Extending **our risk intelligence**

We address sustainability, emerging and political risks in our core business transactions. For this, we have developed specific tools and know-how.

SUSTAINABILITY RISKS

We define sustainability risks as ethical concerns related to potential environmental and socio-economic impacts of our business transactions, and the reputational risks they may entail.

Risk management is an integral part of Swiss Re's business model and key to the controlled risk-taking that underpins our financial strength. It is embedded throughout our business and ensures that the Group and the three Business Units have the necessary expertise, frameworks and infrastructure to support good risk-taking (see 2018 Financial Report, pages 72–73 and 81–97).

Sound risk management is essential for a re/insurer. Tight control of our exposures guarantees that we can fulfil our role in society as ultimate risk-taker and be a reliable partner to our clients when they need us. The core categories of our risk landscape comprise insurance risk (property and casualty, life and health) as well as financial market and credit risk. In addition, we consider it essential for a responsible company to pay attention to further significant risks we may be exposed to, especially in the longer term.

Sustainability, emerging and political risks are particularly relevant in this respect. We have developed instruments and know-how that help us identify and assess all of them. This allows us to determine those risks we think we should avoid – because of their potential to increase losses, for ethical reasons or both.

WEBSITE
To learn more about how we address political risks, please visit our website at: **www.swissre.com/about-us/corporate-responsibility/risk-intelligence/political-risks.html**

Dams can potentially have serious impacts on local communities and the environment. One of the policies of our Sustainability Risk Framework clearly defines when and how our underwriters need to carry out due diligence on such risks.

Our Sustainability Risk Framework

In a market environment, profitable business activities create economic value. Occasionally, however, they may also have adverse effects on the environment and certain vulnerable groups. If such impacts are ignored, they may pose a threat to societies' long-term sustainable development.

For companies this situation can create dilemmas. A particular business transaction may be economically beneficial and in compliance with all legal and regulatory requirements, yet may have significant environmental or social downsides. Swiss Re recognises that such dilemmas exist and develops effective responses through a well-defined approach and by taking decisions based on ethical principles.

Our Sustainability Risk Framework is an advanced risk management instrument designed to identify and address the potentially negative effects of our transactions on local communities, workforces and the environment. This framework applies to all of our business transactions in re/insurance as well as investments, to the extent that we can influence their various aspects.

The Sustainability Risk Framework consists of:

- Two umbrella policies on human rights and environmental protection plus eight specific guidelines on sensitive sectors or issues;
- The Sensitive Business Risk (SBR) process comprising an online assessment tool and a referral tool – due diligence mechanisms to assess our business transactions;
- Company exclusions; and
- Country exclusions beyond mere compliance with international trade controls.

Policies and guidelines

Our Sustainability Risk Framework is based on the overarching principles of respecting human rights and protecting the environment, encapsulated in two umbrella policies that are valid for all our transactions. In addition, specific guidelines apply these overarching principles to eight sectors or issues in which we perceive major sustainability risks: the defence industry; oil and gas (including oil sands, hydraulic fracturing and arctic drilling); mining; dams; animal testing; forestry, pulp & paper and oil palm; nuclear weapons proliferation; and, newly from 2018, thermal coal.

We regularly review all the policies and guidelines of our Sustainability Risk Framework to ensure they stay abreast of relevant new risk developments and stakeholder expectations. In 2018, we introduced a comprehensive thermal coal policy for our underwriting business (see special section on the right), complementing a similar policy we had adopted in our asset management in 2016.

WEBSITE
You can download a summary of our main human rights and environmental concerns in these sectors at: **www.swissre.com/about-us/corporate-responsibility/risk-intelligence/sustainability-risk-framework/policies.html**

The Sensitive Business Risk process

Each of the two umbrella policies and eight sector guidelines of our Sustainability Risk Framework contains criteria and qualitative standards which define precisely when a transaction may present a "sustainability risk". We assess such transactions through our Sensitive Business Risk (SBR) process, which consists of two due diligence mechanisms – the SBR online assessment tool and the SBR referral tool.

The online tool stores the relevant sustainability risk information for these sectors and thus provides our underwriters with an efficient means to check the potential impact of their transactions on human rights, labour rights and the environment. For transactions that reveal low to medium

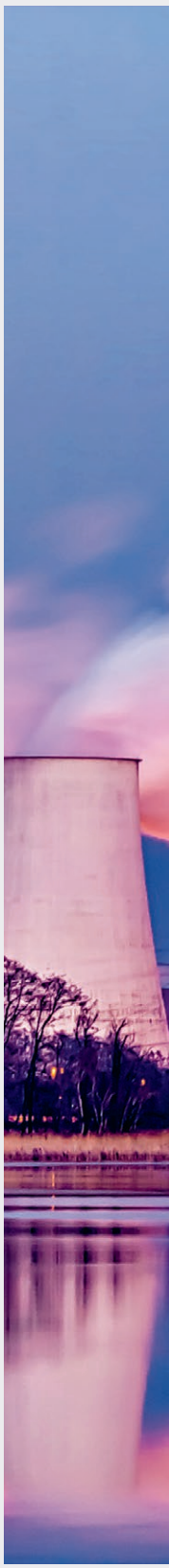
Introduction of our **thermal coal policy**

Swiss Re supports the worldwide reduction of greenhouse gas emissions and contributes to limiting global warming to 1.5–2°C above pre-industrial levels. To this end, we continually review measures to assist the transition to a low-carbon economy. Reflecting our commitment, in 2015 we signed the Paris Pledge for Action (www.parispledgeforaction.org) to affirm our support for the Paris Climate Agreement.

After a range of measures we have taken over the years in our product development, risk management and operations, we have recently taken a further significant step. In July 2018, we introduced a thermal coal policy for our underwriting, pledging not to provide re/insurance to businesses with more than 30% exposure to thermal coal utilities or mining. The policy is fully integrated into our Sustainability Risk Framework. It applies to both old and new thermal coal projects and across all lines of business (direct, facultative and treaty).

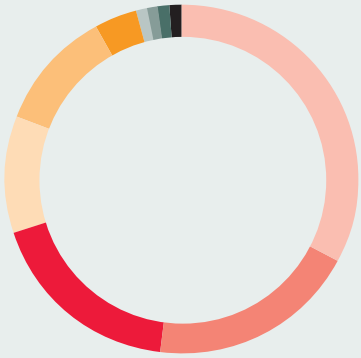
The introduction of our thermal coal policy is the first step towards the development of a carbon risk steering mechanism, to measure our carbon intensity and associated risks embedded in our re/insurance business. Over time, this will help us align our business activities with the Paris Climate Agreement and related Nationally Determined Contributions (NDCs).

Given that there is no established methodology for such a carbon steering model in the re/insurance business, developing a purposeful model will take some time, but will enable us to take a holistic carbon risk perspective on our business and avoid a piecemeal approach.



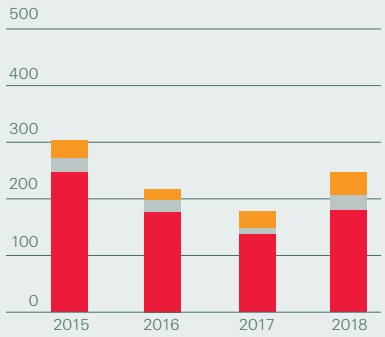
Thermal coal power plants are a significant source of CO_2 emissions. In 2018, we introduced a policy for our underwriting, pledging not to provide re/insurance to businesses with more than 30% exposure to thermal coal utilities or mining.

SENSITIVE BUSINESS RISKS REFERRED TO OUR EXPERT TEAM IN 2018, BY SECTOR/ISSUE



- 33% Oil and gas
- 19% Mining (excl. thermal coal)
- 18% Thermal coal
- 11% Dams
- 11% Other: human rights
- 4% Defence
- 1% Animal testing
- 1% Forestry, pulp & paper, and oil palm
- 1% Nuclear weapons proliferation
- 1% Other: environmental protection

NUMBER OF SENSITIVE BUSINESS RISK REFERRALS AND DECISIONS TAKEN



- Proceed
- Proceed with conditions
- Abstain

* In 2015, we launched our online assessment tool which has resulted in a steady decrease in SBR referrals. In 2018, we introduced our thermal coal policy, which contributed to a rise in referrals.

247

Sensitive business transactions referred to our team of sustainability experts

(178 in 2017)

risks, they need to carry out additional due diligence based on industry and country advice provided by the tool.

If the potential human rights or environmental risks of a transaction are assessed as high but the responsible underwriter wants to pursue it, it is automatically transferred through the SBR referral tool to Swiss Re's in-house team of sustainability experts. These specialists then conduct in-depth research to decide whether the transaction at hand is acceptable on ethical grounds.

This decision takes the form of a binding recommendation either to go ahead with the transaction, to go ahead with certain conditions attached, or to abstain. If there is disagreement about the recommendation, the case can be escalated to the next management level and, ultimately, to the Group Chief Risk Officer and the Group Executive Committee.

Since we introduced the SBR assessment tool in 2015, we have continually fine-tuned it, thus strengthening our underwriters' ability to integrate sustainability risk assessment into their decision-making. Between 2015 and 2017, this led to a marked, and steady, decrease of SBR referrals to our in-house sustainability experts.

In 2018, however, the number of referrals rose, from 178 in the previous year to 247. This increase was mainly driven by the introduction of our thermal coal policy (see special section on page 28). Many of the coal-related referrals were submitted by our underwriters to have the thermal coal exposures of specific transactions clarified. Of the 247 transactions in total, we issued negative recommendations in 40 cases and positive recommendations with conditions attached in 27 cases.

Company exclusions

Our Sustainability Risk Framework policies specify certain criteria that may lead us to exclude a company from both our re/insurance transactions and our investments, to the extent that such an exclusion is permissible (eg by virtue of mandatory law or internal policies) and possible (eg if existing documentation relating to such re/insurance transactions and investments provide for it). These criteria include: involvement in

prohibited war material; verifiable complicity in systemic, repeated and severe human rights violations; causing repeated, severe and unmitigated damage to the environment; unregulated proliferation of nuclear weapons; and unethical/cruel animal testing practices.

Country exclusions

Swiss Re also excludes certain countries from its business that have particularly poor human rights records. This step goes further than compliance with international trade controls (ITCs). Our goal is to refrain from directly underwriting risks or making investments in entities that are based in these countries. We review the list of excluded countries annually based on independent human rights assessments and update it if warranted.

As the Sustainability Risk Framework is based on the principles of respecting human rights and protecting the environment, the SBR process with its two due diligence tools, company exclusions and country exclusions is our principal means to ensure compliance with the UN Global Compact in our core business.

WEBSITE
You can read more about the international declarations and principles underpinning our Sustainability Risk Framework in a special publication dedicated to it:
www.swissre.com/Library/sustainability-risk-framework.html

Training

Ever since we introduced our comprehensive Sustainability Risk Framework ten years ago, we have made considerable efforts to raise awareness of sustainability issues among our underwriters and client managers. Through training, we ensure that they know how to properly apply the framework with its underlying principles of respecting human rights and protecting the environment. In recent years, we have focused on high growth markets where we want to expand our business.

A couple of years ago, we developed a new eLearning course for our in-house training. While this continues to be compulsory for all our employees who work in underwriting and with our clients, it is now mandatory for all our new entrants, as well. In 2018, a total of 3 544 employees completed this mandatory training course.

Client and industry interaction

Over the year, we had a number of important external engagements on sustainability risks with clients, industry peers, investors and civil society groups such as environmental and humanitarian NGOs. We held in-person meetings with clients operating in sensitive sectors such as mining, forestry and oil & gas, discussing potential measures they could take to address their sustainability risks.

Further exchanges took place in the context of our activities around thermal coal, focusing on the dedicated policy we introduced during 2018. For example, we participated in the Coal Exit Roundtable organised by the Unfriend Coal Campaign (unfriendcoal.com) in Paris in March 2018.

In partnership with other re/insurers, we are also developing risk assessment tools designed to help the industry better understand and manage sustainability risks. One of these ongoing partnerships is the UNEP Finance Initiative Principles for Sustainable Insurance (UNEP FI PSI, www.unepfi.org/psi). In 2018, the UNEP FI PSI launched an insurance industry pilot examining the implementation of the Climate-related Financial Disclosures (TCFD), to which Swiss Re actively contributes.

EMERGING RISKS

We define emerging risks as newly developing or changing risks that are difficult to quantify and whose potential impact on our business is not yet sufficiently taken into account.

Emerging risks

Re/insurers operate in a rapidly changing and increasingly complex risk landscape. New demographic, economic, technological, socio-political, regulatory and environmental developments are all capable of changing risks or creating new ones. In addition, growing interdependencies between these developments can lead to accumulations of risk and create significant knock-on effects. People's risk perceptions are shifting, liability and regulatory regimes continue to evolve and stakeholder expectations are growing.

This complex landscape gives rise to "emerging risks" – newly developing or changing risks that are difficult to quantify and whose potential impact on our business is not yet sufficiently taken into account.

Detecting and investigating such risks early on forms an important part of our comprehensive approach to risk management. In analysing how risks are evolving and related to each other, we seek to assess their potential impact on Swiss Re. This is vital to reduce uncertainty and prevent unforeseen losses, raising awareness within the Group and across the industry.

EMERGING RISK CASE STUDY: ALGORITHMIC DECISION-MAKING

Increasingly important in decision-making, algorithms may also reinforce human judgement and are difficult to audit. To cope with potential ethical concerns while adapting to rapid digitalisation, Swiss Re is addressing algorithmic decision-making as an emerging risk.

Algorithms play an increasingly powerful role in ever more areas. They perform certain tasks faster than human beings, eg the analysis of (big) data, and their decisions are held to be more accurate and unbiased. But how objective can a computer programme that has been written, calibrated and tested by humans really be?

With artificial intelligence (AI), machine learning and unsupervised training data from which the machine learns, this question is becoming more virulent. The underlying algorithms may directly feed from human behaviour, thus in fact replicating both human virtues and flaws. Adapting, confirming and reinforcing imperfect human judgment may lead to discriminatory effects and raise ethical concerns. In a re/insurance context, such discriminatory bias can translate into defective modelling and prediction, in addition to causing reputational issues.

A particular challenge of algorithms is their explainability and thus auditability. While the accuracy of outputs may be tested empirically, the explainability of algorithmic workings remains limited. This "black box" problem of algorithms has spurred a whole new field of AI research, which seeks to enhance users' understanding of algorithmic processes and thus help build trust towards them.

With the advent of the "algorithmic economy", ethical debate and regulatory attention have picked up. One particular focus is the lack of – and potential need for – clear governance around the development and application of algorithms.

The re/insurance industry needs to cope with two types of pressure. One is to adapt in real time to the rapid digitalisation of the world, for example to the expected spread of autonomous vehicles.

The other is to be attentive to the risks that may be created if the speed of the digital transformation enlarges potential blind spots.

Swiss Re has covered important aspects of algorithmic decision-making in various publications. "Blame your robot" was the title of an emerging risk theme in the SONAR 2017 report. It was dedicated to the potential shifts in liability regimes caused by the advent of AI. The SONAR 2018 report (see page 33) highlights some of the challenges of algorithmic decision-making described above, under the heading "Algorithms are only human too – opaque, biased, misled".

Swiss Re Institute also supported IRGC in organising a multi-disciplinary workshop on the governance of decision-making algorithms.

irgc.epfl.ch/issues/projects-cybersecurity/the-governance-of-decision-making-algorithms/

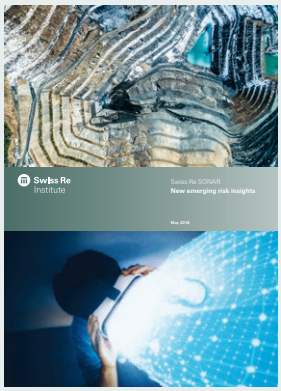
Our SONAR framework

SONAR ("systematic observation of notions associated with risk") is our Group-wide framework specifically designed to manage and communicate emerging risks. Firmly embedded in the Group's risk management organisation, SONAR allows us to identify, assess and report these risks in a timely manner and to factor them into our strategic business decisions.

The SONAR process involves several steps. The first is an interactive intranet platform which enables our employees to share and discuss risk notions based on developments in the re/insurance landscape, allowing for bottom-up identification and peer reviews. While many of the risk notions – or "early signals" – flagged on SONAR will never turn into emerging risks, others may well do so. However, as we cannot anticipate which signals will become emerging risks, we scan the horizon quite broadly before concentrating on those with the highest impact potential on the re/insurance business.

SWISS RE SONAR; NEW EMERGING RISK INSIGHTS

The Swiss Re SONAR report features emerging risk themes that have the potential to impact the re/insurance industry. These topics derive from our SONAR process and have been assessed by our emerging risk management experts in recent years.
www.swissre.com/institute/research/sonar/sonar2018-a-peek-into-future-risk.html



Our emerging risk specialists periodically cluster and further assess these risk notions for their potential impact on our business. Finally, in-depth investigations are carried out on selected topics.

You can learn more about one of these topics – algorithmic decision-making – in the case study on page 32. To share some of our key insights on these emerging risks with external audiences, we published the fifth edition of our comprehensive Swiss Re SONAR report in 2018 (see below).

Further activities on emerging risks identified in the past

The emerging risks we previously examined in more detail and featured in our Corporate Responsibility Reports since 2007 are:

2007: Electromagnetic fields

2008: Critical infrastructure

2009: Carbon nanotubes

2010: Smart grids

2011: Cyber attacks

2012: 3D printing

2013: New forms of mobility

2014: Electronic cigarettes

2015: The Internet of Things

2016: Human-induced earthquakes

2017: Antimicrobial resistance

Since we first identified these emerging risks, we have followed up on several of them in our core business and together with our stakeholders, eg "Critical infrastructure" and "Cyber attacks":

WEBSITE
You can read more about these activities at:
www.swissre.com/about-us/corporate-responsibility/risk-intelligence/emerging-risks/case-study-critical-infrastructure.html and
www.swissre.com/about-us/corporate-responsibility/risk-intelligence/emerging-risks/case-study-cyber-attacks.html

Strategic risk initiatives

Identifying and addressing emerging risks can be challenging. Their novelty and interconnectedness make it difficult to determine when a particular risk notion must be considered an emerging risk. Timing is of crucial importance. If measures to exclude a particular risk are taken too early, we may not be able to offer our clients insurance protection; if measures are taken too late, we may end up with increased loss potential. Given these challenges, we believe it is essential to foster risk dialogue with various partners. By sharing perceptions and assessments, all parties can gain a better understanding of potential emerging risks.

WEBSITE
You can read about our most important strategic initiatives concerning emerging risks at:
www.swissre.com/about-us/corporate-responsibility/risk-intelligence/emerging-risks/strategic-initiatives.html