Being a responsible citizen

To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society. Companies must benefit all of their stakeholders, including shareholders, employees, customers, and the communities in which they operate.

Larry Fink
CEO, BlackRock, in his letter to CEOs published in January 2018

2018 highlights

• Published and rolled out the Novartis Commitment to Patients and Caregivers
• Had an increase in enforcement cases, with more than 140 successful cases initiated or supported through a companywide strategy to combat falsified and counterfeit medicines
• Joined the UN Equal Pay International Coalition (EPIC)
• Became the first major pharmaceutical company to support the UN workplace standards protecting lesbian, gay, bisexual, transgender and intersex rights
• Ranked second in the Thomson Reuters Diversity & Inclusion Index, up from sixth in 2017
• Began the rollout of the Third-Party Risk Management program with the first country, Mexico
• Set new and ambitious environmental targets for 2030, including being carbon neutral by 2025, and plastic and water neutral by 2030

Key challenges

• The number of counterfeit incidents continues to increase, requiring stronger and more coordinated efforts across public and private sectors
• It will take several years to feel the impact of the culture change, which is currently being implemented
• The rollout of the Third-Party Risk Management program has taken longer than anticipated
• The biggest part (around 80%) of our environmental footprint is in the supply chain, making it a challenge to minimize impacts
Why is it important? Society’s expectations of companies have never been greater. Today companies are increasingly expected to serve a social purpose – playing an active role in helping shape the world in which we live – and to respond to broad societal challenges. To achieve long-term growth, it is necessary to not only deliver financial performance but also make a positive contribution to society.

Our approach

As research shows, companies that take a leadership role on societal issues are more likely to do the right thing for all their stakeholders – employees, shareholders, customers, and the communities in which they operate – and to build enduring trust with these stakeholders. Building trust with society requires doing business responsibly wherever we operate. This includes ensuring the safety and well-being of everyone who uses our medicines, supporting and caring for our associates worldwide, respecting human rights, managing risk in our supply chain, and minimizing our environmental impact.

Helping ensure patient health and safety

Throughout the lifecycle of our medicines, we work to ensure the best balance of benefit and risk, and to maximize the safety and therapeutic benefits for patients. We have a variety of systems and processes in place for a continuous and systematic review of the data collected for all products in our portfolio, including those on the market and those in development. We focus our patient health and safety activities in three key areas: pharmacovigilance, safety profile and quality of drugs; combating counterfeit medicines; and health education and prevention.

Boosting pharmacovigilance efforts and maintaining product quality

One way to measure the success of our Group Quality activities is through health authority inspections of our manufacturing facilities. Of the total 202 health authority inspections completed in 2018, all but three were deemed good or acceptable (98.5%). One inspection was conducted by the European Medicines Agency supervisory authority (BfArM) for patient safety in Basel, Switzerland, and we are working with regulators to address open issues related to how we collect and manage reports of adverse events in patients taking our medicines. A second was conducted by the US Food and Drug Administration (FDA) for clinical trial monitoring oversight at Novartis in East Hanover, New Jersey, US, and corrective actions are being taken to address procedures for allocation of placebo versus experimental treatment among trial participants. Thirdly, a manufacturing site inspection was conducted by the Russian Ministry of Industry and Trade in Torre Annunziata, Italy, addressing registration requirement for the Russian market. Corrective and preventative actions are under preparation and on track.

We also work to boost pharmacovigilance capabilities in low- and middle-

Patient health and safety performance indicators

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<tr>
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<tbody>
<tr>
<td>Novartis Group Health authority regulatory reporting (ICSRs)1 (%)</td>
<td>99.1</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Regulatory inspections without major findings (%)</td>
<td>98.5</td>
<td>99.1</td>
<td>98.1</td>
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</table>

1 ICSRs: individual case safety reports
2 Pharmacovigilance activities between the Innovative Medicines, Sandoz and Alcon Divisions have been integrated in 2017 under one single pharmacovigilance system, leading to one single health authority regulatory reporting metric as of January 1, 2018. Data reflects January to November 2018
income countries. For example, in Egypt, the team observed that there was a general lack of pharmacovigilance awareness among both patients and healthcare providers, linked to poor reporting of safety data. Novartis is working with both patient organizations and healthcare professionals in an effort to increase understanding of the importance of pharmacovigilance and to improve the timely reporting of safety data.

Pharmacovigilance training and awareness initiatives have also been introduced in Peru and Ecuador to help strengthen adverse event reporting and promote the overall importance of pharmacovigilance. The programs provide training to hospitals and local authorities, in areas including the reporting of adverse events.

Pharmacovigilance standards in East Africa are considered low by global standards, and there are limited educational opportunities that specifically focus on pharmacovigilance to improve health outcomes and help ensure patient safety. In 2015, Strathmore University in Nairobi, Kenya, partnered with Novartis to help develop its Institute for Health Care Management.

The institute specifically requested support to develop curricula in the areas of supply chain, health research, health financing and pharmacovigilance. Novartis leveraged its corporate volunteering program, using over 20 internal experts to address specific curriculum development needs on a voluntary basis. The feedback received from Strathmore University and course participants was highly positive, and in 2018, the university took ownership of the curriculum for integration into its own core programs.

COOMBATING FALSEFIED AND COUNTERFEIT MEDICINES

Falsified medicines (including counterfeit medicines) pose a significant threat to public health, as they often contain no active ingredients, or harmful ingredients that can lead to therapeutic failure or severe harm and even death. They can also contribute to the rise of antimicrobial resistance. For example, the WHO estimates that up to 270,000 people die in sub-Saharan Africa each year from falsified and substandard antimalarials alone. According to the International Federation of Pharmaceutical Manufacturers & Associations, anti-infectives, cardiovascular, central nervous system and oncology are four of the five most falsified therapeutic areas impacting all regions, particularly low-income countries. Falsified medicines are found on both offline and online illicit markets, and sometimes also breach the legitimate supply chain.

This is an issue Novartis takes extremely seriously, and we are using a multi-pronged, companywide strategy to help tackle pharmaceutical crime. We made significant progress across the board in 2018.

Governance

The anti-counterfeiting program is sponsored by the Executive Committee of Novartis (ECN), led by Global Security, and actively supported by key functions. In October 2018, we announced the creation of a new risk function called Novartis Business Assurance & Advisory, with the Head of the function reporting directly to the CEO. It will host the anti-counterfeiting program going forward (see page 16 of this report for additional information).

Intelligence

We collect and analyze suspected medicines for forensic characterization, and we have built a risk management database that helps us identify trends, high-risk areas and products to better prioritize and allocate resources. We have also significantly expanded our in-house forensic capabilities to authenticate suspicious medicines by procuring two additional authentication spectrometric toolkits (i.e., mobile laboratories) covering the Americas and Asia-Pacific in addition to Europe, the Middle East and Africa. This allows for a faster, non-invasive and more effective authentication process of suspected falsified medicines to aid local health authorities and law enforcement initiatives as well as relevant requests for support. Additionally, we have launched a cross-functional pilot project to procure a substantial number of user-friendly and spectrometric sensors, based on the...
latest technology available, to empower our regional clusters in key areas such as Africa and Southeast Asia with faster authentication means.

Prevention
We have enhanced our prevention strategy in three ways. We are strengthening our product security approach by extending, on a voluntary basis, the coverage of our in-house, technology-based overt/covert security features embedded on secondary packaging. We have broadened our global network of secondary packaging verifiers (PROVE) with more than 260 verifiers in over 80 countries who performed more than 2500 secondary packaging inspections of suspected falsified medicines in 2018. And we have engaged in regular market monitoring activities in high-risk countries, primarily in Africa and Asia. We have also designed and launched a global online market monitoring program using state-of-the-art technology to detect the sale of suspected falsified Novartis medicines through online pharmacies, social media and other commercial platforms.

Enforcement
We investigate all reported cases of falsified and counterfeit Novartis products – regardless of where they are made available – and we bring legal action, whenever possible, against those involved. The Pharmaceutical Security Institute reported a 7% increase in the number of counterfeit incidents in 2017 compared to 2016. This mirrors the very substantial increase in enforcement cases Novartis had in 2018, with more than 140 successful enforcement cases in 23 countries either initiated or supported, compared to 61 reported in 2017. We had notable success in disrupting illegal pharmaceutical manufacturing facilities in China and India, and disrupted import and wholesale activities in all other regions. We also actively contributed to large-scale operations led by international law enforcement agencies, such as the Interpol Pangea Operation XI, which took place in 116 countries and resulted in 859 arrests, 500 tons of falsified medicines seized, and 3671 rogue online pharmacies shut down.

Stakeholder engagement
Stakeholder engagement, beginning with awareness, is the cornerstone of our strategy. We started building a strong and large community of engaged Novartis associates united against pharmaceutical crime. We created and shared videos with all associates to present the program and the reality of pharmaceutical crime; launched a dedicated group on our internal social network for associates to stay up to date; and dedicated substantial resources to face-to-face training in countries. To further build capacity, we actively contributed to over 90 training and awareness initiatives, and reached out to more than 3800 Novartis associates and law enforcement and health authority officials in over 25 countries. Finally, in policy and advocacy, we worked in close collaboration with a large number of trade associations and governmental and nongovernmental organizations to build a strong public-private partnership globally and locally, and to increase the level of focus on combating pharmaceutical crime. We contributed to and endorsed the joint statements issued at the International Conference on Quality Medicines in Oxford, UK, and the Regional Conference on Combating Pharmaceutical Crime in Phnom Penh, Cambodia.

Despite all stakeholders’ best efforts to combat falsified and counterfeit medicines, which are paying off, the problem of pharmaceutical crime continues to grow and will require stronger and more effective joint and coordinated efforts from the public and private sectors to better protect patients’ safety.

WORKING WITH PATIENTS AND CAREGIVERS
In February 2018, we published our Commitment to Patients and Caregivers, which outlines what patients and caregivers can expect from Novartis. This commitment provides a framework for our efforts to help ensure that thinking and acting with the patient at the center is firmly embedded in the way we work every day. It has four overarching pillars: respecting and understanding the patient community perspective, expanding access to our medicines, conducting responsible clinical trials, and recognizing the importance of transparency.
Partnerships with various stakeholders, including the patient community, regulators, academia and healthcare professionals, are critical to advancing our thinking and improving patient engagement. In April, we joined a collaboration among 34 public and private partners, called PARADIGM (Patients Active in Research and Dialogues for an Improved Generation of Medicines). PARADIGM aims to bring together key stakeholders to develop a framework for sustainable patient engagement, and the vision of a system that connects those who develop medicines and those who use them.

In September, PARADIGM and another patient-focused consortium, PREFER (Patient Preferences in Benefit-Risk Assessments during the Drug Life Cycle), signed a memorandum of understanding to enhance the cooperation and collaboration between the two projects. PREFER is co-led by Novartis and Uppsala University in Sweden, and looks at how and when it is best to include patient preferences in decision-making during the medical product lifecycle. By working together, we believe we can leverage the work of both projects to avoid duplication of efforts and to maximize results to better help patients.

Further details about prevention and education activities conducted by Novartis Social Business and the Novartis Foundation can be found on pages 21 and 26 of this report.

Caring for our people
Our company’s culture is central to stimulating innovation, driving long-term value creation and maintaining our reputation. Our goal is to help ensure employees feel inspired, curious and unbossed. To better understand the state of our culture, in May we conducted an Organizational Culture Inventory*, a survey involving nearly 14,000 employees. The results showed that employees overwhelmingly enjoy coming to work and are proud of the company, but they also revealed concerns about competitive behaviors and the desire for a more collaborative style of working.

As a result, during 2018, we took four major steps to transform our culture. First, to help ensure that employees understand our aspirations and are inspired to take action, we created a group on our internal social network that brings together more than 120,000 members, with over 94,000 active users and more than 7.3 million messages shared.

Second, we are helping employees apply the new culture in their daily activities. Our leaders know that we expect them to inspire and empower others, display curiosity and be self-aware. These expectations are reflected in a new 360-degree assessment that forms the foundation for leadership development in the company, and are now embedded in our immersive development programs. We also use an online tool called Team Perspectives to help managers improve their leadership skills by receiving upward feedback from their teams.

Third, we are working to ensure that the company’s internal environment and processes encourage people to do their best work. For example, the process for reviewing employees’ performance has been improved with simpler, informal check-ins, putting more emphasis on conversation and reducing written documentation. We have also introduced a companywide business performance factor, which is one element used to determine employees’ annual bonuses. This replaced the 57 different performance factors based on individual groups or divisions.

Finally, we are taking steps to help employees sustain their energy and impact, both at work and in every other aspect of their lives. For many years, Novartis has offered programs to encourage a healthy lifestyle and flexibility at work. We are now taking an even more holistic, global approach to help associates realize their full potential, through the launch of a program called Energized for Life. Energized for Life aims to ignite everyone at Novartis to be their best self every day and everywhere. It consists of four core strategies to help everyone manage their
energy levels by making the right choices around mindset, nutrition, movement and recovery. In essence, Energized for Life encourages more flexible working practices and greater well-being through a range of programs, such as health and disease awareness.

In addition, we launched a program to support employees who are affected as a patient or caregiver by cancer, cardiovascular diseases or neurological diseases. It currently operates in Brazil, India, Italy, Switzerland and the US, and we plan to expand its reach in 2019.

**DIVERSITY AND INCLUSION**

Diversity and inclusion (D&I) has been a priority for Novartis over a number of years, with the ECN as well as members of the Human Resources Executive Leadership Team held accountable for D&I goals in their yearly objectives. We have maintained our focus on promoting D&I and were ranked second out of more than 7,000 companies in the 2018 Thomson Reuters D&I Index, up from sixth in 2017. Novartis remains committed to achieving gender balance in management within five years. Currently, four of the 19 senior positions reporting to the CEO are held by women. Two of them are ECN members, up from zero in 2017. Women make up 42% of management – similar to 2017. Of the top 350 leaders, 28% are women, also similar to 2017, and a slight increase in senior management is noted, up to 36% from 34% in 2017.

In September, Novartis joined the United Nations Equal Pay International Coalition (EPIC), with a pledge to continue its global practice of conducting regular gender pay equity analyses and remediating where appropriate. To help prevent pay differences, we have pledged to avoid using historic salary data when making job offers. We are also committed to pay transparency by telling employees how their pay compares to internal and external benchmarks.

To further increase the representation of women, in particular, in the management population, we are taking steps toward mitigating any biases that may exist in our staffing process. We began applying techniques to make our recruitment processes more objective and attractive to the right candidates, including training our recruiters specifically on unconscious bias management. One of our most important diversity goals is to increase the representation of women when hiring for senior positions, and there is evidence that a neutral tone in job postings, diverse interview panels and diverse candidate slates increase the chances of attracting and hiring more women.

Demonstrating our focus on inclusion, in 2018 Novartis became the first major pharmaceutical company to support the United Nations’ workplace standards protecting the rights of lesbian, gay, bisexual, transgender and intersex people. Novartis recognizes that it is important to be sensitive to different identities that do not necessarily fit into binary male or female sex categories.

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<tr>
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<tr>
<td>Management representation by gender (% female / % male)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Overall</td>
<td>42 / 58</td>
<td>41 / 59</td>
<td>40 / 60</td>
</tr>
<tr>
<td>Novartis Top Leaders</td>
<td>28 / 72</td>
<td>27 / 73</td>
<td>25 / 75</td>
</tr>
<tr>
<td>Senior management</td>
<td>36 / 64</td>
<td>34 / 66</td>
<td>32 / 68</td>
</tr>
<tr>
<td>Middle management</td>
<td>43 / 57</td>
<td>42 / 58</td>
<td>42 / 58</td>
</tr>
<tr>
<td>Gender representation of Board of Directors (% female / % male)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>25 / 75</td>
<td>23 / 77</td>
<td>25 / 75</td>
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1 Management defined by Global Job Level Architecture and Novartis Top Leaders
2 Novartis Top Leaders comprise the approximately 350 most senior managers at Novartis, including the Executive Committee of Novartis.
CORPORATE VOLUNTEERING
The Novartis corporate volunteering program operates a virtual platform that matches volunteers with volunteering opportunities. Co-sponsored by the Global Health & Corporate Responsibility and Human Resources teams, this online matching tool enables every Novartis associate to register a potential corporate responsibility project idea or sign up to become a corporate volunteer. In 2018, the program continued to grow, with nearly 700 associates registered to donate pro-bono skills and time, and around 180 new projects initiated. As in previous years, our largest global volunteering activity was our Community Partnership Day. In 2018, 23,900 associates from six continents and 58 countries participated, dedicating 191,200 hours to causes in their communities.

Further integrating human rights in our business
As a company that strives to be a responsible citizen, we are committed to conducting our business in a manner that respects the rights and dignity of all people. Therefore, we must avoid causing, contributing to or being linked to human rights violations, and promptly address any adverse human rights impacts we do identify in our own operations or in our supply chain.

The topic of human rights is high on the agenda at both the international and national levels, with governments worldwide expecting companies to undertake and disclose due diligence processes to help identify, assess and address human rights risks and impacts. A recent example of heightened international concern is the issue of modern slavery, including forced labor and human trafficking. Since 2017, we have been publishing on our website a modern slavery statement, setting out the steps we are taking to prevent modern slavery in our operations and supply chain, as required by the UK Modern Slavery Act (2015). Other countries, including Australia, France and Switzerland, have recently passed similar legislation or are in the process of outlining similar requirements. We aim to ensure that we can uncover any human rights abuses within the company and our supply chain, and proactively mitigate, remedy and report them as required.

In 2018, we started putting in place a team fully dedicated to human rights. This team is tasked with leading the development and implementation of our human rights strategy and due diligence program, including human rights impact assessments, awareness raising throughout the company, and development of the necessary internal capabilities to help meet our human rights commitments. The team will also help ensure that respect for human rights is embedded and integrated into all aspects of our business around the world.

To inform our human rights strategy and future due diligence program, we piloted three human rights assessments in Turkey, China and Malaysia (in addition to Egypt in November 2017). We have established that we have strong policies and solid processes to identify and manage potential human rights risks in our operations (e.g., comprehensive processes to try to ensure patient health and safety at all stages of the value chain; efficient workplace health and safety management systems; a living wage program; a functioning whistleblower system with a high level of awareness among associates; and a solid, responsible procurement organization). We have also identified these common risk areas that require follow-up action in 2019:

- Stakeholder engagement: More regular and broader consultation with external stakeholders is needed at the local level (from patient groups, local communities and health authorities to supply chain partners).
- Grievance mechanisms: We need to help ensure that formal grievance mechanisms and processes are in place for communities living close to our manufacturing operations.
- Third-party labor rights: In some of the markets we piloted, we need to address risks associated with our outsourced workforce.

Corrective action plans for the four pilot markets have been developed or are in the process of being developed.
Maintaining a responsible supply chain

As a global healthcare company, Novartis engages with an extensive network of third parties worldwide. With such a global reach, it is essential to help ensure our goods and services are sourced ethically, based on a robust and documented process.

Responsible procurement (RP) is the way we seek to achieve that. It encourages companies that we do business with to meet the standards of ethics, business integrity and environmental practice we expect. Buying responsibly protects our patients, our people, our business and our reputation. It is built into the way we work and is fully integrated into our daily procurement activities. RP covers five areas of potential ethical risk: labor rights, HSE (health, safety and environment), animal welfare, anti-bribery and data privacy. Responsible procurement is aimed at taking responsibility to safeguard and improve ethical standards among our suppliers, and using our expertise to help them find lasting solutions to complex issues.

In 2018, 364 suppliers were identified as posing an elevated risk. Of these, 92 have active follow-up actions, including more information requested, audits or on-site assessments. In 2018, we audited 48 suppliers, representing 52% of those identified as requiring follow-up actions.

We have also taken steps to address suppliers who did not adhere to Novartis labor standards. For example, we found cases of suppliers using contractual clauses to help retain employees. However, these clauses could be interpreted as forced labor. We took steps to work with these suppliers to remove these clauses and set up new human resources processes to help retain employees within their organization.

The Novartis Supplier Code sets out our expectations for suppliers. It is aligned with the Novartis Code of Conduct and is based on the United Nations Global Compact, the United Nations Guiding Principles on Business and Human Rights, and other international standards and accepted good practices, such as those of the International Labor Organization. Novartis is also a member of the Pharmaceutical Supply Chain Initiative and supports its principles for responsible supply chain management for ethics, labor, health and safety, environment and related management systems. These principles are incorporated into the Novartis Supplier Code.

Our Global Policy of Procurement of Goods and Services from Third-Party Suppliers describes our expectations when committing company resources to suppliers. It defines a competitive environment as one in which our suppliers and/or potential suppliers can compete independently, fairly and transparently for the goods or services we wish to acquire on the basis of price, quality, service and other criteria. The policy is supplemented with a global procurement standard operating procedure that is applicable for all divisions, countries and sites, including the processes for competitive bidding and supplier selection.

Additionally, Novartis introduced a No Purchase Order (PO) No Pay policy effective October 1, 2018. This means that Novartis is strictly enforcing the policy that a PO is required for all goods and services ordered from all our external suppliers. By doing this, we are working to ensure that all our purchases of goods and services have the appropriate management approval and are in full compliance with all applicable laws and Novartis policies.

Supply chain performance indicators

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<tr>
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<th>2018</th>
<th>2017</th>
<th>2016</th>
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<tbody>
<tr>
<td>Suppliers posing an elevated risk under responsible procurement</td>
<td>364</td>
<td>459</td>
<td>441</td>
</tr>
<tr>
<td>Suppliers with active follow-up</td>
<td>92</td>
<td>275</td>
<td>147</td>
</tr>
<tr>
<td>Suppliers audited</td>
<td>48</td>
<td>49</td>
<td>76</td>
</tr>
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</table>

1 Includes new suppliers and new products, services or sites from existing suppliers.
2 Follow-up includes more information requested, audits or on-site assessments.
Figures include data on labor rights, health, safety and environment, and animal welfare.
Our approach to responsible procurement has evolved over time, and the need for an end-to-end model, applicable across all divisions and geographies, has been identified.

Continuing our work to implement our new Third-Party Risk Management (TPRM) program, we rolled it out in the first country, Mexico, in October 2018. We expect to build upon the launch in Mexico with a phased rollout worldwide in 2019, planned to begin in the Americas (including the US), followed by Asia-Pacific and Europe later in the year. TPRM creates an integrated approach using a single end-to-end process underpinned by one technology solution. TPRM provides a more consistent and rigorous approach to the management of third-party risks, a simplified process and stronger governance, as well as improved transparency. We believe that TPRM will enable the organization to more effectively manage third-party risks by focusing risk management efforts on areas where the risk is identified to be the highest.

As the program is implemented across geographies, we plan to incorporate all of our suppliers into this program over time. Using this operating model, we will be able to continuously scan for new risks, proactively take corrective measures where needed, and deliver continuous improvement in conjunction with our suppliers. It will also help us to more transparently measure and communicate the impact to the outside world.

Enhancing our environmental sustainability
Building trust with society also includes working to ensure that we minimize any negative impact we may have on the environment. We have made significant progress; while Novartis Group sales have more than doubled in the past 15 years, our consumption of energy and water has increased at a much slower pace, and greenhouse gas emissions have been reduced. However, we believe we need to do more, so in mid-2018, the ECN approved a set of more ambitious environmental targets, which aim for carbon neutrality by 2025, and plastic and water neutrality by 2030.

With regard to our carbon emissions and impact on the climate, our ambition is to make the company both energy and climate resilient. Concretely, this means first becoming carbon neutral in our own operations (Scope 1 and 2) by 2025, and then reducing our carbon footprint, including that of our supply chain (Scope 1, 2 and 3) by half versus 2016 levels by 2030.

The Responsible Procurement (RP) risk indicator tool
The RP risk indicator tool uses the category risk, country risk and contract value in combination to indicate a potential risk around the five areas of elevated ethical risk in the supply chain: labor rights, HSE general, HSE specific, animal welfare and anti-bribery.

**THE RP RISK INDICATOR TOOL**

<table>
<thead>
<tr>
<th>Risk indication trigger</th>
<th>Labor rights</th>
<th>HSE general</th>
<th>HSE specific</th>
<th>Animal welfare</th>
<th>Anti-bribery</th>
</tr>
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<tbody>
<tr>
<td>Applies to</td>
<td>All third-party suppliers</td>
<td>All third-party suppliers</td>
<td>Contract manufacturers, waste contractors, chemical producers, facilities or construction contractors working on our own sites</td>
<td>Third-party suppliers handling animals</td>
<td>Third-party suppliers acting on behalf of Novartis</td>
</tr>
<tr>
<td>Assessment and due diligence</td>
<td>Depending on the risk type, policies and/or guidelines and related standards set forth the due diligence process for suppliers using a variety of tools, including desktop reviews, supplier questionnaires, assessment visits and audits.</td>
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<tr>
<td>Collaboration/engagement</td>
<td>Focuses on implementing improvement plans (developed after audits or other assessments) and other targeted initiatives to help suppliers improve their standards and ethical business practices</td>
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<tr>
<td>Case review</td>
<td>If noncompliance is found through assessment and due diligence, the matter is escalated to a case review.</td>
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In August, Novartis announced a virtual power purchase agreement in the US to reduce greenhouse gas emissions. In collaboration with a renewable energy company, Invenergy, Novartis aims to add 100 megawatts of wind power to the electrical grid. The electricity will be generated from Invenergy’s Santa Rita East wind farm in Texas and is expected to be online in 2019. The 12-year agreement is expected to reduce our greenhouse gas emissions by more than 220,000 metric tons per year through the issuance of renewable energy attributes. This equates to removing more than 48,000 passenger vehicles from the road on an annual basis. Novartis will receive renewable energy credits for all of the electricity generated as a result of the project, which can be used to offset over 70% of the Novartis carbon footprint from purchased electricity in the US market.

Climate change puts our business operations – as well as our supply chain – at risk, and we need to be prepared for eventual changes that may jeopardize how we are able to discover, develop or deliver medicines in the future. In the US, we have been working with the Massachusetts Institute of Technology (MIT) on a project that uses computer simulations to analyze climate risks for over 60 of our most important locations worldwide. From this, we can consider appropriate actions and community collaboration on a case-by-case basis. One example of local action is in Cambridge, Massachusetts, in the US – one of our key R&D locations. There, Novartis is a founding member of the Cambridge Compact for a Sustainable Future, a partnership between the city government, industry, academia and nonprofits focused on developing more sustainable business practices and a more resilient community in Cambridge. In 2018, we conducted a deep-dive assessment of a range of climate-related business risks in conjunction with MIT and the City of Cambridge. The study examined strategies that could be used to increase resilience to heat stress, flooding due to sea level rise, storm surge and increased precipitation locally. We helped design and facilitate a tabletop exercise at Harvard University that connected local stakeholders in a collaborative climate resilience effort, and we shared our newly modeled flooding data with the City of Cambridge for maximum community benefit.

We are aiming to minimize waste and increase material efficiency, with an ultimate goal of becoming plastic neutral. By 2025, we have committed to eliminate polyvinyl chloride (PVC) in

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<tr>
<th>Environmental performance indicators¹</th>
<th>2018</th>
<th>2017</th>
<th>2016</th>
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<tbody>
<tr>
<td>Energy use (million gigajoules), on site and purchased</td>
<td>15.98</td>
<td>16.24</td>
<td>16.39</td>
</tr>
<tr>
<td>Greenhouse gas (GHG) emissions, Scope 1, combustion and process (1 000 tCO₂e)</td>
<td>401.28</td>
<td>392.85</td>
<td>399.67</td>
</tr>
<tr>
<td>GHG emissions, Scope 1, vehicles (1 000 tCO₂e)</td>
<td>145.51</td>
<td>142.57</td>
<td>135.57</td>
</tr>
<tr>
<td>GHG emissions, Scope 2, purchased energy (1 000 tCO₂e)</td>
<td>576.46</td>
<td>714.97</td>
<td>785.13</td>
</tr>
<tr>
<td>GHG emissions, Scope 3, business travel (1 000 tCO₂e)</td>
<td>425.70</td>
<td>239.16</td>
<td>148.14</td>
</tr>
<tr>
<td>Total GHG emissions, Scope 1 and Scope 2 (1 000 tCO₂e)²</td>
<td>1 123.24</td>
<td>1 250.39</td>
<td>1 320.36</td>
</tr>
<tr>
<td>GHG offsets (1 000 tCO₂e)</td>
<td>73.40</td>
<td>84.70</td>
<td>65.70</td>
</tr>
<tr>
<td>GHG emissions (Scope 1 and Scope 2) per sales (tCO₂e per million USD)</td>
<td>21.81</td>
<td>25.46</td>
<td>27.21</td>
</tr>
<tr>
<td>GHG emissions (Scope 1 and Scope 2) per associate (tCO₂e)</td>
<td>9.25</td>
<td>10.28</td>
<td>11.15</td>
</tr>
<tr>
<td>Halogenated volatile organic compounds (VOCs) (t)</td>
<td>75.17</td>
<td>75.58</td>
<td>43.59</td>
</tr>
<tr>
<td>Non-halogenated VOCs (t)</td>
<td>588.42</td>
<td>513.40</td>
<td>479.23</td>
</tr>
<tr>
<td>Non-hazardous waste recycled (%)</td>
<td>77.00</td>
<td>77.00</td>
<td>78.70</td>
</tr>
<tr>
<td>Hazardous waste recycled (%)</td>
<td>62.30</td>
<td>60.50</td>
<td>52.00</td>
</tr>
<tr>
<td>Non-hazardous waste not recycled (1 000 t)³</td>
<td>19.29</td>
<td>20.12</td>
<td>18.11</td>
</tr>
<tr>
<td>Hazardous waste not recycled (1 000 t)³</td>
<td>45.87</td>
<td>48.26</td>
<td>58.77</td>
</tr>
<tr>
<td>Water use (million m³)⁴</td>
<td>72.44</td>
<td>75.77</td>
<td>79.21</td>
</tr>
<tr>
<td>Water discharge (million m³)⁴</td>
<td>15.42</td>
<td>15.27</td>
<td>16.01</td>
</tr>
</tbody>
</table>

¹ The 2018 environmental sustainability data published in this report are actual data for the period from January through September, and best estimates for the period from October through December, which will be updated with actual data in the first quarter of 2019. Significant deviations will be reported on our website and restated in next year’s report.

² Scope 1: combustion and process, and vehicles; Scope 2: purchased energy

³ Reduction target is based on hazardous and non-hazardous waste intensity per tons produced.

⁴ Sum of contact water and non-contact (cooling) water use

⁵ Water discharged via treatment and water lost
packaging (i.e., secondary and tertiary packaging) and to reduce waste disposal by half versus 2016 levels. By 2030, we are aiming to be completely plastic neutral, with all new products meeting sustainable design principles.

We are working to achieve water sustainability, helping ensure sufficient and safe water by being a water steward wherever we operate. Our 2025 goal is to reduce water consumption in our operations by half versus 2016, with no water quality impacts from manufacturing effluents. By 2030, we aim to be water neutral in all areas of our operations, while actively enhancing water quality wherever we operate.

We started our journey in 2015 with the water and micropollutant targets for our own manufacturing sites and then expanded this target to our key suppliers. This approach is aligned with our commitment to combat the global threat of antimicrobial resistance (AMR Industry Roadmap), and our engagement in the Pharmaceutical Supply Chain Initiative. We are also working toward closing the data gap on the environmental impacts of our products by participating in the IMI-iPiE project and voluntary laboratory testing of generic products.

In drug development, we try to reduce our overall footprint by using good science in chemistry. The current focus is on continuous manufacturing, biocatalysis and surfactant technology, which support our approach to produce products under the premise of green chemistry.

We want to be a catalyst for positive change everywhere we work – driving environmental sustainability through our own operations, and empowering and inspiring partners across the world to demonstrate that businesses can be some of the most innovative, productive and responsible stewards of the environment. To truly have a positive environmental impact, we cannot limit our efforts to activities that take place within Novartis, since our supply chain makes up 80% of our overall environmental footprint. We therefore require our third-party suppliers to meet our standards for climate, water and waste management. These standards are embedded in our Novartis Supplier Code, and we will actively measure and hold our partners accountable for meeting these standards, and work with them to make improvements where needed.

Beyond this, we are also beginning to look for ways to address environmental concerns with a direct impact on global health, especially in the developing world. For example, in Rwanda, in partnership with the UN Development Mechanism, Novartis will help provide cleaner burning cook stoves and water filters in 2019. These will be distributed in rural parts of the country, helping to reduce particulate matter in the air due to cook stoves, while also helping to reduce the incidence of diarrhea. Novartis is sponsoring 1,000 stoves impacting approximately 5,000 people.

**NEW ENVIRONMENTAL TARGETS**

<table>
<thead>
<tr>
<th>Target</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon neutral in own operations</td>
<td>By 2025</td>
</tr>
<tr>
<td>Water neutral in all areas</td>
<td>By 2030</td>
</tr>
<tr>
<td>Plastic neutral by 2030</td>
<td></td>
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</tbody>
</table>

Photo: Milena Remić meets with colleagues in her office in Ljubljana, Slovenia. From her office, she advises and encourages patients on a daily basis.