RESPOND

COP24 Katowice

Life after coal

Contents

Cover Image: *An old coal mine shaft in Katowice, Poland has been turned into an observation tower, as part of the modern Silesian Museum. Photo credit: DepositPhotos/kbarzycki.*

Inside front cover Image: *Photo credit: Karl Mathiesen.*

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Let's finish the job the world demands of us

By Patricia Espinosa

We need to unleash the full potential of the Paris Agreement to prevent suffering and seize the opportunity of a low-emissions future.

The special report by the Intergovernmental Panel on Climate Change unequivocally states that the world is not on track to limiting global temperature rise to 1.5C, as outlined in the Paris Agreement - and the window to achieve this is closing rapidly. We're almost out of time.

It's not rhetoric, it's reality. It's not politics, it's science. And it's not a suggestion, it's a warning: a warning that we are in danger of running out of time before runaway climate change is beyond our control.

This is frightening for everyone. And people throughout the world have made it very clear. They expect their representatives to do something about it.

Crucially, the report tells us that time remains to limit climate change. But only if we work with unprecedented speed, fulfill the Paris Agreement, and re-commit ourselves to the multilateral process.

It's one of the biggest challenges humanity has ever faced. This was clearly recognized by heads of states at the recent general assembly in New York.

They stressed this point as the most important threat we face collectively as humanity. The message couldn't be clearer.

But, we're moving in the wrong direction. The International Energy Agency tells us that energy sector carbon emissions will rise again in 2018, after hitting record levels in 2017.

This is illogical, irresponsible and—if things don't change—completely irreversible. That's why Cop24 must be a success.

We have several goals to achieve, but one stands above all others: finalizing the Paris Agreement work programme.

We should be confident that we will be able to approve the work programme. But I am worried.

The officials responsible for coordinating the Paris Agreement work programme. Photo by IISD/Kiara Worth (enb.iisd.org/climate/sb48-2/4sep.html)

UNFCCC Executive Secretary, Patricia Espinosa. Photo by IISD/Kiara Worth (enb.iisd.org/climate/sb48-2/6sep.html)

Parties made some progress at Cop23 in Bonn. And they had another opportunity to make progress at a special session in Bangkok, but it wasn't enough. All this while the stakes have never been higher, or the urgency greater.

So, we must diligently work on the negotiating texts here so that we can achieve in Katowice.

Certainly, after Katowice, further work will be needed in developing the climate change regime throughout all its details.

However, success at Cop24 means finalizing the Paris Agreement work programme.

We no longer have the luxury of time, nor do we have the luxury of endless negotiations.

A completed work programme will not only provide guidelines for the Paris Agreement, but unleash its full potential. More than that, it sends a signal of trust that nations are serious about addressing climate change.

We need progress on several other issues as well, including commitments to boost global climate action and ensuring nations fulfill their financial pledges to support the climate regime.

Let us never forget that climate change, if left unaddressed, will take almost every single challenge humanity faces and make it worse.

It will destabilize the global economy, which will affect all nations. By 2030, the loss of productivity caused by a hotter world could cost the global economy $2 trillion.

It will create conflict over resources and impact migration. It's estimated that climate change could displace between 50 million and 200 million people by 2050.

Worse, it will result in incredible suffering and hardship for people and societies throughout the world.

But addressing climate change, and committing to a low-emissions future, one that is more resilient and sustainable, offers incredible opportunity.

It's not just an opportunity to do the right thing, it's an opportunity to completely transform the way we produce and consume, and the way we live.

And that means new markets, new businesses, and, for so many people throughout the world, new job - quality jobs - a just transition to a future that is just for all people.

As secretary general Antonio Guterres so clearly put it, the idea that tackling climate change is expensive and could harm economic growth is nonsense. In fact, the opposite is true.

The International Labour Organization reports that the green economy could create 24 million new jobs globally by 2030.

Incredible opportunity exists if we embrace a low-carbon future and unleash the power of the Paris Agreement.

But we must first achieve our very specific goals at Cop24. People of the world want us to achieve results at Cop24 and we intend to reach those goals.

So, let's prepare accordingly. Let's get ready to work. Let us recommit to multilateralism. And let's finish the job the world demands of us.

Patricia Espinosa is executive secretary of UN Climate Change. This is a lightly edited version of the speech she gave to ministers and lead negotiators at a pre-Cop meeting in October.

Poland's coal miners: 'EU climate proposals terrify us'

By Natalie Sauer for Climate Home News

The host city of this year's UN climate summit was keen to share a story of post-mining transformation, but the coal industry still holds sway

An old mine shaft in Katowice looms over the glass buildings of the Silesian museum (Photo credit: Deposit Photos/darekkocurek)

As Poland geared up to host this year's UN climate summit, the government was on a charm offensive.

During two days in mid-September, brochures, videos, slides and dark-suited representatives succeed one another, portraying Katowice, the site of the talks, as a green success story. Chaperoned by civil servants, journalists are whizzed around the city in electric cars.

At its industrial peak in the 1980s, the capital of Upper Silesia counted 14 active coal mines. That figure has fallen to two, while museums, concert halls and sport facilities have mushroomed on former mining sites – not to mention the spaceship-like conference centre that will welcome up to 30,000 delegates in December.

Yet for all the mine closures, Poland still overwhelmingly relies on coal, the cheapest and dirtiest of fossil fuels, for energy. In 2015, 81% of its electricity came from coal – and the industry has a strong influence on policy. Many environmentalists are gritting their teeth over the choice of a coal heartland to hold key climate talks.

Michał Kurtyka, president of the Cop24 summit, has no time for such criticism. "I suggest they [environmentalists] go to Katowice! It's a flourishing region in terms of economic activity, in terms of

modernity, with digital industry, with auto industry… 42% of the surface of the city is green," he tells Climate Home News.

Katowice residents say the city has transformed in the past 25 years. Joanna Strekowska, a 61-year old beautician, sits on a bench in the main square under a clear blue sky.

"Let me give you this image," she says, describing the smog they used to experience. "After three hours of walking on a day like today, my arms and legs would look completely different. We could see the air that we were breathing. There were no stars in the sky."

It only takes a short walk from the city centre to the headquarters of the Confederation of Mining Trade Unions in Poland (Konfederacja Związków Zawodowych Górnictwa w Polsce) to realise the transformation is far from complete.

"My grandfather came to Silesia with mining roots in the family," says Piotr Luberta, 51, a trade unionist and mine rescuer. "Back then there was little employment by the seaside. Despite my job, I fell in love with this industry."

Luberta maintains a grave expression throughout our discussion on climate policy, but lights up when asked about his personal relationship to coal. Above all, he loves working with nature, he says.

"We call it black gold," says his colleague, Skawomir Kukasiewicz. "This is the breadwinner for thousands of people – not just miners. For one place of work in the mining industry, you should add four people."

According to Euracoal, the sector employs around 100,000 Poles.

Katowice's coal miners Piotr Luberta (left) and Skawomir Kukasiewicz (Photo: Natalie Sauer)

The trade unionists see EU and international climate action purely as a threat to their way of life. "We are terrified by the propositions of the European Union," Luberta admits.

While it does not single out any fuel or technology, the EU has some of the most ambitious climate targets in the world. In June, commissioner Miguel Arias Cañete called on the EU to increase its contribution to the Paris Agreement to a 45% emission cut by 2030, piling pressure on member states to crack down on the most polluting energy sources.

"Of course," Luberta says, staring down at the table, "we are aware that energy produced from coal is not very clean. We exercise pressure on our government not to reduce the number of mines, but to invest in clean combustion technologies."

Unfortunately, while "clean" combustion technology can filter out the pollutants most harmful to health and reduce carbon somewhat, coal still emits significantly more greenhouse gas than the alternatives.

But the union's arguments hold sway with the ruling Law and Justice party. Polish president Andrej Duda endorsed a "social pre-cop" held by trade unions in August, which sought to push mining jobs up the agenda.

Against this backdrop, Kurtyka walks a line between advocating Poland's fledgling renewable energy industry and soothing the coal sector's fears.

"There has been a very sharp increase of renewable capacity," he boasts. Poland has installed 6,000 megawatts of wind power capacity, overtaking Denmark. Kurtyka claims clean sources met up to 40% of power demand last Christmas, and the government tendered another 2,000MW of renewables in 2018.

At the same time, one of his three priorities for Cop24 is the "just transition": code for protecting fossil fuel workers from the disruptive force of clean energy. A draft declaration from the Polish Cop24 presidency, seen by Climate Home News, called for workers to be ensured a "decent future".

This tension is apparent on the streets of Katowice. Strekowska wants the mines to be cleaner but not to close down. "We need to have our own industry as well. We have nothing else," she says.

"Coal has no future," says Teresa Zlotos-Sobzak, a self-described white-collar worker. "On the other hand, our society is too poor to change to clean heating systems… Let them keep two mines in Katowice. Where else will people find jobs?"

Local environmentalists see Cop24 as an opportunity to shift the tone of debate. Patryk Białas, president of civic association BoMiasto, is hopeful that grassroots voices can challenge greenwashing.

At the unions' social pre-cop, BoMiasto ran an alternative media briefing on the doorstep. "We were not welcome," Białas says. They got their message across to print and radio journalists, although the TV cameras prioritised the official press conference inside.

Together with his colleague Jarosław Makowski, Białas is standing in the local elections on a green platform. BoMiasto runs educational programs for local climate leaders, and coordinates with Katowice Smog Alert to fight for clean air.

"The truth is politicians have the power to produce many messages on the Cop, including to portray the climate crisis as absurd," he says. "But listening to the people organising grassroots movements, I see in society that people are ready for change."

This article was first published by Climate Home News at www.climatehomenews.org

37 things you need to know about 1.5C global warming

By Megan Darby and Sara Stefanini for Climate Home News

The UN climate science panel has released its summary of the evidence around the tougher climate goal demanded by vulnerable countries. We break it down.

The UN published a summary on the science of 1.5C global warming in October. It's a big deal.

This is the first time the Intergovernmental Panel on Climate Change (IPCC) has gathered evidence on the tougher target demanded by countries on the front line of climate impacts.

It validates their concerns, showing that the difference between 1.5C and 2C – the upper limit governments committed to in the Paris Agreement – is critical to millions of people's homes, jobs and lives.

As to whether it is feasible to halt the temperature rise at 1.5C above pre-industrial levels, the report has no easy answers. What it does is elucidate the options.

It was a mammoth undertaking, with 91 authors from 40 countries compiling evidence from more than 6,000 papers and addressing 42,001 comments from experts and governments.

In a tense meeting in South Korea, government representatives haggled with scientists for six days to produce a 33-page summary of four in-depth chapters.

The result of writing by committee is a somewhat dense and technical document. Here is our breakdown of the key messages and omissions, and their political significance.

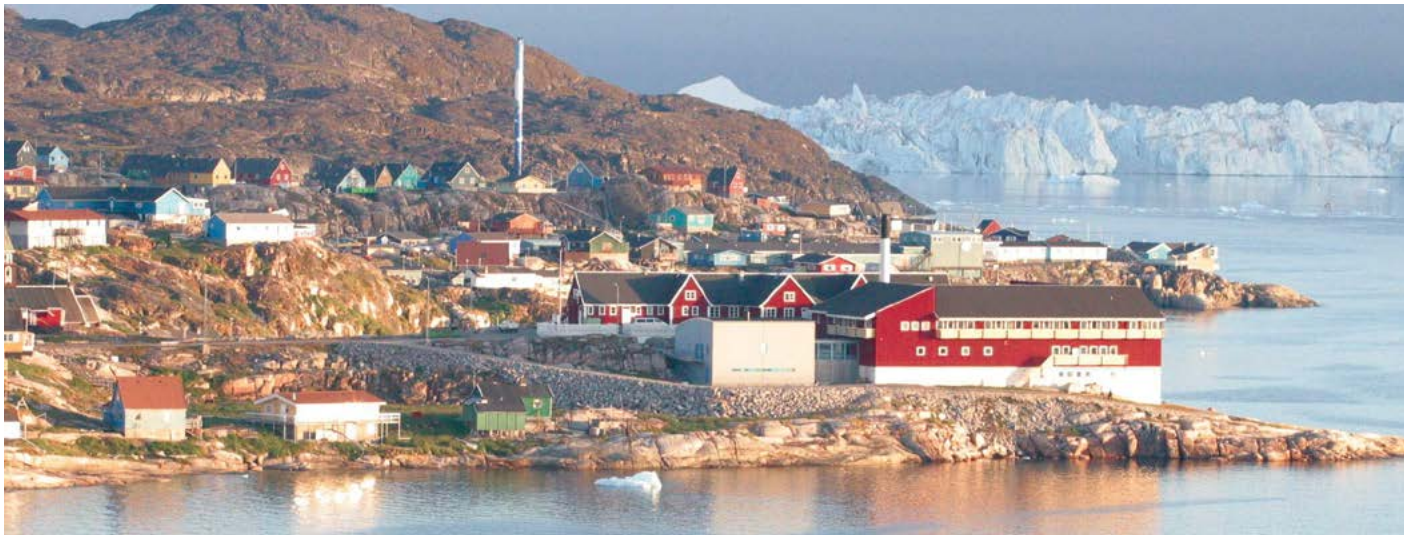
1. The first draft summary circulated for review in January included a high-level statement. That disappeared from subsequent versions, which is a shame because it helped to clarify the findings. It is a sign of how politically sensitive the issues are that governments did not agree on which elements to highlight.

Understanding 1.5C warming

2. The world has already warmed by 1C since pre-industrial times, due to human activity. On current trends, it is likely to pass the 1.5C mark between 2030 and 2052. The land is warming faster than the oceans and the Arctic is warming at 2-3 times the global average rate.

3. There is a time lag between greenhouse gas emissions and their effect on the climate. That means the world is already committed to further warming and sea level rise, but past emissions are unlikely to tip temperatures over the 1.5C threshold.

4. To stabilise temperatures, emissions need to reach net zero and stay there. That means cutting emissions as much as possible and drawing carbon dioxide out of the air to balance out any remaining emissions. The amount of warming is ultimately determined by how long it takes to get to net zero.



Ilulissat fjord, Greenland: Arctic temperatures are rising faster than the global average (Photo credit: Wikimedia, Ranveig Thattai)

A pregnant woman suffering from malaria. As the climate changes, mosquitoes will spread disease to new areas (Pic: Flickr/hdptcar)

5. Global warming is already impacting people and ecosystems. The risks at 1.5C and 2C are progressively higher.

6. Lines on the feasibility of holding the temperature rise to 1.5C and the importance of considering sustainable development have been cut from this section. They are considered in detail elsewhere, but it shows a lack of consensus on the high-level conclusions.

Impacts and threats

7. There will be worse heatwaves, drought and flooding at 2C compared to 1.5C. A previous version characterised these as "substantial differences in extremes". That wording has been replaced with "robust differences in regional climate characteristics", in a win for the US, which argued "substantial" was too subjective.

8. Sea levels are expected to rise 10cm higher this century under 2C of warming than 1.5C. That exposes an extra 10 million people to impacts like coastal flooding and saltwater getting into their fields and drinking water supplies. Slower warming buys them time to adapt.

9. Over centuries and millenia, sea levels will continue rising after temperatures have stabilised. The collapse of ice sheets in Greenland and Antarctica could lead to rises of several metres.

10. One of the most striking quantitative findings concerns the loss of biodiversity. It predicts the proportion of species that will lose half their geographic range. Out of 105,000 species studied, the rate doubles between 1.5C and 2C warming to 16% for plants and 8% for vertebrates, and triples to 18% for insects.

11. An estimated 1.5-2.5 million square kilometres more permafrost will thaw this century under 2C warming compared to 1.5C. That is equivalent to the land area of Iran, Mexico or Algeria. In a vicious cycle, thawing permafrost releases methane, a greenhouse gas.

12. The probability of a sea ice-free Arctic summer increases tenfold from once a century at 1.5C warming to once a decade at 2C. Marine ecosystems will be hit by ocean acidification and warming. 2C virtually wipes out coral reefs, compared to a 70-90% decline at 1.5C.

13. Farming and fishing communities will be hit hardest by these impacts, particularly in the Arctic, drylands, islands and the poorest countries. Limiting global warming to 1.5C cuts the number susceptible to poverty and climate-related risks by up to several hundred million by 2050.

14. That extra half a degree of warming is mostly bad for health. It expands the range of mosquitoes carrying diseases like malaria and dengue, and heat makes a whole range of conditions more deadly.

15. The quantity and quality of staple crops suffers under 2C warming compared to 1.5C, as do livestock. That is bad for the availability of food in many parts of the world.

16. Economic growth is expected to suffer as a result of the impacts of global warming, all else being equal. This assessment does not attempt to balance that with the costs and benefits of cutting emissions and investing in resilience to climate change impacts.

17. There are lots of options to protect against the impacts of global warming, from sea walls to drought-resistant crops. But these adaptations have limitations and some vulnerable populations face losses. The Paris Agreement acknowledged this "loss and damage", but the UN process has yet to yield concrete support for the victims.

Pathways to 1.5C

18. To keep to 1.5C, CO2 emissions would have to decline by about 45% between 2010 and 2030 and hit net zero in 2050. That's significantly faster than what is needed for 2C – a reduction of around 20% by 2030 and net zero by 2075.

19. Methane and black carbon, both more potent greenhouse gases, will need to be cut by at least 35% by 2050, compared to 2010. But cuts in non-CO2 emissions must be made carefully. If more bioenergy is used to replace fossil fuels, it could push up climate-warming nitrous oxide pollution from agriculture.

20. How much carbon dioxide can be emitted before we pass the 1.5C threshold? The way "carbon budgets" are calculated has changed since the IPCC's last big assessment in 2014, adding some 300 gigatons to the estimate. But it's still a slim window.

21. Estimates of the carbon budget vary depending on which measure of warming you use. If you are going by the average temperature over land, it is 420Gt CO2 to give a 66% chance of staying below 1.5C. If you factor in sea surface temperatures, which are rising more slowly, it's 570Gt. Either way, we are using up the budget at a rate of 42Gt a year.

22. There are also "substantial" uncertainties over how sensitive the climate is to greenhouse gas emissions and the level of historic emissions, which affect the size of the carbon budget. Additional carbon released when permafrost thaws, and methane emitted from wetlands, could shrink the budget by up to 100Gt over the century, and continue beyond it.

23. Geoengineering is given short shrift. So-called solar radiation modification – pumping particles into the air to reflect sunlight – could be "theoretically effective" in reaching the 1.5C goal. But it is excluded from the model scenarios due to "large uncertainties", "knowledge gaps", "substantial risks" and "institutional and social constraints".

24. The biggest polluting industries will have to make radical changes. In energy, renewables will need to supply 70% to 85% of power by 2050. There is still room for fossil fuel generation combined with technology to catch and store CO2 emissions, but it's small: around 8% for gas and close to zero for coal by 2050.

25. Energy-intensive industries will have to slash their CO2 by 75% to 90% by 2050, compared to 2010, in order to stick to 1.5C. A 2C limit would require a 50% to 80% decline. This can be done with new and existing technologies that are technically proven – but they have yet to be deployed on a large scale, and are limited by costs and other constraints.

26. Buildings and transport will also need to shift heavily towards (newly green) electricity Buildings should use power for 55% to 75% of their total energy by mid-century, while the transport sector should boost its low-emission sources to 35% to 65% of its energy supply, from less than 5% in 2020.

27. There will be tough choices around how to use land. A lot of scenarios rely heavily on bioenergy and/or expansion of forests, potentially conflicting with demand for pasture and arable land. Sustainable intensification of farming and "less resource-intensive diets" – code for eating less meat – can help ease the competing pressures.

28. Mitigating energy emissions for the 1.5C goal will require around $900 billion of investment per year between 2015 and 2050. That pushes the total investment needed for energy supply to $1.6-3.8 trillion, and for energy demand at $700bn to $1trn over the 35 years. The investment needed is around 12% higher than for 2C.

An oil palm plantation in Indonesia. Food and energy crops are putting pressure on tropical forests (Pic: Nanang Sujana/CIFOR)

Handled right, climate action also supports sustainable development (Pic: AusAid/Stephen Morrison)

29. Tools to remove CO2 from the atmosphere, such as carbon capture and storage and forests, will be needed to suck out 100 to 1,000 gigatons over the century, for a 1.5C limit. If material consumption is kept in check, it minimises the need for carbon removal.

30. Carbon removal measures could help return temperatures to 1.5C above pre-industrial levels if the world overshoots the threshold, but they may have significant impacts on land, energy, water and nutrients if used on a large scale. Governments will have to limit the trade-offs and make sure the CO2 is removed permanently.

Ramping up action

31. Existing national climate pledges under the Paris Agreement are inadequate to the challenge. They would lead to 52-58 gigatons of CO2 emissions a year in 2030 – in line with a 3C temperature rise. Almost all the pathways to 1.5C require greenhouse gas emissions to fall below 35Gt/yr by then.

32. The lower the emissions in 2030, the easier it will be to limit global warming to 1.5C. Delay in cutting greenhouse gases risks increasing the cost of reductions, locking countries into carbon-emitting infrastructure or stranding high-emission assets. It could also add to the uneven distribution of climate impacts between developed and developing countries.

33. Adapting to the effects of climate change, and reducing vulnerabilities to it, can support sustainable development. It can ensure food and water security, lower the risks of disasters, improve health and reduce poverty and inequality. Adaptation measures that also lower emissions, such as low-carbon buildings that are efficiently cooled, can help sectors go green at a lower cost.

34. While emissions reductions in line with 1.5C can support the UN's sustainable development goals for 2030, they present a few trade-offs too. They fit particularly well with the development goals for health, clean energy, cities and communities and responsible consumption and production. But if not properly managed, they could harm the goals on poverty, hunger, water and energy access.

35. Directing finance towards infrastructure that lowers emissions and adapts to climate change can help meet the 1.5C goal in a way that supports sustainable development and lowers poverty. This includes private funds from institutional investors, asset managers and development or investment banks, as well as public funds. Governments can help with policies that lower the risk of investment in low-emission and adaptation projects.

36. It's difficult to quantify the finance needed for adaptation measures that fit with a 1.5C limit, and how that compares with 2C. The data on investments that boost resilience to climate change is insufficient. That said, the cost of adapting to 1.5C "might" be lower than for 2C.

Say it with confidence

37. On the whole, the authors only put stuff in the summary they are sure of. They indicate the strength of consensus in brackets after many of the statements. "Very high confidence" appears five times; "high confidence" 107 times, "medium confidence" 60 times and "low confidence" just twice.

This article was first published by Climate Home News at www.climatehomenews.org

How buildings can pave the way for the electrical vehicle revolution, while keeping global warming within the 'Paris boundaries'

By **Harry Verhaar**, Head of Global Public & Government Affairs, Signify (the new name of Philips Lighting)

You may wonder why a climate change article combines buildings and transport as these seem two different unrelated subjects. How are these related in energy and climate scenarios, and what can one recommend that links these areas together?

Although the climate rhetoric may differ at federal level in various countries on this planet, the situation is that almost everywhere the projected CO2 emissions reductions from consolidated commitments and initiatives is only roughly half of what is needed to keep global warming below 2C. From IPCC and IEA analyses we know that energy efficiency must do between half and two thirds of the job of keeping us below that level. Here the two big areas that require more ambition and action are buildings and transport. And the elegant relationship between the two is that by increasing building renovation rates we can 'free up' the energy that is needed to accelerate the electrification of transport!

The International Energy Agency (IEA) predicts that global building electricity demand will grow 69% by 2040. If left unchecked, this will require electricity infrastructure investment of $2.5 trillion by 2040 in the United States alone to accommodate increasing demand (although recent trends suggest this load growth might not fully materialize, the associated infrastructure expense is often already planned).

Based on predictions made by the IEA, even without the addition of EVs to the grid, a 12% absolute reduction in building electricity use versus business as usual (BAU) will be required by 2040 for the buildings sector to meet its contributions to a 2°C global warming target. Current energy efficiency trends in the buildings sector are not sufficient to meet this goal as the BAU building retrofit rate is estimated at only 1.0% of the global building stock per year. Achieving 2°C targets within the buildings sector will require an increase in the retrofit rate to 3.2% per year, suggesting a need for much more aggressive deployment of highly efficient building technologies, driven in part by mandatory and progressively tightening building energy policies.

The momentum behind the EV revolution has been gathering over the past year, with countries like Canada, China, France and Japan committing to increase their use of EVs, and companies like Volkswagen, Volvo and Ford setting targets to significantly increase production of EVs within the next five to ten years. This growth in EV use offers tremendous climate benefits (as

Harry Verhaar, Head of Global Public & Government Affairs, Signify

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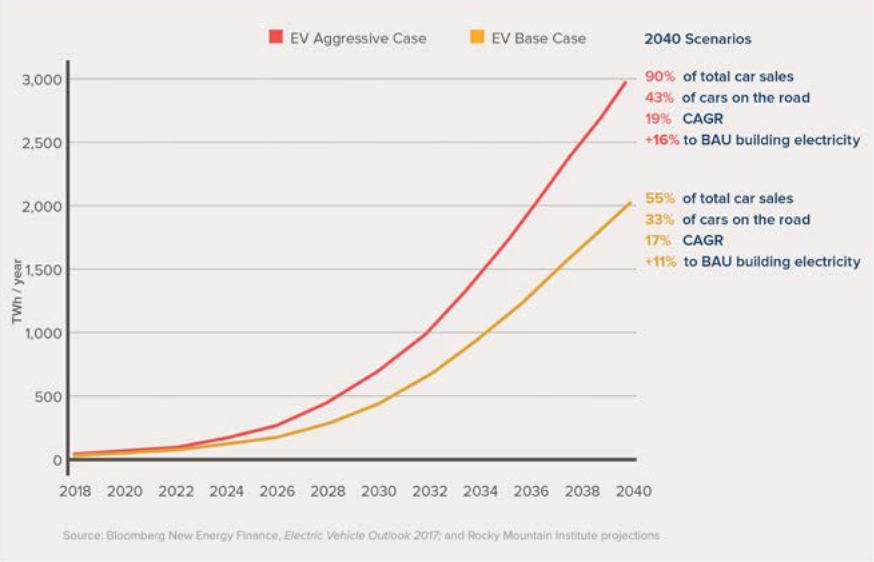
Figure 1. Global EV Electricity Demand: Base Case vs. Aggressive Case



Signify (Euronext: LIGHT) is the world leader in lighting for professionals and consumers and lighting for the Internet of Things. Our Philips products, Interact connected lighting systems and data-enabled services, deliver business value and transform life in homes, buildings and public spaces. With 2017 sales of EUR 7.0 billion, approximately 32,000 employees and a presence in over 70 countries, we unlock the extraordinary potential of light for brighter lives and a better world. News from Signify is located at the Newsroom, Twitter and LinkedIn. Information for investors can be found on the InvestorRelations page.

well as more comfortable driving). Because the vast majority of EVs are charged at home or at the workplace, this growth in EV adoption represents incremental growth in building electricity use. The accelerated deployment of energy efficient technologies in buildings (where most of our electricity is consumed) is by far the most cost-effective way to accomplish this.

The base case scenario predicts that EVs will comprise 55% of annual vehicle sales by 2040 (with 50 million EVs sold in the year 2040) and 33% of total cars on the road worldwide (reaching 550 million total EVs). This case represents Bloomberg New Energy Finance's (BNEF's) 2018 EV outlook, which is based on current projections of EV adoption from public goals, targets and sales trends. We view BNEF's prediction as a realistic representation of EV adoption based on current trends. To determine the upper limits of EV adoption, Rocky Mountain Institute designed an aggressive scenario to represent what effect rapid adoption of EVs would have on electricity demand. EV adoption rates are much higher in this scenario and reach 90% of annual vehicle sales by 2040 (with 63 million EVs sold in the year 2040) and 43% of total cars on the road worldwide (reaching 830 million total EVs). This scenario represents RMI's most aggressive outlook based on internal research looking at continued commitments, cost declines and infrastructure rollout goals.

Figure 1 shows that ambitious deployment of Electric Vehicles (EVs) with 90% of car sales being electric by 2040 requires an additional 3000 TWh of electricity, which is more than the whole of Europe consumes per year today. Increasing building renovation rates from the current 1% to between 3 and 5% per year (with the 5% rate estimated at current practice of 30% efficiency improvement, and the 3% renovation rate requiring approximately a 50% efficiency improvement) will prevent the need to build and invest in new power generation. Furthermore, another important practical relationship between buildings and EVs is that the EV charging points can be included in the building (residential, commercial or public sector building) as part of the renovation. After all we will charge our cars while we are at work or at home. The economic argument for increasing building energy efficiency retrofits rests on the fact that there are numerous market-ready technologies that can be deployed with short payback periods, and that building retrofits create more local economwic development than the construction of additional power generation. For reference, according to a 2013 Ecofys report investing in energy efficiency measures could create 380 jobs per TWh of electricity saved, whereas investing in coal-fired power plants creates 110 jobs per TWh of electricity generated. Job creation from energy efficiency can happen both directly (e.g., in manufacturing and implementation) and indirectly (e.g., by freeing up disposable income). Investments in local construction enable direct capture of energy cost savings and returns on retrofit investments by local residents and businesses, whereas investments in electricity generation facilities will divert returns elsewhere, with less immediate benefit to the community.

A third linkage between buildings and EVs (**see Figure 2**) is that most if not all new efficient technologies – like LED lighting – are digital, and thus our buildings can become smart buildings connected to the Internet of Things following these renovations. This will enable smart charging and load management that can further reduce power demand on the grid! In the case of grid-interactive efficiency investments in building controls, smart LEDs, and smart appliances (among others) make demand flexible, thereby promoting grid stability. When paired with the deployment of smart EV charging infrastructure to enable EVs as distributed energy resources, this can help to balance loads and better harness renewable energy generation. As an example, **Figure 3** illustrates the impact of widespread deployment of fast payback measures, including LED retrofits, appliance replacements, and retro-commissioning across the state of California. These measures have a payback of less than four years and achieve about a 7% reduction in statewide hourly electricity use. Paired

with smart EV charging controls to control charging times, the peak evening load can be reduced to entirely offset EV electricity use.

All in all, renovation makes our buildings fit for the 21st century as was also highlighted in a recent study by the Corporate Leadership Group.

So, what should be done to make this happen? There are several recommendations of which the most important is that policy makers should develop integrated policy frameworks, particularly on buildings and transport, while combining these with renewable energy policies making the energy we consume clean and sustainable. An important enabler for the increase in building renovation is that when the moment of building ownership or tenancy change would be used for deep building renovation – either for our homes, commercial or public buildings – this would result in the required renovation rate that is compliant with the Paris Agreement. And come to think of it, the additional budget required can easily be included in the mortgage or in the real estate portfolio, as these buildings will be cheaper to use and are safer investments for individuals and investors. Recent insights even show that an energy efficient building does not even require higher investments. It is critical that we get the charging infrastructure right, so that charging can be done where we live or work, and that demand response management balances the load on the electricity grid.

So, we see through these scenarios and recommendations that the task at hand is pretty big. Yet, I believe that when we embrace these goals and work together to accomplish what is needed, we can get this done. It is not the first time to see massive change in a short period. The transition to LED lighting is possibly the fastest of the past decades. Only a little over 10 years ago two thirds of our sales volume were incandescent light bulbs, while today 70% of our sales is LED, and by 2020 every LED we put on the market will be a connected or connectable LED, thus fully converting to an IoT portfolio.

For the planet our long-term goal should be to move to a net zero carbon world by 2050. This is why as Signify we announced that we joined the WorldGBC's Net Zero Carbon Buildings (NZCB) by 2030 commitment as well as the EV100 program of The Climate Group. As a company our buildings will become net zero carbon and our company fleet 100% electric by 2030. My thinking is that if we can do this in this timeframe, we should be able to jointly do this across all sectors and geographies by 2050!

Figure 2. Building Retrofit Rates Required to Offset EV Demand and Meet 2°C Targets

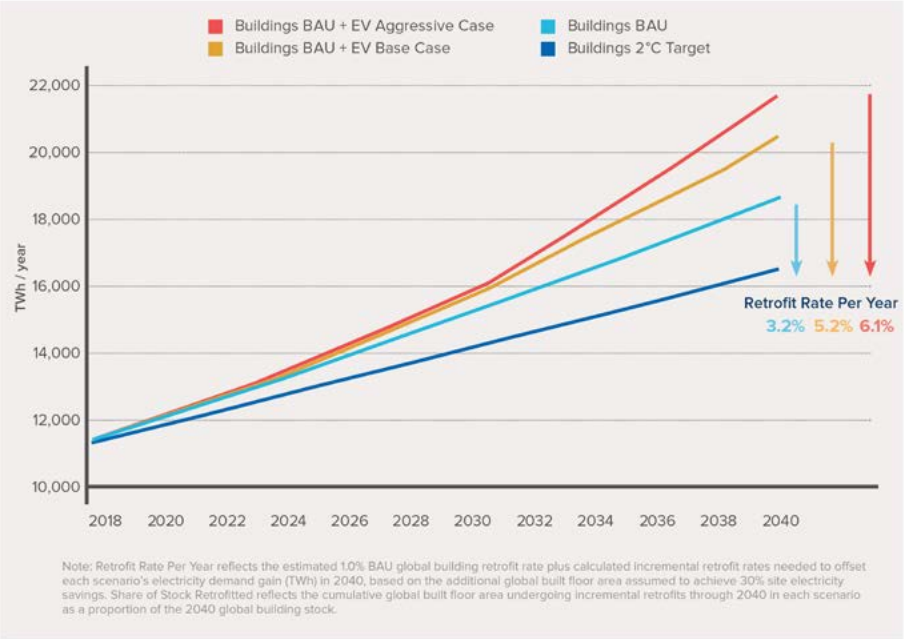
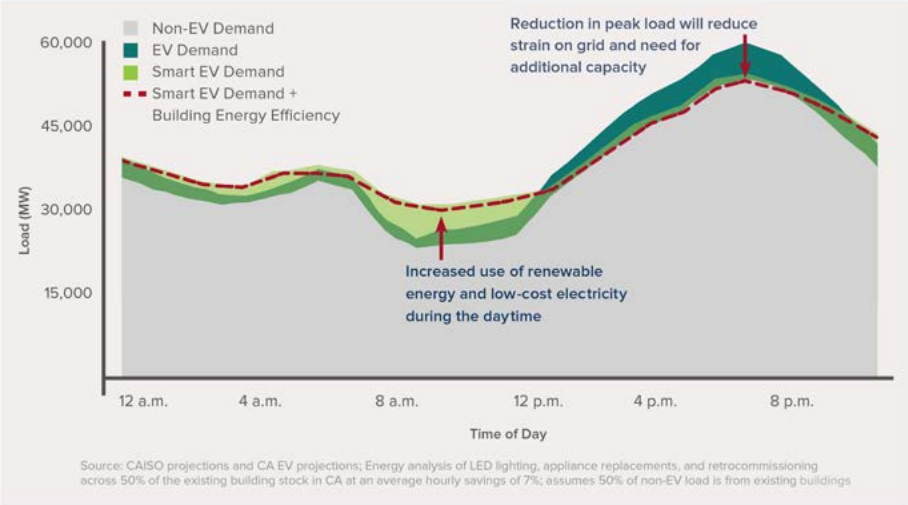


Figure 3. Hypothetical Effect of Smart EV Charging and Building Energy Efficiency on Peak Electric Load



World Bank dumps Kosovo plant, ending support for coal worldwide

By Karl Mathiesen for Climate Home News

The Kosovo e Re lignite plant could not compete with renewables on price, said bank president Jim Yong Kim

The proposed plant would replace Kosovo A power station (pictured), which was opened in 1962 and frequently breaks down (Photo: Karl Mathiesen)

The World Bank has abandoned the last coal project on its books, with its president publicly dumping the Kosovo e Re plant in October.

Speaking at a town hall event in Bali, Jim Yong Kim was asked by civil society representatives from Kosovo whether the bank was still considering guaranteeing loans to the plant.

"On the Balkans, yes, we have made a very firm decision not to go forward with the coal power plant," he said.

Climate Home News reported in June that World Bank officials had met minister of economic development Valdrin Lluka, amid rumours that a bank review had rejected the project on the grounds that there were cheaper options to solve Kosovo's energy crisis.

On Wednesday, Kim said: "We are required by our by-laws to go with the lowest cost option and renewables have now come below the cost of coal. So without question, we are not going to [support the plant]."

In 2015, the Kosovo government announced that it had signed an agreement with the World Bank and US company ContourGlobal to build the new station.

It is unclear what the withdrawal of the bank's guarantee means for the financing of the project, which has long been a centrepiece infrastructure project for the Kosovo government.

In a statement last month, Kosovo prime minister Ramush Haradinaj said construction was likely to begin early next year. Lluka and ContourGlobal did not immediately return requests for comment.

Dajana Berisha, founding member of the Kosovo Civil Society Consortium for Sustainable Development (Kosid) said: “We’re happy that our efforts, work has been proven to be right. But now another battle will probably begin, because we don’t know whether the government will continue searching for other investors to come and support the project.”

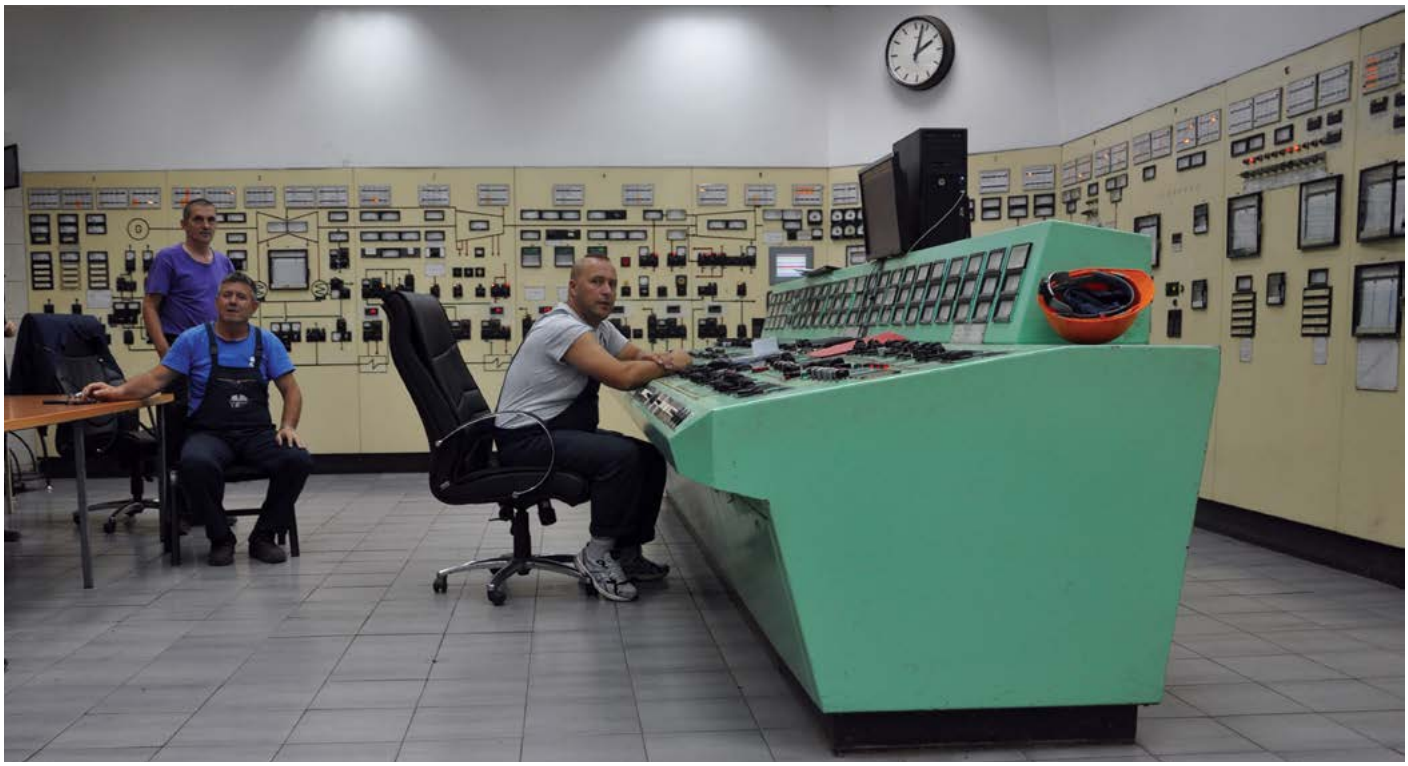
In 2013 World Bank revised its lending policies to rule out new coal projects, except in “exceptional circumstances”. Kosovo e Re has been the only coal project for which the bank has been considering support.

Years of war and slow reconstruction have left Kosovo with a power sector based entirely on the tiny country’s abundant lignite resource. Two Tito-era power stations, just outside the capital Prishtina, are notorious for breakdowns, black outs and air pollution.

In September, Joseph Brandt, founder and CEO of ContourGlobal, announced several bids for contracts to build and operate the plant. He said it was “crucial to the future of Kosovo’s energy supply”.

The World Bank’s involvement in the coal sector in Kosovo has been controversial. In 2016, CHN reported on leaked internal documents that found the bank had breached its own rules when villagers were forced from their homes to make way for a coal mine expansion.

This article was first published by Climate Home News at www.climatehomenews.org



FUTURE CLIMATE FOR AFRICA

Changing rainfall patterns spell risk for hydropower in Africa

New research warns planned hydropower dams across eastern and southern Africa are vulnerable to drought

Hydropower dams planned for eastern and southern Africa could put electricity supply at risk for vast regions because they rely on the same rainfall patterns for electricity generation.

This is the warning from new research led by Professor Declan Conway from the Grantham Research Institute on Climate Change and the Environment and the ESRC Centre for Climate Change Economics and Policy at the London School of Economics and Political Science, in collaboration with researchers at University College London, the University of Pretoria and the University of East Anglia.

The study, which was published in the journal *Nature Energy* on 8 December 2017, reveals that if all the large dams that are currently planned are constructed, by 2030 70% of total hydropower generating capacity in eastern Africa will be dependent on areas with similar rainfall patterns. In southern Africa 59% of hydropower generation will depend on areas with similar variability in rainfall.

This significant dependence of hydropower generation on areas with the same rainfall pattern means that within eastern and southern Africa the majority of hydropower generation will be vulnerable to the same dry periods and droughts, which could lead to electricity shortages and power outages.

This could pose a significant challenge for electricity security as hydropower is heavily relied upon in Africa. For example, hydropower accounts for over 90% of national electricity generation in Ethiopia, Malawi, Mozambique, Namibia and Zambia.

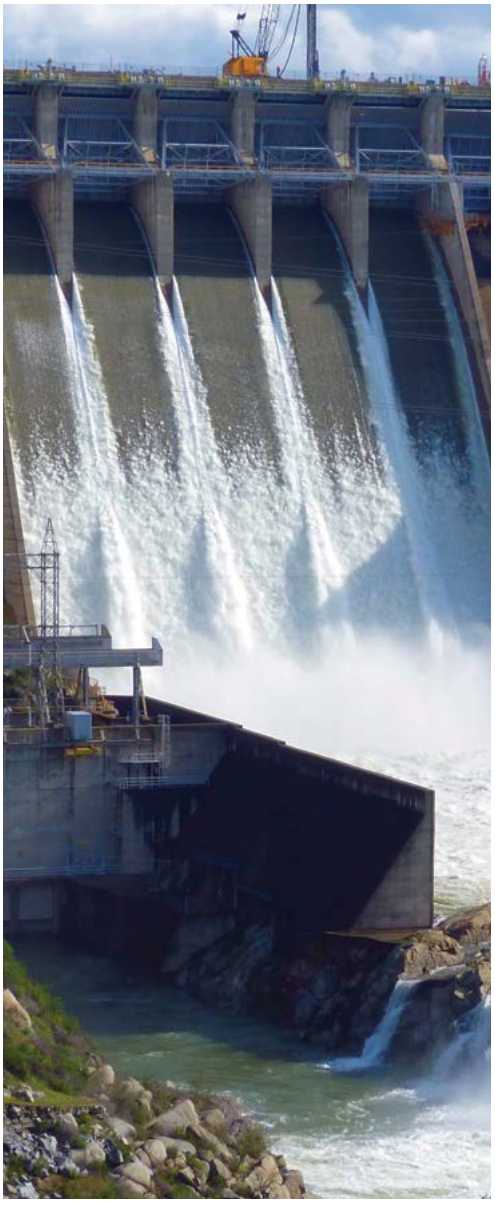
Rainfall variability, in the form of dry years with little rainfall and wet years with more rainfall, can be similar for several years at a time and is a characteristic feature of much of Africa's climate.

The researchers add that the problems of a changing climate are likely to exacerbate existing management challenges for hydropower and increase the threat of climate-related disruption in electricity supply.

Hydropower relies on the flow of water to drive turbines for electricity generation. Drought or successive dry years could result in lower volumes of water in dams which are insufficient to drive electricity-generating turbines. Where there is no alternative generating capacity, fluctuations in hydropower can disrupt electricity supply.

Electricity utilities can be forced to turn off supply to ration dwindling water resources to maintain intermittent electricity generation or simply because they are unable to meet electricity demand.

The study points out past examples of power outages due to the rainfall changes. Following dry conditions in much of southern Africa during the recent El Niño event of 2015–16 Malawi, Tanzania, Zambia and Zimbabwe all experienced electricity outages due in part to reduced rainfall.



Blue Nile Falls, Ethiopia, home of the new Grand Ethiopian Renaissance Dam (Photo: Giustino/Wikimedia)

The researchers used a technique called cluster analysis to define areas that tend to experience dry or wet years together. This approach identified three rainfall clusters in eastern Africa and seven in southern Africa. Analysis of the location of dams planned for construction reveals that in each of the regions the majority of dams are concentrated in just one rainfall cluster.

The researchers point out that while dams within regions will be dependent on the same rainfall patterns, the rainfall patterns differ between regions. This indicates that new regional power-sharing mechanisms, called 'Power Pools', could provide a means to buffer variations in river discharge or reservoir storage and allow electricity trading between regions.

However, the researchers note that there are considerable infrastructural and political challenges to these power-sharing systems.

Professor Declan Conway, lead author of the Nature Energy study and Professorial Research Fellow at the Grantham Research Institute said:

"More electricity is being supplied by hydropower in sub-Saharan Africa than ever before and the proportion of electricity from hydropower is likely to grow further. The last decade has seen renewed interest in dams, with the commissioning of several major new developments, including the Grand Ethiopian Renaissance Dam on the Blue Nile, now almost completed.

"Rainfall variability is just one cause of electricity supply disruption but our research highlights this potentially significant challenge for southern and eastern Africa. Guidelines to incorporate present and future climate risks into infrastructure planning are emerging and they should consider how spatial patterns of rainfall variation and changes in climate could affect hydropower supply.

"The increasing importance of hydropower, growing concentrations of dams in linked river basins, and the potential for higher levels of rainfall variability due to climate change, underline the need for effective planning of hydropower in Africa."

Dr Carole Dalin, co-author of the Nature Energy study and Senior Research Fellow at UCL ISR said:

"One of the main development challenges in southern and eastern Africa in the coming decades is to improve and expand power generation capacity and access to electricity. Hydropower is already a significant source in the electricity mix and is planned to become even more important, however, it is exposed to increasing precipitation variability. In this paper, we map these precipitation patterns with existing and planned dam sites, and find that concurrent, climate-related risk is expected to increase in both regions. This is an important aspect to consider in hydropower planning."

For more information on this research, the policy brief 'Climate risks to hydropower supply in eastern and southern Africa', can be accessed at http://www.lse.ac.uk/GranthamInstitute/publication/climate-risks-hydropower-supply-eastern-southern-africa/

The policy brief is drawn from analysis of the spatial distribution of rainfall in the regions, as well as climate models and research into the impacts of the 2015/16 El Niño event. The brief explains the increasing risk of concurrent climate-related disruption to hydropower and provides policy recommendations for overcoming the challenges.

The research was supported by the UK Department for International Development (DFID) and Natural Environment Research Council (NERC) through the Future Climate for Africa Programme and a project called UMFULA, as well as the South Africa National Research Foundation. For related research visit www.futureclimateafrica.org.

This news story was originally published as a press release alongside the brief in August 2018.

ROLIM, VIOTTI & LEITE CAMPOS
advogados

The RenovaBio program: Brazil's public policy to achieve the Paris climate change agreement goals

By **Dr. Maria João** and **Ana Paula Chagas**, Rolim, Viotti & Leite Campos

An overview of a Brazilian energy scenario indicates that: there is a significant share of renewables in the energy mix, notwithstanding there is also great space to improve the participation of clean sources in the country's energy mix. Currently, although most of the electricity generated in Brazil comes from clean sources[1], 36.5% of Brazilian energy mix still comes from oil and its derivatives, making Brazil the 7th largest oil consumer in the world[2]. The introduction of biofuels into the Brazilian energy mix was initially implemented as a way to reduce the dependence on oil, the source potential for combating the socio-environmental challenges ahead, to be seen later as a positive side effect.

In this context, given that the country is one of the signatories of the Climate Change Convention and of the Paris Agreement with targets regarding the reduction of greenhouse gas emissions, the Brazilian Government instituted the RenovaBio Program in 2017.

RenovaBio is a policy that seeks to encourage the growth of the biofuels share in the energy mix in order to fulfill the targets established at the Climate Change Convention 21 of Paris and to safeguard the Brazilian fuel market predictability, improving energy security in line with sustainability demands.

Biofuels have a strategic position in reducing the use of fossil fuels as well as in diversifying the Brazilian energy mix contributing significantly to the reduction of greenhouse gas emissions.

Established by means of the Federal Law no. 13.576/2017 it is interesting to note that, contrary to other programs, the RenovaBio does not rely on creating a tax on carbon emissions, subsidies, tax credit or a volumetric command for adding biofuels to fuels. The focus is more holistic, aiming at transforming the positive externalities generated by biofuels production into incentives to develop sustainable methods of producing bioenergy.

The program is comprised of two main instruments, as described below, that shall be interconnected by the issuance and sale on the Brazilian stock exchange (IBOVESPA) of Decarbonization Credits by Biofuels (*Créditos de Descarbonização por Biocombustíveis - CBIOs*)[3]:

i) Establishment of national targets regarding the reduction of emissions for the fuel matrix, defined for a 10 year-term. The national targets shall be unfolded into individual annual targets, mandatory for all fuel distributors, in accordance with their participation in the fossil fuel market. Thus, in order to achieve the individual targets, the fuel distributors are obliged to acquire the decarbonization credits.

ii) Certification of the production regarding biofuels, by private inspection companies. Different grades shall be assigned to each production unit, in

such a way that the producer who produces the largest amount of net energy with lower CO2 emissions in the life cycle shall receive a higher grade. For instance, a plant that produces only 1st generation ethanol will receive a lower grade than a plant that produces 1st generation ethanol, 2nd generation ethanol and bioenergy.

As a result, the grade will accurately reflect the individual contribution of each producer agent to the mitigation of a specific amount of greenhouse gases in relation to their fossil substitute (in terms of tons of CO2). The process of certification regarding the production of biofuels under the RenovaBio will be the responsibility of the National Petroleum Agency ("*Agência Nacional do Petróleo – ANP*").

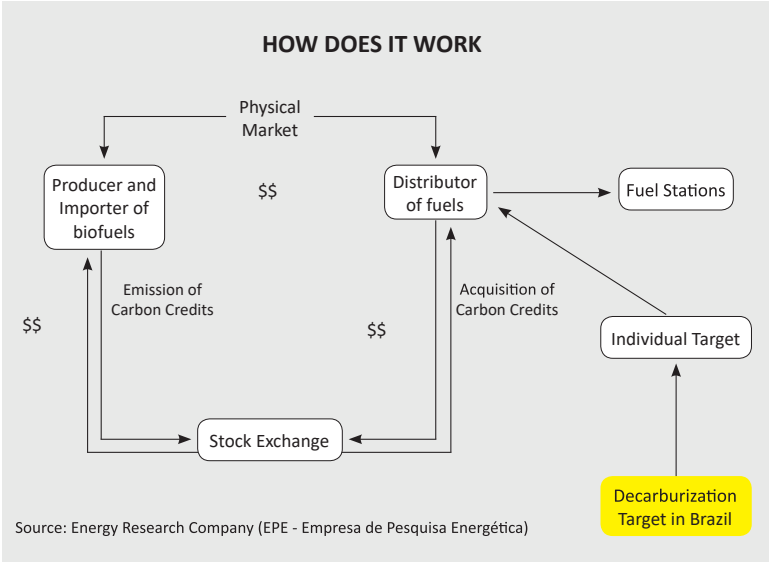
The methodology adopted for the calculation of the carbon intensity of each certified biofuel is based on the assessment of its life cycle, which considers the environmental impacts of that product during its entire life cycle, through consecutive stages, beginning from raw material, or since its generation from natural resources until its final destination.

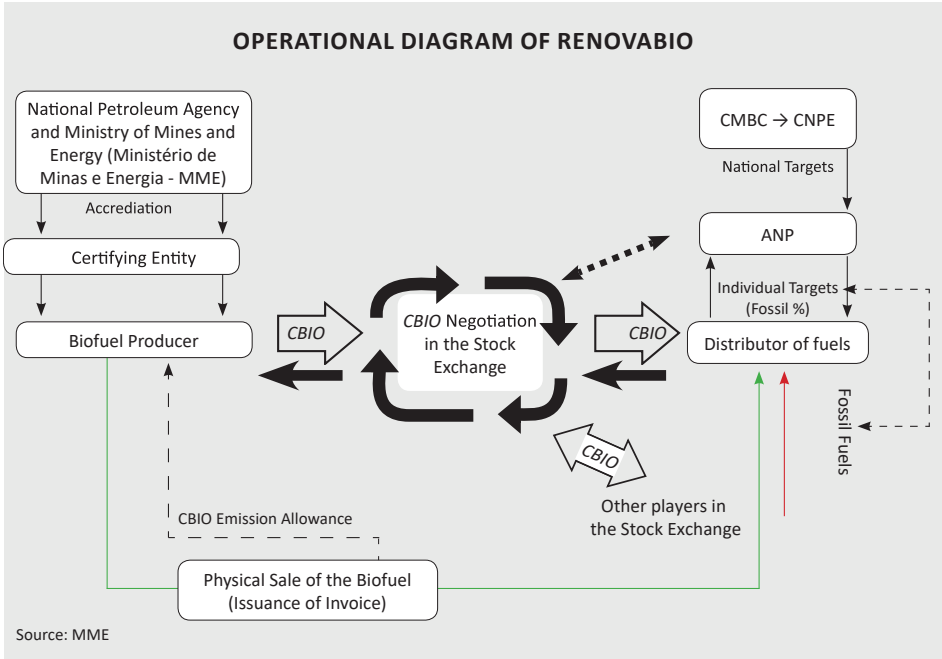
The Federal Decree nº 9.308/2018 was the first step in the national policy regulation, with the establishment of the policy's governance, the accreditation process and target definitions for the fuels distributors.

Despite the broad and innovative view adopted, the effectiveness of the policy still needs to be tested. There are still uncertainties about how the provisions will be regulated, in particular in relation to the marketing conditions of the CBIOs. Nonetheless, this policy represents a major step towards the increase of the participation of the bioenergy in the Brazilian energy mix, contributing to meeting Brazilian reduction emission targets agreed on in the Paris Agreement.

1 Renewables account for around 85% of the electricity mix including hydroelectricity. Source: International Energy Agency - IEA (Country Outlook - Brazil)
2 Source: Energy Research Company (EPE - Empresa de Pesquisa Energética)
3 Source: Ministério das Minas e Energia

Dr. Maria João, Rolim, Viotti & Leite Campos





What are some of the most pressing challenges that we face today?

According to the United Nations (UN) Chronicle, energy consumption and pollution are two critical issues faced by urban communities, which account for half of the population or 3.5 billion people. About 60 to 80% of the world's energy, which is a dominant contributor to climate change, is consumed by cities. The air quality in cities has deteriorated to such an alarming level that about 92% of the world's population breathe unsafe air and more than 7 million die annually, according to World Health Organization (WHO).

What can we do to change the situation?
In the "2030 Agenda for Sustainable Development", the United Nations established 17 Sustainable Development Goals with a comprehensive list of targets to be achieved by 2030. Individual countries are expected to take ownership and establish national frameworks to implement the actions. As a leading global paints and coatings company with a strong commitment to sustainability, AkzoNobel supports these goals, which is in line with our purpose to create everyday essentials to make people's lives more liveable and inspiring. We have been at the top of the Dow Jones Sustainability Index rankings for the fifth time in six years.

At AkzoNobel, we believe that we can address some of these challenges with the innovative solutions that we have developed. With a focus on India and China, we highlight the major problems faced by these two populous countries and the solutions that we can offer.

India
While India's economy continues to expand at the world's fastest growth rate of about 7.5% annually, millions of its citizens are exposed to increasingly unhealthy air. The latest air quality report from the WHO in May 2018 has announced that the world's top 10 most polluted cities all reside in India.

Residents in India's capital, New Delhi, which has been ranked the sixth most polluted, are taking the brunt of the health crisis due to vehicle emissions and burning of crops and woods. The air has become so smoggy and severely toxic that Delhi's government had to declare a public health emergency and school closures last year. It also unveiled 26 new programmes with a budget of US$ 8.2 billion to clean its air with such initiatives as electric buses and vehicles, tree planting, switching from coal-fired to electric or gas ovens.

How can AkzoNobel help Indian cities combat pollution? We have developed an air-cleansing paint based on photocatalytic technology that can degrade major atmospheric pollutants like nitrogen oxides and sulphur oxides. These gases not only pose health implications themselves but also contribute to the formation of PM2.5 particulate matter that can penetrate deep into lungs and bloodstream causing diseases such as stroke, heart disease, lung cancer and respiratory infections. With sunlight exposure and moisture, our paint will generate radicals that can decompose these pollutants. A large-scale field trial is currently being planned to quantify the efficacy of our paint in improving the air quality in Delhi.

To help improve air quality in India through reduction of the emission of volatile organic compounds (VOC), we

AkzoNobel is a leading global paints and coatings company. We supply industries and consumers worldwide with innovative products and are passionate about developing sustainable answers for our customers. Our portfolio includes well-known brands such as Dulux, Sikkens and International Paints. Headquartered in Amsterdam, the Netherlands, we are consistently ranked as one of the leaders in the area of sustainability. With operations in more than 80 countries, our 47,000 people around the world are committed to delivering leading products and technologies to meet the growing demands of our fast-changing world.

www.akzonobel.com

Pamela Phua has more than 20 years' experience in Research, Development and Innovation (RD&I) in the coatings industry. In her current role as Director of RD&I for AkzoNobel, she drives new technology development and product implementation across the South East, South Asia and Middle East regions.

Pamela was instrumental in setting up the global research and laboratory operations for AkzoNobel Decorative Paints (Global Exterior Wall Paint Expertise Group) in 2011. In her global capacity, Pamela implements the functional and production innovation strategy for Exterior Wall Paint. She spearheads the RD&I functional excellence, standards and capability, and the efficient delivery of processes as the approved Standards & Processes across the globe.

Pamela Phua, Cluster General Director of Vietnam, Singapore and Indochina, Decorative Paints South Asia.

Email: Pamela.phua@akzonobel.com | Mobile: +65 90279663

have launched our strategic programme called Waterway. Our aim is to drive the transition of solvent-based products currently offered in our portfolio for wood care and metal care applications to water-based products with equally high quality and performance.

We can help to mitigate soil pollution in India by controlling the release of biocide used in our paints. Biocide is a film preservative added within the regulatory compliant amount in an exterior paint to help protect building façades against the growth of fungus and algae, which is especially important for tropical and subtropical climates in India. Conventional types of biocide may not be able to release effectively from the paint over its lifetime and they may also be washed off by rain and can contaminate the soil. Encapsulating the biocide allows for its controlled release at its optimum level, therefore safeguarding our paint for better durability in terms of film protection while minimizing the environmental impact due to soil pollution. Our researchers also continuously strive to explore biocide-free or low-biocide solutions.

Public urination has been a major issue in India. The Government has launched a nationwide campaign called "Swachh Bharat Abhiyan" to promote public cleanliness. To address this problem, we have developed a superhydrophobic coating with extreme liquid repellency that can protect walls by resisting the adhesion of urine, spit and other stains. Our product will be able to help transform and maintain cleanliness of many cities and towns across India, thus providing the communities with more liveable neighbourhoods and inspiring surroundings.

China

According to the International Energy Agency (IEA), China has surpassed the United States as the world's biggest energy consumer in 2009. This has definitely taken a toll on air quality due to China's predominantly coal-based energy production. Key major economic zones such as Beijing and Shanghai have been marred with pollution and notorious thick choking smog in recent years.

In China, buildings account for a large part of China's energy consumption. In order to promote building energy conservation, the Chinese government has developed a sophisticated policy system in recent years. These include building energy codes which state the minimum standards for the energy efficiency of building components such as envelope; heating, ventilation, air conditioning (HVAC), and the power system. These codes are mandatory for residential and commercial buildings in urban areas, and voluntary for rural residential buildings but are promoted through incentives.

How is AkzoNobel going to contribute positively to better the country's energy efficiency and adapt in this storm of policy changes? We approach this by providing solutions for suppressing heat outflow in winter with our ***Thermal Insulation Decorative Board*** systems and reducing the heat gain in the building in summer through our ***Keep Cool*** offerings.

Thermal Insulation Decorative Boards are prefabricated boards constructed in the factory setting where the insulation and decoration layers are assembled together. These boards are made with a controlled quality unlike the traditional Exterior Insulation and Finish Systems (EIFS) which are highly subjected to the reliability and quality of workmanship. They can be easily secured on the exterior façade of a building just like a jigsaw puzzle with a smart system of bracket and screws. The system also incorporates Air-vent plugs to prevent moisture buil-up that leads to cracking and peeling issues we see in traditional insulation systems. Factory fabrications also allow us access to a much wider technology platform such as UV-curing systems and sol-gel processes, which would have been prohibitive to use in conventional exterior wall paint. This solution essentially allows us to provide a better and higher quality alternative to building insulation and hence effective energy management.

Another contribution from AkzoNobel concerns the energy savings brought about by specialised coatings. Other than improving our existing Keep Cool offerings to chase the ever tighter standards, we have also extended our Keep Cool offerings to Texture products in China. Keep Cool coatings reflect heat by reflecting in Infra-Red (IR) and Near Infra-Red (NIR) radiation of the solar energy. This is achieved by careful pigment management and the use of special IR-reflective pigments. With less heat built-up on the building façade and less heat transfer to the inside of a building, less energy is then required to maintain a comfortable temperature. Based on the simulation results from external parties, energy savings are quite substantial.

Beyond innovation - people

Proposing true and sustainable technical solutions is one aspect of our contribution. We also firmly believe in improving everyday life through our Corporate Social Responsibility.

Giving back to communities is deeply rooted in AkzoNobel's culture. Our Human Cities initiative is our commitment to regenerating and energizing urban communities across the world. We use our products and expertise to help cities deliver a stronger sense of community purpose, pride and happiness.

For instance our global "Let's Colour" program has been revitalizing urban areas all over the world, with almost 70 million people benefiting from 2,000 projects and 12,000 volunteers. The 100th mural of the 100 'Let's Colour Walls of Connection', created by AkzoNobel and global peace movement MasterPeace, took place last November in a school in Badshahpur in India. The project transformed the lives of more than 5,000 children by getting them back to school and ensuring they continue their education and improve their grades.

AkzoNobel has also partnered with SOS Children's Village to train the next generation of painters and drive local economic growth through painting training and business development knowledge, thus contributing employability of young people coming from a difficult background. This successful partnership has been rolled out in countries like Brazil, Nigeria, South Africa, Indonesia and will be extended to up to 10 countries such as India in 2018.

Prince Sultan Bin Abdulaziz International Prize for Water

Recognizing Innovation

Winners for the 8th Award (2018)

Creativity Prize

The Prize is awarded to two teams of researchers:

1) Dr. Andre Geim and Dr. Rahul Nair (National Graphene Institute, University of Manchester, UK)
for developing novel graphene oxide membranes that promise to enable energy-efficient and high-volume water filtration and desalination.


Dr. Andre Geim


Dr. Rahul Nair

2) Dr. Günter Blöschl (TU Wien, Austria) and Dr. Murugesu Sivapalan (University of Illinois at Urbana-Champaign, USA)
for developing the new field of Sociohydrology, a ground-breaking paradigm for water management and a new validated approach for studying the dynamic interactions and bi-directional feedbacks between water systems and people.


Dr. Günter Blöschl


Dr. Murugesu Sivapalan

Surface Water Prize

Dr. Wilfried Brutsaert (Cornell University, USA)
for developing, demonstrating, and validating a new theory that can generate unprecedented estimates of evaporation from the natural landscape.


Dr. Wilfried Brutsaert

Groundwater Prize

Dr. Martinus Th. van Genuchten (Federal University of Rio de Janeiro, Brazil)
for the development and application of key theoretical and software tools that describe water flow and contaminant transport in the subsurface.


Dr. Martinus van Genuchten

Alternative Water Resources Prize

Dr. Omar Yaghi (University of California, Berkeley, USA) and Dr. Evelyn Wang (Massachusetts Institute of Technology, USA)
for creating a solar-powered device that uses an innovative porous metal-organic framework (MOF) to capture water from the atmosphere.


Dr. Omar Yaghi


Dr. Evelyn Wang

Water Management and Protection Prize

Dr. Jim W. Hall and Dr. Edoardo Borgomeo (Environmental Change Institute, Oxford University, UK)
for developing and applying a new risk-based framework to assess water security and plan water supply infrastructure in times of climate change.


Dr. Jim W. Hall


Dr. Edoardo Borgomeo

Nominations are open for the 9th Award. Nominations can be made online until 31 December 2019.

www.psipw.org
email: info@psipw.org

A green future for mining: time for change

By **Gustavo Emina**, CEO, New Steel

How a simple process can save billions of litres of water and recover what was considered waste.

Mining industries provide most of the materials on which the world relies on to build infrastructure and instruments of daily use. At the same time, mining is one of the human activities that have been most disturbing to the environment and are linked to large social impacts. Notwithstanding, the world's future is deeply dependent on mining.

Mining activities are very diverse and may have different ecological footprints. Two issues, in particular, are of major and worldwide importance: water consumption and mining waste.

Mining can become more environmentally sustainable by developing and integrating practices that reduce the environmental impact of mining operations. These practices include measures such as reducing water and energy consumption, minimizing land disturbance and waste production, preventing soil, water and air pollution at mine sites.

Committed to sustainable development, New Steel has created an innovative dry processing technology for iron ore beneficiation. Differing from the traditional existing processing technologies – that utilize at least one thousand litres of water to process one ton of ore – this innovation aids an extraordinary amount of iron ore recovery at competitive costs while mitigating environmental impact.

This new processing technique – with its patent recognized in 56 countries – is capable of transforming the mineral exploration waste, which has a low iron content, into an economically viable product with a high iron ore content and a minimum of contaminants.

Results from New Steel's process: magnetic (iron) and non-magnetic (silica) particles

The iron and steel industry is the largest industrial source of CO2 emissions due to the energy intensity of steel production and its reliance on carbon-based fuels.

A simple way to contribute to CO2 reduction is using high grade iron ore, in fact, using ore with 65% iron content consumes about 12% less coking coal than using 58% iron ore, resulting in energy saving, less CO2 emissions and less slag.

Reducing water consumption

Water is used in a number of applications at mine sites. Traditional iron ore beneficiation plants using washing, screening and jigging processes require large volumes of water.

Considering that the global iron ore production in 2017 was nearly 2 billion tons and that around 800 million tons were beneficiated using a wet process, we can conclude that an impressive total of 800 billion litres of water were used in the iron ore industry, more than the annual water consumption of Haiti, Angola, Ruanda, Uganda, Mozambique and Ghana together.

Furthermore, by diverting surface water and pumping groundwater, mining operations can reduce both the quantity and quality of water available downstream for aquatic ecosystems and other industrial and municipal water users, especially in areas with arid climates.

With New Steel's technology not a single drop of water is used during the beneficiation process. A simple

New Steel's dry beneficiation plant in Minas Gerais, Brazil

breakthrough flowsheet inverts the traditional wet beneficiation method by introducing a drying station before magnetic separation. By doing this, the moisture contained in the ore is reduced to under 1% and this new process allows the efficient separation of magnetic particles (iron) from the non-magnetic particles (silica).

In developing countries around 1.1 billion people have inadequate access to clean water. At the same time, some world class iron ore deposits are located in arid areas and cannot be fully explored due to water scarcity. New technologies like New Steel's enable the unlocking of the value of constrained assets, providing goods and services necessary for human and environmental well-being.

Turning mine waste into resource

Like the majority of human activities, mining operations produce waste materials. "Waste" is a general term for material which currently has little or no economic value.

The type, amount and properties of mine waste produced at different mines vary depending on the resource being mined and the process technology used. The large volumes of waste produced at mining operations are expensive to manage and are frequently cited as an obstacle to the environmental sustainability of mining.

Today around 1 billion tons per year of waste rocks and tailings are left behind after the ore has been processed to remove the valuable commodity.

However, the difference in mineral content between ore and waste can change depending on market conditions and available technology, New Steel's dry technology enables the recovery of low grade marginal ores, nowadays considered waste, in an economically viable manner due to its high efficiency, thereby producing a high-grade iron ore and a clean by-product that can be used in civil construction.

A green future for mining, that is 100% sustainable, can be a reality and could be implemented in the near future around the globe, allowing sustainable growth in remote areas. There is always time for change if our goal is leaving a legacy for future generations.

New Steel Global NV

Headquartered in the Netherlands and with business operations in Brazil, New Steel is a processing company that is deploying its unique dry beneficiation technology around the globe. The company invests through its subsidiary companies in scientific and technological development of sustainable products for the mineral, steel and waste sector.

www.newsteelglobal.com

Project development in a sustainable world

By **Diana Miranda MSc.,** PSM Corporate Director, Mexichem

As a response to the Paris commitment, industrial projects' development must include sustainability within its conception. The industry challenge is to act as a contributor under the equilibrium of, steady growth, law aligned and, cost-effective projects. Thus, the industry should execute projects that make use of modern authorized products which provide a positive social and environmental value; either for solving historical problems or developing and researching new product lines taking into account the needs of a new automated age.

Project management practitioners should include "Sustainability" as an additional topic to the known "triple constraint" concept (time, scope and cost). It means, grounding the concept by including the "societal impact" prevention as an inherent part of the project objective instead of only contemplating the effects after the execution. Even when the subject is frequently commented on and debated, it is still not a mandatory statement for practitioners to implement. This inclusion consequently, represents additional uncertainty and risks for managing and controlling; either during project initiation, planning, implementation and close-out. The performance and risk potentiality analysis while in practice is a crucial task. Thus, business strategies should consider the impact project execution generates on the environment and society throughout the project's lifecycle and beyond. The positive impact is a strong possibility once implemented.

Project Managers and Scientific Researchers should jointly include societal risks analysis and its management as part of their duties. The entitlement requires specific skills from those involved in such an important task, which implies more than complex mathematical methods and decision-making capabilities. Analytical skills for every scenario development,

possible consequences and actions definition to contain, mitigate, manage or avoid are also needed. It is important to remark that all projects, regardless of size, should consider a sustainability risk analysis.

Frequently, great ideas come from simple things. Daily routine jobs and tasks sometimes prevent us from seeing the obvious, as being so involved in the detail we do not notice what is important about the thing as a whole. 'Blindness by use' commonly creates working without developing evidence-based good practice. Revisiting the regular industrial tasks and inviting "industry-science binomial" for a surveillance visit, enables the identification of sustainable areas of opportunity. This action involves production facilities and project development tasks, within an automated environment. Both are subject to create the expected impact in a global sustainable society.

Maximizing the appropriate use of materials is a common industry asset and scientists' main goal. The introduction of industry and a merged science concept creates a commitment; either by researching the possible effects of energy and mass transformation or evolving different value-added products. The responsible use of commodities is part of production chain surveillance which requires the inclusion of both practitioners' views and contributions. By considering that some materials have insufficient history of use to demonstrate 'fit for purpose', the possible effects prediction is subject to study while a new production process age and its evolution occurs. This approach is essential in a constantly evolving industry such as Chemicals, due to its commitment to contributing to the modern lifestyle with value-added products able to fulfill people's needs.

The "science merged industry" benefits all stakeholders, including workers and the general public, prevents negative environmental impact and resolves previously created issues. The root cause analysis of scientific or industry concerns makes a sustained solution. Sustainable projects create added value to both society and business. This challenging topic has a common objective 'worldwide benefit.'

Why engagement and participation in the practice of sustainable finance is so important

By **Sasja Beslik**, Head of Group Sustainable Finance, Nordea

> "The financial sector is truly the global citizen that can fully integrate sustainability in everything we do. Imagine what we could accomplish and how fast we could get this transition to happen!"

Q: Can you tell us about your position and your responsibilities?

A: My rather new role is related to all sustainability issues for Nordea Group – financing, investments, advice and internal operations. In practice this is a business move from Nordea to align and further develop our client offering in all segments of our business. This change has enabled us to focus on business drivers, needs and opportunities related to sustainability in our business. My responsibility is to ensure that we integrate relevant and material sustainability issues throughout the Group.

Q: You are very involved in investigating, promoting and creating awareness about climate change in social media and several other channels. Tell us about your drive.

A: From a personal standpoint, I have three children and I want to be able to look them in the eye and tell them that we at least did what we could in relation to climate change that will affect their lives much more than many other things. I believe in the constructive and collaborative nature of humans, despite destructive elements of it as well, and our intrinsic need to survive. We have a story to tell and we want to engage with people around the world on what can be done, on solutions.

Q: How do you plan to increase engagement and participation in the practice of sustainable finance?

A: Sustainable finance is growing internationally both as a concept as well as a business opportunity, thus it is moving slowly at the moment. Clients still need much more information about the facts related to their investments. They need to see their importance as well as ability to impact, for example on climate change. Our industry has been, and is, very slow in adapting to the needs of future generations when it comes to sustainability in banking. Our target is to offer the best sustainable investment, financing and advisory solutions to our existing and future clients.

Q: You have been all over the world and witnessed the effects of climate change, for example the Jakobshavn Glacier on Greenland. What did you see?

A: It was stunning, scary and very enlightening. The pace of destruction is so fast that you can physically feel it when you are there. Most of the glaciers will be gone in the next 50 years if we don't stop or at least slow down global warming. Let me put it this way, glaciers melting is not good for business and people doubting that are either too short-sighted or just very ignorant and selfish.

Sasja Beslik, Head of Group Sustainable Finance, Nordea

Q: Sweden recently set a goal of phasing out greenhouse gas emissions by 2045 while in contrast America boost their coal and fossil fuel industries. What's your view on this?

A: Yes, Sweden has ambitious goals, daring and visionary goals that deserve all respect. We can't give with one hand and take with another. We need global consistency and we need political agreements that hold over time. What is happening in the US today with the new US administration will hurt the US in the long run more than anybody else. We need financial solutions, and don't forget that the financial sector is truly the global citizen that can fully integrate sustainability in everything we do. Imagine what we could accomplish and how fast we could get this transition to happen!

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