2020 was an exceptional year for everyone in which the main focus was on fighting the COVID-19 pandemic. Despite these difficult circumstances, we succeeded in raising awareness about sustainability, together with the employees and students of Erasmus MC.

Whereas the previous Sustainability Report, with the exception of demolition and construction activities, mainly focused on planning and commitments based on achieving the ambitions set out in Strategy23, Erasmus MC is now clearly moving towards a more sustainable future. Important cooperation agreements and statements were made in the field of mobility and nutrition. We drew up our own specific Green Deal on Sustainable Healthcare 2.0, based on the national Green Deal on the Sustainable Healthcare 2.0 framework.

The Sustainability Report 2020 gives a comprehensive overview of sustainable initiatives that we put in place in the year under review. The United Nations Sustainable Development Goals (UNSDGs) are becoming more and more embedded in various areas. Erasmus MC is contributing to achieving these global ambitions.

It was at times necessary to strike a balance between the restrictions imposed as a result of the COVID-19 pandemic and compliance with laws and regulations with regard to the fixed reporting elements. This meant that training sessions, explanations, and inspections were mostly carried out remotely.

In the end, a good deal of creativity helped us give a reliable overall picture of the sustainable developments and the environmental aspects. Where applicable, we have clearly indicated that the results were affected by the exceptional situation in the year under review.

Chairman of the Executive Board Erasmus MC
Prof. dr. E.J. Kuipers

Dean and vice-chair Executive Board
Prof. dr. J.P.T.M. van Leeuwen

Member of the Executive Board
Dr. J.G. Boonstra

Member of the Executive Board
Dr. P.A.M. Boomkamp

Disclaimer: photos on which social distancing is not observed were taken before the COVID-19 crisis.
1 STRATEGY23 SUSTAINABILITY – ‘A SUSTAINABLE ERASMUS MC’

1.1 Good health and well-being SDG 3
1.2 Quality education SDG 4
1.3 Reduced inequalities SDG 10
1.4 Responsible consumption and production SDG 12
1.5 Climate action SDG 13

2 ENVIRONMENTAL MANAGEMENT (SYSTEM)

2.1 Internal and external inspections and self-assessment
2.2 Education, information, and training
2.3 Annual reports and routine reporting
2.4 Complaints and environmental incidents
2.5 External contacts

A ENVIRONMENTAL ASPECTS

A1 Energy consumption
A1.1 Primary energy consumption
A1.2 Electricity consumption
A1.3 Natural gas consumption
A1.4 District heating
A2 Drinking water consumption
A3 Waste water
A4 Waste materials
A4.1 Non-hazardous waste
A4.2 Hazardous waste
A5 Helicopter movements

B ACTIVITIES WITH GENETICALLY MODIFIED ORGANISMS (GMOS)

B1 General
B2 Records of contained use and employees
B3 Environmental Safety Officer - Gene Therapy
B4 Contained areas and GMO waste
B5 Incidents, accidents, and calamities
B6 Education, instruction, and training
B7 Implementation Quality Management System

C PUBLICATION DETAILS
SUMMARY

The ‘A Sustainable Erasmus MC’ project coordinates the sustainable transition of Erasmus MC. The task force of 12 experts used 2020 to introduce our employees to the United Nation Sustainable Development Goals (SDGs). Five specific SDGs have been deliberately selected for prioritization in the period ahead.

Topics such as circularity, participatory legislation, diversity, and inclusiveness have now been given a clear status. Progress has also been made in the area of education and research. Agreements have been made to include sustainability in the new curriculum, and various regional population studies are being carried out in cooperation with the municipality of Rotterdam. Incidentally, this municipal collaboration goes further; developments and results have been achieved in the areas of sustainable construction, the healthy environment, and mobility.

In 2020, Erasmus MC’s carbon footprint was measured for the first time. This will serve as the basis for the emission reductions required by 2030. Moreover, we specifically emphasized Sustainability Day (10 October) by organizing a comprehensive program that week.

We started our efforts to make sustainability a part of Erasmus MC in 2019. From there, we started working on the development of Green Teams in 2020. These teams are an important driving force for awareness and creative inspiration to make Erasmus MC even more sustainable. We also worked hard on internal and external collaboration regionally (municipality of Rotterdam, SRZ (Rotterdam Hospitals Foundation), Erasmus University Rotterdam, Delft University of Technology), nationally (NFU, Ministry of Health, Welfare and Sport (VWS), Environmental Platform Care Sector (MPZ), CSR Netherlands) and internationally (ECHO - European Children’s Hospitals Organization, HCHW – Health Care Without Harm, EUHA - European University Hospital Alliance). Furthermore, we took on the organization of ‘Launch of the 2020 Lancet Countdown Report on Health and Climate Change’.

In addition to the path that is being defined for the reduction of carbon emissions, circularity has been given more priority. We had already taken an important step in making our construction activities more sustainable, and we are now paying specific attention to sustainable and responsible procurement, with deliberate emphasis on the transition from linear to circular operational systems. Circularity is increasingly seen as the premier means to achieve sustainability. The Green Team of the Intensive Care Unit has started a study on material flows, which should result in recommendations for innovation strategies and conscious material choices. This study can serve as a spin-off for multiple material flow and/or life cycle analyses.

Progress was also made in the area of energy savings by taking various measures such as replacing conventional lighting with LEDs and making more efficient use of workstations.

A new invitation to tender has been issued for waste collection, specifically emphasizing aspects such as better separation of waste and recycling of the resulting streams. In the future this should lead to better management of the waste streams and another step towards circularity.

1 The Netherlands Federation of University Medical Centers (NFU).
‘A Sustainable Erasmus MC’

Erasmus MC endorses the sustainable development goals of the United Nations, the UNSDGs. As a large employer and university medical center, we take our responsibility seriously in our response to the social call for sustainability and a circular economy. These are the two main Strategy23 ambitions in which the ‘A Sustainable Erasmus MC’ project has chosen to give five SDGs a more prominent role in the coming years.

The project contributes to a healthy society, a cleaner environment, and better climate, which is clearly expressed in SDG 3 (good health and well-being) and SDG 13 (climate action). In addition, it stands for sustainable healthcare and equal opportunities and development options that are reflected in SDG 3, SDG 4 (quality education), and SDG 10 (reduced inequalities). Finally, the project aims for circular operational systems; SDG 12 (responsible production and consumption).

It should be emphasized that the task force does this together with and for all staff and students. This bottom-up approach serves as the basis for achieving the goals, where the direction is top-down.

This Section gives some noteworthy examples to explain the developments per SDG.
ERASMUS MC SUSTAINABLE GOALS

Contributes to:
- a healthy society
- a cleaner environment and better climate

Stands for:
- sustainable healthcare
- equal opportunities and development options

Aims for:
- circular operational systems

We do this with and for all staff and students

People

Good health and well-being
- We do this by focusing on a healthy start in life and further life course, on promoting a healthy lifestyle, and on understanding diseases.

Quality education SDG 4
- As a provider of education and training programs, we do this by providing equal opportunities and development options for everyone, by giving public lectures, and by providing knowledge and skills on sustainable developments, sustainable lifestyles, human rights, and gender equality.

Reduced inequalities
- We do this by implementing the principles of inclusiveness and diversity in all layers of our organization. These principles serve as the basis for recruitment and selection policies, appointments, and training and education programs. We strive to provide a pleasant environment that is both physically and socially safe for our patients, staff, volunteers, and students.

Prosperity

Responsible consumption and production
- We do this by focusing on people’s well-being and preserving nature (i.e. New Economy). We are committed to maximizing the reusability of products and raw materials and minimizing value destruction.

Climate action
- We do this by achieving a reduction in carbon emissions of at least 49% by 2030. To this end, we participate in regional, national, and international bodies.

Planet
GOOD HEALTH AND WELL-BEING SDG 3

SDG 3 is about health and well-being for everyone, young and old. For Erasmus MC, this goal means that we particularly focus on access to healthcare, promoting good health, education, combating infectious diseases, mother and child, and the reduction of diseases caused by pollution.

With regard to the promotion of good health and well-being, Erasmus MC has been active in various fields, both internally at Erasmus MC and externally. This includes such aspects as lifestyle, healthy food, a smoke-free Erasmus MC, and a healthy and safe working environment, but also mobility and participation in local and regional developments. In 2020, we agreed in the Green Deal on Sustainable Healthcare 2.0 that we would support the 010 Local Prevention Agreement together with the municipality of Rotterdam. By merging the research activities of Erasmus MC, Delft University of Technology, and Erasmus University, we are creating a sustainable, resilient, and healthy city. In this Section we expand on some of the initiatives.

Development of Your World

The Your World mobile app was developed in 2020. This app facilitates behavioral change in the field of personal and climate sustainability. The app’s primary goal is to promote the long-term employability of employees while they reduce their ecological footprint at the same time. Your World is an innovative app developed by Dr. Laura de Graaff (Internist for Hereditary and Congenital Diseases) at the department of Internal Medicine, together with the start-up company ‘Sustainable Me’. Your World was created in collaboration with Dr. Gerdien de Vries (climate psychologist) and Dr. Rens Kortmann (university lecturer of Gaming and Simulation), who both work at Delft University of Technology. Your World is an excellent example of the synergy that the collaboration between Delft University of Technology and Erasmus MC can generate.

Your World fits in seamlessly with the Strategy23 motto ‘Technology and Dedication’. The dashboard function of Your World enables the resilience of employees to be measured at group level. In 2020, the parameters to be displayed in the dashboards were determined and allowances were made for the results of the culture barometer. Your World can accommodate virtually all existing and new sustainability initiatives within and outside Erasmus MC. Your World primarily focuses on ‘taking care of the employee’, which is why employees will embrace the sustainability initiatives more readily and will not experience this as ‘just another obligation’.

The first version of the app was built in 2020 in consultation with the test group of PhD students, nursing staff, and physicians. A pilot will be conducted in 2021, which will provide useful information for the broader rollout of the app.
Erasmus MC: forefront hospital

The goal set by the National Prevention Agreement (NPA) is that 50% of Dutch hospitals are to have a healthy food offering for patients, visitors, and staff by 2025, rising to 100% by 2030. However, on Wednesday 2 December 2020, Erasmus MC signed a letter of intent for an accelerated transition to a healthy food offering for patients, visitors, and employees. By doing so, Erasmus MC intends to facilitate all parties that offer food within the hospital, including caterers, medics, paramedics, and facility management service providers, in a sustainable way to jointly make the food offering as healthy as possible.

By signing onto these goals, Erasmus MC now participates in ‘At the Forefront of a Healthy 2022’ (Voorhoede Gezond 2022), which is part of the ‘You can taste good care’ (Goede Zorg proef je) project, led by the Alliance for Nutrition in Healthcare. As a national example, the forefront hospitals want to be an inspiration and are committed to achieving the goals by 2022. The underlying principle is that good nutrition is part of good care, helps patients recover faster, and that it helps achieve and maintain a healthy lifestyle for both visitors and staff.

Focus areas of the ‘You can taste good care’ project include ensuring that more than 80% of the product range for patients, visitors, and employees is healthy and that making a healthy choice is facilitated by the appealing and eye-catching presentation of healthy products. Furthermore, attention will be devoted to food waste and waste reduction, which are important goals of the ‘A sustainable Erasmus MC’ task force. In short, this is a win-win situation in the pursuit of both health and sustainability.

Smoke-free zone results in fewer smokers

The area in front of Erasmus MC has been smoke-free for over a year now. This meant that Rotterdam was one of the first municipalities in the Netherlands to have a smoke-free zone in a public space. All organizations located in the area adjacent to Erasmus MC and Rotterdam University of Applied Sciences joined forces to actively contribute to a Smoke-Free Generation.

One year on, the pilot has been completed and the results are in: the zone has contributed to a reduction in smoking in the entire area. The number of smokers within the zone has decreased by 45%, as shown by research conducted by Erasmus MC. The decrease in the number of smokers was most visible on the Erasmus MC grounds (48%). The downward trend on the school grounds was 38%. Especially employees (-63%) and patients (-70%) smoked less in the areas mentioned after the introduction of the zone, followed by pupils/students of the University of Applied Sciences and preparatory high school (-45%).

Although the number of smokers just outside the boundary of the smoke-free zone increased, this increase was much smaller than the decrease in the number of smokers in the smoke-free zone. An average of 432 more smokers per day were found outside the zone compared with an average of 1857 fewer smokers per day inside the zone. This indicates that smoking has decreased in the entire area around the institutions.

Senior researcher and pediatrician Jasper Been is pleased with the results: “It is of course fantastic to see that the number of people smoking is decreasing because of the zone. We now need to look at what we can improve together to achieve that Smoke-Free Generation.” Smoking is not prohibited in the smoke-free zone. However, visitors to the zone are asked to help keep the area smoke-free. Lines, tiles, banners, and signs are used to indicate
where it is preferable not to smoke. In the first weeks, monitors actively approached smokers and requested that they refrain from smoking.

Research by medical students has shown that the vast majority of smokers responded positively when approached. Three-quarters of the smokers then observed the policy (extinguished their cigarette or continued smoking outside the zone). Additional research by the municipality of Rotterdam also showed that many tobacco users consider it perfectly acceptable not to smoke in the vicinity of a hospital/educational institution.

The results are promising and a step in the right direction, says alderman Sven de Langen: “Smoking still causes the greatest burden of disease and mortality. Rotterdam is therefore striving to reduce the number of smokers in Rotterdam and to achieve a Smoke-Free Generation”.

**Top-level sporting events for a healthier Rotterdam**
The city of Rotterdam has a rich history of hosting sporting events. Since 2010, Rotterdam has been using side activities at these sporting events to encourage sports among the city’s population. But has this resulted in getting more people to exercise? A study on this topic was conducted by looking at ten international top-level sporting events in Rotterdam. The level of sports participation among Rotterdam adults before the event was compared to the level of sports participation after the event. Three of the ten events showed an increase in the level of sports participation one year after the event, while one event showed a decrease in participation. The number of people in Rotterdam cycling recreationally after the Grand Depart of the Tour de France in 2010 was the only increase that was still evident five years after the event. The increase in the level of sports participation through side activities only occurred after 2010, the year in which promoting sports participation became an explicit goal in municipal policy.

The researchers of CEPHIR, a partnership of the department of Public Health and the Public Health Services in Rotterdam and the surrounding region, thus showed that a city with a clear ambition to promote sports participation by organizing top-level sporting events can have an effect on sports participation.

All findings were compiled and published in 2020. In summary, it can be concluded that there is a clear link between top-level sporting events and healthy behavior. This is one way in which we are using research to contribute to better health in Rotterdam.
QUALITY EDUCATION: SDG 4

SDG 4 is about ‘ensuring equal access to high-quality education and promoting lifelong learning opportunities for all’. Erasmus MC believes it is important that everyone is entitled to quality education. We are committed to sharing our acquired scientific knowledge both internally and publicly as much as possible.

In addition to teaching future physicians the knowledge and skills they need, Erasmus MC devoted a great deal of energy in 2020 to emphasizing the theme of sustainability. This resulted in proposals for adjustments to various curricula, including that of ErasmusArts 2030 (Bachelor’s and Master’s degrees in Medicine). Sustainable development, sustainable lifestyles, human rights and gender equality, diversity and inclusiveness will certainly be included in this curriculum.

The new ErasmusArts 2030 curriculum
Major steps were taken to integrate sustainability into teaching programs in 2020. In the new ErasmusArts 2030 curriculum (intended start: September 2022) there will be room for four so-called profiles in which students can develop their skills in certain areas: A. Healthcare Innovation (focuses on scientific research), B. Healthcare Technology (focuses on technological developments), C. Sustainable Public Health & Healthcare, and D. Healthcare Vision (focuses on policy and management in healthcare). The Sustainable Public Health & Healthcare profile addresses the question: ‘how can prevention and care be improved in a sustainable way?’ ‘Sustainable’ is a broad concept in this context, ranging from climate policy to protecting the health
of the global population to making operating rooms more sustainable. The students collaborate with students from other Erasmus University Rotterdam faculties and/or Delft University of Technology and various other parties in different sustainability projects. These can range from projects aimed at the best possible and person-centered care for patients with multiple chronic conditions, to municipal projects aimed at improving the health skills of the general public.

Healthy population and environment
The partnership between the departments of Public Health and General Practice has ensured that students doing their internships in these fields can conduct a scan of a neighborhood in the region. This is an extremely instructive course giving insight into the problems, facilities, and opportunities for better health. The research is conducted through observations, interviews and/or desk research including socio-demographic data of a neighborhood. During the extramural internships for family medicine and public medicine, the students learn to take a broader view that looks beyond the patient and the disease. By studying the neighborhood, they also experience that there are group problems that often cannot be solved individually. ‘If the air quality in the Feijenoord district does not improve, then care for COPD patients will continue to take place on an ad-hoc basis.’ The research has led to interesting discussions with the municipality of Rotterdam (e.g. environmental zones for diesel cars) and with patients who enjoy talking about their experiences in the district. The students also learn how important it is to include the patient’s context when looking at diseases, treatment, and prevention.

The role of nutrition included in the curriculum
A healthy diet and lifestyle play an important role in both the prevention and treatment of diseases and in promoting sustainable public health. Physicians can play an important role in identifying issues related to lifestyle and nutrition, in advising and motivating patients to seek effective help, and in referring them to appropriate healthcare providers. Recent polls show that over three-quarters of physicians regularly receive questions about nutrition and that 95% of the Dutch population sees the physician as the most reliable source of information about nutrition. In stark contrast, only a few percent of physicians consider themselves competent to do so.

The working group on nutrition and lifestyle in medical education was established in 2015. This is a partnership of physicians, nutritional scientists, dieticians, and Erasmus MC students. In recent years, new teaching programs have been developed and rolled out for undergraduate education and for family medicine internships. These programs have been very well received and evaluated by students, although they did indicate that more is possible. In 2020, the working group put great effort into the further development of a nutrition and lifestyle curriculum that could be a common thread throughout the program. Consistency was sought with the development of the ErasmusArts 2030 ‘Sustainable Public Health & Healthcare’ profile and a partnership with the Alliance for Nutrition in Healthcare was formalized. Funding for developing this teaching program is being sought from national initiatives.

1 Cognitive and social skills that are required to obtain, understand, and apply information to promote or maintain good health.
SDG 10 is about reducing inequality within and between countries. Erasmus MC initially adapted this objective to our own organization. We took various initiatives in the field of diversity and inclusiveness. In addition, we continued creating and preserving jobs, a process that had already been started in accordance with the Participation Act.

**Participation Act**

Erasmus MC aims to be an inclusive organization that is a true reflection of society. We do this by creating a work culture worthy of Erasmus MC and by implementing the Participation Act (Job Agreement Act). Erasmus MC will focus on the quality of work and long-term job security by, among other things, focusing on the development of employees and offering standard employment contracts.

A total of 109 of these jobs were created in 2020, and 10 enthusiastic colleagues were trained as line managers\(^2\) through the HARRIE training course. This training course is given by the youth wing of the CNV trade union and provides tools for guiding a colleague with a reduced ability to work. The result was subject to the challenges posed by the COVID-19 pandemic. This led to pressure on efficiency targets and staff and also affected the deployment and availability of candidates with a work disability. This is why Erasmus MC’s focus was mainly on retaining existing jobs. The various departments made great efforts in this respect, partly by providing good supervision and additional social support.

\(^2\) By comparison: the number of jobs created in 2019 was 92 and 15 people took part in the HARRIE training course.
To help manage the uncertainties of the situation, a supplementary program was provided together with the job coaches. The program provided additional coaching and e-learning to cope with, for example, the changes in the range of tasks, work-life balance, along with the skills needed to work remotely. Erasmus MC will face a major challenge in 2021. We will deal with this by focusing on activities that yield a Social Return, by creating jobs for a broader group of people with an occupational disability, and by continuing to invest in development and mobility to foster long-term employment.

**Diversity and inclusiveness**

The ‘Erasmus MC diversity and inclusiveness (D&I) scenario study’ was completed in 2020. The Executive Board assigned this exploratory study to the Human Resources section of Support Services. The objective was to structure operational systems at Erasmus MC in such a way that D&I is not an isolated matter, but that the Erasmus MC processes for students, staff, and patients are all geared toward promoting D&I. Erasmus MC is represented by a diversity officer on behalf of the Faculty at D&I Erasmus University Rotterdam meetings. All Erasmus University Rotterdam developments are shared by the diversity officer in the TIR (Talent Innovation Council).

A D&I recommendation was given with regard to the design of a quiet room (to be developed and used as a reflection space) in the hospital, the use of the current quiet room in Sophia Children’s Hospital, and the Faculty’s renovation plans. The topic of D&I was discussed during a Strategy23 momentum session, as part of the PhD students target group. The results of this meeting will be implemented in 2021 by organizing a buddy track and network structure. Furthermore, those carrying out the study initiated a project for colleagues who felt somewhat unconnected due to the COVID-19 pandemic to bring them into contact with the right people. Within the educational domain, steps are being taken by a group of enthusiastic lecturers and educationalists as part of the HOKa (Higher Education Quality Agreements) project (Diversity and Inclusiveness for ErasmusArts) to teach a new generation of students the relevance and importance of D&I in terms of knowledge, skills, and attitudes. Several initiatives were taken to this end. Firstly, a D&I training course was developed for our lecturers to instill in them the pertinence of D&I, but also to provide them with specific tools to make their lectures more inclusive. Moreover, student initiatives were supported, including ‘the introduction during the first day of classes’ and the ‘eating with a physician’, which were both organized by DISCO (Diversity and Inclusivity Student Commission). Finally, explicit and implicit education is being developed on the D&I theme for undergraduate medical students. The following was selected as the overarching objective: ‘ErasmusArts reflects on diversity and inclusiveness in healthcare issues, so that it can deal with human diversity in healthcare in a respectful and professional manner and propagate the importance of inclusive healthcare’.

These education and training programs are mostly provided on a small-scale and motivational basis. For 2021, we are working hard to implement all these initiatives within the organization and hope to be able to use a new HOKa grant to develop a curriculum for the Master’s degree program.
RESPONSIBLE CONSUMPTION & PRODUCTION: SDG 12

SDG 12 is about ‘Ensuring sustainable consumption and production patterns’. It uses the transition from a linear to a circular business model as a frame of reference to achieving this goal. Many raw materials are required to keep our society running. Mining, transporting, and processing these raw materials has a major impact and leads to climate change, loss of biodiversity, ozone depletion, nitrogen emissions, and pollution of ecosystems.

RESPONSIBLE CONSUMPTION AND PRODUCTION

1.4

SDG 12 plays a prominent role in achieving the Green Deal on Sustainable Healthcare 2.0. Sustainable procurement procedures foster this, in addition to awareness of the ‘10 R ladder’ of circularity, where the focus at Erasmus MC is on ‘Refuse’ and ‘Reduce’ (together with the internal SLIM FIT program), ‘Re-use’ and ‘Recycle’.

Various Green Teams have been set up and the Integrated Building Program (PIB) has implemented sustainability as a guiding principle, entirely in accordance with the agreement in the Green Deal. PIB contributes to achieving this vision by setting up sustainable operational systems and sustainable accommodation and infrastructure. One of the ways in which this is done is through BREEAM-NL. Last year, a start was made on taking concrete steps towards the sustainable demolition of the old hospital and other buildings.

Levels of circularity (10 Rs)

<table>
<thead>
<tr>
<th>Most sustainable</th>
<th>Least sustainable</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Refuse</td>
<td>• Refuse/prevent use</td>
</tr>
<tr>
<td>• Reduce</td>
<td>• Use less raw materials</td>
</tr>
<tr>
<td>• Redesign</td>
<td>• Redesign with circularity in mind</td>
</tr>
<tr>
<td>• Re-use</td>
<td>• Reuse product (secondhand)</td>
</tr>
<tr>
<td>• Repair</td>
<td>• Maintenance and repair</td>
</tr>
<tr>
<td>• Refurbish</td>
<td>• Refurbish product</td>
</tr>
<tr>
<td>• Remanufacture</td>
<td>• New product from secondhand</td>
</tr>
<tr>
<td>• Re-purpose</td>
<td>• Reuse product but differently</td>
</tr>
<tr>
<td>• Recycle</td>
<td>• Process and reuse materials</td>
</tr>
<tr>
<td>• Recover</td>
<td>• Energy recovery</td>
</tr>
</tbody>
</table>

Integrated Building Program (PIB)

Various small- and large-scale construction activities and developments are taking place within PIB in which sustainability plays or has played an important role. A few examples are included in this Section. In addition, the activities are mainly described under SDG 12 and SDG 13. Construction activities certainly also contribute to various other goals, however. These include SDG 3: Good health, SDG 6: Clean water and sanitation, SDG 7: Affordable and sustainable Energy, SDG 9: Industry and SDG 11: Sustainable cities and communities.

3 A ‘short-cycle’ improvement cycle aimed at starting quickly and achieving real efficiency improvements.
Eread

The sustainability criteria for the Eread program were set in 2019 based on the BREEAM outstanding ++ sustainability ambition, which is in line with the sustainability ambition of PIB. Specifically, this means that in the future the designs will have to be assessed against this ambition, taking the available resources into account. Furthermore, the decision has been made to replace the façade of the faculty tower. Details and design are forthcoming.

Pharmafilter

The Pharmafilter has been in operation since 2019. The original objective to dispose of the majority of the residual waste through the Tonto waste grinders has been abandoned. The burden on the sewer system and, as a result, the number of blockages, proved to be too great. The Pharmafilter and the Tontos are now in use to replace bedpan washers and for the disposal of a small portion of the Specific Hospital Waste. The treatment of waste and wastewater is progressing satisfactorily. This is also shown by the number of pollution units in the wastewater (see Appendix A3). Use of the Pharmafilter will be scaled up in 2021. This will involve more processing of Specific Hospital Waste in the Tontos. High-grade waste streams such as paper, glass, and metal, for example, will continue to be separated and disposed of as usual and will not pass through the Pharmafilter installation. In late 2018 and early 2019, Erasmus MC had contact with the Water Board and the municipality of Rotterdam about the possible reuse of the clean water in waterways or underground storage facilities in times of drought. The quality parameters of the clean discharged water were also discussed. Research into reuse is also a requirement of the WABO (General Provisions for Environmental Law Act) permit. To date, however, there has been no follow-up to this action by the government.

Reuse of materials

Oranje BV was selected for the extensive demolition work at Erasmus MC in 2019. Part of the work involves the reuse of materials and products. By 2020, many materials and products will have been harvested for reuse from buildings V, Va, C, and D. The materials are being offered for sale on the Oogstkaart.nl platform, both for individuals and companies. In addition, the Oranje BV’s network is also being used to sell the products. Considerable sales were made to companies in Rotterdam, Moerdijk, Culemborg, and Den Bosch. In addition, materials and products were sold through Marktplaats, both to private individuals and companies.

Some of the demolition materials and products are not suitable for reuse because of the presence of asbestos, Chromium 6, or because the material cannot be disassembled and therefore cannot be removed intact, or because the material does not meet today’s requirements in terms of flammability, size, etc.

<table>
<thead>
<tr>
<th>Sold*</th>
<th>Example</th>
<th>For sale*</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building V Dining room, offices, and outpatient clinic, 3 floors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>623 Materials and products</td>
<td>Power generator, inverters, natural stone kitchen countertop, kitchen units, floor standing toilet pots and fixtures.</td>
<td>143 Materials and products</td>
<td>Wheelchair sink, faucets, kitchen countertop heatpreserving dishes, radiators and fixtures.</td>
</tr>
<tr>
<td>Building C Auditorium, 2 floors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>174</td>
<td>Interior window frames, sink and sink combinations, counters, curtains, and lighting fixtures</td>
<td>265</td>
<td>Foam extinguishers, folding chairs, escape route signs, door and stair railings.</td>
</tr>
<tr>
<td>Building D Outpatient clinics, 4 floors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>326</td>
<td>Kitchen counter, work, and buffet tops, door closers, interior window frames, doors, 140 natural stone columns and cabinets.</td>
<td>1500</td>
<td>Light fixtures, Luxaflex, alarm and detection systems, stair steps and balustrades and kitchen counter, work, and buffet tops.</td>
</tr>
<tr>
<td>1100</td>
<td></td>
<td>1900</td>
<td></td>
</tr>
</tbody>
</table>

* Materials can vary greatly; this table gives an impression.
Building V was demolished first, and Building D was the last; dismantling in V-Va was carried out at about the same time, which is reflected in the amount of materials sold so far.

**Tender for waste collection, commitment to a route to better separation and recycling**

The tender for waste processing and recycling service was completed at the end of 2020. The new contract will take effect from 1 February 2021. The contracted services relate to:

- The collection, transportation, and processing of waste, with the vast majority being corporate waste and non-specific hospital waste. The collection and processing of the Specific Hospital Waste, recyclable fractions, and support services in hazardous waste are also included, as well as the provision of appropriate collection equipment (containers and packaging) and standard account management.

- Optimization and recycling maximization has been included as optional service. These include:
  - Reduction of carbon emissions. Erasmus MC, as a signatory to the Zero Emission City Logistics Rotterdam Covenant, is committed to promoting the transition to emission-free logistics.
  - Increasing the recycling percentage. Suez contributes to increasing the percentage of waste that is recycled and used in new materials and products instead of incinerating the waste.
  - Creating awareness of waste management. Making it clear to staff, patients, and other users what the possibilities for sustainable waste management are.

**The Circular Intensive Care Unit**

Only 10% of the raw materials are currently being reused. What does this mean for the core patient care process, for an operating room, Intensive Care Unit or ward? Can we continue to assume that all items are and will remain available? How much do we actually use? And what is the impact? Can we make smarter use of raw materials to make medication, products such as adhesive bandages, needles, and the like? These and more questions are being answered in the Circular ICU project that started in late 2020. The purpose of this project is to obtain an overview of all current raw materials used and consumed in the Intensive Care Unit. This will enable us to document in a data-driven way where the biggest gains can currently be made to improve the department’s resource consumption. We will use this material flow analysis to identify three circular innovation paths that have the most potential to achieve a positive impact.

**The Operating Room Green Team**

The operating room was in the spotlight in 2020 by being the first to start a Green Team. During the course of the year, a structured Green Team was set up with representation from the operating room management, anesthesia assistants, operating room staff, anesthesiologists, members of the ‘A Sustainable Erasmus MC’ task force, project members of ‘SLIM FIT’, and surgeons. This is a splendid example of how the organization addresses this broad issue. The enthusiasm led to a multitude of results, creative ideas,
and plans. In addition, the Green Team phenomenon has been introduced in several places throughout Erasmus MC. There is hospital-wide interaction between the Executive Board, the ‘A sustainable Erasmus MC’ task force, and the national Green Deal thanks to short lines of communication, involvement, and support among staff. The goal is to emphasize, in relation to the circular economy, the following principles when making operating rooms more sustainable: reduce - reuse - recycle.

The following steps have already been taken and/or results have been achieved:

- A first start has been made with the ‘Green Operating Room network’ on a nationwide scale. The idea is that major changes involving companies can be enhanced if hospitals work together. We are participating in this network.
- Increasing visibility of the Operating Room Green Team.
- There is now greater awareness of the nexus among concepts such as sustainability, costs, hygiene, regulations, and organization. This is a great development because decision-making and change at this level will lead to progress.
- In the week of sustainability, a large-scale clean waste collection campaign was organized in which all users of the operating rooms participated. The result was an impressive mountain of clean unused materials. A video was made of the result and distributed via Intranet. At the same time a start was made to take steps to reduce the mountain.
- Interviews with surgeons resulted in an interesting collection of annoyances and points for improvement with regard to sustainability.
- We are currently investigating what specifically would be feasible to reduce and/or optimize the operating rooms networks per specialty.
- During the process, the Operating Room Green Team was in contact with external companies/suppliers and Delft University of Technology for innovations and the implementation of ideas.
- The air flow in the operating rooms outside operating hours was adjusted to a safe level using presence detectors.
- An extra piece of plastic is no longer supplied with a breathing mask (a reduction in plastic weight equivalent to a Boeing airliner per year).
- Disposable laryngoscope blades are no longer used.
- Premedication is given in tablet form in advance. Glassware, lateral lines, and venting needles for premedication are no longer used in the operating room, which saves a lot of waste.
- Desflurane (gas with very high emission load) is no longer used in the operating room.
- The use of reusable coffee cups is encouraged.
- We recommend that disposable coats/coveralls are only used if really necessary. A reusable alternative is being sought.
- Efforts are being made to reduce the use of Inco pads for under the arms.
- For short interventions, an ear thermometer can be used rather than a temperature probe.
- The correct use of the blue waste bins is being monitored.
Green Deal 2.0 Drug residues in water and environment

The Radiology Green Team has started to take sustainable steps in preventing the discharge of contrast agents. This is a major step towards achieving the Green Deal on Sustainable Healthcare 2.0. It is estimated that around 30,000 liters of CT contrast agents are discharged into surface water via the sewer system every year. The contrast agent accumulates in surface water because it is not biodegradable.

At the radiology department of Erasmus MC and five other hospitals in the Netherlands, outpatients are provided with urine bags to take home after their CT scan with contrast agents so that they can collect their urine at home the first three times they need to urinate. This is because the contrast agent administered during the examination will be excreted within 24 hours of the examination. The urine bag prevents the contrast agent from entering the environment. These bags have been extensively tested and are easy for both men and women to use. The urine bag can be disposed of with the household garbage after use.

In addition, patients are requested to pass urine once before leaving the hospital. The Pharmafilter, unlike the regular sewage plants, can filter out the contrast agent.

The ultimate goal of this pilot is to implement the urine bags nationwide. This would be a major sustainable step towards reducing the amount of contrast agent in surface water.

In addition to this project, radiology is also collecting contrast agent that is left over after a procedure. Previously, this unused contrast agent ended up in the hospital waste, but this has now changed. At the end of the working day, the leftover contrast agent is poured into a special container. These containers are collected by the manufacturer to be recycled into new contrast agent. The containers can now be found in all CT rooms, in the interventional radiology rooms, and radiotherapy has recently joined this initiative.

Sharing radiology images

Radiology images and reports are all sent digitally, which means an end to sending and reading DVDs and CDs. Digital means safer and the chance of losing them has been reduced to nil. In addition, it is considerably more sustainable because no more material is used and it saves storage space. The external images are made available digitally in HiX (electronic health record) and imported directly by the Radiology & Nuclear Medicine team.
SDG 13 is about taking urgent action to combat climate change and its impacts. This Section focuses on activities related to parameters that we have included to measure our carbon footprint.

Erasmus MC’s carbon footprint
The first measurements to get an impression of Erasmus MC’s carbon footprint were made in 2020. This was determined for the year 2019 and this will be the baseline value for Erasmus MC from which we will aim to achieve our carbon reduction objectives. The footprint amounted to 95,987 tons of CO₂. In 2021, a new measurement will be performed for the year 2020, which will also take into account the impact of the COVID-19 pandemic.

The ‘gray’ electricity that Erasmus MC purchases represents the largest emissions. The purchase of electricity has, also in 2020, become greener with European Guarantees of Origin. By purchasing Guarantees of Origin, investors are encouraged to invest in green electricity generation. However, European Guarantees of Origin do not count in the method used to determine our carbon footprint. In principle, the goal for the coming years is to generate or purchase entirely green electricity. On paper it is possible to use Dutch Guarantees of Origin for greening the method used. In practice, fossil electricity, possibly with Carbon Capture Storage, will remain part of the Dutch electricity mix for decades to come. At times when the supply of renewable electricity is insufficient, there will always be a switch to fossil electricity.

The target for green electricity will be met by Guarantees of Origin (European) and the automatic greening of the Dutch electricity mix (government policy). The options being investigated to improve the greening of the electricity supply are:
- Guarantees of Origin (Dutch)
- Participation in a wind farm in NFU or other alliance
- Installing solar panels

Carbon footprint overview (tons of CO₂)
Commuting and waste are in second and third place in the footprint respectively, although it should be noted that national figures have been used for commuting. These figures will be determined more accurately in 2021, which means that, as a result of our forward-looking sustainable transport policy, a downward correction will be made to these findings. In addition, the emission volumes of both travel by staff and patients (fifth place) will continue to be influenced by the measures imposed in connection with the COVID-19 pandemic in 2021. There will be a correction for employees because more work is being done remotely. Due to the increase in digital consultations (e-Health) we saw fewer travel movements (positive effect on emissions). However, patients coming to Erasmus MC opted for transport by car more often (negative effect on emissions).

Further research in the field of e-Health will certainly be conducted in 2021, but a target of 10% more digital consultations than before the COVID-19 pandemic period should definitely be possible in the future. In fourth place is the consumption of natural gas and other fuels (for example, for maintenance and the emergency power generators).

**Actions taken by Integrated Building Program (PIB)**

As part of SDG 13, PIB has also been able to contribute significantly to reducing carbon emissions. A number of examples are explained below whereby considerable steps were taken in the area of building management in particular (most new construction projects were postponed in 2020). The use of LED lighting was one of the most important matters.

- Purchase of Nordic freezers: On 01-01-2020 we had 486 freezers at Erasmus MC. One year later this had been reduced to 425.
- LED lighting was installed at various locations in the building to replace existing lighting. This replacement program will continue in the coming years.
- Replacing heat exchangers (heat exchangers - district heating connections): A necessary replacement of the heat exchangers at Erasmus MC was carried out in 2020. This replacement provided an opportunity to not only modify but also optimize the installation, thus resulting in energy savings. It is expected that savings of € 185,000 per year will be possible.
- Solar panels on the roofs of Erasmus MC: PIB carried out a study on the possibility of installing solar panels on the roofs of the buildings. The solar energy would be for own use and to supply to users in the direct vicinity. A decision will be taken in 2021.

**Energy consumption and measures**

Primary energy consumption in 2020 amounted to 1051 TJ, a decrease of 1.5% compared to 2019. Primary energy consumption is composed of three components: electricity, gas, and district heating. There was an increase in the use of electricity by 0.1% and a decrease in the use of natural gas and district heating by 2.9% and 70% respectively. Trends and graphic representations of the consumption of different energy carriers can be found in Appendix A1.

The COVID-19 pandemic also affected energy consumption in the year under review. On the one hand, less energy was used during office hours due to remote working, and on the other hand, temporary use was made of buildings that were vacant. In the hospital, energy-saving measures had a clear effect. In the medical faculty, there was a reduction in energy consumption due to the vacancy of Buildings Ec and Fd. Energy consumption in Sophia Children’s Hospital increased slightly. Completion of the renovated multi-functional Building Ca (11,322 m²) and the increased use of the Buildings Ad, Bd, and Ba caused an increase in energy consumption. Total square meters of buildings remained the same at 466,427 m².

The renovation of building Ca was completed in 2020. The building has received a Class A energy label. An important project is improving the use of the heat pump; the supply area will be increased by making a connecting pipeline for heating between Building Ee and Eg. This project was started in 2020 and will be completed in 2021. It will result in savings in the use of district heating. Major maintenance work was carried out in the summer on the steam boilers in Building Ee. The steam boilers are now equipped with new control technology and several pumps are now speed controlled. The monitoring of the boiler house process has also been improved. The steam boilers are the largest energy consumers in the hospital and provide humidification.

In May 2019, special software that will allow office spaces to be used as efficiently as possible was put into service. The insight gained from this software will lead to a reduction in the number of office workstations. The implementation of the software means that the demolition of Building Z can start earlier than planned.

The experience gained from working from home due to the COVID-19 pandemic is expected to result in a further reduction in the number of office workstations.

Energy management is entering a new phase; 2020 was the last year that Erasmus MC had to conform to the Multi-Year Agreements (MJA in Dutch) with the government for saving energy. The objective, included in the covenant for an energy saving of 8.5% compared to 2015 for the period 2017 to 2020, appears to have been met. The final assessment will take place later this year. The termination of the long-term agreements means that Erasmus MC is now subject to the EED (European Energy Efficiency Directive). The directive requires organizations to carry out and submit an energy audit. We submitted our audit to DCMR Rijnmond Environmental Service at the end of 2020. The audit was carried out on the basis of the approved list of measures for healthcare and social welfare institutions. The results are now being evaluated. The audit must be conducted once every four years. Another part of energy management involves participation in the Green Deal on Sustainable Healthcare 2.0. To this end, a roadmap was drawn up with benchmarks in 2030 and 2050. A separate item for making Erasmus MC buildings more sustainable was included in the long-term investment plan for the first time at the end of 2020.
Taking the train or plane for business travel?
Due to the increasing internationalization of research, education, and social services, Erasmus MC staff make quite a number of business trips every year. A sizeable number of these are made by plane. Most of the business trips take place within Europe. The carbon emissions from air travel are 7 to 11 times higher than emissions from travel by train (www.milieucentraal.nl). Several departments have already taken the initiative by opting for video conferences, not flying to easily accessible cities, compensating for carbon emissions, and introducing an extra check on the value of a distant conference. A sustainable travel policy has now incorporated these measures. A ‘Train Zone Map’ is a convenient tool for making decisions. The map provides employees and students with an overview of the differences between traveling by airplane and public transport (principally the train) in terms of carbon emissions, travel time, and ease of travel. The information has led several departments to make a more conscious choice for the more sustainable solution. Before the introduction of this Map, a competition was run for the department with the most sustainable business trips. However, the COVID-19 pandemic meant that traveling by plane was reduced to a minimum. Once the COVID-19 pandemic has passed and business travel resumes, the campaign will be brought back to the fore.
The Erasmus MC environmental management system, which was set up in accordance with the international ISO 14001-2015 standard, has not been maintained or updated, partly due to one of the environmental advisors leaving.

However, the procedures from the system did continue, including the self-assessments of the various environmentally relevant departments. These took place at the end of December 2020 using a new system in which the shortlist has been integrated into the Quality Management System (QMS). The results of this self-evaluation are shown in Section 2.1.

The annual management review with the portfolio holder of the Executive Board took place on 29 April, during which an explanation was given of the development of sustainability in general, the ‘A sustainable Erasmus MC’ task force in particular, and the environmental and energy results achieved.

Only eight internal environmental consultations/inspections were conducted due to the outbreak of the COVID-19 pandemic. Except for some minor areas of concern, the departments were found to still have their environmental affairs fully in order.

In addition to the internal inspections, DCMR Rijnmond Environmental Service also conducted external inspections in 2020. The inspection with regard to environmental legislation took place digitally this year in connection with limited access due to the COVID-19 pandemic. Like last year, the emphasis was on the inspection reports of EPGs and fuel tanks. In addition, the environmental advisor provided photographs of the storage of hazardous substances, among other things. No violations were found in either case.

Another inspection carried out by DCMR Rijmond Environmental Service was in the area of aviation law and concerned the helicopter landing platform. This inspection found no violations either, as was the case in 2019. The platform and associated items such as the fire extinguishing system comply with the regulations.

Results of self-assessments December 2020
The laboratories inspected their own departments using the shortlist. This is the first year in which inspections were carried out using a shortlist made available by the Quality Management System (QMS). A deviation from environmental regulations was found in 6% of all observations. This is a decline of 2.3% compared to 2019. In most cases, the deviations were related to the improper use of the acid/base cabinets and the fact that in some cases the lower tray of the fire safety cabinet was used as a storage tray. This is not permitted as the lower tray should serve as a drip tray for the cabinet. These deviations will receive additional emphasis in OHSE meetings and during on-site inspections.
A total of 15 new Occupational Health and Safety and Environment (OHSE) officers were trained in 2020. The group that was trained in the spring met in person, but the course was modified to an online version due to the lockdown for the group that was trained in the fall. Taking attrition into account, the total number of OHSE officers remained the same. Of the 171 OHSE officers, 82 are active in the Laboratories, 54 in Nursing and Care, and 36 in the Other group, such as facility management and offices.

Two online network meetings were held, one for laboratories and one for nursing and care. During these meetings, the departments were able to share the problems they experienced as a result of the COVID-19 pandemic and good examples from practice. There was too little interest in the Other group.

An OHSE SharePoint environment was set up to strengthen contacts and share knowledge and best practices. The course information can also be found there. Specific education through clinical lessons on nursing wards and operating rooms took place three times in the first two months of the year. As in the previous year, the lessons were about the correct separation of waste streams and information about the Pharmafilter, including the use of the Tontos. Due to the COVID-19 pandemic, no further lessons could be given during the rest of the year.
CSR Annual Report and Erasmus MC Annual Report
The 2019 Annual Report was published online and interactively. The CSR Annual Report is available on the intranet and internet for stakeholders of Erasmus MC and other interested parties.

e-AER
The e-AER (electronic Annual Environmental Report) is an environmental report that must be completed every year as part of the Multi-Year Agreements (MJA3 in Dutch). This report was also completed in the year under review. Topics covered in the report were: amount of energy purchased, energy-saving measures, developments in gross square meters, and other developments. The report also includes an energy consumption analysis. The report was submitted at the end of March 2020 and approved by the Netherlands Enterprise Agency in mid-2020. The report can be consulted by DCMR Rijnmond Environmental Service for information purposes.

ETS
In 2015, Erasmus MC joined the EU Emission Trading System (ETS). Joining the ETS also means that Erasmus MC must prepare an annual emission report for carbon emissions and submit sufficient emission allowances to the Netherlands Emissions Authority (NEAs). Both obligations were met in 2020. The number of free emission allowances will no longer be sufficient as of 2022; allowances will have to be purchased.
DCMR Rijnmond Environmental Protection Service received a noise complaint in June 2020. The complaint was likely due to the nitrogen delivery truck. This was investigated and a specification of the complaint was also requested. No more similar complaints were subsequently received. The truck probably passed by at an unusual time.

A local resident indicated that he had recently been bothered by the illuminated letters Erasmus MC on the Faculty building. However, the illuminated letters have been there for years and have not changed in terms of light intensity. To confirm this, a study was carried out on the light intensity, which was found to be well within the established standards. The complainant was provided with feedback on the findings and he showed understanding and acceptance of the situation.

No environmental incidents occurred in the year under review.
The Environment team and others involved in sustainability maintain external contacts in a number of ways with the government, other UMCs, and other experts. This Section provides a brief description of these contacts and the topics that were presented or discussed. Most of these meetings took place online because of the COVID-19 pandemic.

Collaboration between UMCs
Regular consultation takes place with colleagues from other UMCs. The sustainability coordinators’ meeting monitors the progress of the four Green Deal-related working groups and ensures interaction with the steering committee and the management group.
There is also close cooperation in the field of procurement, and national Green Teams are now also starting to support each other in the sustainability transition. Erasmus MC is widely represented within the various NFU (Netherlands Federation of University Medical Centers)-related bodies. We also collaborated constructively with CSR Netherlands Network for Healthcare and the Environmental Platform.

SAAZUNie working group on the Environment
In 2020, the SAAZUNie working group on the Environment met online on one occasion. Cooperation was sought in a number of areas and knowledge and information was shared. The working group contributed to progress on the subject of Substances of Very High Concern (SVHC), Mobility at UMCG/RUG, and the need to apply for exemptions per province under the Nature Conservation Act, which is time-consuming and costly.

Municipality of Rotterdam and SRZ (Rijnmond Hospitals Foundation)
There is effective, inspiring, and positive cooperation with the municipality of Rotterdam in various areas on the way to a cleaner and healthier environment. Agreements and covenants have been signed with regard to mobility. Furthermore, great opportunities have also been identified in terms of sustainability for the development of the campus.

Recently, a start was made within the SRZ to explore the possibility of focusing more on common sustainability issues within the region. Many partnerships are based on inspiring and informing and, where appropriate, forming collectives to put complex issues on the Agenda together.

5 Collaborating Occupational Health and Safety Services of Academic Hospitals and Universities.
This first section of the Appendices presents the main environmental aspects, along with an analysis insofar as not present elsewhere in this report. Environmental aspects covered are: energy and water consumption, waste, and helicopter movements.
Introduction and explanatory remarks on graphs

This Section shows the details of the various energy flows. As there have been many developments in the field of energy consumption in recent years, it was decided to present energy consumption over several years. The analysis of the data presented is included in Section A1.1. In the graph on natural gas consumption, diesel consumption has been included in natural gas equivalents.

The indicators cooling degree days, degree days, and gram-hours help explain the degree to which the following are effective:
- cooling (electricity consumption)
- heating (district heating consumption)
- humidifying (gas consumption to produce steam)
A1.1 Primary energy consumption
Annual consumption of primary energy in the period 2005 through 2020.

Specific energy units are converted to primary energy according to the following rules:

- 1 Terajoule (TJ) of heat via district heating corresponds to 1.11 TJ of primary energy (1 TJ = 1 Terajoule = 1 trillion joules).
- 1 Gigawatt-hour (GWh) of electricity corresponds to 9 TJ of primary energy (1 GWh = 1 Gigawatt-hour = 1 million kWh).
- 1 million m³ of natural gas corresponds to 31.65 TJ of primary energy (1 m³ = 1,000 L).
- 1,000 tons of fuel oil corresponds to 42.7 TJ of primary energy (1 ton = 1,000 kg).
A1.2 Electricity consumption
Annual electricity consumption for the period 2005 through 2020.

Cooling degree days are used to check to what degree cooling is required. If the average day temperature is above 12 degrees, cooling degree days are calculated for that day. If the temperature is 20 degrees for 30 days, this month will have $30 \times (20-12) = 240$ cooling degree days.
A1.3 Natural gas consumption
Annual natural gas consumption relative to climate in the period 2005 through 2020.

Gram-hours are used to determine the degree of humidification required. A gram-hour is defined as the difference between the desired moisture content of the air supplied (standard humidity after air treatment 8 g/kg air) and the absolute humidity of the outdoor air per hour. If the humidity is 5 g/kg air for 24 hours, this day will have $24 \times (8 - 5) = 72$ gram-hours.
### A1.4 District heating

Annual heat consumption relative to climate in the period 2005 through 2020.

**Degree days** are used to check to what degree heating is required. If the average day temperature is below 18 degrees, degree days are calculated for that day. If the temperature is 2 degrees for 30 days, this month will have $30 \times (18-2) = 480$ degree days.
The consumption of drinking water in 2000 was 20.9% higher than in 2019. A significant part of this higher consumption was related to work on the steam boilers. During the work, it was not possible to return condensate from the steam pipe network to the steam boilers. The condensate had to be cooled using drinking water and disposed of into the sewer. Additional water also had to be used to prevent dust formation as much as possible during demolition of the old Dijkzigt hospital.

**Annual consumption of drinking water in the period 2015 through 2020**

<table>
<thead>
<tr>
<th>Year</th>
<th>Drinking water Erasmus MC in m³ - Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>441,000 m³</td>
</tr>
<tr>
<td>2016</td>
<td>417,000 m³</td>
</tr>
<tr>
<td>2017</td>
<td>488,000 m³</td>
</tr>
<tr>
<td>2018</td>
<td>512,000 m³</td>
</tr>
<tr>
<td>2019</td>
<td>424,447 m³</td>
</tr>
<tr>
<td>2020</td>
<td>511,701 m³</td>
</tr>
</tbody>
</table>
The pollution units were again determined by measurements taken during two measurement weeks. The total number of pollution units was 1198. In 2019, this was 1381, representing a decrease of 13%. This decrease may have been caused by the lower occupancy of workstations due to the COVID-19 pandemic.

Sophia Children’s Hospital is not yet connected to the Pharmafilter. Once Sophia Children’s Hospital has also been connected to the Pharmafilter, the number of pollution units are most likely to continue to decrease significantly.

In addition to measuring the pollution units, additional investigations were conducted in both 2019 and 2020 into the quality of the waste water to demonstrate that the Pharmafilter is actually working as indicated in the 2016 environmental permit application. This involved sampling for additional parameters such as heavy metals, oils and fats, and sulfate. The reports were assessed by DCMR Rijmond Environmental Service at the end of 2020 and found to be in order. This means that regulation 2.1.10 of the revision permit of 23 May 2017 has been met.
A4.1 Non-hazardous waste

- Metals
- Paper / cardboard
- Wood
- Residual waste

Weight (kg) (X 1000):

2016: 155, 340, 23, 15
2017: 15, 71, 10, 16
2018: 140, 23, 120, 68
2019: 2,344, 313, 16, 259
2020: 2,297, 36, 18, 36

A4.2 Hazardous waste

- Specific Hospital Waste
- Chemicals
- Appliances and electronics

Weight (kg) (X 1000):

2016: 346, 32, 50, 8
2017: 370, 37, 50, 8
2018: 400, 9, 9, 8
2019: 415, 9, 11, 8
2020: 395, 9, 11, 8
HELICOPTER MOVEMENTS

The regulations in paragraph 3.3.6, ‘The use of helicopters at hospitals’, of the Activities Decree apply to helicopter movements. These regulations do not limit the number of flights, but they do impose requirements on the equipment used and require the number and purpose of the flights to be recorded.

Figure A5 shows data on the number of flight movements of the trauma helicopter over the last five years (one flight movement includes landing and take-off). In 2019, 404 landings by the trauma helicopter were recorded, six of which were carried out by external helicopters, for instance, coast guard, police, and military helicopters that may also land at Erasmus MC in the event of medical necessity or mandatory exercise.

In 2020, 14 more trauma helicopter flights were performed than in 2019. Of these, seven were flights to transfer COVID-19 patients. The purpose of all flights was tracked by the Safety and Environment Sector, which means that Erasmus MC complied with the requirements of the aforementioned Decree.

Figure A5: Number of Erasmus MC flight movements
ACTIVITIES WITH GENETICALLY MODIFIED ORGANISMS

B1   General

Research involving the use of genetically modified organisms (GMOs) requires a notification or contained use (IG) permit issued by the Ministry of Infrastructure and Water Management (IenW). The current Decree and Regulation on Genetically Modified Organisms (GMO) came into force on 1 March 2015. Since then, GMO work must be applied for by level of containment. As of 1 January 2021, the distinction between level II-k and Level II-v will cease to exist, making all level II work subject to a notification requirement, as is level I; level III is subject to a permit requirement. The BioSafety Officer (BSO) performs a risk assessment when applying for a notification or permit and determines whether additional regulations need to be applied. If the work cannot be classified based on the regulations, a 2.8 request must be submitted.

The current regulation allows institutional notifications for levels I and II. The advantage of this is that applications for all GMO work of a certain level and/or involving a specific microorganism or activity can cover Erasmus MC as a whole. This makes it less of a burden for researchers; starting new activities that are already covered by an institutional notification does not require a new notification. It also simplifies the transfer of GMOs between departments. The size and associated complexity of the records has increased the administrative burden for the BSO.

Besides applying for notifications and permits for work with GMOs, the BSO is responsible for the assessment of the professional competence of employees who work with GMOs, carrying out internal inspections of GMO work that has been licensed or notified, inspection of work spaces where GMOs are handled (contained areas), supervising compliance with work regulations, and providing advice and recommendations on working with GMOs and working safely with microorganisms. The BSO also takes action in the event of incidents, accidents, and emergencies, and reports these to the Executive Board.

B2   Records of contained use and employees

Since the new regulations took effect in 2015, all ‘old’ permits present at Erasmus MC were ‘frozen’; this means that the activities with GMOs described in these permits may still be performed, but that the permit can no longer be amended. If changes need to be made to old permits, the components of the permit must be transferred via separate Level I, II, and III procedures. In 2020, 19 old permits have been closed and all activities in these permits have been transferred to a new notification and/or permit(s).

At the end of 2020, there were still 86 ‘old’ permits at Erasmus MC. A significant number of these old permits are used as a ‘storage permit’; all or part of the work is no longer performed, but only stored. If the activities are resumed, a new risk analysis has to be carried out and these activities will then be included in a notification or permit.

Eleven new records of contained use have been applied for in accordance with the GMO Regulation. One of these applications was withdrawn by the BSO at the request of the Ministry of Infrastructure and Water Management (IenW). In 2020, 39 amendments to existing records were submitted to the Bureau for Genetically Modified Organisms (Bureau GGO); this primarily concerned 2.8 requests and notifications at Level II-k. Amendments to notifications at Level I are entered into the records by the BSO and are only reported to the Bureau GGO if they fall into a different category of physical containment (CFI). Figure 1 shows the new records that were submitted to the Bureau GGO in the last six years.
A number of ‘old’ permits are so complex that they cannot be converted into various notifications/permits through the standard ranking of the current regulations. For these ‘complex’ records, a tailored regulation was created in 2018 by the Bureau GGO and the Human Environment and Transport Inspectorate (ILenT). For Erasmus MC, eight permits have been registered for this process and an action plan has been drawn up that includes a timeline for splitting these complex permits. Six old permits have now been split into 19 new notifications, permits, and requests. In 2021, the last two records will be converted in accordance with the current regulations.

To comply with GMO legislation, in 2020 the BSO inspected 64 research leaders/responsible employees from 27 departments to verify whether GMO work was carried out in accordance with the notifications/permits. These inspections were largely conducted online because of COVID-19 pandemic measures, whereby the research leader/responsible employee completed a questionnaire to the best of their knowledge.

The research leader/responsible employee of a GMO project notifies the BSO of new employees. By the end of 2020, 1252 employees were involved in GMO work, including 187 students (Figure 2).

B3 Environmental Safety Officer - Gene Therapy

The Environmental Safety Officer (ESO) oversees the safe deliberate release of GMOs into the environment (IM-MV permit), such as in gene therapy and other clinical research involving human contact with GMOs. The ESO supervises the application of an IM-MV permit and the implementation of GMO-related work. At Erasmus MC, the BSO also holds the position of ESO.

In 2020, three new IM-MV permits were submitted and effectuated. A total of 20 IM-MV permits were active, with a total of eight patients being included under two CAR T-cell therapy permits and one patient being included under a Hemophilia B permit. Under five permits, only storage of patient material or gene therapy for analysis is taking place, and under eight permits the first patients are expected to be included in 2021. Three permits are no longer valid. A progress report for each active permit is written by the BSO at the beginning of the year and sent to Bureau GGO.
B4 Contained areas and GMO waste

Work with GMOs takes place in work spaces that are specially equipped to prevent the escape of GMOs (physical containment). As the risk class of the GMO increases, more stringent requirements are imposed on equipment measures and applicable work procedures. Different categories of physical containment are thus achieved (AP-I, ML-I through ML-III, D-I, DM-I through DM-III). All rooms have a supervisor who has been authorized by the BSO. At Erasmus MC, we have a total of 236 contained areas of the above categories of physical containment (Figure 3), distributed over 27 departments and two Core Facilities. The number of contained areas has increased compared to 2019 due to the use of several new laboratories. In addition, several new DM-III and ML-III rooms have been taken into use in the new BSL-3 facility. The BSO inspected 186 contained areas (90%).

The BSO records the number of waste bins of Specific Hospital Waste containing GMO waste annually. In 2020, 5,457 Specific Hospital Waste bins containing GMO waste were collected by Erasmus MC and transported to the waste incinerator. This was a decrease compared to 2019 (Figure 4), and was a direct result of COVID-19 pandemic measures; in mid-March, GMO activities in most research laboratories were halted, only to be restarted in the second week of May (Figure 5). There were 3741 waste bins from an ML-I or DM-I laboratory (69%); 1716 waste bins were from ML-II or DM-II areas (31%) (Figure 5). ML-III and DM-III waste is inactivated at Erasmus MC by autoclaving.

Figure 3: Contained areas

![Figure 3: Contained areas](image-url)
Figure 4: Number of GMO waste drums 2020

ML-I  ML-II

Figure 5: Registered GMO waste

ML-I / DM-I  ML-II / DM-II
B5 Incidents, accidents, and calamities

The BSO received three reports this year of incidents, accidents, and calamities involving GMOs. There was no risk to humans or the environment from any of the reports.

B6 Education, instruction, and training

As in previous years, the BSO gave lectures to students of the Winter Course (Research Master’s in Infection & Immunity). Presentations were given to staff of CAR T-cell studies and to students of the Laboratory Animal Science (Article 9) course. These took place online due to COVID-19 pandemic measures.

Three training sessions on the safe cleaning of contained areas were provided for cleaning staff. The BSO provides an annual mandatory training program to employees who work with GMOs who work with GMOs in high containment laboratories (ML-III and DM-III) to ensure biosafety.

B7 Implementation Quality Management System

The GMO administration and work processes are largely integrated and implemented in the Erasmus MC Quality Management System. This is done using:

- A digital index card system to register data relating to records, content of notifications, employees, biological agents, and contained and non-contained areas. The information on the index cards has partly been made accessible to the research leaders, responsible employees, alternate contact persons, and supervisors; personal data and rights are protected in line with privacy legislation.
- Questionnaires for internal inspections of contained areas and research leader/responsible employee.
- Notification forms for the registration of new employees.
- Work regulations, procedures, forms.
PUBLICATION DETAILS

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- The 'Sustainability Report 2020' was published by Erasmus MC, and created by the A Sustainable Erasmus MC task force and the Safety and Environment Sector.

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Disclaimer: photos on which social distancing is not observed were taken before the COVID-19 crisis.