Swiss banking with a mission

GlobalanceBank

The Futuremover

3rd quarter 2018

THINGS THAT OUR CHILDREN WILL NEVER EXPERIENCE

The astrophysicist Dr Michio Kaku assumes in his book "Physics of the Future" that things will be a whole lot better for many more people in the future.

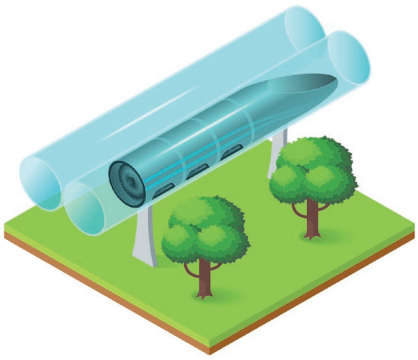
And that science, research and technology will point the way to an exciting future for mankind. But we don't have to think anywhere near that far ahead in order to make fascinating discoveries. Just a decade can produce quantum leaps in innovative technologies – for all the children who have just been born they will probably seem to be part of the normal everyday world. By contrast, the following ten situations are something they will only know about from stories.

New world

10 THINGS THAT OUR CHILDREN WILL NEVER EXPERIENCE

1. Long, boring journeys

Does your daughter want to go and see her grandmother? Time to enter the tubes or, to put it more accurately, the hyperloop. This technology which "shoots" passengers through a tunnel in capsules is being worked on by companies, researchers and universities around the world. Hyperloop travel should be faster, more comfortable and even cheaper than flying. Just a gag? The US company "HyperloopTT" is taking it seriously. In France an original size test track is being built right now. Getting to the USA in just three and a half hours? You probably won't have to make the effort to "entertain" the kids anymore. Many people dream about the comeback of supersonic aircraft, but so far the high costs involved have meant that this form of travel is only affordable for a few people.



2. Being the most intelligent species

Artificial intelligence is getting smarter and smarter, and chatbots are constantly learning how to do new things and perfecting communication between humans and machines. The female robot Sophia recently achieved the feat of becoming a citizen of Saudi Arabia. Clever kids should therefore become more creative, visionary and empathetic.

3. Paying in cash

Since the introduction of credit cards we have slowly but surely been weaning ourselves off cash. Even the traditional board game "Monopoly" has been available for some time now in a cash-free version with a card reader. Cash by contrast has to put on a brave face: PayPal, Apple Pay, Venmo and many other payment systems are overtaking it. Cryptocurrencies and the "blockchain" transaction technology, are reaching ever new heights of sophistication. And who knows, in future perhaps kids will demand their pocket money in bitcoins?

4. Peace and quiet

Population growth, urbanisation, megacities. Flying taxis, and autonomous vehicles on the ground – things are getting more exciting but also a lot noisier.

5. Learning off by heart

Google Pixel Buds are innovative earbuds which operate as little interpreters in your ear. Now Skype too has a translation function, so people can chat on-screen in real time – in several languages. Other companies such as Waverly Labs in New York are working on refining translation software to make it as good as the Babel fish in "The Hitchhiker's Guide to the Galaxy".

Communications technologies based on artificial intelligence will make it possible for anyone to talk to anyone else. Language barriers will be unknown to our children, but cultures will still be distinct.

GLOBALANCE FOOTPRINT

Virtual and digital, but not limitless.

Futuristic visions can easily make us lose our grip on reality: we're dependent for our survival on the preservation of the world's natural "life support" systems. This includes among other things preserving the diversity of species by keeping the atmosphere – and the world's seas, rivers and soils – in pristine condition. This in turn enables enough food to be produced. Societies that are "fit for the future" are also based on prudent governance in the fields of nutrition, healthcare and education. That's why it's a good idea to subject every potential technological development – no matter how crazy it may seem – to a reality check by using an objective screening process.

6. Knowing just one world

For the generation born in 2018 the earth is not enough. New human habitats are needed. Entrepreneurs such as Jeff Bezos, Elon Musk or Richard Branson are already working on a technology to take people to Mars.

7. Passing your driving test

When the babies of today are 16 years old, they'll be amazed that we used to own cars which we drove ourselves and for which we needed a driving licence. And that once, i.e. in 2018, an average of six young people between the ages of 16 and 19 died in collisions with other vehicles every day. They'll probably nod gravely and explain to us that human failings can only be stopped by intelligent machines. Then they'll call up a self-driving car and look forward to a great evening out – without any fear of losing their driving licence.

8. Wearing bog-standard sneakers

Neon-pink mesh lining, leather toecap, and your own initials on the soles. Made just as you like them, and printed off on the 3D printer in a matter of minutes.

9. Going hungry

5.6 million children currently die of malnutrition every year. An unacceptable figure. But simply increasing food production would squeeze out small farmers, damage the environment, and promote monoculture farming. At Columbia University in New York people are doing research into vertical farms in the form of skyscrapers: 150 vertical farms would be enough to feed the whole of New York. But there are also companies which make it their business to reduce food waste. So food residues can be made into sweets, or coffee grounds can be recycled for growing mushrooms. Another idea is so-called "smart farms". Here digitisation helps to calculate more accurately how much fertiliser and seed needs to be used, to report pest infestations, and to predict weather conditions. Innovations can help to put agriculture on a local and ecologically rational basis – so that children who are born in future won't know what it means to be really "hungry".

10. Sitting in front of a computer

Sitting in front of a computer with a mouse and screen is an outdated concept. It's better to be in the middle of the action with virtual reality (VR) and augmented reality (AR), to direct processes and applications by using gestures, and to interact with all the devices.

A wealth of budding talent

Swissloop, the students' club at ETH (the Swiss Federal Institute of Technology) in Zurich and at other universities as well as EPFLoop, the team at ETH Lausanne, are leading the field in Elon Musk's Hyperloop Pod Competition.

Now there have been three international competitions for the fastest and best technical version of the transportation capsule over the 1.25 kilometre vacuum tube test track. After qualifying in several test runs, in 2017 ETH Zurich's "Swissloop" which is built by one of many student teams taking part from around the world, raced into 3rd place. A year later ETH Lausanne was grabbed by the innovation bug. The "EPFLoop" was among the competitors at the SpaceX site in LA, and it finished in a respectable 3rd place.

GLOBALANCE FUTURE-MOVER

New Mobility

Autonomous driving: The self-driving vehicles market provides huge scope for growth. It is expected that over 33 million selfdriving vehicles will be sold in 2040.

Car-sharing: Over 50 percent of the world's population is already living in urban areas, and by 2050 it's expected to be as much as 65 percent. The size of the car-sharing market is expected to exceed USD 16.5 billion by 2024.

GLOBALANCE FUTURE-MOVER

Smart Farming

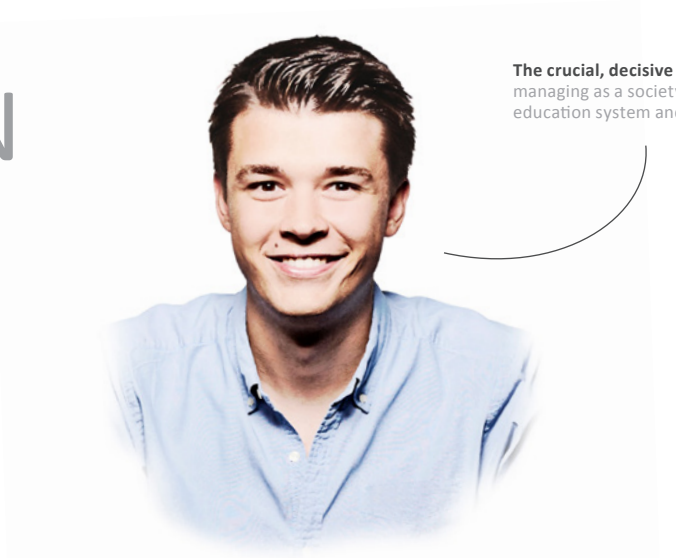
Food waste: The global food waste disposal market was estimated to be worth USD 31.71 bn. in 2017 and it's expected to grow at an annual rate of almost 6 percent to reach 42.37 bn. by 2022.

Automation of agriculture: The use of modern information and communications technologies opens up huge potential for increasing agricultural productivity. The global "smart farming" market is expected to grow from USD 5.18 bn. in 2016 to USD 11.23 bn. in 2022.

Interview with rising star Philipp Riederle

THE DIGITAL GENERATION

A 23 year-old explains the (digital) world to old-established companies. In conversation with Philipp Riederle, a young entrepreneur and an author, about the prejudices and advantages of digital natives.



The crucial, decisive challenge will be managing as a society to reform our education system and our skills.

"The new jobs will be much more demanding."

Mr Riederle, you represent digital natives. What motivates this generation, and what's important to it?
By definition I still count myself as part of generation Y (1980–1994). I bracket this generation together with generation Z (1995–2010) as the digital generation. The digital transformation is not happening for us because we grew up with it – we have no experience of the analogue world. What we're actually experiencing is a change of values and prejudices.

The digital transformation is not happening for us because we grew up with it.

So are there actually any values left along with the bits and bytes?
We are in fact often called the superficial smartphone generation who only make swipe gestures on Instagram, and Snapchat etc. and constantly travel around the world and don't want to tie themselves down. But the clear values which for example have been identified in studies of young people are completely antithetical to many prejudices. In these studies we've specified that having "local roots" and "personal connections" are especially important values.

It's called social media – but doesn't it turn us all into asocial beings?
Current studies relating to "How we use social media or social networks" conclude that we use digital technologies to make arrangements more quickly, including at the level of a group. And that enables us to spend a lot more 'real' time together. We can keep in touch with friends and acquaintances.

Quicker, more complex and more networked – how does this affect our quality of life?
We look at our mobile phones every 18 minutes – my generation actually every nine minutes. Media skills also include self-reliance and self-determination. Should I check my emails just once or twice a day or do I let myself be distracted by every push notification? That's why the technology is neither good or bad. Technology can free up a lot of my time, or rob me of lots of time – ultimately it's me who decides.

Developments in the digital world are racing ahead. How will we be living in ten years' time?
Technological developments will probably obey Moore's law which assumes a doubling of performance levels every two years. We've been experiencing the transformation of the labour market for years already – automation is making many jobs redundant but new ones are also being created. In my opinion digitisation will have more radical effects. This is because artificial intelligence and increasingly clever algorithms will also make jobs in the service sector redundant. Some studies predict that 40 to 60 percent of jobs will simply disappear.

What can society do to manage the changeover to a digital world?
The crucial, decisive challenge will be managing as a society to reform our education system and our skills. Not only in schools but also in the workplace. The issue is underestimated in my opinion. One thing is clear, the new jobs will all be much more demanding.

What do you recommend to today's schoolchildren?
Don't let the labour market forecasts get you down. Don't base your search for a training course or a job on rational reasons. Do what you're really interested in, what you're really passionate about.

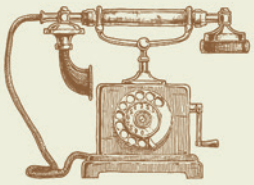
Then you won't be afraid of coming into contact with the appropriate technology, and life-long learning will become natural for you.

Philipp Riederle

Philipp Riederle has already reported from his bedroom to the world wide web. His podcast "Me and my iPhone" achieved massive numbers of downloads which made him an overnight internet sensation.

The 23 year-old has already written two highly regarded books about digital natives: "Who we are and what we want" was on the Spiegel bestseller list for four weeks in 2013. "How we work and what we demand" came out in 2017. Riederle has already given advice on 400 companies, he's in demand as a speaker, and he's currently studying Sociology, Politics and Economics at the Zeppelin University in Friedrichshafen.

Yesterday's Futuremover



Maria Montessori (1870–1952) was an Italian woman doctor, a reformist teacher, a philosopher and a philanthropist. She developed the Montessori method of education.

Maria Montessori

What's new is often instinctively rejected, and anything out of the ordinary is frequently derided. Pioneers have always had to be pretty thick-skinned (and they still do) in order to stick to their objectives in the face of resistance from habitual doubters. Maria Montessori, the great reformist teacher, was one such pioneer. Her famous motto "Help me to do it myself" is more relevant than ever in today's angst-ridden debate about digitisation.

Joy, personal responsibility and individuality.

No marks, no pressure, no timetable, no teacher-centred learning. What seems to be unstructured is actually based on a methodology. Education is not about being forced to learn, rather it's about the joy that's involved in making discoveries and experimenting, and in thinking and acting autonomously.

The joy of discovering, experimenting and thinking and acting.

Dr Maria Montessori, a teacher and philosopher, and one of the first women doctors in Italy, opened her first Children's House "Casa dei bambini" in a poor district of Rome in 1907. This was where her ideas were first implemented, and they had amazing results. Today there are 40,000 schools and countless institutions around the world which operate on the basis of the inspiration provided by the Montessori method of teaching.

MONTESSORI, AMAZON, GOOGLE?

In Silicon Valley the techies are discovering the computer-free alternative school for their kids. Networked thinking and finding solutions for yourself appears to many people to be more important than simply learning by rote. Elon Musk was so "hacked off" by his school that he set up a school of his own for his children.

Education is becoming more important

Intelligent, self-learning machines are replacing humans in more and more areas of life. The machine "knows" more than humans, that's why we have to rethink education and adopt new approaches so that we complement machines instead of competing with them.

Personalities like the founder of Amazon, Jeff Bezos, the video games pioneer Will Wright, or Larry Page and Sergey Brin who developed Google, are former Montessori schoolchildren. The reforming spirit of those times lives on successfully in them.

Learning by rote doesn't really help children to develop.

So at Google employees can devote one day a week to working on their own personal ideas.

And Bezos is said to respond to any form of resistance by saying "Why not?" Precisely, why not?

FAMOUS MONTESSORI PUPILS

ANNE FRANK
Author

BEYONCE KNOWLES
Musician, actress

BILL GATES
Founder of Microsoft

FRIEDENSREICH HUNDERTWASSER
Artist, painter, architect

GABRIEL GARCIA MARQUEZ
Author

GEORGE CLOONEY
Actor

JACQUELINE KENNEDY ONASSIS
Wife of John F. Kennedy

JEFF BEZOS
Founder of Amazon

LARRY PAGE UND SERGEY BRIN
Founder of Google

MARK ZUCKERBERG
Founder of Facebook

OUR CHILDREN'S WORLD

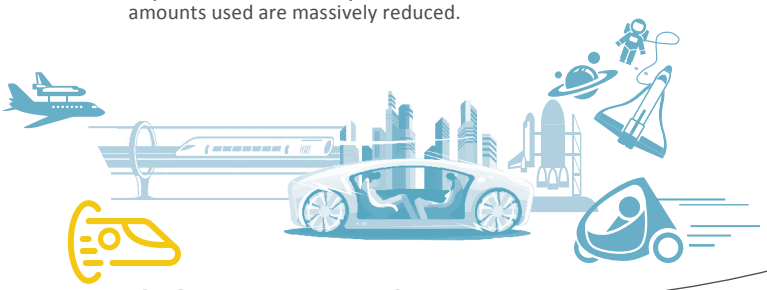
What is a futuremover?

Futuremovers are companies which respond successfully to the global megatrends and develop solutions to global challenges.

They replace redundant business models with forward-looking concepts whilst simultaneously achieving a positive footprint. They build smart megacities, make the energy revolution possible, focus on the circular economy, or they develop sustainable mobility platforms.

Smart Farming

- Cleverly used artificial intelligence increases agricultural productivity. The use of water, seeds or pesticides is constantly monitored, and the amounts used are massively reduced.



Mobility & travel

- Mexico is planning "Mexloop", a hyperloop service to link up some of its major cities. The journey time between Mexico City and Guadalajara would be slashed from 6 hours to just 45 minutes.
- Elon Musk has won a contract from the Chicago city authorities to build a high-speed (hyperloop) link between the city and O'Hare airport.
- ETH in Lausanne is involved in the hyperloop project and is developing some of the technology for it.

Cash & blockchain

- In Africa increasing numbers of people are using blockchain technology and cryptocurrencies for making payments.
- But blockchain also has potential in relation to land ownership rights, particularly as a way of curbing corruption. Ghana is already using the start-up 'Bitland Blockchain' to try out new applications.

Expedia

Affordable online platforms are changing our travel habits. Traditional tour operators are facing stiff competition.

The number of travellers worldwide reached a record of 1.32 billion in 2017. But our travel habits are changing radically. As a leader in the sector, Expedia is at the forefront of developing innovative online travel solutions.

Globalance Footprint 58

AGCO

By 2050 the world will need 70% more food to feed a population of 9.6 bn. people.

AGCO is a global "intelligent agriculture" pioneer and is mainly working on the use of modern information and communication systems to achieve a more efficient way of producing food using less resources.

Globalance Footprint 43

SAP

Blockchain technology has the potential to fundamentally reshape companies' business processes.

SAP is taking a leading role in the use of blockchain technology for industrial solutions. The aim: intelligent networking of suppliers, production facilities and end products.

Globalance Footprint 81

Computers & virtual reality

- Prezi, PowerPoint's "little" competitor from Hungary, is going a step further. Presentations no longer consist of boring slides, instead they're made with the aid of augmented reality.
- Prezi is just launching a new presentations technology which can convey an entirely new range of experiences to the audience.

Learning languages

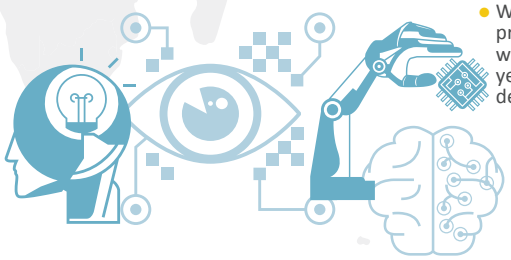
- Microsoft has developed a technology which achieves so-called "human parity" when translating from English into Chinese. It's a level that's normally only achieved by professional interpreters.

Printing clothes

- 3D printers are becoming increasingly important in the fashion world too. Glasses, gym shoes and even clothes are being printed.
- The Taiwanese designer Zoe Jia-Yu Dai has specialised in bespoke, individually designed footwear. New technologies like this fundamentally alter traditional manufacturing processes.

Artificial intelligence

- Watson – an artificial intelligence computer program – recently won a discussion debate with people. An IBM team in Israel spent six years training the computer to win such debates.



Criteo

Artificial intelligence (AI) makes customised advertising possible for specific target groups.

The Adtech company, Criteo, is a pioneer working at the interface between AI and online advertising. The company has invested EUR 20 bn. in the development of self-learning technology which is intended to make personalised advertising possible.

Globalance Footprint 50

Align Technology

Beautiful teeth for everybody – thanks to scanning and 3D printing.

Align Technology's iTero® Scanner saves patients from having to put up with unsightly metal braces. It digitally records crooked teeth, which means that high-precision braces can be printed out on a 3D printer straight away – in less than 24 hours.

Globalance Footprint 66

Microsoft

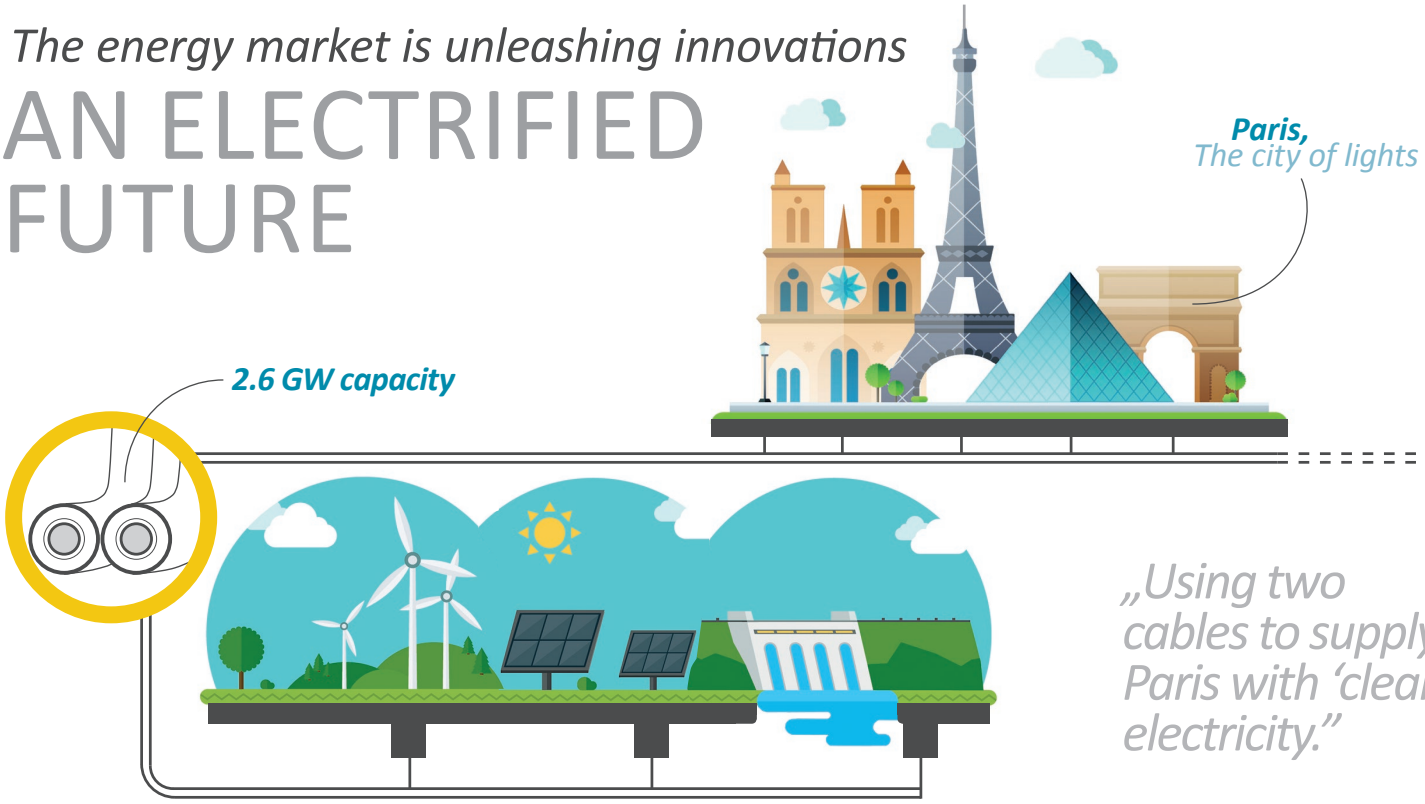
Thanks to artificial intelligence, swotting up vocabulary is becoming a thing of the past.

Microsoft is one of the leading companies in the field of speech recognition and translation as well as image and object recognition technologies. The company has merged the cloud and AI aspects of its business to provide cumulative growth potential for the future.

Globalance Footprint 82

The energy market is unleashing innovations

AN ELECTRIFIED FUTURE



„Using two cables to supply Paris with 'clean' electricity."

Energy consumption is rising – and fossil fuels are gradually running out. Climate change is not just a hot topic for politicians and society as a whole, it also highlights energy diversity as a way of reducing CO_2 emissions. Furthermore, huge amounts of energy will be needed in order to provide an intelligent distribution system via smart electricity grids.

Every year the IEA (International Energy Agency) submits a report that attracts a lot of attention from the energy sector and the world of politics and society at large. The "World Energy Outlook" provides medium- and long-term forecasts on issues such as trends in global energy requirements.

Over the coming years the demand for energy will increase by a third.

Over the last 40 years it has more than doubled – although the world's population has only grown by 70 percent. Now the IEA expects energy demand to increase by a further third over the next 20 years despite the implementation of energy-efficiency measures.

The "BP Energy Outlook 2018" arrives at similar results and attributes the responsibility for this rise to the fast pace of economic growth in developing countries. In addition, according to forecasts the global energy mix will be more diverse than ever in 2040.

Today electricity's share of total energy consumption is just 13 percent. But you don't have to be a clairvoyant to appreciate that electric vehicles and heat pump technology will massively increase this figure. The proportion of energy needs provided by renewable forms of energy will grow fivefold, making it the fastest growing type of energy.

WIND AND SUN – NATURALLY DIFFERENT

The problem is that up to now it's been relatively simple to reduce or increase the amount of electricity that is fed into the system by conventional energy suppliers. However, renewable forms of energy such as wind, solar energy and hydropower are heavily dependent on weather conditions and the time of day, and are often not produced where they are used.

CAN ELECTRICITY COMMUNICATE?

Electricity grids and grid operators therefore have to deal with tricky technical issues. It's not just a question of transporting the electricity that is produced with the lowest possible level of losses. All the parties involved, from the electricity generators to the consumers, grid operators and storage businesses, must also be part of a common communications network. ABB undertakes really pioneering work in this field. "Smart grids" use digital technology and artificial intelligence, they gather and analyse usage data, and they therefore ensure that power is efficiently produced and distributed.

GLOBALANCE FOOTPRINT

PETER ZOLLINGER
Head of Impact Research

The energy and transport revolution is coming.

The dependence of economic systems on fossil fuels has to be reduced, and closed-loop material cycles have to be created.

Climate protection is a precondition for preserving our natural life support system. When selecting investments it's important to make sure that they help to reduce the worldwide consumption of resources in absolute terms. The financial advantage of this is that it forces many industries to reduce their emissions. The further a company lags behind in this respect, the more it will cost to bring about the reduction, and the larger will be the negative effect on its corporate profits, share price and credit-rating.

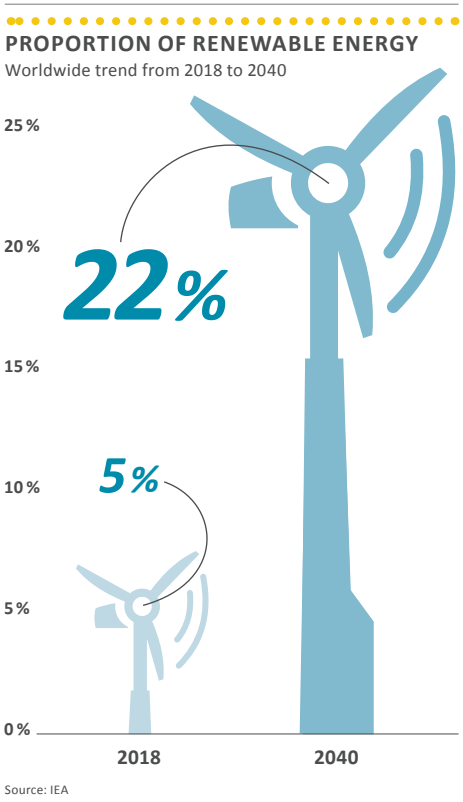
New energy requires new thinking …

In order for clean electricity to remain clean, it has to be transported over long distances with minimal friction losses. High-voltage direct current transmission technology is becoming more and more innovative. Current in the high-tech power lines can now travel up to 1,500 instead of 1,000 kilometres, and the transmission losses are being reduced to less than 5 percent – so clean electricity could be supplied to the whole of Paris by using just two cables. The new cable system frees up huge amounts of energy and makes many renewable energy projects possible for the first time. The cable technology can be used both underground and underwater, so electricity can be transported efficiently even through heavily populated or environmentally sensitive areas.

… and the setting of realistic targets.

Fast cars and dramatic overtaking manoeuvres – "Formula E" doesn't have to hide behind Formula 1. Many well-known car makers, such as Nissan, Jaguar and Audi have already joined ABT Schaeffler on the starting grid for the race to an electric future. BMW, Mercedes and Porsche have announced that they will soon be joining in. Hardly surprising since even the traditionalists have recognised that electromobility has become ecologically and economically unstoppable.

Admittedly Formula E racing is not environmentally pristine – the infrastructure and logistics put paid to that idea. But if it attracts more and more fans of the energy revolution, of E-mobility, and ultimately of new careers, important objectives will have been achieved. It's no coincidence that the technology company, ABB, is the latest global partner of this type of motor racing. The company's development of smart



Source: IEA

A fast charging point provides 200 kilometres worth of charge in just 8 minutes.

electric power line solutions as well as electric drive systems and batteries covers the whole sector.

The issues that also concern the ordinary drivers of E-cars are fairly obvious: Do the low operating costs make up for the comparatively high costs of buying the vehicle? How long does the battery charge last for, and how quickly can I charge it up again? ABB recently displayed a fast charging point at the Hanover Trade Fair which provides 200 kilometres worth of charge in just 8 minutes.

The future is off to a flying start.

GLOBALANCE
FUTURE-MOVER

DAVID HERTIG
Founding partner & Head of Investments

David Hertig on futuremovers in the energy sector:

Schneider Electric Advanced Distribution Management System (ADMS) provides a modern and comprehensive solution for the management of electricity grids. It provides supply companies with a modular, flexible platform offering a familiar user experience, data modelling and an integration framework as well as secure infrastructure – from transmission to distribution.

Mitsubishi Electric is a global leader in the development and production of power transmission and distribution systems. The company's high-voltage switchgear, transformers, power stabilisation systems and monitoring systems are renowned for their efficiency and economic use of resources.

Prysmian is the global market leader in the production of underwater and underground cables, and one of the key companies involved in the continuous enhancement of intelligent, green electricity grids and systems.

Education has to wise up

"NOW CHILDREN SHOULD ONLY LEARN THINGS THAT THEY CAN DO BETTER THAN COMPUTERS"

No, that's not a quote from an overenthusiastic humanistic teacher, it actually comes from Jack Ma, the founder and CEO of the Chinese internet giant, Alibaba.

At this year's World Economic Forum in Davos he issued a warning: "If we don't change how we teach people, we'll find we have major problems in 30 years' time." Not much has changed so far, despite continual reforms. Most educational institutions still follow the mantra: a lot of knowledge = a lot of success. However, the run-away success of "digitisation" should make us change our tune.

Homework part 1: Improve access to education

IT and telecommunications companies are opening up access to Information and Communication Technology (ICT) for all schoolchildren.

Mobile phones and broadband access make classrooms mobile and networked. In Columbia the national literacy programme provides mobile phones with learning programs for adults who can't read. The chip designer, Arm Holdings, which is now owned by SoftBank in Japan, is developing so-called "talking books" – cheap computers which are specifically designed for people who can't read. The increased rate of learning achieved by the people taking part has already learning been confirmed by UNICEF.

The technology firm zSpace is developing 3D applications, which provide virtual "bridges" from the classroom to the workplace of the future.

GLOBALANCE FOOTPRINT

Access to education is a basic requirement if societies are to develop in a sustainable way.

Goal 4 of the UN's Sustainable Development Goals (SDGs) is actually: 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.'

Education gives students of all ages the necessary abilities and values to be a responsible citizen of the world.

Homework part 2: Improve the quality of education

Digital technologies make sophisticated, personalised learning processes possible. For example, IBM is creating learning programs for educational specialists which provide motivation through gaming elements and adapt the content to the pace of learning in real time. The technology company zSpace is developing 3D applications which provide virtual "bridges" from the classroom to the workplace of the future. Our education is highly prized, but also expensive. UNESCO estimates that about USD 30 bn. is needed every year in order to close existing gaps in the provision of education. This would also provide opportunities for private investors. In 2015 educational firms in the USA alone attracted USD 3 billion of spending. One example of this is EdCast in California which offers "intelligent" learning platforms for individuals and companies.

Homework part 3: Define new educational content

Back to Jack Ma. Should we carry on treating our kids as machines by cramming the knowledge of the last 200 years into them? Does it make sense in view of the fact that algorithms are already changing the world of work? Or should they (as Jack Ma suggests) learn things that distinguish them from machines?

Values, conviction, art and music, independent thinking, teamwork and empathy.

Walmart wants to pollinate plants

THE ROBOTIC BEES ARE COMING

In March 2018 Walmart caused a buzz by applying for a patent. The description of it, "pollination robots", revealed where the US supermarket giant wants to make its mark. About a third of all our food depends on pollination by bees and insects.

According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services this "work" can be valued at 250 to 600 billion euros a year, which shows that the death of bees is not just an ecological challenge but also an economic one.

The 'extinction' of bees is also an economic challenge. Roughly a third of foodstuffs depend on pollination by bees and insects.

The robotic bees could not only safeguard pollination, if fitted with cameras and sensor systems they could also spot damage and help to rectify it, or they could supply data about growth and product stock levels. The result would be transparent supply chains and waste minimisation.

Cameras and sensor systems carry out damage detection.

But things are abuzz in the world of science too: The European research initiative, Focas, has managed to infiltrate robotic bees into swarms and obtained valuable findings about how they communicate.

The question of whether real bees will get on with their electronic counterparts is an issue that swarm robotics is already working on.

Robotic bees are set to revolutionise the future of agriculture

Software finds children

LOST AND FOUND

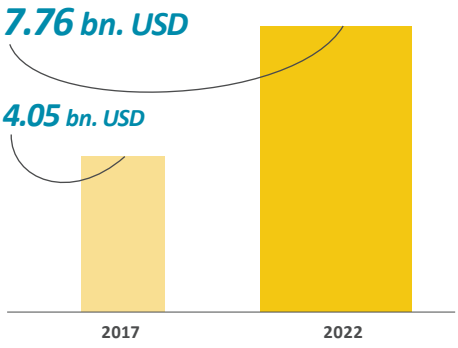
Thanks to new facial recognition technology, thousands of missing children in India are being identified.

It's the nightmare of all parents – a child getting lost. In India there are about 200,000 missing children. The country has about 90,000 children in children's homes who have been picked up off the streets and have no hope of ever returning to their families. This was the spur for the children's charity "Bachpan Bachao Andolan" to come up with a unique pilot project: once it had official approval facial recognition software was used to compare thousands of photos on the "TrackChild" missing children platform with the pictures of the kids in the homes, and after four days it had identified almost 3,000 children.

It would have been impossible to do that manually – and it's a milestone in terms of tackling social problems.

THE FACIAL RECOGNITION MARKET

One of the fastest growing markets



Source: Reportlinker. Facial recognition market, November 2017

GlobalanceCockpit

58 % DECLINE OF GLOBAL WILD ANIMAL POPULATIONS

Average rate of change between 1970 and 2012

(Source: World Wildlife Fund, The Living Planet Report 2016)

Economy

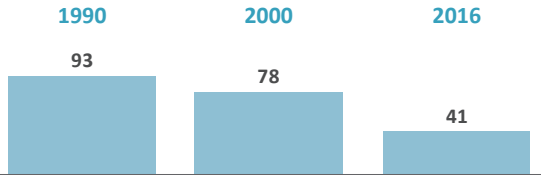
Global Innovation Index 2017 ranking

(Source: https://www.globalinnovationindex.org/gii-2017-report)

Health

Mortality rate of children under 5 around the world (deaths per 1,000 live births)

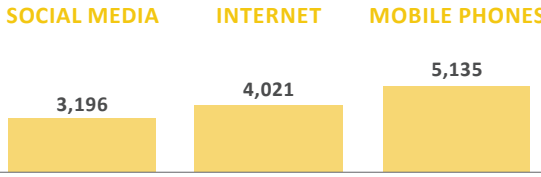
(Source: https://data.unicef.org/topic/child-survival/under-five-mortality/)



Technology

Indicators of digital usage around the world, January 2018 (bns. of users)

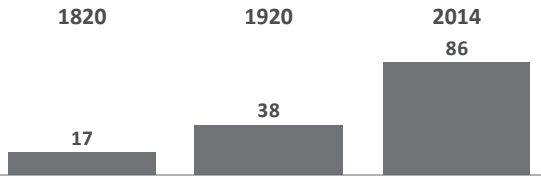
(Source: https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/)



Society

Access to primary school education around the world (%)

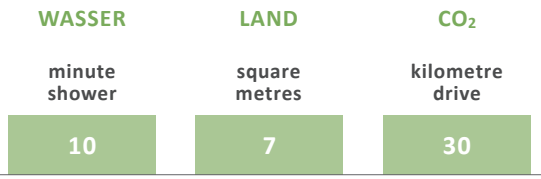
(Source: https://blog.tagesanzeiger.ch/nevermindthemarkets/index.php/41232/doch-doch-die-welt-wird-besser/)



Environment

Eating a beef burger is equivalent to:

(Source: Fleischatlas 2013, Heinrich-Böll-Stiftung/Bund für Umwelt- und Naturschutz Deutschland)



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