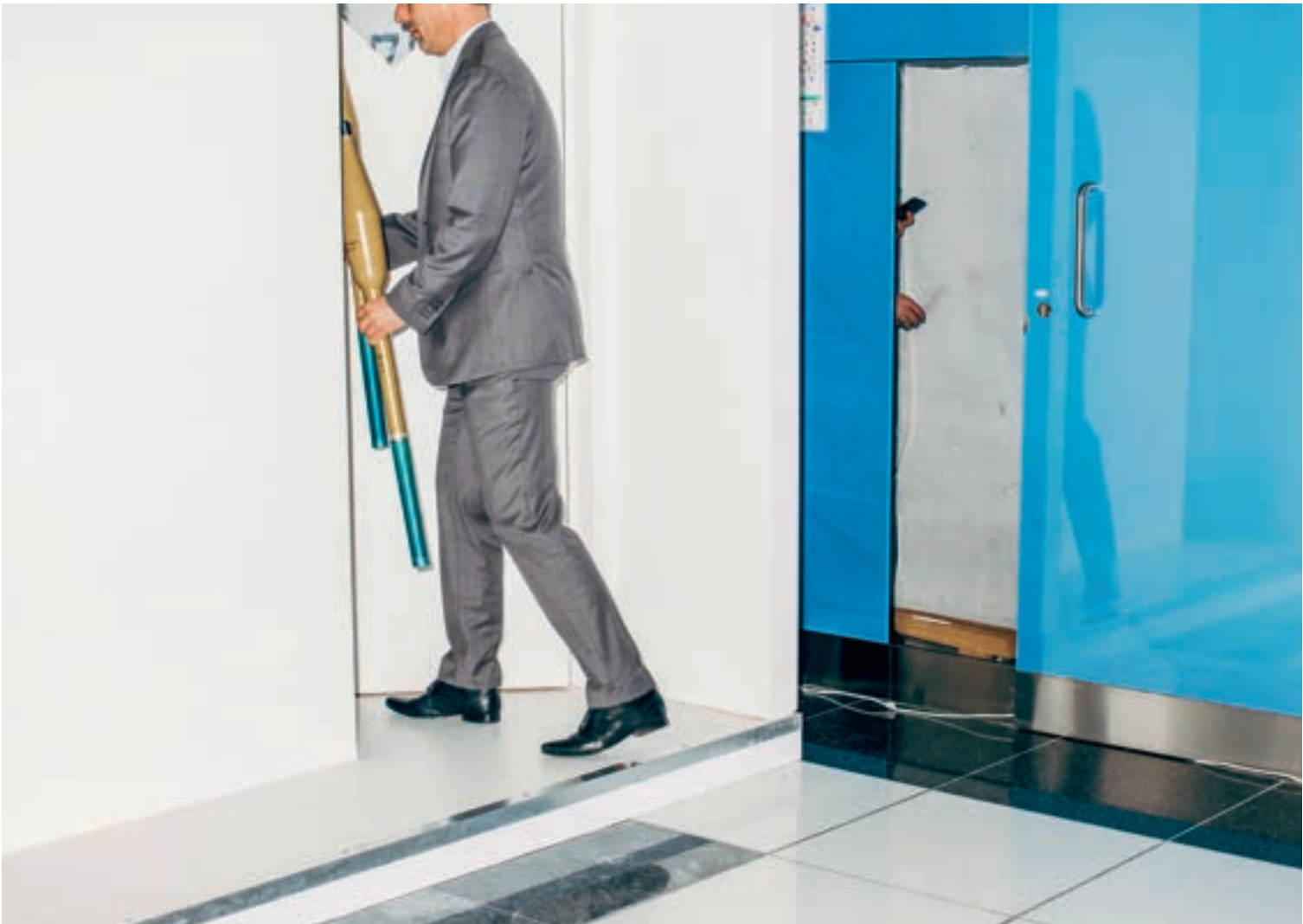
SECRET SERVICE "I didn't want to blame anyone, so I decided not to show faces and to play with the metaphor of anonymity and the confidentiality of the industry," says photographer Nikita Teryoshin.

WINSTON CHURCHILL once said that meeting jaw to jaw was better than war. Of course, talking is better than fighting and in today's world where the geopolitical tectonic plates are shifting, we are reminded more than ever of the importance of business diplomacy and how shared business interests can help build bridges between nations. That said, we should never lose sight of the fact that war and conflict can be just around the corner. Nikita Teryoshin's arresting photographs put an unusual frame around the business of weapons and war; his quirky view captures the commerce behind conflict. The language of a business conference or sales event set against weapons and defense is unsettling, perhaps, —>

PRESENT ARMS
*A rifle demonstration
 at the MILEX Defense
 Fair in Minsk,
 Belarus, May 2017.*







LOCKING IN Weapons being secured safely overnight at the International Defense Exhibition and Conference (IDEX) in Abu Dhabi, United Arab Emirates, the biggest fair of its kind in the Middle East.

EXPLOSIVE SALES

A representative of the Serbian arms industry watches the bombs at the Serbian stand at IDEX in Abu Dhabi, February 2019.

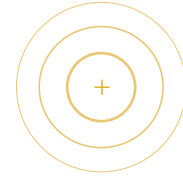
but we shouldn't forget it exists. The prevalence of surveillance tools in society shows how the instruments of tech and defense have become a part of our everyday lives; this set of photos amplifies how conflict has the face of business too. If significant geopolitical rifts deepen and trade can't help to resolve differences between nations, then the arms trade could grow. Talking to *Think:Act*, Teryoshin says that his aim is to show to a global audience what goes on behind the scenes at such events, before commenting irreverently: "Sometimes I feel like a spy sent to the arms fairs not by a certain country, but in the name of love, peace and humanity." If only there were trade fairs for those qualities too. ■





BUSINESS FATIGUES
A handshake concludes business at the Africa Airspace and Defence event (AAD) in 2018 in Pretoria – the biggest defense fair in Africa.

DON'T GET LOST



The world is changing and you need to know how to adapt. If you have business beyond your shores, you would do well to follow these seven steps for cultural change and success.

BY **Bennett Voyles**

GEOPOLITICS

C

LOUDS OF SMOKE. Broken windows. Chanting picketers. It was hard to believe the chaotic images on the television had anything to do with you. But the tight-lipped reporter confirmed the news: Your factory was on fire. But could the clash at

the plant have been avoided? Maybe not. Protests against foreign companies in your sector had been building for months and your company's brand recognition made it an obvious target.

But what if you had listened to the protestors before the boycott grew? Or if you had asked headquarters for backup earlier? This imagined scenario is all too believable as the world changes from an outward-looking global trading playground to a place full of fenced-up borders and national interests. And as the business demands that your organization increasingly work across national borders, navigating the nuances of different cultures becomes all the more complicated. And one reason for that is that in many

places around the world, people are increasingly skeptical of the benefits of international trade.

A 2020 survey, conducted even before the spread of Covid-19 boosted xenophobia in many markets, found the numbers of people who see international trade as a force for good had slipped dramatically since 2018. In many countries, including some that have arguably benefited hugely from global exports – India, Canada, France, Japan, Germany and Mexico – more and more people see international trade as a negative force in the world, according to Bertelsmann Stiftung research.

Although enthusiasm for globalization may be shrinking, a lot of business is still being done far from your backyard. If you have foreign customers, an overseas assignment or need to manage a team that works six time zones away, what do you need to know about the people you're working with to work with them? How should you communicate? And how do you improve the odds that this assignment is a stepping stone for your career, not a stumbling block?

IN TRANS

1

Don't assume you know what you're doing.

You can't assume that the words you now use and the behaviors that you exhibit in your meetings at home are automatically usable in your new environment," warns Edward Hess, a professor emeritus at the University of Virginia's Darden School of Business, and author of *Hyper-Learning: How to Adapt to the Speed of Change*.

A former senior executive at Warburg Paribas Becker and other firms, Hess says he learned over the course of 12 foreign engagements that it paid to do some research about a new place before you arrive. "Talk with colleagues who have visited the country and seek their advice on how to behave," advises Hess. "What would be taken as a big faux pas? If there are people who were transferred from your home base to the new country, talk with them about how they built trusting relationships with their foreign colleagues."

2

Do your homework.

I always dive in" is the advice Eric Rubin, the former United States Ambassador to Bulgaria and a 35-year veteran of the US Foreign Service and president of the US Foreign Service Association in Washington, D.C., has to offer. "I do a ton of reading and I talk to people. Not everybody does that, but I think that's the right way. First of all, you arrive knowing a lot more. And second, if you really get excited and get into it, it's going to be a better experience."

US foreign service officers typically study a language full time for between six months and two years before being sent to a post. Before his posting in Bulgaria, for instance, Rubin studied Bulgarian for six months – being a Ukrainian and Russian speaker, he was quick to pick up a third Slavic language – and he watched the Bulgarian evening news. "That was really good because it got my ear accustomed to what the language sounds like on television, but also, they talk really fast, so it was a good challenge." →

ATION



Get your Fingerspitzengefühl on.

B

ut what about getting to know not a country, but a new organization? What's the best way to handle that? "I think my answer is two words: relentless curiosity," says David Omand, who has served at both the British

Government Communications Headquarters and the Home Office as Permanent Secretary. "You don't know the culture and the environment, so you have to find that out. And the only way you can do that is by asking."

Omand, who is also the author of *How Spies Think: Ten Lessons in Intelligence*, adds: "There's a wonderful German word, *Fingerspitzengefühl*, which is feeling with your fingertips. I was introduced to this word by one of my colleagues who served in the British army on the Rhine. They used it for the good military commander's sense of the territory – you just get this feel with your fingertips that tells you whether 'this looks okay' or 'this isn't right.' I think senior executives develop this – they can go into a plant or factory or, in the case of a civil service, one of these case-working factories where the staff are processing files on individuals and very quickly get that feel ... Businessmen I've known have said it's exactly the same when you walk into a factory or production line ... is there swarf on the ground that's not cleaned up? Go into the toilets – what do they smell like? It's olfactory. It's little things like that that give you a sense of, this is well run, these people know what they're doing."

GEOPOLITICS

O

f course, as a leader, you can't just be an anthropologist. If your assignment requires leading an unfamiliar group, not only will you have to understand its members, they need to understand you. Even a very simple request is likely to be executed more quickly if people understand why you are making it. "You want to supplement your quick request with a little bit of context," Kaipa says.

Kaipa also encourages frank conversations with your team. "Right upfront, if we give an opportunity for people to bitch and moan a little bit, the connection seems to come deeper." And that includes yourself: By "sharing authentically and being willing to be vulnerable," people will be more open with you, he says.

At the same time, you may still need to stay on your guard. For US diplomats, even offering a straight answer to a question like how you are liking your new post can present a possible security risk, says the State Department's Rubin.

Get to know your team.

F

ind out what you can about your colleagues' personal life, suggests Prasad Kaipa, an advisor, researcher and leadership coach based in Campbell, CA, and the co-author of *From Smart to Wise: Acting and Leading with Wisdom*. "You need to get into their private life to make sure there is meaning, there is a connection, there is engagement and there is interest. If these are not integrated into the work, you might get productivity, but it will be a dull kind of productivity," he says.

**Speak
frankly –
most of
the time.**

Define your leadership style together.

Leadership is a tango," says Nancy Benthien, a coach and culture consultant. "A leader who is perhaps from America or Germany or Canada, trying to lead somebody in a dramatically different culture, they have to recognize that the people in their team in another part of the world may look at them and have different expectations about what makes a good leader."

Beyond issues like how centralized decision-making is going to be, it can be helpful to set some norms of behavior. "An example would be being late to meetings. If the team norm is that we will all begin on time... and then somebody shows up late and nobody talks to them about it, or they're not held accountable, the norm is broken." This is why setting norms directly in the beginning is important, Benthien says. "And it's doubly so if [the team is geographically] distributed because people come in with all kinds of expectations about how things are supposed to be done, why we're here and why we're working as a team."

GEOPOLITICS

**Swap
stories.**

In many cultures, building trust is a gradual process, Benthien says, one that can be accelerated a bit by exchanging stories. "Sometimes I'll start off a workshop or a team coaching session by having people tell a story about something that is meaningful to them. Then others see a glimpse of somebody that's a little different than what they would see in an office building or meeting – those little openings help build that psychological safety."

But not all bonding activities are for everyone. "In some countries I worked in, the leaders and their team loved to

drink a lot at dinner over many hours," recalls Hess. "I found in some cases that my limits were offensive to my hosts and I had to go to Plan B: I sat next to flowers or plants and when they were engrossed with each other, I delicately poured my drink into the flowerpot."

Whether building a rapport with a story or a dodged toast, deep down, people everywhere have more in common than not. "People are people at the end of the day," Benthien explains. Or as the traveler and essayist Michel de Montaigne noted, "There is as much difference between us and ourselves as there is between us and others." ■

CLIMATE CHANGE'S

There is, right now, a moment of opportunity to act globally to fight the climate emergency. But that gap could close as some countries see a benefit in climate change. It could lead to a whole new world order and tip the balance of power.

BY **Detlef Gürtler**

PHOTOS BY **John Wessels**



CLOSING WINDOW



A RACE TO ADAPT

Nearly two-thirds of Senegal's population lives near the coast. The government now plans to relocate 15,000 people who live within 20 meters of the beachline. In the town of Saint-Louis, it is building a "sea wall" to prevent losing more houses to rising seas.

G

LASGOW, November 2021: 197 signatories send delegates to the 26th UN Climate Summit. This event, and the 25 preceding it, have become

a symbol for the Sisyphus-like task of unifying world leaders to tackle a global challenge that needs global solutions. They tell the story of the geopolitical shifts that have shaped the first decades of the 21st century. But now a new story is hovering above the horizon – and it's equally global, but not at all unifying.

More than wars or treaties, the issue that is redrawing the geopolitical world map is climate, and not just because of the flooding or droughts. Rather it is because it defines – or in fact redefines – the political rules of global action. From Rio 1992 via Kyoto 1997 and up to Poznań 2008, the target was to reduce greenhouse gases – with western countries in the lead. The climate summit order resembled the world order established after the end of the Cold War.

BOTH BROKE DOWN within a year. The Western-dominated world order was shattered by the 2008-09 financial crisis and the climate world order came apart at the Copenhagen summit of 2009. The approach of setting the rules for everyone, under guidance of the rich, failed. China held against it, assisted by many countries from the Global South who were fed up with Western dominance.

In 2015, Christiana Figueres said Copenhagen "was the most successful failure we had." As the then-leader of the UN Framework Convention on Climate Change (UNFCCC), it fell on her to mop up the Copenhagen debris and design a new strategy to fight the – still global – warming. "My image of Copenhagen is that we tried to build a huge ➔

cathedral of effort – but Copenhagen attempted to put the dome on the cathedral upon a non-existing structure. That's not a sound way to build a cathedral." She opted for a multi-pillar structure: Each country should decide on its own commitments for fighting climate change. A common goal, but multiple individual ways to reach it.

On these new pillars, a "new dome" was placed, namely the Paris agreement of 2015. "This is not about something for just five years," Figueres said at that time. "This is about a policy framework that is built to guide the global economy for some decades." She hoped that time would bring an upward spiral: Countries competing for ever-stronger contributions to sustainability, joined by industries, regions, cities, that set and achieved their own climate goals.

SIX YEARS ON from the Paris agreement, the balance is mediocre at best. Even if every country kept its commitments – which is a big *if* – the global carbon emissions would still grow until the year 2040. Net-zero emissions would not be reached in this century, and by 2100 the global temperature would rise 2.8°C to 3.2°C. But up until now, no major industrialized nation was implementing the policies nor meeting the emission reduction targets they pledged. To meet the Paris Agreement's 2°C upper target, the rates of emissions reductions would have to increase by 80% beyond the actual national commitments.

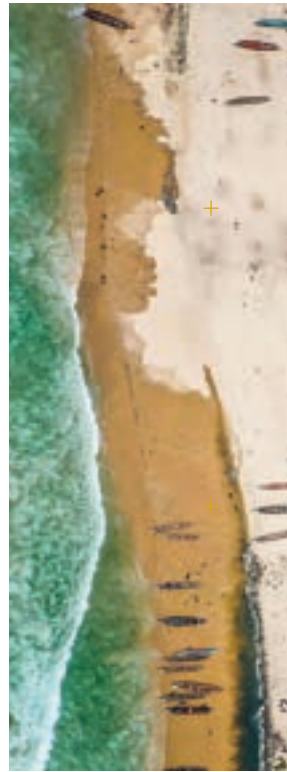
For Figueres, now 65 years old, the 1.5°C threshold is still within reach "if everyone understands that we are all in this together." A mindset has to evolve that sees climate change risk not as a national, but as a global challenge. If we fail, we're heading to what Figueres calls the three-degree world: "By mid-century human misery would be high, biodiversity would be decimated, and we and our children would live in a world that is constantly deteriorating with no possible recuperation." Global solidarity is, however, not the default of international

"The threats from climate change are now immediate."

→ Christiana Figueres,
Former executive secretary of the UN
Framework Convention on Climate Change

LIFE CHANGES

Thirty thousand tons of fish pass through the Guet N'dar neighborhood of Saint-Louis each year. Fishing is the second-largest employer in Senegal, but changing water temperatures and coastal erosion now pose an active threat to a major source of livelihood.





80%

The amount by which rates of emissions reductions would have to increase to meet the Paris Agreement's upper targets of 2°C warming by 2100.

3.2°C

The projected rise in global temperature by 2100 based on currently implemented policies.

politics – and that's putting it mildly. So how do we get there? Nature. Figueres says: "Some believe we are hardwired to react to threats only if they are immediate. Well, the threats from climate change are now immediate."

THE RECENTLY PUBLISHED IPCC report shows that the era of climate-related disasters has begun. With global temperatures more than one degree above 19th century levels, the probability of events like heatwaves and droughts has doubled. With a further one-degree rise, the number of heat waves will double once again. While climate change is never the only cause of extreme weather events, it is playing a role in a rising number – and public opinion will blame all of them on global heating. So pressure is mounting to act on the national, international and global level.

A carbon-reduced, climate-changed world will present new geopolitics. Less dependency on fossil fuels, that's for sure. Maybe the last oil war has already been fought – in Iraq. China's decision to unilaterally stop financing coal power stations outside the country will take another fossil fuel out of the global power game. Regarding other resources, it's not so clear. Coltan, lithium and rare earths remain scarce – and are needed for batteries and tech products. And then there are two additional resources: sun and water.

A little square in the middle of the Sahara Desert – about 300 x 300 kilometers in size – represents the entire space required to power the whole world with solar energy. Producing solar energy in the Moroccan desert and transporting it to Europe was one of the first giga projects for the post-carbon world. Proposed by the Club of Rome, the Desertec consortium, founded by mostly German companies and institutions in 2009, was a total failure. The project partners in Morocco were indeed interested in huge solar energy investments – but only to cater for their national and regional needs. A solar-powered Africa →

would have been a great vision; but that was not what Europe wanted to pay for. Under the suspicion of perpetuating colonial structures in the post-carbon world, Desertec was doomed before it had even begun.

GIVEN THIS BACKDROP, European solar power is likely to come from Spanish plants and German roofs. While surely less energy-efficient than a Sahara megaplant, at least these sources bear no political risks. After six decades of dependency on oil-rich countries like Iran, Venezuela or Saudi Arabia, there should be little appetite for rushing into the arms of desert-rich countries, such as Morocco, Algeria or Mali.

Water is less abundant than sunlight, and as such it has been a resource of conflict throughout human history. Peter Gleick, head of the Oakland-based Pacific Institute has counted 926 major

water conflicts – or even wars – in the last 4,000 years. And with fresh water consumption now growing faster than the population, they remain a cause of conflict, whether between Israel and Jordan or Egypt and Ethiopia.

With climate change, tensions will rise sharply. Global warming will lead to some major changes in precipitation

"Agriculture is moving north, and people will follow."

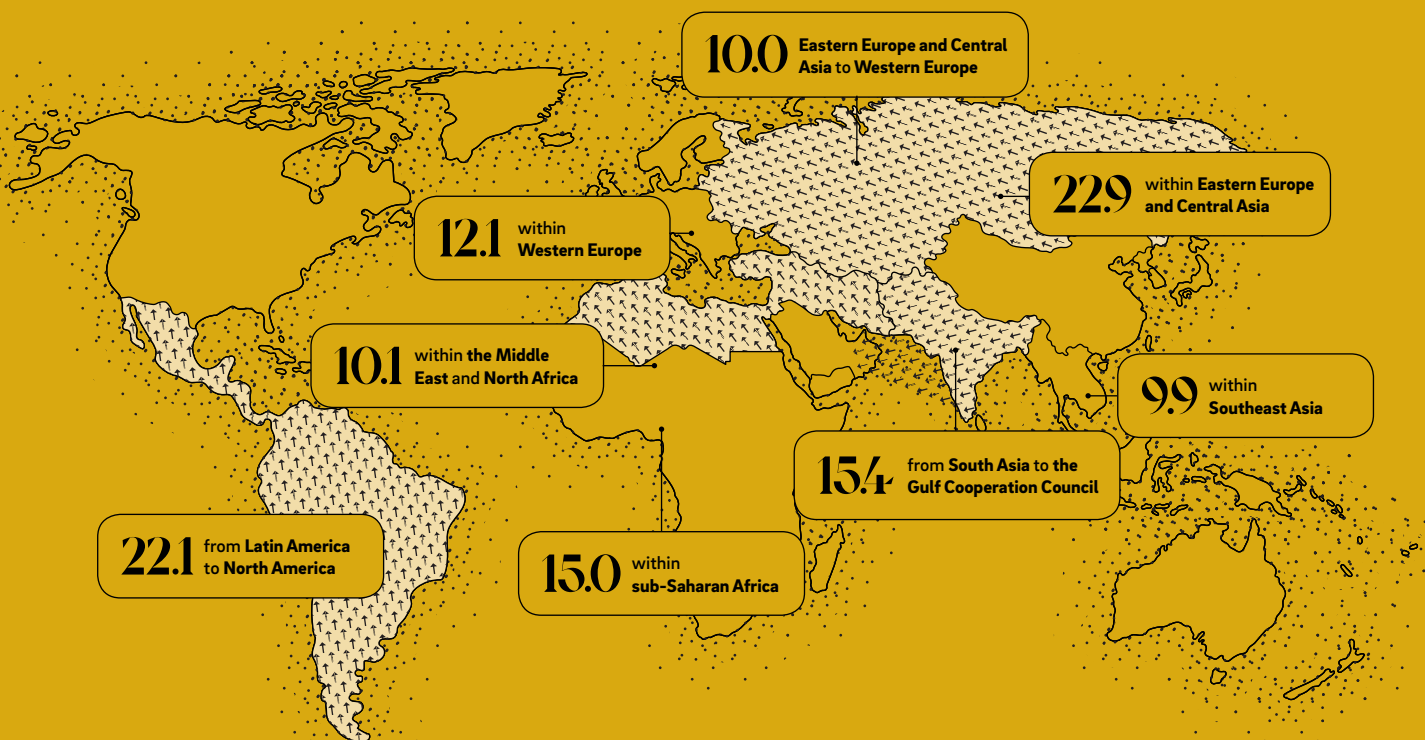
→ Parag Khanna,
Geopolitics and
globalization specialist

across some regions. It's still almost impossible to predict which regions get more and which get less rainfall, which will see flooding and which will see drought. But these redistributions of water will lead, if not to wars, then to another form of unrest: migration. "Too much water is better than too little water," says Singapore-based geostrategist Parag Khanna. "With too much water, you may have to move some hundred meters away from the river – with too little water, you will have to find another place to live."

In Khanna's view, climate migration will be a hot issue in the 21st century. He shows a world map with huge green zones – "climate oases" that will profit from climate change. The bulk of these zones lies in the two biggest countries of the world, by size: Canada and Russia. Both are very sparsely populated, but that is about to change. "Agriculture is

CLIMATE MIGRATION

Geopolitical expert Parag Khanna sees higher temperatures redrawing the map of human civilization over the coming 20–30 years, leaving a logistical question of how to resettle affected populations. Here, **in millions of people**, is what these shifts could look like.



LOSING GROUND

A one-meter rise in sea level by 2100 would result in the loss of up to 86 km² of Senegal's coastal land and could flood 6,000 km² of its low-lying areas. Hundreds of Guet N'dar's resident workers have already been displaced to relocation camps further inland.

moving north, and people will follow," Khanna predicts. "Former fertile and densely populated regions get reduced to solar energy production." We should brace for large-scale migrations from climate change losers, the red zones on Khanna's map, to the winners: from South China to Siberia, North India to Kazakhstan, the US "sun belt" to the Great Lakes, Brazil to Patagonia, the Mediterranean to Scandinavia. And when Khanna says large-scale, he means it: By the end of the century, we may see "two billion people moving north."

THIS WOULD NOT ONLY redraw the world map, it would also redraw human civilization – and require a huge amount of at least regionally coordinated action: How else do you resettle a hundred million Indians in Central Asia? India-born Khanna could imagine some kind of "reverse moghulization": 500 years ago the Mughals came from Central Asia to India, and now the flow could move in the opposite direction. And the hope is, peacefully as well.

Perhaps Khanna's map is correct, perhaps not. At the beginning of the global heating century, the outcomes are still just too unpredictable. Just a small change in the monsoon pattern could lead to a greening of the Arabian Peninsula – like today in parts of Oman. Desertification for one person could mean more fertile land for another, and resilient technologies may reduce damage and keep migration rates low.

Right now, with the impact largely known, but exact outcome largely unknown, it is the right time for Christiana Figueres' "we're all in this together" attitude. There's a window of opportunity to forge some kind of global climate solidarity – and action. But it won't be open for long. With the results of climate change becoming more visible and predictable, global solidarity may dwindle once more and the window for global action against climate change could close. After all, why would you prevent something that is beneficial for your own country?

1 BILLION

The approximate number of people projected to be forced to leave zones human beings have inhabited for thousands of years for each and every degree that the Earth's temperature increases.

SOURCE: US NATIONAL ACADEMY OF SCIENCES

ALL AT SEA

Over 80% of traded goods are moved over water. Shipping is the backbone of world trade, driving and driven by globalization. But as the recent blockage of the Suez Canal shows, maritime chokepoints can cause havoc to complex supply chains. As trade increases, so do these risks – and the search for ways round them.

BY **Janet Anderson**

SATELLITE IMAGES BY **FleetMon**

SEEN FROM SPACE, the Suez Canal stands out against the contours of the Asian and African continents, connecting the Mediterranean

Sea to the Indian Ocean via the Gulf of Suez and the Red Sea. Since opening in 1869, it has served as a maritime shortcut between the Asian, African and European markets. Today 12% of world trade passes through the human-made passageway.

In March 2021, the container ship *Ever Given* blocked the Suez Canal for six days, holding up nearly \$775 million worth of goods on the ship and sending shock waves through global supply chains. With 85% of goods by volume shipped by sea, it was a reminder of how dependent our economies are on the flow of traffic along maritime trade routes – and how easily things go wrong.

LITTLE CHANGED OVER TIME, many of our maritime trade routes have existed for hundreds, if not thousands, of years. "In the Age of Sail, ships naturally had to follow the prevalent sea currents and wind patterns. With the introduction of the steam engine, shipping routes were set and haven't changed since," explains Jean-Paul Rodrigue, professor of geography at Hofstra University in the US and author of *The Geography of Transport Systems*.

Recently, the emergence of potential new maritime trade routes such as the Arctic Route have attracted great interest. But establishing a new route is not easy. "There are many reasons why the Arctic would not work as a shipping route. It would require specialized ships and would still only be seasonal. From a cost/benefit perspective, it doesn't appear to be profitable," says Rodrigue. "And if the Arctic Route did become economically viable year-round, that would be our least concern – if the ice had melted to that extent, many coastal ports would be submerged."

Considering how well established today's maritime trade routes are, ➔

Suez Canal

30°27'18" N, 32°20'60" E



WHERE Egypt

NARROWEST POINT 55 meters

VOLUME OF GOODS AND SHIPS 18,829 ships bearing 1.17 billion tons of goods in 2020, down only marginally over 2019, even in the midst of the pandemic

CHOKEPOINT RISK 12% of world trade passes through the canal

El-Adabiya

Suez

One year's traffic in the Suez Canal

● Tanker ships

● Cargo ships



Panama Canal

9°4'48" N, 79°40'35" W



WHERE	Panama
NARROWEST POINT	150 meters
VOLUME OF GOODS AND SHIPS	13,369 ships bearing 255.74 million tons of goods in 2020
CHOKEPPOINT RISK	Around a fifth of global soybean exports and a sixth of global maize exports transit the Panama Canal each year; much of this trade originating in the US and Brazil and destined for Asian markets.

and how reliant we are on them, there are still a number of key chokepoints that pose a serious and growing risk for global shippers. Any infrastructural entity within a supply chain that forces a convergence of traffic can be a chokepoint. Straits, canals, ports, bridges – there are many potential bottlenecks that goods must routinely pass to reach their destination.

THE MAJORITY OF CHOKEPOINTS were, historically, strategic geopolitical assets for the countries that controlled them. The Suez Canal was built for European interests to connect with their colonies. The Panama Canal was an American attempt to connect east and west coasts. Today, these assets are managed by independent authorities that operate like businesses under commercial pressure and principles – which means it is in their interest to keep traffic flowing.

Not all chokepoints, however, are human-made. Of the world's 14 major chokepoints, the Strait of Malacca is the most important. It links the South China Sea with the Indian Ocean, carrying 40% of the world's trade. Annually

"Over the past four decades, global trade increased significantly ... That put chokepoints under increasing pressure."

→ Jean-Paul Rodrigue,
Professor of geography at
Hofstra University

nearly 100,000 vessels pass the strategic waterway which, at its narrowest point, is only around 2.7 kilometers wide.

The reason for the heavy traffic in the strait is the ever-advancing globalization of our world economy. "Over the past four decades, global trade not only increased significantly, but also saw a shift from Atlantic to Pacific trade. That put chokepoints under increasing pressure," says Rodrigue.

Assessing and mitigating these risks is the job of the insurer. Lars Lange is secretary general of the International Union of Marine Insurance in Hamburg, Germany. "As supply chains become more complex, they also become more vulnerable," he says. "In China, for example, one of the biggest ports in the world went into lockdown when one employee was infected with Covid-19." Indeed, many chokepoints are caused by a confluence of nature and human behavior. As the Covid-19 pandemic raged around the world, 400,000 seafarers were unable to leave their ships. The transport industry expects many workers to quit in the wake of this experience, further disrupting troubled supply chains.

Meanwhile, harbors along the west coast of the US currently cannot cope with the increase in traffic, and drought has made some of South America's inland waterways unnavigable, impacting world trade in grains and iron ore. On top of that, there is currently a shortage of shipping containers everywhere. "International trade would not be possible without financial backing for cases in which it goes wrong," says Lange. "We see ourselves as enablers."

The insurer's job is to model risks, calculate future exposure to risks and advise on ways to avoid them. "We look at the size of the ship, the weather situation, the influence of pilots and the claims frequency of vessels, and then take into account what the consequences could be," says Lange. What salvage operations are available, can the ship be refloated, can the cargo be kept safe, are there alternative routes and how much longer do they take, do they pass regions with piracy? All this helps to create an overall picture.

THE CONSEQUENCES OF DISRUPTION are as varied as the goods transported along the main maritime arteries. The damage may be limited to a local area, but it could also cause systemic collapse if essential goods cannot leave an exporting country or region. For consumers it could mean a delay in receiving a luxury gadget, but for the poorest countries that rely on food imports the consequences can be dire. "Depending on the magnitude of the disruption and how long it lasts, how critical the supply chain is, and which markets are affected on either side of the blockage, it could have much broader spillover effects and a longer-term impact on price and market stability," says Richard King, senior research fellow in the Environment and Society Programme at Chatham House. "If supplies become scarce, it can even lead to export bans. For some perishable foodstuffs stuck in transit it simply means the end of that supply."

King believes that global warming poses the greatest risk overall to

85%
of goods are
transported via
maritime shipping.

55%
of internationally
traded maize, wheat,
rice and soybean was
shipped through at
least one maritime
chokepoint in 2015.

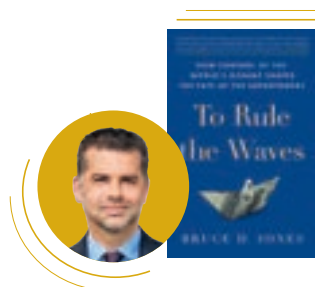
The shifting center of global trade

A RETURNING POWER China's entry into global markets has been highly profitable for commerce and led to a huge increase in maritime trade. What new chokepoints and risks does this bring? Bruce Jones of the Brookings Institution believes the world could be entering choppy waters.

1 HOW DO YOU SEE TRADE AT SEA CHANGING? There is a tendency to think of China as a rising power. But that is wrong. China is a returning power. China pulled out of globalization for a century, but from the 1980s on, this has changed. Pacific trade is back in full flow and the ports that serve it have become the largest in the world by far. China hadn't been a sea power since the 1500s, but it certainly is one now.

2 WHAT IMPACT IS THIS SHIFT HAVING? Fifty percent of world trade now flows through the South China Sea, the Singapore Strait and the Strait of Malacca. The center of gravity of the world economy is now in the Western Pacific. This seismic shift has increased the potential for naval contestation in the area. A core mission of the US Navy is to uphold the implementation of the United Nations Convention on the Law of the Sea by sailing through contested waterways, pushing back ships attempting to assert dominance. The Chinese government feels increasingly uncomfortable with this situation and has developed its own capacity. It has created a core rivalry between the two largest economies and powers in the world.

3 WHAT RISKS DO YOU SEE TO MARITIME TRADE? A huge challenge is piracy. When globalization was based on the trade of stable countries in Europe and the United States piracy didn't play a role. But once we reopened the flow to Asia through the Strait of Malacca and across the Indian Ocean, sea trade took place along the coasts of very unstable countries. We've seen a surge in piracy in these areas in the past decades. Beyond that, I fear we will see a continuation of tensions between the world's major navies with serious risk for commercial shipping around the main chokepoints.



Bruce Jones is director of the Project on International Order and Strategy of the Foreign Policy program at the Brookings Institution, Washington DC, where for five years he was also vice president. His book **To Rule the Waves – How Control of the World's Oceans Shapes the Fate of the Superpowers** was published in 2021.

maritime trade. "Climate change is a risk multiplier. It impacts infrastructure and causes floods, droughts and storm surges. Risks are compounded, like security and conflict that trigger geopolitical tensions. The more extreme and more frequent climate change-driven impacts get, the higher the risk to supply chains," he says.

IN THE WORST CASE, climate-related impacts could block multiple passage-ways. "If several of the main arteries from breadbaskets in Eastern Europe, Central Asia, North America and South-east Asia got disrupted at the same time – cargo from the Black Sea region alone has to pass three chokepoints to reach East African ports – and these interruptions coincided with climatic disruptions to harvests, a significant portion of global food wouldn't reach the markets with the biggest impact on the most vulnerable," says King.

Consumers as well as states – both the wealthy and the poor – all have an interest in mitigating the risk arising from our continuing dependency on sea trade. In some cases, it is simply a

question of market management. Rodrigue gives an example: "If there are too many ships approaching the Suez Canal, a bidding system can be introduced whereby customers who are prepared to pay can use the infrastructure. Markets tend to be pretty good at discriminating around what matters and what matters less."

But many of the other challenges shipping faces are more complex. "The list of factors that could disrupt supply chains is jaw-dropping, from climate change to a local strike. But when it happens, it's mostly at strategic gateways

or corridors. So there is a predictable unpredictability," says Rodrigue. And the best way to tackle this is resilience – designing systems with alternatives.

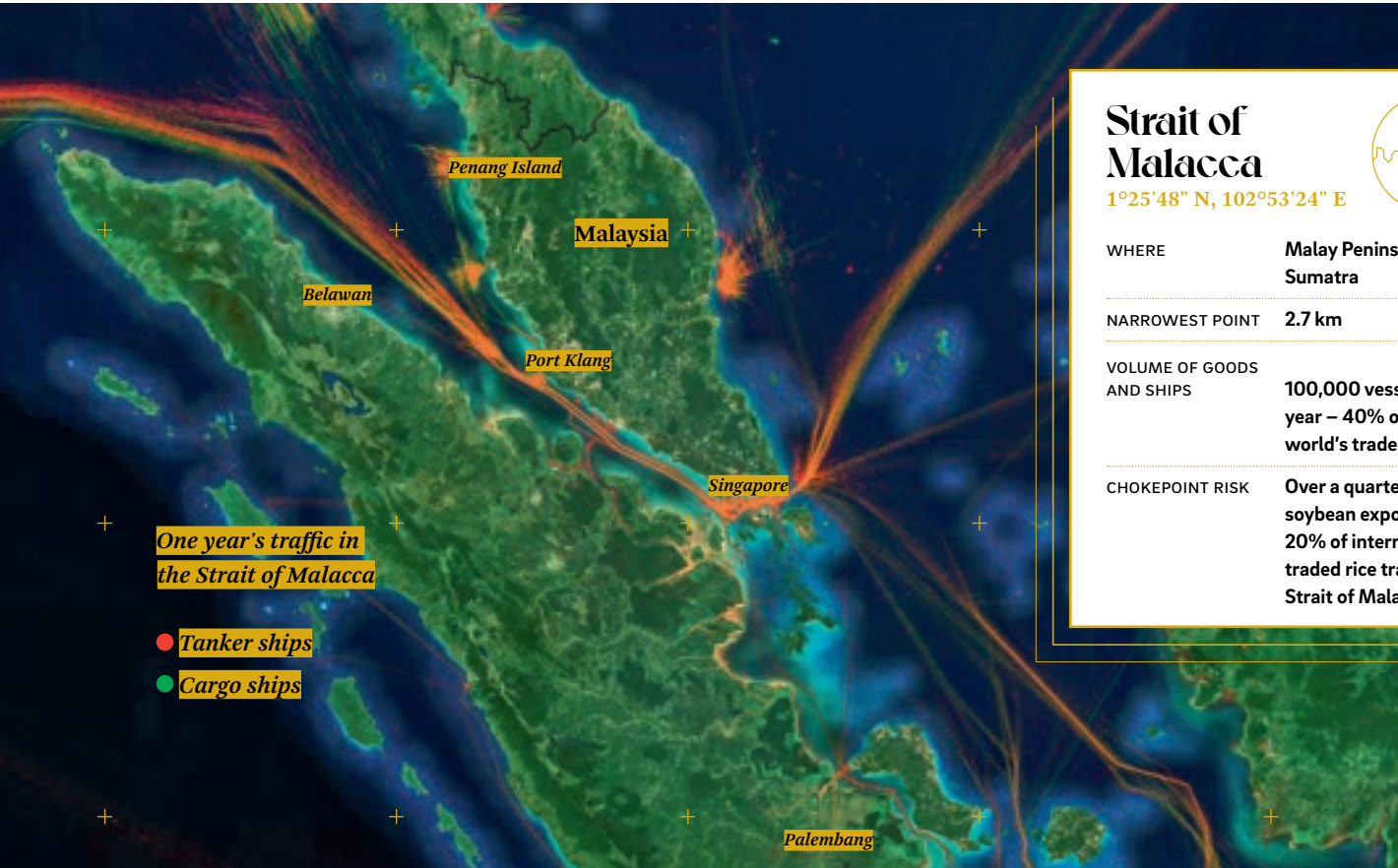
King argues that port infrastructure needs to be upgraded to cope with potential storm surges and poorer countries should take a strategic view of food storage. Better transparency along supply chains is also important. "Accurate assessments of food stocks are essential to bring together the theoretical chokepoint risks and real-time market data," says King. Lange argues that more incident-driven information is required in order to better learn from past mistakes.

Unless we recognize the burgeoning threats to our complex supply chains the likelihood of a serious breakdown is not a question of if, but rather a question of when. "Unfortunately, it usually takes a crisis to happen before we take appropriate action," says King. "It's probably going to take a series of shocks to nudge us in the right direction, and we've got to be hopeful that those shocks are manageable rather than being truly catastrophic."

11%

of internationally traded maize, wheat, rice and soybean now depends on one or more of the maritime chokepoints as the only viable shipping option.

GEOPOLITICS



Strait of Malacca

1°25'48" N, 102°53'24" E



WHERE Malay Peninsula, Sumatra

NARROWEST POINT 2.7 km

VOLUME OF GOODS AND SHIPS 100,000 vessels a year – 40% of the world's trade

CHOKEPOINT RISK Over a quarter of global soybean exports and 20% of internationally traded rice transit the Strait of Malacca.

CLOSING THOUGHTS ON
GEOPOLITICS

**"THERE IS
NOTHING
MORE DIFFICULT...
THAN TO
TAKE THE LEAD
IN THE
INTRODUCTION OF
A NEW ORDER
OF THINGS."**

Niccolò Machiavelli
Italian diplomat

Wide angle



*Read on for
diverse insights
into the wider
world of business
and ideas.*



Lessons by the dozen

Former Dunkin' CEO Robert Rosenberg opens up about how he went from a fresh business school graduate to a seasoned leader while growing his family's business into a global franchise.

BY **Neelima Mahajan**

PHOTOS BY **Tony Luong**

ROBERT ROSENBERG'S EYES light up as he talks about one of his favorite subjects: "I love donuts! My favorite donut is the Jelly Stick," he says before breaking into technical details of how sticky buns are made. "The little puffy shells you see are yeast flavored and the honey dips. And the cake donuts are cakey, and they're leavened by baking soda," says the octogenarian speaking from his summer home in Martha's Vineyard.

The son of the founder of Dunkin' Donuts – now rebranded as Dunkin' – Rosenberg worked in the company's stores and as a district manager. His father, a first-generation entrepreneur and child of the Depression, then asked him to run the family business at the age of 25. It was a daunting task: The company was bleeding and a lot was at stake. Rosenberg engineered a fresh new strategy and a dramatic turnaround, taking the company from \$10 million to \$2.6 billion. But not everything



Robert Rosenberg

was CEO of Dunkin' between 1963 and 1998. A former board member of the International Franchise Association, his 2020 book *Around the Corner to Around the World* chronicles his experience building the globally recognized brand.

was smooth during his 35-year tenure at Dunkin'. In this freewheeling interview with *Think:Act*, Rosenberg talks about his journey at Dunkin', his missteps and what he learned along the way.

Can you describe what you were up against when you took over Dunkin' Donuts?

In 1963, within weeks of me graduating [from Harvard Business School], my father asked me to assume leadership of [Universal Food Systems, at the time a conglomerate of small food service businesses]. I came to the conclusion that the business really could stand a change in strategy: niching down to one focused business, basically. That was the first phase and it worked incredibly well. We decided to focus on a coffee and donut shop and starve the other businesses of capital and our time and begin to build that business in very focused market areas. At first, you can imagine that the management team was kind of off-put by →



this youngster coming in who was wet behind the ears. But as we began to achieve some success, the team started to coalesce behind me and I brought in other senior executives who were highly talented. Five years after we assumed responsibility, profits had grown with this new focus strategy from \$100,000 in pre-tax profit to \$800,000. The next five years were a different story. But the initial strategy was overwhelmingly successful.

As a 25-year-old without really much experience under your belt, how did you even start thinking through the challenge you saw in front of you?

I think one of the big helps to me was the ability to go to graduate school. It was clear to me that the most important function for a leader was to bring together management to fashion a strategy that provided a unique advantage. [At first], everything worked well. I was 25-30, we were now public. But a company my father couldn't sell for \$1.5 million was worth, in 1968-69, something like \$120 million in market cap as a public company. I began to change the strategy to look upon myself as a franchising business, rather than a focused coffee and donut shop. That's when the trouble began. Whatever humility I might have had in the early years of not knowing a lot had vanished. I got seduced by Wall Street and the need to keep my market price high. I took my eye off the core business and began to focus on what it would take to keep earnings growth upwards of 50% a year, which was naïve. Then I ran into real trouble. So I had to mature. There's an old saying: You can't put an old head on a young body. In my case, that was absolutely true. It was a result of that near failure that I began to mature.

You mentioned that others in the company saw you as someone who was wet behind the ears. How did you counter that?

I didn't come in to tell them what to do. Basically we caucused and we talked about the dilemma we were in, the tactical issues we were facing. If I were to look at my predecessor, he was spending a lot of time with the team solving and putting out fires. So the question we had before us was: How could we put the fires out by virtue of having broader policy, a different strategy? The company that I joined in

DUNKIN' IN NUMBERS

**2
billion**

How many cups of hot and iced coffee Dunkin' now serves worldwide each year.

12,600

The number of Dunkin' restaurants currently operating in markets in 40 countries.

**\$1.37
billion**

Dunkin' Brands' reported revenue in 2019 before it was acquired by and merged with Inspire Brands in 2020.

SOURCE:
DUNKIN'

1963 was called Universal Food Systems. The team would meet and we decided that we were going to focus on one of those businesses that was in our midst. Before this, the prior management had lost confidence in a coffee and donut shop concept by itself. They were building the last 26 stores the year I joined: all restaurants that served hot dogs, hamburgers, breakfast – and they had store sizes anywhere from 18 to 90 seats.

What we decided to do was focus on a 20-seat donut and coffee shop, go back to the roots of what was successful when I went off to college and we did it as a team. But that's how we coalesced, and then I ran into a few lucky breaks. We made some decisions to back up our strategy that worked out overwhelmingly well. People began to feel good about the direction we were heading and earnings were growing, bonuses were being paid.

You had eight businesses in all and decided to focus on donuts and coffee. What made you believe this was the diamond in the rough?

Early on, when my father and my uncle decided they needed to diversify their business, they opened a small awning store in Quincy, Massachusetts, called the Open Kettle. It was no more successful than the other 1,500 donut shops that existed in 1948 in the state of Massachusetts: It did \$1,000-1,500 a week. It served superior coffee and great handmade donuts made fresh throughout the day, but it was a little awning shop where you couldn't see in it. When a competitor opened nearby, they decided to rip it down and put in a new California-style business. That store went from \$1,000 a week to \$5,500 at very modest prices: a dime for a cup of coffee and 55 cents for a dozen donuts.

As they began to change, they lost confidence in the ability of that narrow menu – breakfast snacks and bakery take-home products – as the basis of the business, and they began to change it. My belief was that [it was] the only thing that we really had in our portfolio of little companies that was unique, that had somewhat of a sustainable competitive advantage. Now I wasn't sure how far it could go – it did show signs it was temperamental. It was more of a bakery than it was a restaurant, or at least equally, but it was the best option I had



"I had to mature. There's an old saying: You can't put an old head on a young body. In my case, that was absolutely true."

— Robert Rosenberg

available at the time. It made the most amount of sense. We weren't as refined as we ultimately became, but overall, more things worked well than didn't, and it was the right choice.

To what extent did you have to rethink the coffee and donuts business for the so-called "new age"?

Dramatically. We started with a 20-seat counter in a question mark style with porcelain cups. We had a separate takeout donut section and we made donuts on-premise in every single store. As time went by, drive-through windows [and self-service] became important. We did away with porcelain cups, went to paper. We eliminated the question mark counter – at some great consternation to our customers – and we changed the way we went to market as a result of some experimentation some franchise owners had done on their own. Instead

*A CHANGING VIEW
Rosenberg came to
a young company
as a young man,
but grew as a
leader alongside
the business.*

of a 2,000-square-foot donut shop with 1,000 feet of retail space at high rents to manufacture donuts on-premise, we went to centralized operations that would make donuts and distribute them. We moved away from being a donut company to a beverage company. When we changed the service delivery system – paper cups, faster delivery – coffee grew from 35-40% to 60-70% of the business. We went into more commissary-like operations for production and we focused more on beverages and self-service and distributed that and took the product beyond the four walls of the store to wherever people work, shop, travel, play. The profitability and returns on that investment improved dramatically.

A lot of that was listening to franchisees. The case of distributing the product to other facilities under our name – large petroleum stations, theaters, convenience stores – was really pioneered by →

our Philippine franchise owners. I told them that's not the way we go to market. But they convinced me that they had a better way, and we began to adopt it in the US. It proved to be a huge change. The customer, the competition and technology is constantly changing. If you don't change your strategies, you're gonna be left behind. We, as a management team, were willing to adapt to all those changes. And we did so in a very conscious way by revisiting what we wanted to be, what we wanted to have and which four to five strategic levers we were going to pull at any given time to allow us to do that.

As CEO, how did you develop the ability to pick up signals, even if they are weak, and then translate them into something that works for the business?

Initially, I didn't do that, and that was when we ran into trouble. I went into what I can only describe as "the arrogant period." I was reading a book called *The Best and the Brightest* by David Halberstam. It was about the Kennedy/Johnson administration and the Vietnam War, how the government [had] some of the best and brightest Ivy League-educated people, but they weren't going into the towns and hamlets where the war was being waged: They were operating on body counts and on data. Sitting there watching some problems that were a result of my diversifying from a donut and coffee company to a franchise business and taking my eye off the business, I came to the realization that I was guilty of the very same thing myself.

So we caucused together and decided what we would do as a team: Each of us would visit at least 100 stores a year with a district manager. I personally asked [franchise owners] two questions: If you had to invest in this business again, would you do it all over again? That was my acid test of whether or not the franchise was offering returns for the effort and the risk they took. The second question was: If they were CEO, what would they do differently than I do? I wasn't there to inspect the store. I was there to listen and show concern for both the district manager as well as the owner. And slowly but surely, with that kind of mindset we started to get ideas pumped into us for products – and ultimately how we reconfigured the stores and changed our service delivery system, how we

*STANDING TALL
Rosenberg thinks
accepting his
own failures and
responsibilities
was key to saving
his business.*

distributed our product and changed the returns at the unit level. So it was as a result of making a terrible mistake that I began to learn a new better way of listening better, and the whole management team did, and it served us well for the next 25 years.

You talked a bit about the mistakes you made. How did you come out of that?

Well, when leadership makes a mistake, it doesn't just affect the leader: It affects all followers. So earnings were faltering, the stock price started to fall – it fell as low as \$1.70. Franchisees weren't happy. They lost confidence in management and started an \$80 million class action lawsuit, which



"The best way for me to manage was to have a team of people that were, in many ways, smarter than me. I wasn't challenged by that; I was comforted by that."

— Robert Rosenberg

at the district level was found in their favor and could have spelled the end of the company. It was a tumultuous, sad time. One of the key guys, my classmate from business school, lost confidence in my leadership and left the company.

When I started running into trouble, I started to blame other people: my ungrateful franchisees for suing me, the guy that left me as disloyal. I began to blame everybody except the person that counted the most, which was myself. It wasn't until I read that book [by Halberstam] that I realized that the problem doesn't lie in our stores, but in ourselves. It was then that we started to come out of it. It was tough. But that's part of growing up. Life is lumpy, and then you really get paid for living through the lumps. That's when, if you're smart, you grow the most. But if you get through, you come out a lot better on the other side.

Over your 35-year stint at Dunkin', how would you describe your leadership evolution?

I basically synthesized what I thought were the four major roles or activities of a leader, [starting with] shepherding strategy: What do you want the company to be? What do you want it to have? What four to five strategic levers do you pull to achieve an objective? The second was to recruit and retain an organization that was capable of implementing that strategy. Those are the two I came to the job understanding. The third, that I came to as I matured, was the need for the CEO to communicate and align all constituents – the board, franchisees, employees – and that is a time-consuming task. Most

35%

The compound rate of return earned by investors during Rosenberg's tenure as CEO while Dunkin' Donuts remained publicly traded between 1968 and 1989.

SOURCE:
BABSON COLLEGE

people think that if they communicate in writing or they say it once at a company meeting, it's absorbed and picked up. Not true. It's an endless task. [Fourthly], there were maybe four or five times when certain issues spelled life or death for the business: so crisis, and the management of crisis.

I didn't come that way in 1963: It was a process evolving through trial and error, through taking courses, listening, making mistakes, looking at myself objectively. Fundamentally, I came to the conclusion that I had some strengths and some weaknesses. And the best way for me to manage was to have a team of people I could rely upon that were, in many ways, smarter than me. I wasn't challenged by that; I was comforted by that.

The management team was together for 20 years, the top 20 people. We worked well together until we got bought out in a hostile takeover, when I was forced to sell the business in order to save it. I could see clearly firsthand the impact of this terrific team of able people pulling together, many of whom had better insight about what to do than I did. I didn't have to get all the credit. I did learn this as time went on: When things go wrong, the buck stops [at the CEO]: They will take 100% of the blame. When things go right, you share the credit with everybody. ■



ONLINE EXCLUSIVE

See the Short Takes interview video with Robert Rosenberg online:

rolandberger.com/en/rosenberg

The cost of Covid-19: \$10,30

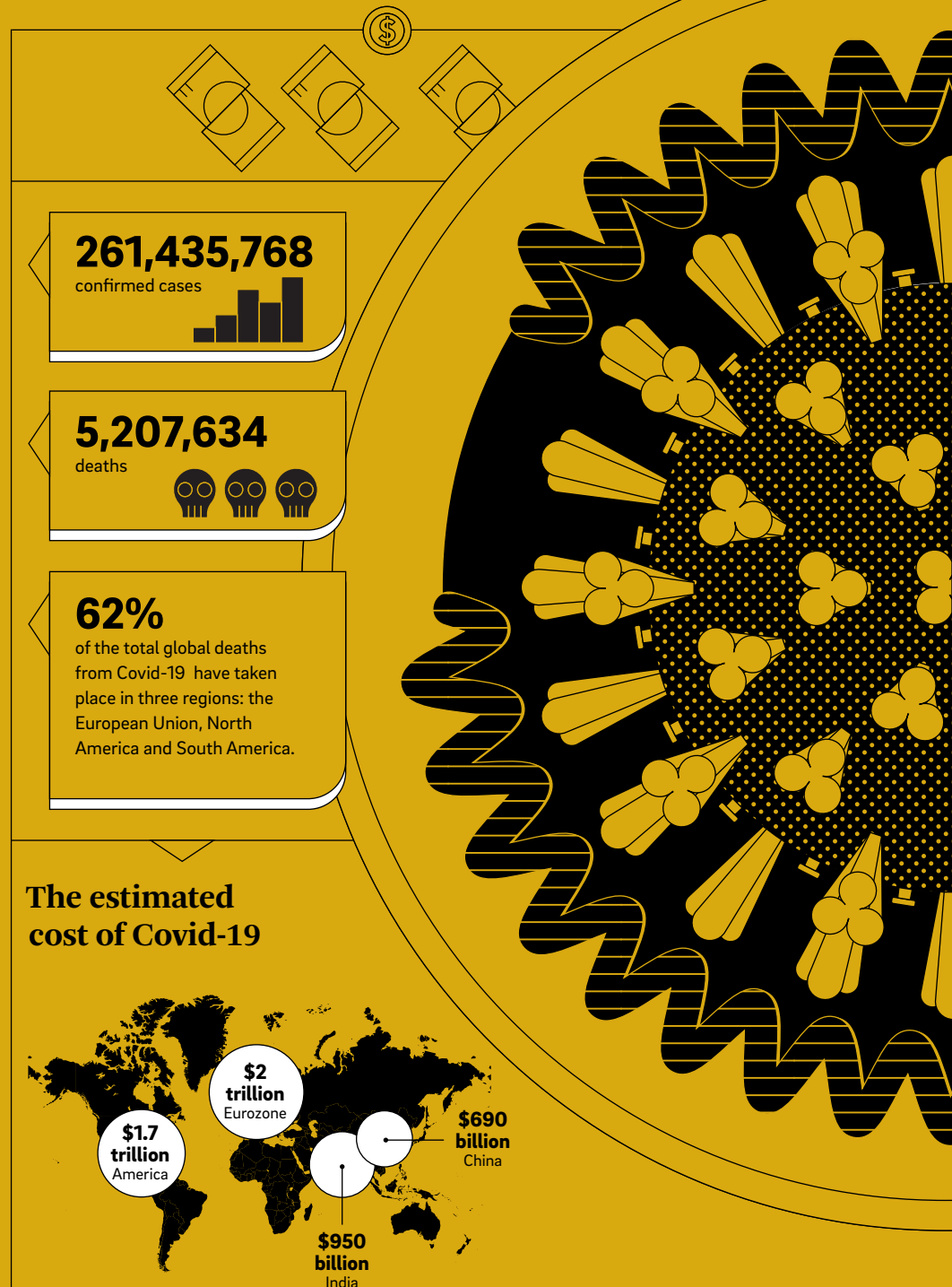
BY **Anthony Myers**

INFOGRAPHIC BY **Matteo Riva**

RICH NATIONS, in particular, need to look at rebalancing the economy and ending the pandemic, as a greater collaborative effort is needed that requires investment to help other countries secure financing for vaccinations so they can protect their citizens.

From the first reported outbreak of Covid-19 on December 31, 2019 in Wuhan, China, until December 1, 2021, there were 261,435,768 confirmed cases and 5,207,634 deaths reported to the World Health Organization (WHO). Sixty-two percent of total global deaths from Covid-19 have taken place in three regions: the European Union, North America and South America. While the quest for the "Holy Grail" – a universal vaccine – continues, the true monetary and human cost of Covid-19 continues to rise with each and every mutation of the virus.

Approximately \$200 million has been allocated to develop a universal vaccine for SARS-CoV-2, as the virus is officially known, as such a vaccine would offer protection against a broad range of coronaviruses. It would also reduce the need to modify the vaccine on a regular basis. The rapid success of various vaccines against Covid-19 has encouraged scientists ... but other variables are presenting themselves as concerning factors: Growing population density, human mobility and ecological change could trigger fresh, and hitherto, unknown pandemics. ■



00,000,000

The cost to developing countries

\$0.80

In 2018, developing countries paid a median price of \$0.80 per dose for various types of vaccines when buying them via UNICEF.

\$3

The Oxford/AstraZeneca vaccine is one of the lowest priced on the market, yet almost 4 times higher at a price of \$3 per dose.

\$10

Johnson & Johnson prices its vaccine at nearly 13 times higher, a purported non-profit price of \$10 a dose.

46x more

The Pfizer/BioNTech and Moderna vaccines are up to 46 times more expensive for developing countries.

#inequality

Vaccine rollout remains highly unequal, as does access to financial liquidity, leading the International Monetary Fund to conclude that fault lines are widening in the global economy.

The cost to wealthy countries

How much EU countries potentially overspent for Pfizer/BioNTech and Moderna vaccines (in millions)

\$796

Belgium

\$339

Denmark

\$4,642

France

\$5,757

Germany

\$339

Ireland

\$4,154

Italy

\$1,177

Netherlands

\$372

Norway

\$3,213

Spain

\$694

Sweden



The UK paid \$20.50 per dose for the Pfizer vaccine for 100 million doses and ordered 17 million doses of the Moderna vaccine at \$34 per dose.



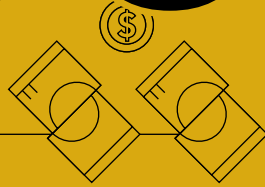
The US government made an estimated overpayment of \$17.4 billion against potential prices of the Pfizer/BioNTech and Moderna vaccines, paying \$19.50 for 300 million doses and \$25 for 500 million doses, respectively.



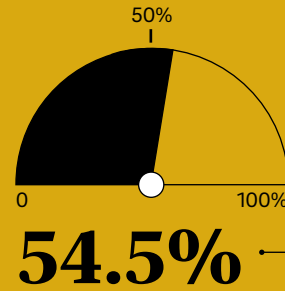
The EU paid Pfizer/BioNTech an initial \$18 per dose for 600 million vaccines, rising to \$22.75 per dose for 900 million more vaccines.

0,000

\$10.3 trillion



Vaccines



31.93 million

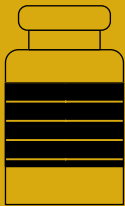
doses now administered each day

8.02 billion

doses have been administered globally

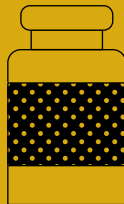
of the world population has received at least one dose of a Covid-19 vaccine

Vaccine billionaires

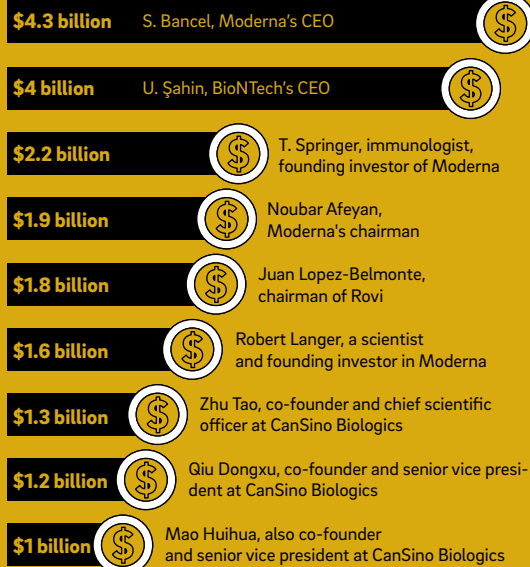


Pfizer, Johnson & Johnson and AstraZeneca have paid out **\$26 billion** in dividends and stock buybacks to their shareholders between April 2020 and April 2021.

Moderna and Pfizer/BioNTech are making combined profits of **\$65,000** every minute from their vaccines.



New billionaires created by the vaccine, in order of net worth:



First doses administered by country



A total of **184** countries have now administered at least first doses of a Covid-19 vaccine.



Cuba was leading in doses given as of December 2021 with **251 doses** administered per **100 people**. It uses a vaccine that requires three doses.

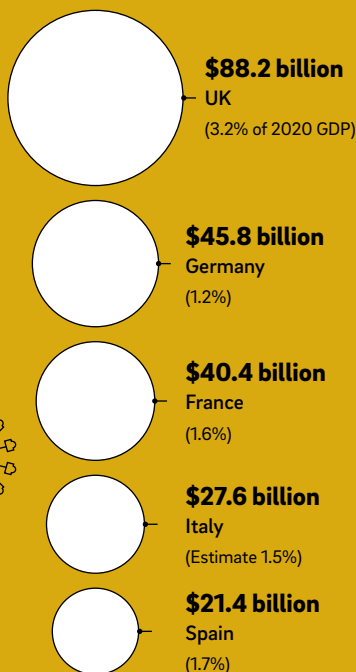
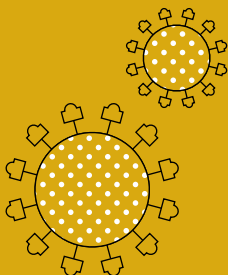


The United Arab Emirates is currently the most vaccinated country. By December 2021, it had given a first shot to 98% of its population.

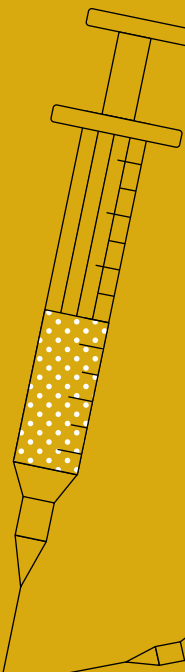
Subsidies

Wage subsidies during the pandemic

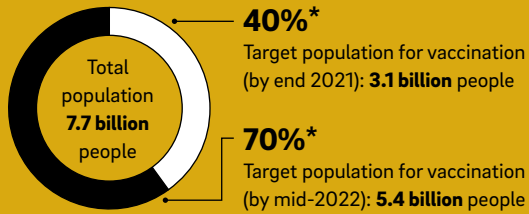
In April 2020, 23.19 million jobs in Europe's three largest economies were covered by main government job retention schemes, falling to approximately 9.58 million at the beginning of 2021.



\$790 billion
US
(approximately 3.7% of US 2020 GDP)



Vaccine monitoring



Doses

Required doses (by end 2021)
6.2 billion doses (for 40% of total population)

Required doses (by mid-2022)
11 billion doses (for 70% of total population)

Secured vaccines/expected vaccine supply
15.7 billion doses

Delivered doses - **8.4 billion doses**

Doses administered - **7.4 billion doses**



Vaccine disparity

500 million

doses pledged to
developing world by
US President Biden

1.7 billion

doses delivered to
91 countries by Covax

7 Covid-19 vaccines

have international
regulatory approval
and **five** are under
assessment.

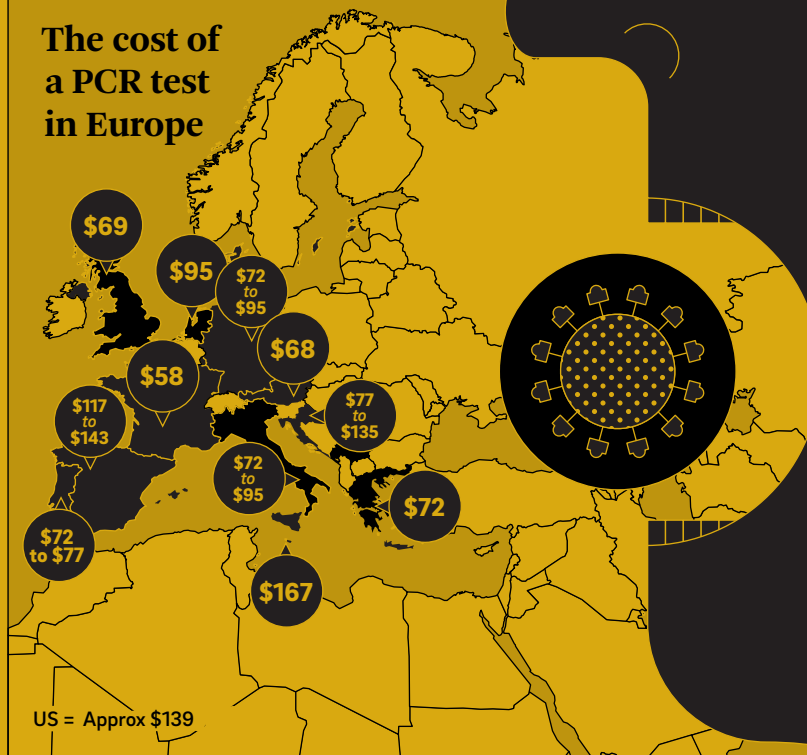
Masks

Top 10 safety face mask manufacturers in the world:

1. Honeywell International Inc.
2. 3M
3. Alpha Pro Tech
4. Superior Glove
5. DuPont
6. Kimberly-Clark Corporation
7. The Medicom Group
8. Eclipse Automation Inc.
9. Breathe Easy Labs
10. Huhtamaki Oyj

Tests

The cost of a PCR test in Europe



SOURCES : BBC.CO.UK, GOV.UK, ECONOMIST.COM, OXFAM.ORG, FORBES.COM, IMF.ORG, UNSDSN.ORG, COVID19.WHO.INT, OURWORLDINDATA.ORG, ENDPANDEMICS.CEPI.NET, SCIENCE.ORG, THECONVERSATION.COM, FORTUNE.BUSINESSINSIGHTS.COM, RESEARCHANDMARKETS.COM, SORTIRAPARIS.COM, HEALTHSYSTEMTRACKER.ORG, DATA.COVID19TASKFORCE.COM/DATA, SCIENCEALERT.COM, LIVESCIENCE.COM, NEWSIDENTIST.COM, BLOOMBERG.COM, WHO.INT, PUBLIC CITIZEN/IMPERIAL COLLEGE LONDON



Auto correction

Tech disruption is hitting the car industry. Elon Musk's Tesla is now worth more than the main automakers combined – and he seems poised to be the 21st century Henry Ford to lead the electric revolution. But is it really as simple as making cars electric and switching to battery power?

BY **Fred Schulenburg**



*REINVENTING THE WHEEL
Tesla plans to build 500,000
Model Ys each year at its new
"gigafactory" near Berlin.*

THE SANDY SOIL of Brandenburg seems an improbable setting for a revolution. Yet, here on the outskirts of Berlin the woods are being cleared for, in the words of Elon Musk, "a new future." The founder of Tesla was referring to the electric carmaker's "gigafactory" in Grünheide, 30 kilometers from the German capital. The facility, the company's first in Europe, will power Tesla's ambitious drive to expand its share of the growing market for electric vehicles. Grünheide, the company says, will turn out as many e-cars as were sold in the whole of the EU in 2020 – another milestone in the remarkable success story that is Tesla, a company that was only founded in 2003 and yet is now rated by investors as the most valuable car company in the world. It puts Musk in pole position as the figurehead for a new clean car dream, to do for the car industry what Henry Ford did for the horse and cart. His plans, though, have already hit a stumbling block. Revolutions, it seems, do not come without the odd bureaucratic hurdle. Especially in Germany.

Despite backing from the highest levels of the German government, Tesla has battled with local authority red tape, environmental protests and challenges from labor unions. Delays to the plant going online meant that when Musk flew to the site in mid-October 2021 it was still a work in progress, with local visitors to a trust-building open day entertained by fairground attractions rather than a humming production line. That said, Grünheide is nevertheless part of a seismic shift shaking the auto industry, with profound consequences for manufacturers, road users and policymakers.

AS EUROPE STARTS TO EMERGE from the pandemic, one marked difference to the pre-Covid world can be seen on the streets. Whereas Tesla may once have been a lone disruptor, a cool Californian start-up with bold ambitions of upending one of the biggest industries in the world with innovative technology and a different business approach, it now finds itself in a rather more crowded field, with familiar and famous automaker brands as well as startups getting in on the battery-powered action.

This comes as governments are stepping up their push toward cutting greenhouse gases →



*GOING GREENER
Audi Brussels
assembles its
batteries in a
CO₂-neutral plant.*

"The whole industry is up for grabs in a way that it hasn't been for 100 years."

— Peter Wells,
Professor at Cardiff University

with ambitious targets for the phasing out of vehicles with internal combustion engines and subsidy packages and incentives for their electric replacements. Depending on where you live, the next 10-20 years will see the roads around you cleared of the emissions and noise that have been a familiar feature of daily life for decades.

IT'S NOT JUST ABOUT MUSK, however, or his ersatz Model T(esla) leading a clean car concept to change driving habits. It's more urgent than that. A potential sea change in attitudes to cars and how to power them could emerge as the climate emergency becomes ever more apparent. "The whole industry is up for grabs in a way that it hasn't been for 100 years," says Peter Wells, director of the Centre for Automotive Industry Research at Cardiff University. "Software, services are all in play – it's not just about going electric." This, he adds, creates a "lot of space" for newcomers and puts a lot of pressure on incumbents, "some of which will fall by the way-side." Investors seem to agree. Tesla currently enjoys a stock market valuation of \$900 billion – more than that of all its main competitors combined. Although, in terms of sales, units produced and people employed it remains a minnow in comparison.

For Alain Kornhauser, professor of operations research and director of the program in transportation at Princeton University, there are various reasons for the Tesla phenomenon. As well as offering investors a clear focus on innovative "auto tech" without any of the "legacy" issues faced by the incumbents who will have to adapt complex

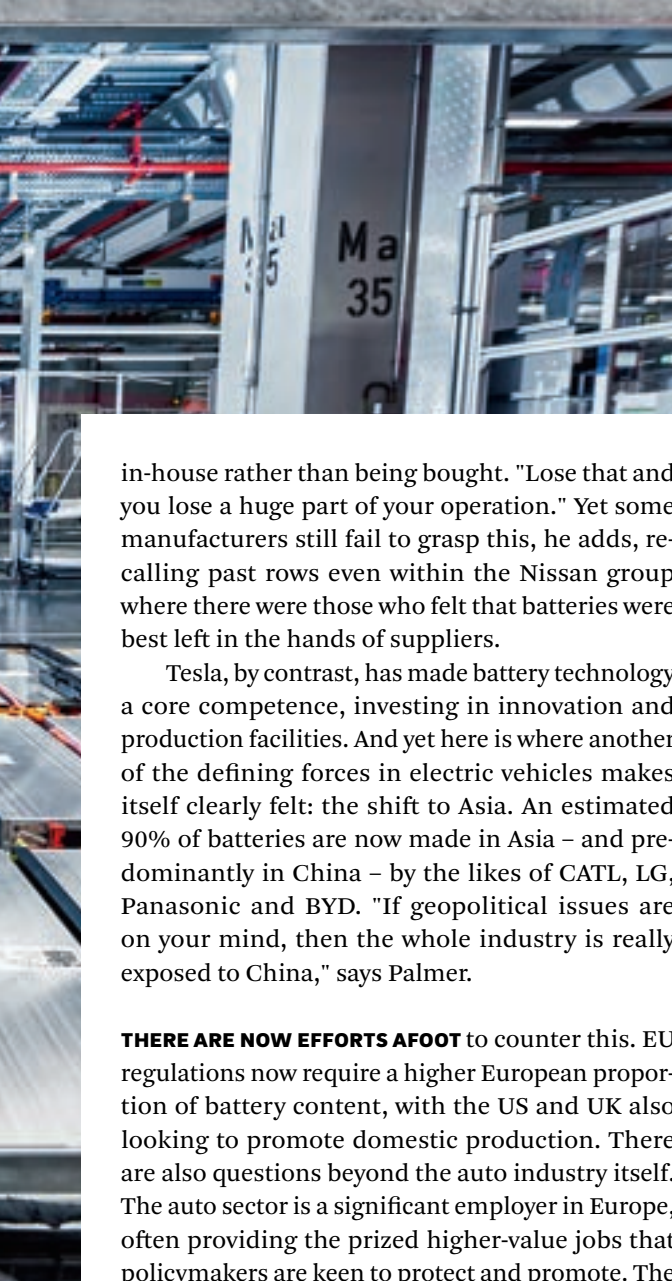
97%

How much the price of lithium-ion battery cells has fallen since 1991. Today, however, a single car lithium-ion battery pack could contain around 8 kg of lithium, 35 kg of nickel, 20 kg of manganese and 14 kg of cobalt.

SOURCE: NATURE

existing systems, Tesla also offers an immensely powerful, upscale brand and has been "largely successful up to this point, which creates a halo effect." That all brings access to willing capital – and talent. "Guess who my students want to go and work for?" asks Kornhauser. "It's the Googles, Apples, Teslas and Space-Xs."

Yet, before one declares the race to electric is all but over, it's worth remembering that there are other decisive factors to consider. Andy Palmer, former chief operating officer at Nissan, sometimes dubbed the "godfather of electric vehicles" for his role overseeing the development of the pioneering Leaf, the world's first mass-produced electric car, has some powerful insights which shed light on Tesla's strength and influence to create the perception that cars should be battery powered. Palmer thinks batteries are a decisive factor. Batteries, he says, are essentially becoming the engine – the core part – and thus something that has to be kept



in-house rather than being bought. "Lose that and you lose a huge part of your operation." Yet some manufacturers still fail to grasp this, he adds, recalling past rows even within the Nissan group where there were those who felt that batteries were best left in the hands of suppliers.

Tesla, by contrast, has made battery technology a core competence, investing in innovation and production facilities. And yet here is where another of the defining forces in electric vehicles makes itself clearly felt: the shift to Asia. An estimated 90% of batteries are now made in Asia – and predominantly in China – by the likes of CATL, LG, Panasonic and BYD. "If geopolitical issues are on your mind, then the whole industry is really exposed to China," says Palmer.

THERE ARE NOW EFFORTS AFOOT to counter this. EU regulations now require a higher European proportion of battery content, with the US and UK also looking to promote domestic production. There are also questions beyond the auto industry itself. The auto sector is a significant employer in Europe, often providing the prized higher-value jobs that policymakers are keen to protect and promote. The electric revolution will no doubt generate new jobs. But with markedly fewer components and demands – how many mechanics will we need if our vehicles are software machines that can be remotely upgraded? – it is questionable whether it will sustain current levels of direct and indirect employment.

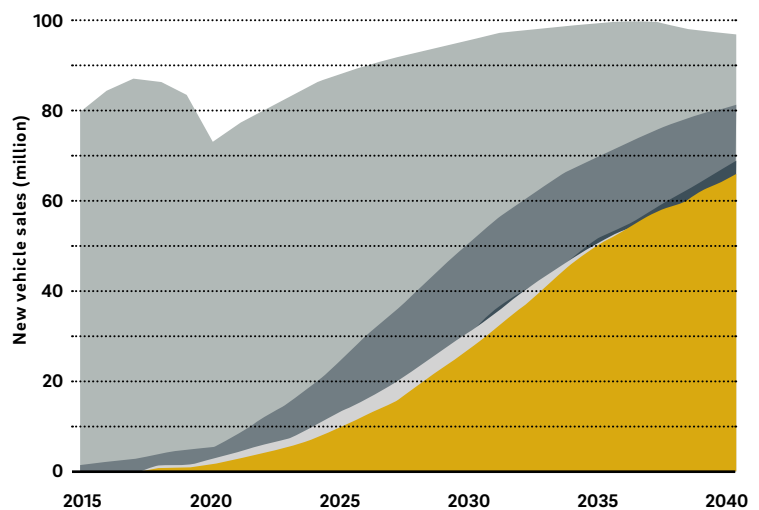
Another, more profound question is whether electric – and battery power in particular – really is the right technology? Should we be looking at alternatives, such as hydrogen-based technologies or "eco" fuels? The immediate answer, according to most experts, is that electric and hybrid is the way forward. For now. "That ship has largely sailed," says Andy Palmer. It is the technology that many governments have backed in their drive to net-zero with associated targets underpinned by legislation: Electric will shape the industry's near future.

So is battery power the way to go? It certainly brings its own challenges. "We never really talk about how we get the electricity that goes in," says Kornhauser. If it is being generated by fossil fuels, how much does that undermine the overall goal of

The switch to electric

By 2035, more than half of new passenger vehicles sold could be electric – even if no further policies promote the move away from internal combustion.

SOURCE: NATURE



- Internal combustion
- Hybrid
- Fuel cell
- Plug-in hybrid
- Battery electric

cutting emissions? Is it realistic to expect the considerable increase in future demand to be covered through renewables or nuclear power? And despite development, batteries are still relatively heavy and their manufacture and disposal come with significant environmental costs.

Many environmental campaigners fear we have placed our faith in technology providing an escape route from a climate crisis that essentially allows us to pursue our existing lifestyle, albeit by different means. It might not be what Musk wants to hear – and it would certainly create a counter-revolution to his vision for mobility – but perhaps what is needed is a more fundamental change in our behavior: less driving, less air travel. The experience of the first pandemic lockdowns, which saw emissions drop sharply, demonstrated how effective such dramatic shifts can be. But achieving that in a more "normal" post-pandemic world could require a whole new revolution – one that could lead to replanting that forest outside Berlin. ■



A TÊTE-À-TÊTE WITH

Katy Milkman

Change is hard. If you want to build a new skill or healthier habits, everyday challenges can threaten the best intentions. Behavioral economist Katy Milkman shares some insights into how we can better set ourselves up for success.

BY **Neelima Mahajan**

ILLUSTRATIONS BY **Nigel Buchanan**

ALL OF US HAVE BEEN through the same experience in different contexts: We make a resolution and start pursuing it wholeheartedly. A few weeks down the line, enthusiasm wanes and within no time, we abandon our goal. Despite our rational selves telling us that we need to change, something invariably gets in the way. It affects our health, our finances, educational pursuits – you name it.

Behavioral economist Katy Milkman has been fascinated with the subject of why humans self-sabotage their change efforts despite their best intentions. For years, the Wharton economist has studied the idiosyncrasies of the mind and come up with a set of practical tools we can use to convince our wayward selves to do what's best for us. Her book, *How to Change: The Science of Getting From Where You Are to Where You Want to Be*, breaks down the strategies we can use to better stick to our efforts.

In a conversation with *Think:Act*, Milkman, whose work has been used by Google, the US Department of Defense, 24-Hour Fitness, Walmart and recently

by the White House with advice on how to convince people to get the Covid-19 vaccine, walks us through her work and how we can apply it to our lives.

We know what's good for us and why we need to change. Yet change continues to be very difficult. Why?

The first [common barrier] is finding the motivation to begin. The second is impulsivity, the tendency to focus on instant gratification rather than long-term rewards. The next one is procrastination, the flip side of impulsivity. Forgetfulness can be a real barrier – people undervalue reminders, that they'll need some trigger to follow through. Then laziness: It's a very negative word, but we tend to look for the path of least resistance, something we share with the best algorithms. [Then there's] confidence and →



AVAILABLE ONLINE

Hear what Katy Milkman has to say on our website: rolandberger.com/en/milkman



Katy Milkman is a professor at the Wharton School of the University of Pennsylvania and holds an appointment at Penn's Perelman School of Medicine. She is the former president of the Society for Judgment and Decision Making and, in 2021, ranked in the Thinkers50 and received the list's Strategy Award.

conformity: If we lack the confidence to believe that we have a shot at making a change, we may not ever take action [just as we] look to others for evidence of what's possible and to shape our beliefs about what we're capable of. If you deploy a one-size-fits-all solution, you tend not to be nearly as successful as if you actually understand and diagnose what is standing in your way.

Should we calibrate our behavior change goals in some way, strive for something smaller instead of a big goal?

One of my favorite studies on this was done in partnership with a large non-profit that asked its volunteers to commit to 200 hours of volunteer work per year. They sent out biweekly reminders: "We want to make sure you keep volunteering, that you're making time for us." What we experimentally varied was [breaking] down the 200-hour yearly goal into smaller component parts, so some of the reminders said, "Remember this means four hours a week," or, "This means eight hours every two weeks," to be a little bit more flexible. We found overall a roughly 10% increase in volunteering time when we broke that big goal down into smaller component parts.

Why do we overweigh things that will happen immediately and underweigh long-term consequences of our actions?

This is what economists call present bias. If you're choosing between pizza and salad for lunch, you think, "Oh, the pizza sounds so delicious." You undervalue the long-term goal of staying fit and healthy. The same decision might apply to savings. You get a bonus and get excited about celebrating right now and going out for a nice meal or buying a nifty new gadget instead of setting that money aside for a rainy day.

Why present bias happens is difficult to answer without insight into human evolution. Maybe thousands of years ago it would have been extremely adaptive in a world where you're constantly facing survival risks and you might not have a long-term time horizon to work

with. But it doesn't seem to be advantageous in today's world. [But there are] tools for how we can overcome present bias and achieve some of our long-term goals more successfully.

I did some research on a strategy I call temptation bundling. Imagine only allowing yourself to pick up a favorite treat when you're heading to the library to hit the books – we can link temptations with something that otherwise wouldn't be that enjoyable. A critical insight about how to overcome present bias is to lean into it: recognize it in

yourself and recognize that instant gratification matters tremendously if you want to persist at something.

You've talked about our 'want self' and our 'should self'. What does that mean?

We have these different perspectives and agendas, depending on the time frame of a choice. One way of thinking about that is thinking that we have two selves that are dueling: A 'want self' that focuses on instant gratification and prefers all of those things that give us immediate pleasures, and a 'should self'

Choreograph your way to stickier habits

1.

Don't be too rigid

Allow for flexibility. If your autopilot is flexible, you will be able to respond consistently, even in less than ideal circumstances.

2.

Track yourself

Keeping tabs on new habits helps avoid forgetting to follow through. It also reminds you to celebrate your successes.

3.

Aim for streaks

Anything more than a short lapse in a behavior you hope to make habitual can keep a new habit from forming.



that focuses on long-term objectives. If they're in conflict, you can think about what would be the things that might tip the balance in favor of the 'should self' winning those battles.

You talk about the power of 'fresh starts.' Psychologically speaking, what do fresh starts do to us?

New Year's resolutions [are] one moment when we're particularly motivated to pursue goals. But the phenomenon of moments when we feel like we have a fresh start and are extra motivated arise whenever we feel like we're turning a page in our lives and have a sense of a new beginning: the start of a new week, a new month or birthdays give us the sense that we can set aside past failures. They were the failures of someone else. This leads people to be more likely to visit the gym at the start of these new periods or following fresh start dates. And this is true [also of] finances and educational goals. In one study we see a 20-30% increase in retirement savings when we invite someone to save after an upcoming birthday or after the start of spring, rather than just inviting them to save in an equally distant point in time.

Can our tendency to default to the path of least resistance be flipped to make it work for us in a more positive way?

In some situations, you can structure choices so the path of least resistance is actually the one that gets you to the best outcome. About 20 years ago, a company wanted to get more employees enrolled in their retirement savings program. To enroll, you checked a box on your first day and said, "Yes, I'd like to have a portion of every paycheck sent to this retirement savings account." They changed the paperwork so that on your first day you actually had to check a box to opt out. What happened if you took no action whatsoever, was you started saving: a 40% increase in savings ensued.

[Another study] I love was done at the Penn Medicine Nudge Unit, where doctors were prescribing brand name drugs at too high of a rate. Doctors

agreed it's not what they wanted to do, but they remember the brand name and they type it in when they were putting together a prescription. So the default was changed: Unless you checked a box that said, "Please send the prescription to the pharmacy exactly as I typed it in," the prescription was automatically sent in generic form. This led to this huge increase in generic prescribing, which everyone hails as a huge success because it reduced costs for both insurers and patients and also increased compliance with these lifesaving medications.

We can change our default settings to make the path of least resistance the one we want to take as opposed to the one that's happened to be selected for

us: changing the kinds of foods that are in your refrigerator and pantry; changing your default browser from, say, social media, to a landing page that may help you achieve your long-term goals.

You have compared managing change to managing a chronic disease. Why work with that analogy?

I was talking to Kevin [Volpp, a behavioral economist leading the Center for Health Incentives and Behavioral Economics at the University of Pennsylvania] about some research that really disappointed me. Angela Duckworth [author of *Grit*] and I partnered with 24-Hour Fitness, a national chain of gyms. We'd offered programming that lasted for a month with the goal of kick-starting lasting exercise habits. After the program, change by and large fell off and mostly reverted to past patterns.

Kevin said: "I don't understand why we think behavior change will always endure after we take away whatever is working." When we diagnose someone with diabetes, we don't put them on insulin for a month, then take them off and expect them to be cured. We treat it as a chronic condition. He asked, "Why do you think behavior change would be any different?" That insight for me was so powerful. It changed the way I do research and think about coaching and changing behavior and encouraging others to change. To the extent that we have sustained challenges and want to create sustained behavior change, we should have sustained solutions. ■

"In some situations, you can structure choices so the path of least resistance is actually the one that gets you to the best outcome."



You vs. you

Treat change like a game you're playing against an opponent – yourself. A tailored attack will always beat a one-size-fits-all approach, but the obstacles to change can shift over time and you may need to adjust your strategy as you go.

Deep dives



Take a deep dive and find out more in related articles and studies.

TRAVEL INDUSTRY

Long-distance information

IT DOESN'T TAKE a genius to conclude that the pandemic lockdowns all over the world had a massive impact on mobility. But where does that leave the future of travel? The startling drop in air travel [see Covid strikes] could have dealt some parts of the industry a mortal blow. But now as we transition to post-pandemic travel, other factors are likely to be at play in how people decide to take up, demand change to or reject long-distance mobility. The Covid-19 pandemic disruption was immediate, but what will be the long-term effect and what does the future of travel look like, particularly over long distances?

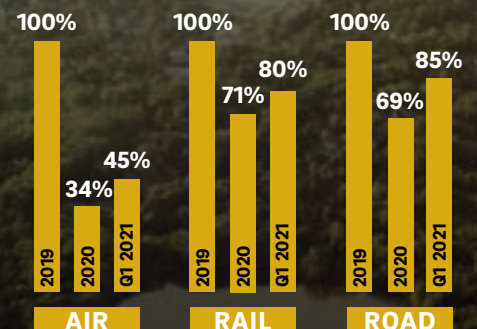
Three key trends are immediately obvious which will lead to structural change and impact the future of travel. Firstly, consciousness and efficiency will come into play, where businesses, for example, are already questioning the need for travel and the polluting impact

is being borne in mind when choosing a mode of transport – for instance, train over plane for shorter distances. Secondly, green mobility and sustainability; with everyone now questioning their carbon footprint and the undeniable evidence from the pandemic – CO₂ emissions related to air travel in April 2020 fell by up to 52% in Europe – a green element is part of most travel plans. And thirdly, innovation in mobility modes ranging from passenger drones and hyperloop to autonomous vehicles heralds a drive for new transport modes.

Eventually, long-distance travel will endure, but it's going to change: We are bound to see higher train demand and a desire for environmentally friendly air travel and longer trips instead of short breaks or business meetings. So if you are in the travel industry or a customer, the big message is: double down on sustainability and get ready for change.

Covid strikes

The pandemic caused a massive drop in long-distance travel demand, with only a partial recovery so far (% of 2019 value)



A NEW ERA OF TRAVEL
Read the full study here:
rolandberger.com/en/longdistancemobility



BLOCKCHAIN

Token advantage

IF YOU ARE BAMBOOZLED by new tech and don't know bitcoin from blockchain, it's time to get up to speed. After all the benefits that blockchain has brought with its immutable ledger system to manage supply chains and cryptocurrencies, now comes the tokenization of assets, which allows a more efficient, transparent and accessible trading system. With tokenization, Roland Berger puts the cost reduction for equity trading at 24% – and it's not the only financial activity that could gain from the new tech. Roland Berger's new study sets out four steps that can be tailored to your aims. First evaluate the implications; split your organization into logical value chain steps and activities and identify impact points. Then create a series of development scenarios. After that you need to define the capabilities that enable rollout taking into consideration the technology, business and regulation, before finally putting the practices in place. The disruptive influence tokenization will have on core financial activities means that putting analysis in place now will prevent you from playing catch-up later.



THE IMPACT ON CAPITAL

Read the full study here:
rolandberger.com/en/tokenization

EMISSIONS TECHNOLOGY

Steel's green rush

IN EUROPE, steel accounts for a whopping 5.7% of the EU's carbon emissions. Now that the EU has targets to become climate neutral by 2050, it means big changes for steelmakers to contribute to the project. In less than 10 years, steel production needs to cut its emissions by 30% to help the EU meet its goal. Carbon capture and transforming production processes are on the table – but what will they cost? And what's the best option?

Those questions formed part of Roland Berger's study for green steel and in its findings it explored a process called direct reduction of iron (DRI), using natural gas or hydrogen as reductant, as a positive process to meet the targets. A staggering 29 million tons of steel production would need to be converted with greener processes and

DRI performed well – hydrogen and gas were both part of the calculations – although it comes with a hefty price tag of \$19.25 billion to perform the task. While the price is high, the price of doing nothing is even more uncomfortable – the costs associated with climate change caused by human emissions are likely to be many times higher. A large chunk of the costs falls on the taxpayer, but it makes sense for steelmakers to make use of the \$1.13 trillion climate funds available from the EU now, and pass on the costs to the end user in 2030.



GREEN DEAL FOR STEEL

Read the full study here:
rolandberger.com/en/greensteel

FORGING A NEW PATH
The steel industry is at a turning point in lowering emissions through cleaner production processes.



On an mRNA mission

For decades **Katalin Karikó** researched mRNA medicines as a laboratory scientist without a prestigious professorship. Now, her discoveries underpin both the Pfizer-BioNTech and Moderna Covid-19 vaccines, saving millions worldwide. Here, she answers three questions about the future of this incredible technology.

1 How did you keep faith that your work would eventually be successful?

Some people might say I am a stubborn person. I applied for my first mRNA grant in 1989 – we first showed it could work in human cells in 2004, 15 years later. But as soon as I first became interested, I was convinced it would eventually work. I was probably very annoying. I would approach colleagues at lunch, at meetings: "Hey, you should get involved in this research, it's going to be great." But you could see the slow success – we saw it work in mice, then monkeys, then humans. Even when they were testing the Covid vaccine, I wasn't nervous. I expected it would work like a charm.

2 What has it been like seeing your work recognized and making such an impact on the world?

I'm glad, of course. And I'm glad to help. They offered me a dose at the University of Pennsylvania [where Karikó did much

of her pioneering research] a week after it was approved. It's incredible to think there are now millions – hundreds of millions of people – who now have a shot. And that our work could be part of that. But there is more to do. The new variants are so contagious. When cases were declining in the US in February, people I know in Hungary [where Karikó is from] were writing to me saying people were dying there. It's still a worldwide problem.

3 What does the future hold for mRNA medicines?

It is a very good tool against viruses – flu and other viruses were being worked on before Covid. And we're always working to make it better, more efficient, more targeted. But I always believed it would be good for many many more things than just viruses: mRNA is a genetic instruction that living cells can read so you can use it like a drug, provoking whatever response you need from the cells. In the past, I looked into repairing heart cells, fixing genetic disorders like cystic fibrosis. Now there are new companies and labs starting up every day to work on these. I'm glad more people are doing it now, that's what I always wanted. ■

Katalin Karikó

is known as the "mother of mRNA." She is a biochemist and the senior vice president at BioNTech.



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is chief foreign affairs commentator of *The Financial Times* and won the Orwell Prize for Journalism in 2016. His new book, *The Age of the Strongman*, will be published in April 2022.

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LATIGRE

is a graphic design studio founded by Luisa Milani and Walter Molteni in 2009. The studio has since worked with *The Independent*, *The New York Times Magazine*, *The New Yorker* and *Wired* as well as IBM and Apple.

→ COVER AND PAGE 12



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→ PAGE 38

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"The struggle
of today, is not
altogether for
today – it is for a
vast future also."

ABRAHAM LINCOLN,
16th US President

