SUSTAINABILITY REPORT

2021

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SUSTAINABILITY IS HERE TO STAY

When writing these lines I had a look at last year's report – the 5-year anniversary report – and realised that at that time, we expected that this year would be the year to get out of the shadows of COVID-19 and return to normal conditions.

Sadly, this turned out not to be the case. Nevertheless – this year has been exceptional – as everyone seems to be putting sustainability at the top of their agenda – at least in Denmark.

With the EU taxonomy as the driver, almost all big companies are now addressing sustainability by setting very ambitious goals but also aligning their strategies. This shift has indeed been remarkable, and since this has implications on the scope 3 and value chain many SMEs will be impacted.

In DEM we have been positively impacted by this development and have increased our services within SDG and ESG including climate audits and foresee these to develop further. Almost 100% of our turnover whether domestically or internationally is now SDG-related.

DEM committed itself to Global Compact in 2016, and we will continue and develop our support. We have succeeded in optimizing our strategy towards a wide range of sustainability related services to meet our clients' needs, a selection of which is showcased in this report. This development relates to e.g. minimising carbon footprint of buildings and upscaling of energy efficiency during our design phase, but can also be seen by our engagement in international projects where our clients seek advice on policies and tools in order to increase sustainability actions in developing countries.

UN Global Compact will implement a new Communication on Progress Platform in 2023. DEM has decided to enroll in the Early Adopter Programme where we will be able to test and disclose via the new platform already in 2022.

Yours sincerely

Jørn Lykou
CEO

DEM's COMPANY IMPACT MEASUREMENT

Since 2016, we have been using our online SDG reporting system to measure sustainable impact and progress towards SDG 7, 11, 13 and 17 across all projects based on 30 specific indicators. Each relevant SDG, action-oriented SDG target, and company specific indicator is connected to our financial system so that impact can be measured both in terms of monetary value, and in terms of hours worked.

Today almost all of our entire revenue is 100% SDG-related i.e. supporting the SDG goals. In the coming years DEM will change its impact measuring system and create an improved system for keeping track of this development.

Advisory services on how to implement the SDGs constitute an increasing market for us. This means, that in addition to the four SDGs below, we are contributing to the uptake of all of the SDGs in general.

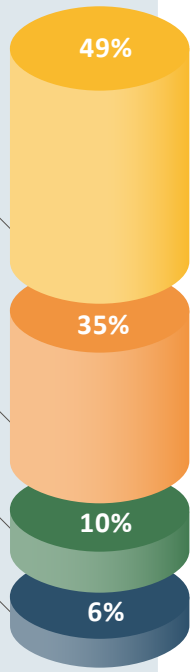
DEM MARKET AREAS CONTRIBUTING TO THE GLOBAL GOALS

- **Energy & Climate**
- **Sustainable Buildings & Cities**
- **Monitoring & Evaluation**
- **Sustainability (SDG) & Energy Management**
- **ESCO & Energy Performance Contracting (EPC)**
- **Client Consultancy**

ACCUMULATED PROJECT SDG AND TARGET IMPACT

For each of the SDGs and SDG targets that we work with directly, we measure progress towards sustainable development and also provide performance metrics that complement official data. Here is a visual representation of employee working hours, as they relate to our primary sustainable development goals and SDG targets.

DEM DISTRIBUTION OF WORKING HOURS IN SDGs 2020-21



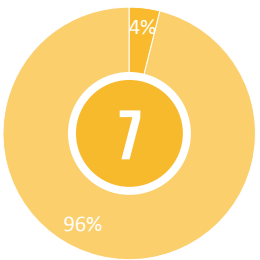
SDG 7
Affordable and clean energy

SDG 11
Sustainable cities and communities

SDG 13
Climate action

SDG 17
Partnership for the goals

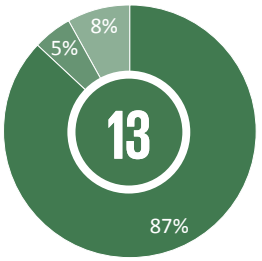
DEM DISTRIBUTION OF WORKING HOURS IN SDG TARGETS 2020-21



SDG 7.1
Ensure universal access to energy services

SDG 7.2 RE
Increase share of renewable energy globally

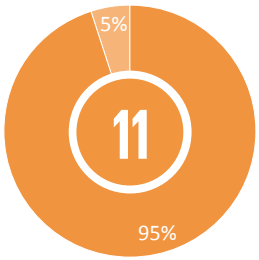
SDG 7.3 EE
Double the rate of improvement in energy efficiency



SDG 13.1
Strengthen resilience and adaptive capacity to climate-related hazards

SDG 13.2
Integrate climate change measures into national policies

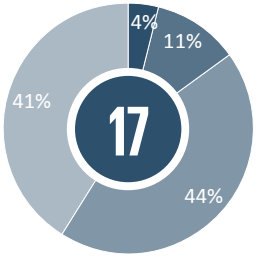
SDG 13.3
Improve education, awareness-raising and human and institutional capacity



SDG 11.1
Ensure access to housing and basic services

SDG 11.3
Enhance inclusive and sustainable urbanization

SDG 11.6
Reduce adverse impact of cities through waste management



SDG 17 FINANCE
Funds mobilized for sustainable development

SDG 17 TECHNOLOGY
Technology transfer initiatives in developing countries

SDG CAPACITY BUILDING
Support for national plans and capacity building

SDG SYSTEMIC ISSUES
Statistical and data handling systems or platforms

OUR EMPLOYEE WORKING HOURS CONTRIBUTE SUBSTANTIALLY TO SDG 11. THIS YEAR, THE EFFORT ON SDG 11 HAS INCREASED FROM 17% TO 35%

WHAT WE DO AND OUR PROGRESS IN SUSTAINABILITY

DEM – Danish Energy Management A/S – is an engineering and consultancy company providing services in Denmark and worldwide. The range of services are mainly related to strategic sustainability within the energy and building sector comprising:

- New buildings
- Renovations
- Energy efficiency in buildings
- ESCO-concepts
- Renewable energy
- Energy policy and energy regulation, tariffs, and capacity building
- Energy management including IOT and AI, environmental management, asset management/ action plans, feasibility studies, SDG/ESG transformation, EU taxonomy, building certification, climate accounts, EPDs, LCA and LCC.

The services span from overall strategic advice to detailed specifications, tendering, contracting supervision and commissioning. 60% of our revenue is generated domestically.

DEM is part of the DMG Holding Group from where administrative and financial services are provided. The number of staff including service providers and associates is approximately +50.

Internationally our clients are typically the EU, the World Bank, GiZ, the European Investment Bank, AIB and Danida/IFU. Domestically our clients include private developers and private companies, real estate companies, pension funds, private foundations, institutions within the Danish state, municipalities and regional authorities.

WE WORK TO BUILD A BETTER WORLD – TOGETHER WITH OUR CLIENTS AND PARTNERS IN DENMARK AND ABROAD

DEM was founded to make a difference. Therefore, we are happy to see the sustainability agenda accelerating and becoming mainstream in Denmark and abroad. We take our own medicine by applying sustainable principles and sustainable reporting practices to our own company as well as advising our clients about best practice.

FUTURE SUSTAINABILITY FOCUS: MORE CONCISE, MORE MEASURABLE, MORE IMPACT

In 2017, DEM produced its first sustainability report inspired by the newly developed SDGs. The front-runner for this report was the UN's SDGs. In DEM, we defined 4 overall SDGs, 7, 11, 13 and 17, against which we would measure our activitities, and we defined 30 indicators based on the SDG targets, which were relevant to the consulting services DEM worked with. The goal was not just to report generically that we worked to realize the targets under the 4 selected SDGs, but to be able to specifically measure our efforts – i.e. for every project we carried out we should be able to measure its impact and how the work would contribute to the SDG goals. A new building was measured in relation to how much better the project was in relation to the current building regulations, and an energy renovation project was measured in relation to how much renewable energy was produced, CO_2 was saved and how much fossil fuel was avoided through energy efficiency measures.

This is now the 6th sustainability report and as a side benefit of this work, our employees have been trained in tangible sustainability, which in turn has resulted in the fact that today DEM is providing advice to other companies within the building/real estate sector.

WE AIM TO HAVE AN ENGAGING STRATEGY PROCESS IN 2022 EVOLVING AROUND THE FOLLOWING HEADINGS:

Revisiting the SDGs on which we have the biggest impact

Global Compact's 4 pillars and 10 principles are our foundation. The sustainable development goals our aspiration. Time has come to revisit the SDGs on which we measure our impact. For example, expanding our expertise areas from energy solutions in buildings' use phase to full life cycle analysis of all the phases of a building's life including embedded energy in materials.

Consistency between and merging of SDGs and ESG approaches

We work for both private and public organizations. SDGs were born out of cooperation between nations, ESGs due to investors needing more and better sustainability data from businesses. The EU taxonomy is the best collection of common and transparent ESG criteria to date. Ultimately, the different frameworks are pointing towards the same desired future. We want to integrate the work to have clear goals as well as clear measures to get there.

Thus, today we provide advice to investors and companies in the real estate sector, pension funds, property developers, suppliers of goods and services to the building/real estate sector as well as the state, regions and municipalities.

In Denmark, the government has now announced its goals in the national action plan for the realization of the SDGs. DEM participated in the work with Statistics Denmark in the preparation of the analysis report “Our goals/Vores Mål”. Our goals/Vores Mål goal has been an innovative project that aimed to add more national measurement points and a baseline to create the basis for measuring the sustainable development in Denmark.

Against this background, DEM has decided that we will ratify our indicators and measurement system so that the next sustainability report captures the Danish measurement points to a greater extent when we assess our national projects but at the same time preserve and further develop our indicators from the UN goals on our international projects.

More synergy between strategy and practice

At DEM we are a range of different people with a wealth of backgrounds – from engineers projecting projects to DGNB consultants and advisors creating CO2 accounting and overall strategies. This is one of our major strengths that we should utilize better. One of the most relevant projects for DEM to engage in is to include recycled as well as designed-for-disassembly installations in the projects we are offering to our clients. To both point to and actually bring down the CO2 footprint on the projects we are part of. This requires new and exciting collaboration with suppliers – of old and new materials.

Communication

We advise our clients to communicate about their small and big sustainable progress. A lot of initiatives are taking place and they can make it clear to employees that there is much meaning in what the organization does as well as they can serve as inspiration for others. No one is perfect, not even us in DEM. But we have an ambition to highlight what we do, including the things that are difficult and the dilemmas we face.

A co-workers fun day at Escape Room.

OUR FOOTPRINT

The technical capacity in Sub Saharan Africa is constantly improving.

Photo: DEM

HUMAN AND LABOUR RIGHTS

> At DEM we have learned that we can have an even higher degree of flexibility – working at the office or at home, depending on what suits the individual best. That is a positive effect of Covid-19 that we will continue to practice in the future.

HUMAN RIGHTS

DEM is committed to ensuring equal opportunities. We respect cultural differences and see these differences as a strength allowing us to achieve our vision and tailor our consultancy services to the needs and requirements of our clients and partners. Working in partnerships, we respect and protect all internationally proclaimed human rights and strive to prevent any form of discrimination.

LABOUR STANDARDS

DEM respects all international declarations adopted by the International Labour Organization.

- Fair wages reflect the qualifications of employees and the local average wage level.
- We do not accept any form of forced labour and/or child labour under any circumstances and include this as a parameter when choosing sub-suppliers and sub-contractors.
- We respect the freedom of association and the right to collective bargaining.
- We have developed and implemented structured plans for continued education for all groups of our employees and we support employee initiatives to upgrade their qualifications.
- We provide private health insurance promoting early treatment and well-being.
- We endeavor to ensure a healthy balance between work and family through a designated sustainable working culture group.

VIRTUAL SOCIALIZATION IN DEM

For a period of time during the pandemic we all worked from home. We introduced a new Thursday ritual – each went for a walk after lunch, and in addition to this little exercise, we also had a phone chat with a colleague to pick up on anything and everything. Furthermore, we met online to talk about new assignments and projects, and occasionally it was time for celebrating that the company was still going strong.

Virtual walks with a colleague on the line


We are celebrating our success


Meeting and eating

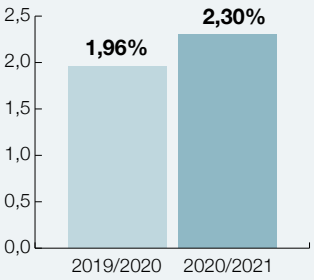
THE PEOPLE AT DEM

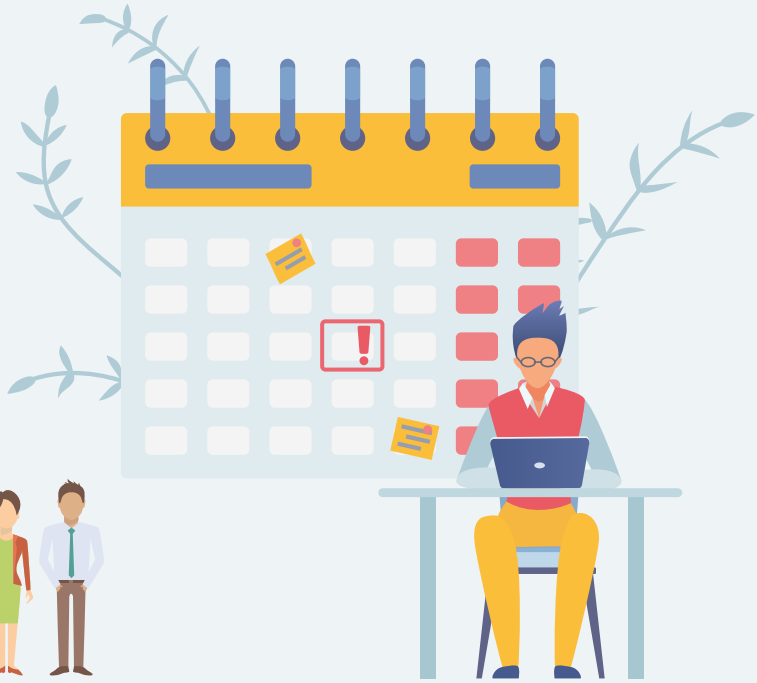
At DEM we have during the COVID pandemic had an increased focus on protecting jobs and well-being of our colleagues with the aim to ensure that preventive measures interfere as little as possible with people's everyday work life, while at the same time ensuring that we prioritize everyone's health and safety.

For the protection of jobs all employees voluntarily agreed to a salary reduction for a limited period and so far we have avoided any redundancies. We have introduced the possibility of increased flexibility to ease the pressure for employees struggling to juggle their working and private lives, and the employee satisfaction remains very high. DEM has had no reporting of sexual harassments.

Unlike many engineering companies we have a high percentage of both female employees and people with diverse backgrounds. That is a base for an inclusive culture, where we respect each other and enjoy our varied professional perspectives and ways of socializing. At DEM we strive to make our people thrive. As shown below, this is reflected in the employee absence rate which is quite low.

Sickness absence





Gender split

	2019/2020	2020/2021
♂	63%	62%
♀	37%	38%

ANTI-CORRUPTION AND BRIBERY POLICY

At DEM we are open and honest about our behavior, and we take responsibility for our actions, for which we are always prepared to be accountable. That is a promise to ourselves and to our stakeholders. Such a promise means that we intend to combat corruption and the negative impacts corruptions have on people and societies all over the world. We pride ourselves of working with SDG 16 target 5: 'Substantially reduce corruption and bribery in all their forms', and SDG 17: 'Strengthen the means of implementation & revitalize the global partnership for sustainable development' which underline our commitment and obligations to conduct good and ethical business practices both at home and abroad.

We have a policy in place for anti-corruption and bribery in order to ensure that we always work to minimize corruption in the countries in which we operate.

The policy at DEM is to carry out healthy and responsible business practices where bribery and other related forms of corruption that create unfair competition do not take place. DEM is an international company and we operate in markets where bribery or facilitation payment can occur. That does not change the fact that DEM views both methods as highly unacceptable and unethical ways for businesses to get an unlawful advantageous position, e.g. by giving a customer money under the table or return commission.

DEM and employees at DEM therefore do not engage in receiving bribes, return commission or other similar unethical or illegal actions. At DEM our position is very clear; we wish to support and engage in healthy and value creating competitive practices – even though a firm policy on corruption and bribery may cause inconveniences for the company or its employees.

ENVIRONMENTAL CARBON FOOTPRINT REPORT

ORGANIZATIONAL AND OPERATIONAL BOUNDARIES AND BASE YEAR

This carbon footprint report estimates the GHG-emissions caused by DEM activities in the reporting year 2021 (May 1, 2020-April 30, 2021). The operational boundary covers scope 1, scope 2, and part of scope 3 (business travel).

Figures provided follow the Green House Gas (GHG) protocol, and the GHG calculation tool provided by the World Resources Institute.

DEM offices included in the 2021 reporting year are: • Aarhus • Copenhagen

To calculate results, emissions are categorized as either direct (Scope 1) or indirect (Scope 2 & Scope 3). Direct, Scope 1, emissions are those that are directly caused by a source that the company owns or controls. Indirect, Scope 2 and Scope 3, emissions are derived from the company's consumption of energy products and services, where the company does not own or control the emissions source.

FOLLOWING THE GHG PROTOCOL CORPORATE STANDARD, THE DIRECT AND INDIRECT EMISSIONS ARE DIVIDED INTO THREE SCOPES:

SCOPE 1: **All direct emissions caused by the company, e.g. emissions from company owned cars, or combustion of fossil fuels such as natural gas in company-owned equipment**

- Use of company cars for business purposes – managers
- Use of company cars for business purposes – employees

SCOPE 2: **All indirect emissions caused by the company's purchase of energy**

- Electricity use in offices
- District heating used in offices

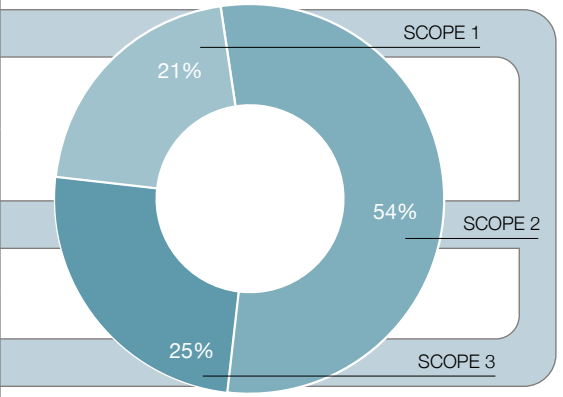
SCOPE 3: **Other indirect emissions caused by the consumption of products and services**

- Use of employee cars for business purposes (car allowance)
- Transportation by train
- Transportation by bus
- Transportation by ferry
- Transportation by taxi
- Domestic air transport
- International air transport

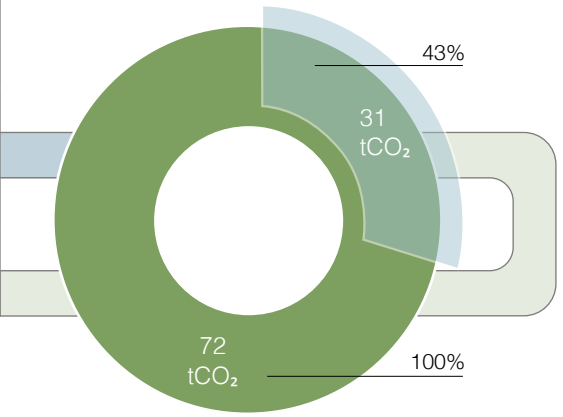
TOTAL CO_2-EMISSIONS IN THE 2020-2021 REPORTING YEAR

ACTIVITIES	DISTANCE (km)	ENERGY CONSUMPTION/ PRODUCTION (kWh)	CO_2-EMISSIONS (tCO_2)
SCOPE 1			
Use of company cars for business purposes – managers	19,522		4.24
Use of company cars for business purposes – employees	19,852		2.42
SCOPE 2			
Electricity use in offices		59,610	14.20
District heating use in offices		59,578	2.82
SCOPE 3			
Use of employee cars for business purposes	36,935		6.5
Transportation by train	9,575		0.5
Transportation by bus	298		0.0
Transportation by ferry	5,309		0.7
Transportation by taxi	141		0.0
Domestic air transport	-		0.0
International air transport	-		0.0
Total	**91,632**	**119,188**	**31.43**
OFFSETS			
Middelgrunden offshore wind farm		303,949	72.40
Total		**303,949**	**72.40**

% CO_2-EMISSIONS DISTRIBUTED BY SCOPE



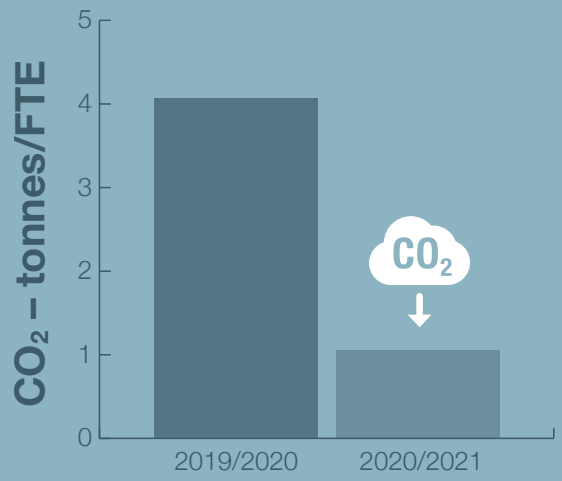
ENERGY USED BY DEM IS EQUIVALENT TO 10% OF THE RENEWABLE ENERGY GENERATED BY OFFSETS



CO_2-EMISSIONS PER EMPLOYEE

DEMs carbon footprint data for 2021 show reduced activity when it comes to business travel and energy consumption. The reduced activity is a consequence of COVID-19. We continuously aim to reduce the need for travelling by holding on to video conferences and online meetings whenever possible.

We are fully aware that we have moved part of our CO_2 consumption to the employee home offices. This will be addressed in next year's reporting.

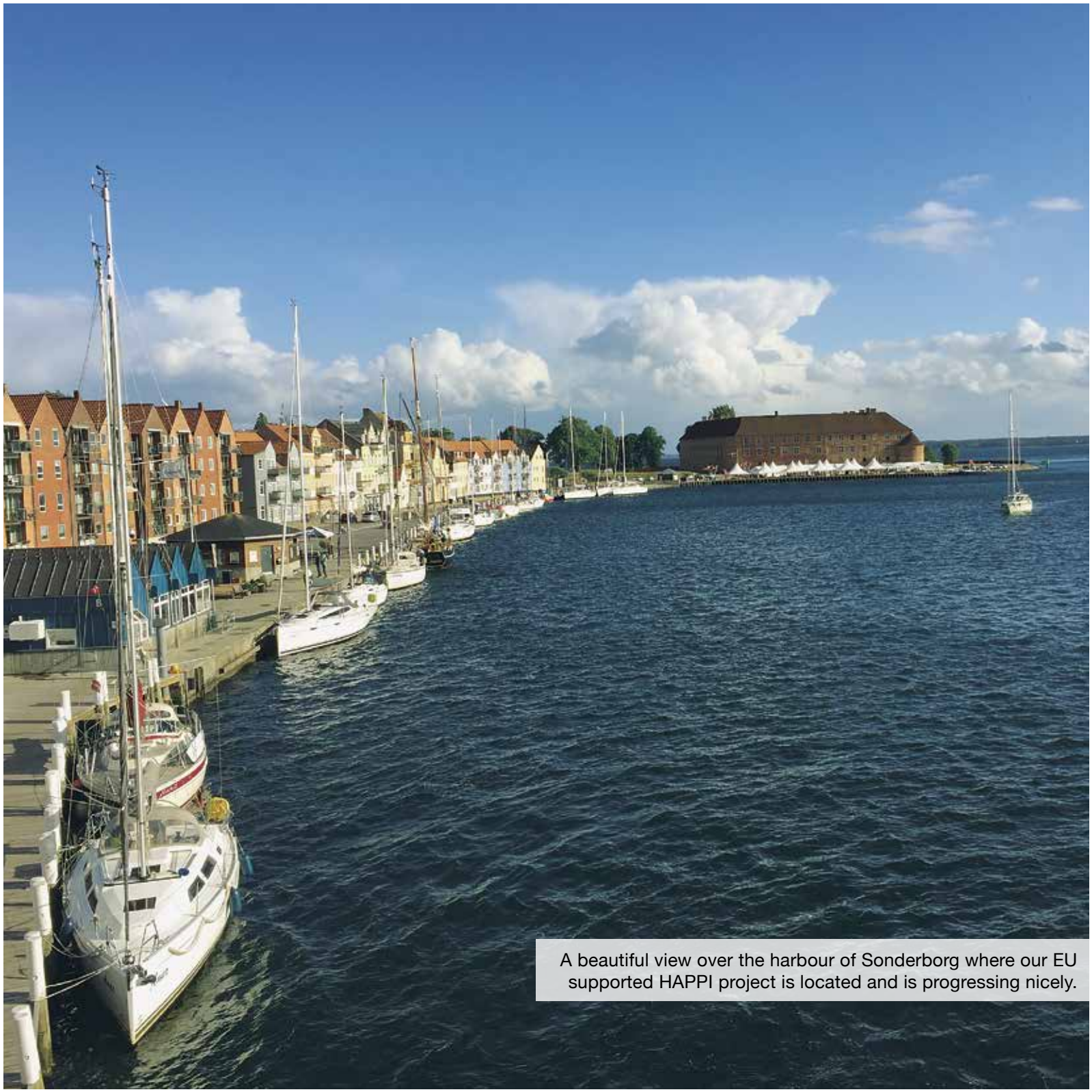


SCOPE 1: At DEM, there are no boilers etc. in buildings that could contribute to own oil/gas use. For this reason, our Scope 1 consists of "use of company cars for business purposes – managers" and "use of company cars for business purposes – employees."

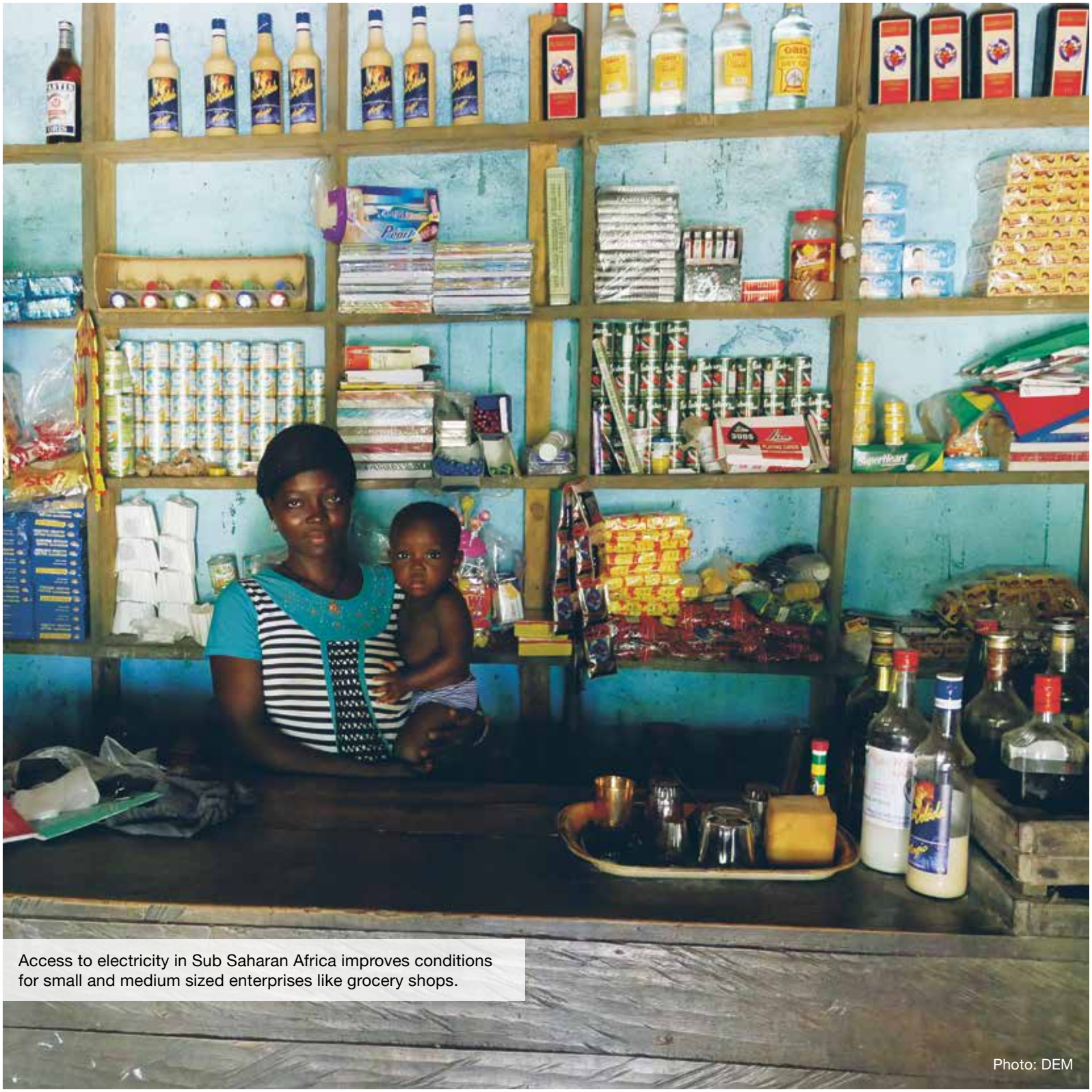
The Scope 1 emissions are based on specific car models where scope 3 transport in cars is based on generic CO2 emissions per kilometer. Managers' use of company cars for business purposes is estimated 50/50. In reality, there has been far less driving for business purposes derived from Covid-19, but the methodological approach from previous years has been maintained.

SCOPE 2: There is a significant fall in CO_2 emissions from district heating (from 8.57 tonnes CO_2 in the 2019-2020 reporting period) which is mainly caused by a change in methodology: Previously the national average emissions were utilised, while in this report, we have used the specific environmental declaration for the district heating plants in Aarhus and Copenhagen.

SCOPE 3: The scope 3 emissions from our services have drastically decreased due to the pandemic situation – basically due to travel restrictions on our international projects but one positive takeaway from the pandemic is that in future we will adhere to virtual meetings whenever possible without jeopardizing the value of our services to the clients.



A beautiful view over the harbour of Sonderborg where our EU supported HAPPI project is located and is progressing nicely.



Access to electricity in Sub Saharan Africa improves conditions for small and medium sized enterprises like grocery shops.

Photo: DEM

LIVING BY OUR VALUES

To achieve better utilization of the earth's scarce resources, DEM is constantly working to develop our innovative advisory methods and tools to improve the sustainability of our customers.

TARGETS AND ACHIEVEMENTS

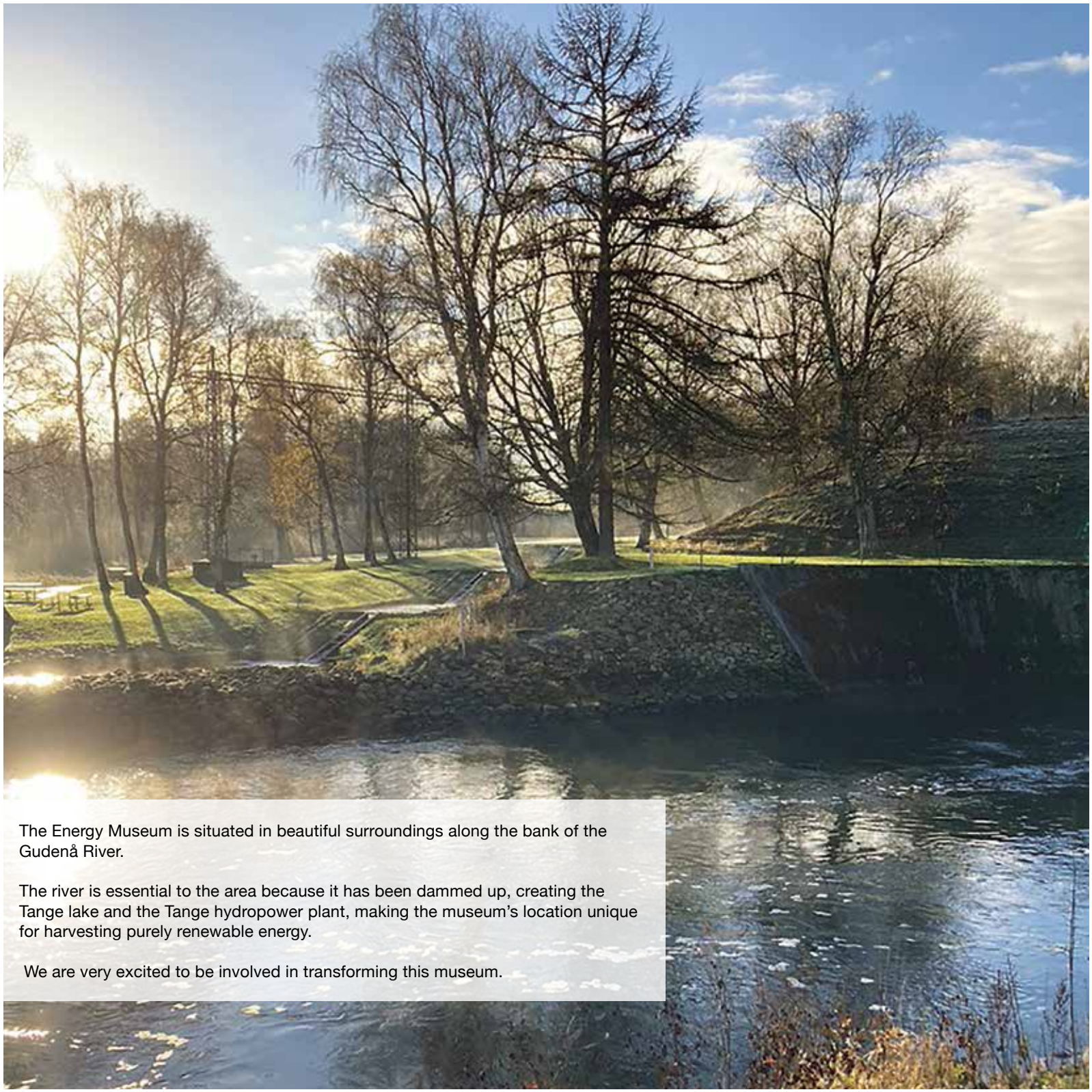
Progress: ▲ Achieved ● In progress ■ Delayed

OBJECTIVE	INITIATIVE	DESCRIPTION	TIME FRAME	STATUS
CO_2 reduction and contribution to the achievement of the 2030 objectives	Hybrid or electric car	For offices in Denmark, replace company cars with electric or hybrid cars.	1-2 years	■
Environmental sustainability and contribution to the achievement of the 2030 objectives	Become an active member in the Global Compact	DEM is an active member in the Global Compact network.	Achieved	▲
CO_2 reduction and employee health and well-being	"We Bike To Work" initiative	Starting May 1st of each year, employees create teams and compete to see which team has biked the most kilometers during the month.	Achieved	▲
CO_2 reduction and contribution to the achievement of the 2030 objectives	Paper and glass recycling	Paper and glass are being separated from general waste in our Aarhus office. Our Copenhagen office is currently not separating waste as before.	1-2 years	■
Environmental sustainability	Organic fruit and milk	Organic fruit and milk are delivered on a regular basis every week.	Achieved	▲
Environmental sustainability and energy savings	Lighting	LED lighting in the offices and motion sensors. This was achieved in our Copenhagen office, but after moving premises, this is not currently installed. Delayed implementation in Aarhus due to lease considerations.	1-2 years	■
Environmental sustainability and energy savings	Optimized temperature regulation	Intelligent thermostats for temperature control and optimization were installed in our Copenhagen office, but after moving premises, this is not currently the case. Delayed implementation in Aarhus due to lease considerations.	1-2 years	■
Environmental sustainability and employee health and safety	Ventilation	Regulation of the existing ventilation and installation where needed, improving energy savings and employee health.	2-3 years	■
Environmental sustainability and contribution to the achievement of the 2030 objectives	Water saving	Water saving taps, dishwashers, etc.	Achieved	▲
Employee well-being and positive work environment	Employee association	Association that arranges activities like fishing, game nights, etc. for employees. Financed and managed by the employees themselves. DEM supports the association financially.	Achieved	▲
Employee well-being and positive work environment	Knowledge sharing	A project in connection with the Danish Innovation Fund was completed in 2019. DEM is following the knowledge sharing initiatives developed in the project.	Achieved	▲

TARGETS AND ACHIEVEMENTS

Progress: ▲ Achieved ● In progress ■ Delayed

OBJECTIVE	INITIATIVE	DESCRIPTION	TIME FRAME	STATUS
Employee health, safety and well-being	Workplace risk assessment (APV)	Screening to evaluate work environment and improvement areas. Last evaluation conducted in August 2018. Next evaluation scheduled in 2022 due to corona.	Achieved	▲
Employee health and well-being	Private health insurance	Promoting good health by contributing to access to medicines and vaccination, and early detection of diseases.	Achieved	▲
Employee health and well-being	Incorporate the 6th vacation week	The 6th vacation week was fully rolled out by 2019.	Achieved	▲
Employee well-being	Pension	The pre-existing pension is being incrementally improved, and was fully rolled out in September 2020.	Achieved	▲
Employee health and well-being	Access to employee shower facilities	Shower facilities established at our Aarhus office in 2019. Our Copenhagen office also has shower facilities in their new premises.	Achieved	▲
Employee health and well-being	Sustainable working culture group	A group was established with a focus on work/ life balance and working with sustainable projects, teams and processes. Company-wide initiatives are continually being initiated.	Achieved	▲
Environmental sustainability and energy savings	Shutting down of servers	In this period, no additional servers have been shut down. Server shut down of the currently 16 running servers is postponed to 2022.	In progress	●
Employee well-being	Update of employee handbook	New initiatives like the sustainable working culture, 6th vacation week, private health insurance etc. are included in the employee handbook. Membership of the employee association has been achieved.	Achieved	▲
Employee well-being	Lunch	Providing daily lunch for employees at both locations is being prepared for end 2021	In progress	●
Employee health and well-being	Flexible working hours to accommodate private appointments	“Freedom with responsibility” – a long-standing company tradition at DEM.	Achieved	▲
Knowledge sharing and positive work environment	Implementing new document handling systems	DEM is now using a cloud-based, administrator driven file structure and accompanying information sharing platforms.	Achieved	▲
Employee well-being and positive work environment	Guidelines for workplace in the office / at home, task solution etc.	Due to Covid-19 the possibility of increased flexibility has been introduced to ease the pressure for employees struggling to juggle their working and private lives.	Achieved	▲



The Energy Museum is situated in beautiful surroundings along the bank of the Gudenå River.

The river is essential to the area because it has been dammed up, creating the Tange lake and the Tange hydropower plant, making the museum's location unique for harvesting purely renewable energy.

We are very excited to be involved in transforming this museum.

OUR IMPACT

TRANSFORM AND CONNECT

Today the existing Energy Museum consists of a main building, a number of large and small exhibition buildings as well as an outdoor museum, all part of the landscape area around Gudenåcentralen, Gudenåen and Tange Sø. In the new museum, the outdoor museum must be strengthened and both the main building and the future House for Renewable Energy must undergo a major transformation.

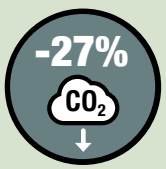
The project is based on a holistic approach to sustainability where buildability and sustainability go hand in hand. Both environmental, economic and social sustainability will be addressed in parallel to recycling of both buildings and materials.

Use what is to create what should be

NEW-BUILD VERSUS RENOVATION

In line with using sustainable new materials, upcycling and recycling existing ones, the most direct and environment-friendly way to upcycle existing buildings is to reuse part of the existing structure.

Instead of designing two new buildings from scratch, a design proposal was made reusing the existing core structure of the two buildings. By doing so, calculations indicated at least a 27% reduction in CO_2 equivalent tonnes when comparing the actual project to a traditionally constructed reference project using common building materials.



NEW-BUILD	KG/CO_2 EQ
The Main Building	2,189,000
The House for Renewable Energy	545,700
Total	2,734,700

TONNES/CO_2 EQ
2,734.7

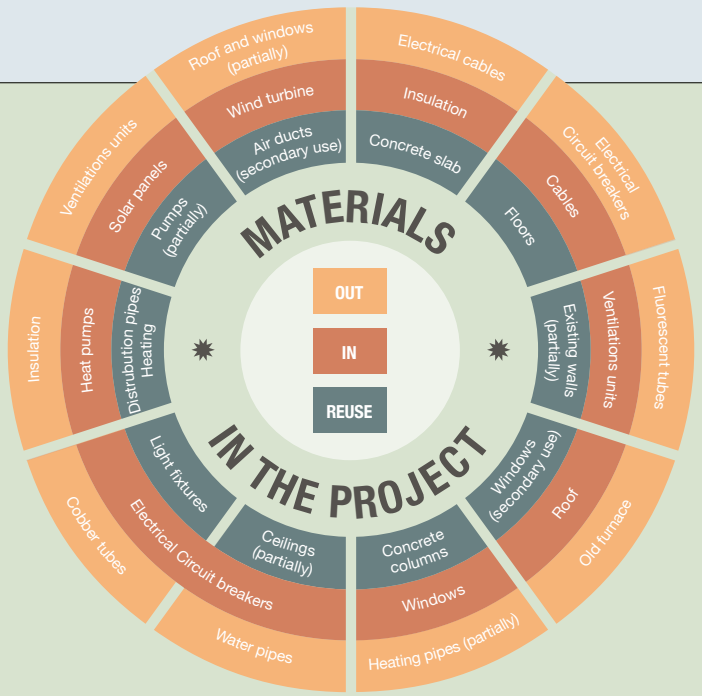
TONNES/CO_2 EQ
2,002.9

RENOVATION	KG/CO_2 EQ
The Main Building	1,654,000
The House for Renewable Energy	348,900
Total	2,002,900

SDGs AND SUSTAINABLE MATERIALS

The project has been analysed and linked to specific UN SDG indicators, and the Danish SDG indicators. Each indicator will be measured and evaluated to ensure a transparent data history of the overall sustainability of the project. A high priority in the project is to use circular materials, as well as more environmentally friendly materials such as wood. All existing materials have been analyzed and divided into different categories based on their potential for recycling.

A specific plan for each material is then developed to ensure the most direct way of recycling at a minimal cost. In terms of the new materials needed for the completion of the project, calculations have been made to ensure the optimal choice of low impact materials for the completion of the project.



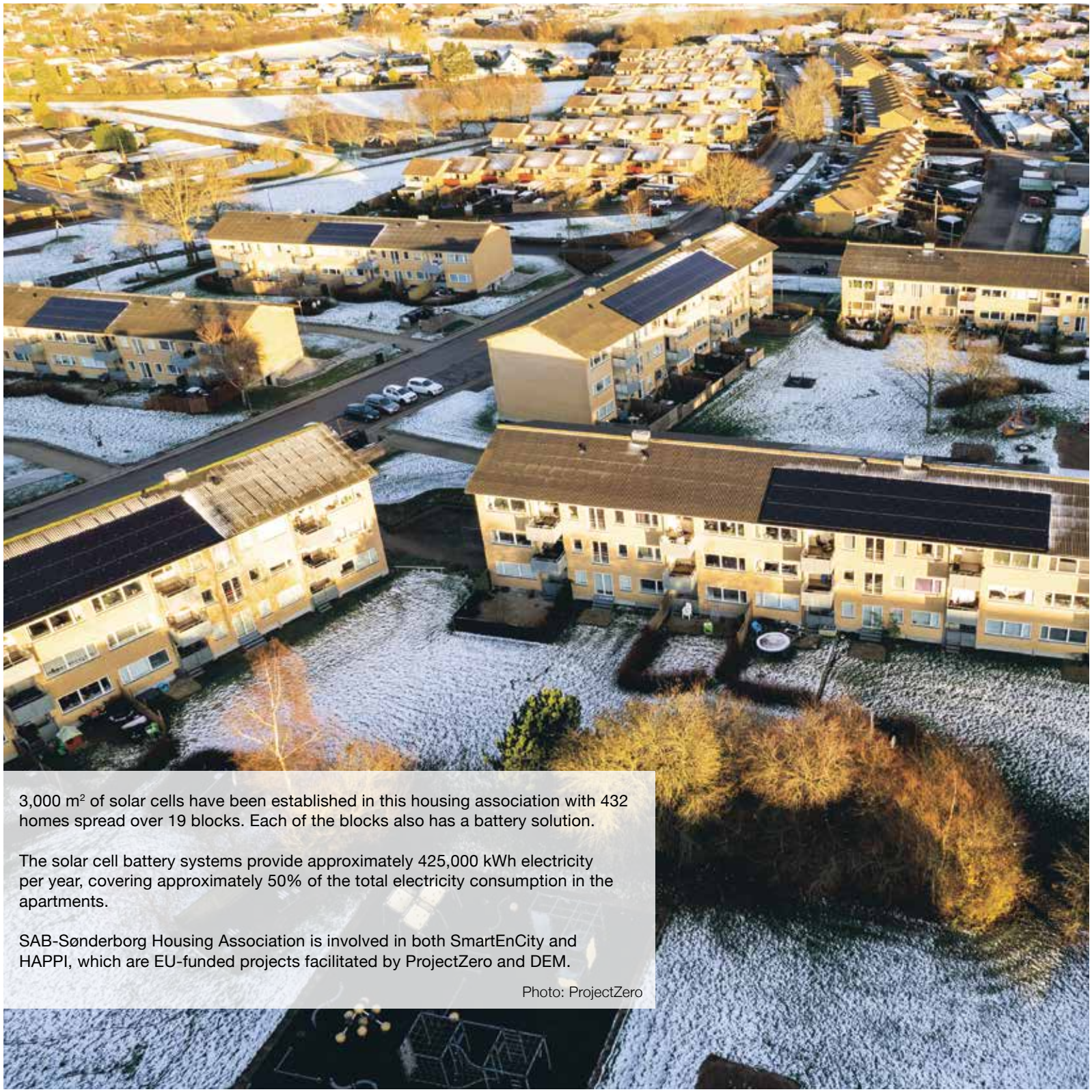
MATERIALS THAT ARE TAKEN OUT OF THE PROJECT
Must be recycled or disposed in a responsible manner

MATERIALS THAT ARE BROUGHT INTO THE PROJECT
Recycling, profits and circular materials

MATERIALS THAT STAY IN THE PROJECT
Direct reuse and reuse elsewhere in the project

THE PROJECT AFFECTS THESE SDGs

UN Global Goals	Target		Substantial/ moderate influence
3 SUNDHED OG TRIVSEL	3.9	Reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	Moderate
4 KVALITETS-UDDANNELSE	4.7	Ensure that all learners acquire the knowledge and skills needed to promote sustainable development	Substantial
6 RENT VAND OG SANITET	6.4	Increase water-use efficiency and ensure sustainable supply of freshwater	Moderate
7 BÆREDYGTIG ENERGI	7.2	Increase the share of renewable energy in the global energy mix	Substantial
	7.3	Double the global rate of improvement in energy efficiency	
8 ANSTÆNDIGE JOBS OG ØKONOMISK VÆKST	8.4	Improve resource efficiency in consumption and production	Moderate
	8.5	Achieve full employment, decent work, and equal pay for work of equal value	
	8.8	Protect labour rights and promote secure working environments	
	8.9	Promote sustainable tourism	
9 INDUSTRI, INNOVATION OG INFRASTRUKTUR	9.5	Enhance scientific research, upgrade the technological capabilities of industrial sectors	Moderate
11 BÆREDYGTIGE BYER OG LOKALSAMFUND	11.4	Protect and safeguard the world's cultural and natural heritage	Substantial
	11.7	Provide universal access to green and public spaces	
12 ANSVARLIGT FORBRUG OG PRODUKTION	12.2	Achieve the sustainable management and efficient use of natural resources	Substantial
	12.4	Achieve environmentally sound management of chemicals and waste	
	12.5	Substantially reduce waste	
	12.8	Ensure that people everywhere have information and awareness for sustainable lifestyle	
13 KLIMA-INDSATS	13.1	Strengthen resilience and adaptive capacity to climaterelated disasters	Substantial
	13.3	Improve education on climate change mitigation, adaptation and impact reduction	
15 LIVET PÅ LAND	15.1	Ensure the conservation and sustainable use of terrestrial and inland freshwater ecosystems	Moderate
	15.5	Reduce the degradation of natural habitats and halt the loss of biodiversity	



3,000 m^2 of solar cells have been established in this housing association with 432 homes spread over 19 blocks. Each of the blocks also has a battery solution.

The solar cell battery systems provide approximately 425,000 kWh electricity per year, covering approximately 50% of the total electricity consumption in the apartments.

SAB-Sønderborg Housing Association is involved in both SmartEnCity and HAPPI, which are EU-funded projects facilitated by ProjectZero and DEM.

Photo: ProjectZero

CASE STUDIES

INTEGRATED ENERGY DESIGN FOR THE MAIN BUILDING

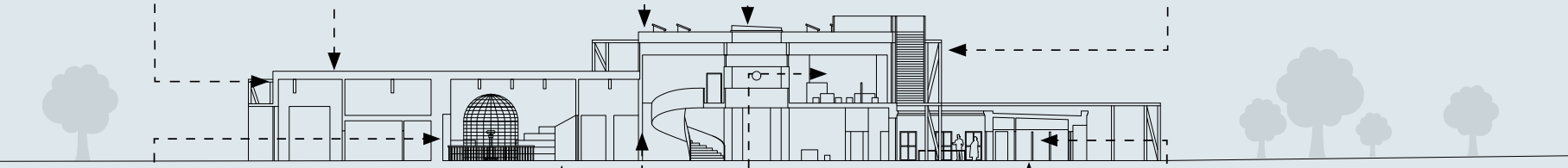
DESIGN FOR DISASSEMBLY
The constructive and technical principles of the buildings are designed according to the principle of Design for Disassembly.

ENERGY PRODUCTION
Establishment of high-efficiency south-facing solar cells on a flat roof.

NATURAL VENTILATION
In central high-ceilinged rooms, natural ventilation is established with air intakes in the facades and the natural pressure leads the air out through large openable skylights in the roof.

GREEN ROOF
Establishment of green roofs for delaying rainwater in relation to local handling on site (LAR).

NATURAL SOLAR SCREENING
The outdoor wooden construction around the building, as well as the establishment of sunlight protection, protects against glare at workplaces and overtemperatures inside the building.



RECYCLING OF MATERIALS
The characteristic masonry of the building remains untouched after the transformation, and is included in its full and exact form in the future main building. Other constructions and materials are preserved or recycled elsewhere in the museum.

ENERGY EFFICIENT LIGHTING
Exhibitions are equipped with efficient LED lighting.

DEMAND-CONTROLLED VENTILATION
In mechanically ventilated rooms demand-controlled balanced ventilation is established with variable air volumes (VAV) with CO_2 and temperature control.

CIRCULAR EXHIBITIONS
Exhibitions are developed according to a circular economy principle, Design for Disassembly, easy handling and environmentally friendly materials.

ECO-LABELLED MATERIALS
As a rule, new building materials are eco-labelled or indoor climate-labelled. Substances and materials harmful to heath or the environment are not tolerated.

SUSTAINABLE OPERATION
Energy management and sustainable behavior maintain the museum's sustainability in everyday life.

Client:
Energimuseet, Denmark

MUSEUM OF ENERGY

Sustainable transformation

ENERGIMUSEET

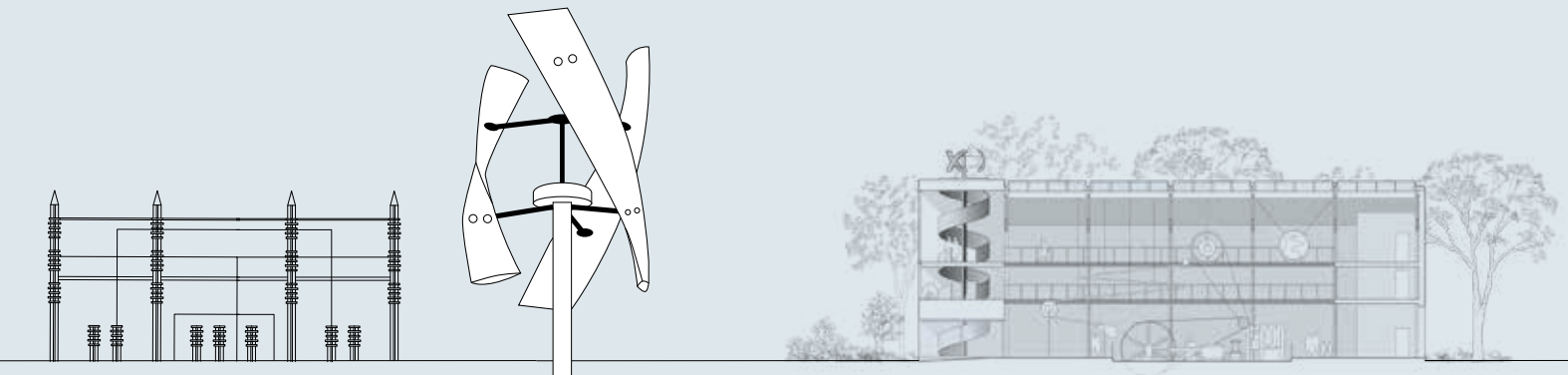
The vision of this project is to create a modern sustainable museum which honors the need for a healthy indoor environment, as well as intriguing outdoor surroundings. The Museum of Energy will embrace the qualities of an open air museum linking museal exhibitions in two buildings together with the beautiful surroundings. A core part of the project is to ensure that the new museum has a minimal impact on the global resources both in terms of establishment and operation. This is ensured through the following four pillars: environmental sustainability, social sustainability, economic sustainability, and cultural sustainability. These four sustainable qualities will be applied to assess the project throughout the entire project period from design to commissioning.

As part of the design team, DEM has been responsible for the overall project management, sustainability, technical installations, energy design and commissioning.

DGNB certification

The goal for the museum is to achieve the DGNB gold certification which is the second highest certification and at the same time to ensure a holistic sustainability that extends beyond construction technology.

DGNB

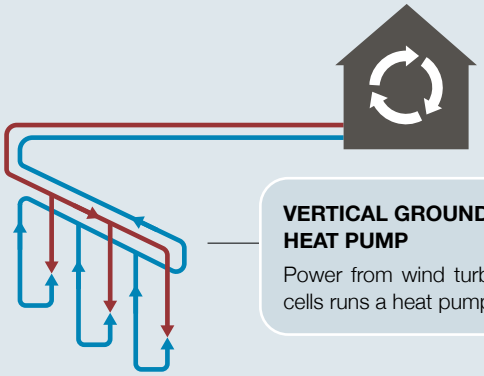


ENERGY CONCEPT FOR THE HOUSE FOR RENEWABLE ENERGY

The House for Renewable Energy is mainly supplied by the most essential renewable sources.

HORIZONTAL WIND TURBINE

The vertical wind turbine (VAWT) is much easier to integrate in a local environment, on or near a building. It enables the integration of an active wind-producing element that visibly contributes to the energy production of the building. This is an important part of the dissemination of different types of renewables, even if the mill itself is not a major contributor to the overall energy production.



VERTICAL GROUND SOURCE HEAT PUMP

Power from wind turbines and solar cells runs a heat pump.

SOLAR CELLS

Solar cells can easily be integrated into a building, and thus contribute to energy production with a minimum of inconvenience to architecture, noise, operation, maintenance, etc.

Services provided:

- Overall consultancy
- Conception stage
- Construction program
- Project outline

Properties:
2 buildings

m²:
3,465 m² + 1,416 m²

Timeframe:
June 2021-

11.3

SUSTAINABLE CERTIFICATION

Green Circular Conversion

A roadmap on how to continue the path towards a greener and circular transition.

Services provided

- Consultancy relating to different certification schemes and which one is most suitable.

11.6

SUSTAINABLE URBAN DEVELOPMENT

1 waste management project

Designing for 100% disassembly in order to base the future business model on a take-back scheme.

Reduce – Reuse – Recycle

11 SUSTAINABLE CITIES AND COMMUNITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

Services provided

- Avoiding waste due to take-back solutions.

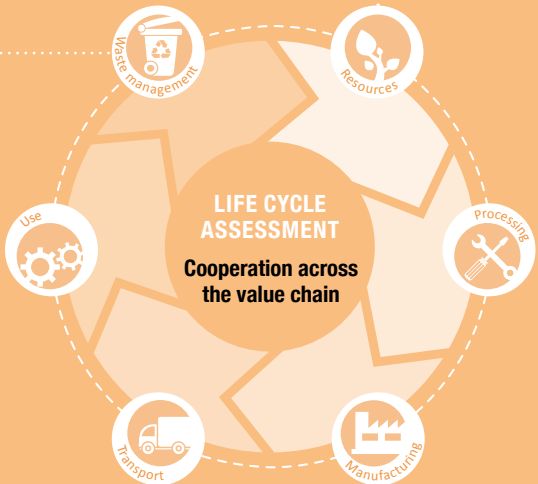
11.6

SUSTAINABLE URBAN DEVELOPMENT

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

- Raw materials, steel and aluminium
- To circle as 'technical nutrients' in buildings

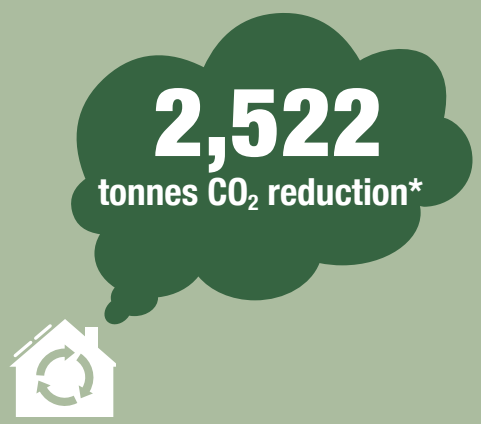


Services provided

- Changing from virgin to reused materials.

EMISSION REDUCTION

13.2



Services provided

- Raw material and CO_2 reduction due to shift from virgin to reused materials and take-back solutions.

*This is the potential from the roadmap, based on the EU project calculation tool and projected for 2023. Calculated over a 25-year lifetime.

DAMPA ACOUSTIC CEILINGS

Technical nutrient for the building industry

"Net zero", "carbon neutral", "0 CO_2 emission". In the building sector, focus is currently not only on the energy used during the operational phase of a building life cycle. Embedded CO_2 in building materials has become just as important in relation to energy consumption and life cycle approaches are becoming mainstream.

DAMPA's acoustic ceilings are made of steel and aluminium, raw materials which are not the most sustainable materials. However, if produced, used and re-used, their qualities are often overlooked as they have the potential to continually circle as so-called 'technical nutrients' in buildings.

This way of thinking requires a change of mindset in the company as well as cooperation across the value chain. With the purpose of helping businesses transform to the circular economy and a sustainable future, DAMPA was part of the EU funded programme, Green Circular Conversion, with DEM as an advisor.

Many green possibilities and actions have been identified and pursued. DAMPA is already working on procuring reused aluminium, changing the material used for the acoustic batches, and designing the products for 100% disassembly in order to base the future business model on a take-back scheme.

The potential related to the reuse of aluminium and take-back strategy – 2 years down the line – is a 2,522 tons CO_2 reduction across all of DAMPAS products per year. This requires a shift in cooperation and production processes, as well as a communication effort to highlight the potential of circular acoustic metal ceilings to the building industry.

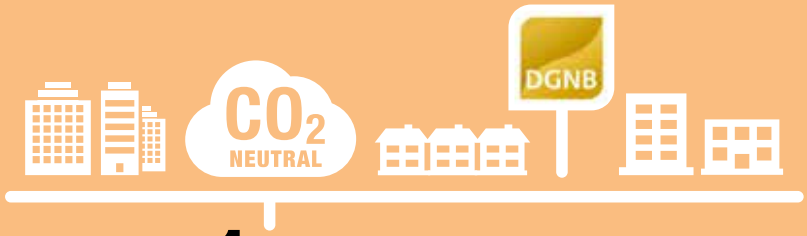
Client:
Dampa ApS, Denmark

Product delivered:
Green Circular Conversion project

Timeframe:
April 2021-
December 2021

11.3

INCLUSIVE AND SUSTAINABLE URBANIZATION



1 DGNB Building in Use Certification

11 properties

Services provided

- DGNB BIU Portfolio Certification.

11 SUSTAINABLE CITIES AND COMMUNITIES

11.6

REDUCE THE ENVIRONMENTAL IMPACT OF CITIES

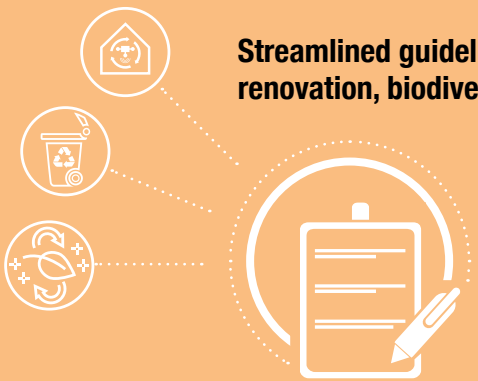
Services provided

- Development of an organization for sustainable building operations.

11 SUSTAINABLE CITIES AND COMMUNITIES

11.6

REDUCE THE ENVIRONMENTAL IMPACT OF CITIES



Streamlined guidelines for renovation, biodiversity, etc.

Services provided

- Tools for performing sustainable building operations.
- Streamlined guidelines for renovation, biodiversity, etc.

13 CLIMATE ACTION

CLIMATE ACTION

13.3

CO_2-neutral building operation in 2032

Services provided

- Awareness through defining the organization for sustainable building operations and tool development.
- CO_2-neutral building operation in 2032.

DGNB BUILDING IN USE

Establishment of DGNB Building In Use with a large Danish client

The client has adopted a strategy for CO_2-neutral building operations by the year 2032. In order to achieve this ambitious strategy, the client has initiated several relevant initiatives to support the goal.

One of the initiatives is to have all their properties sustainability certified. The client has chosen the DGNB certification for their Danish property portfolio.

The client will DGNB certify both future and existing properties. DEM has been an advisor to the client and has helped certify their existing property portfolio according to the DGNB Building in Use standard.

The idea of certifying according to DGNB Building in Use arose when the developer lacked an overview of the energy consumption in their property portfolio. The new DGNB Building in Use scheme could meet this challenge, and at the same time provide a structured plan for working with sustainable construction, cf. their strategy of CO_2-neutral building operations by the year 2032.

In the project, the first decision was whether to carry out portfolio certificates or prepare building certificates. The client chose the basic portfolio certification combined with building certificates, when relevant.

The portfolio certificate has been a catalyst for establishing an organization for sustainable building management, as well as for formulating a strategy for sustainable building management. It has been an iterative process where DEM started with an initial screening of the building portfolio to select DGNB criteria and relevant properties. Subsequently, DEM defined which criteria were present and which were to be developed. A large part of the project has involved data collection and creating the right structure and developing auxiliary tools.

In collaboration with the client, DEM has developed a number of tools that can support the work with sustainable building operations. Among other things, the development of an organization and terms of reference for sustainable building operations as well as working with an annual cycle, building documentation, uniform building inspection and a number of streamlined guidelines for renovation, biodiversity, etc.

For the client, it is important to be able to maintain the sustainable building operation. Therefore DEM has established a system for ongoing monitoring, analysis and reporting of energy consumption, as well as initiated optimization measures. This provides a good process when new buildings and building certificates are added. As a result, the quality of the entire portfolio has been improved.

Client:
Anonymous

Properties:
11 buildings

m²:
72,000

Timeframe:
December 2020-
August 2021

7.1

ACCESS TO RENEWABLE ENERGY

Energy supply for

235,000

people*

*Estimated long term impact of the project if realised

Services provided

- Technical assesment of different scenarios for the transmission line-project.
- Economic viability assessment of the scenarios including a risk assessment.
- Assessment of environmental and social impacts.

7 AFFORDABLE AND CLEAN ENERGY

7 AFFORDABLE AND CLEAN ENERGY

ACCESS TO RENEWABLE ENERGY

7.1

Sector Study

✓ Access to affordable, secure and modern energy supply.

Services provided

- Assessment of the project's relevance to Mali's development strategy.
- Assessment of the project's alignment with Mali's energy master plan.
- Assessment of alignment with Danida policy and programmes.
- Workshop held in Mali with Malian civil society organisations.

13.2

ACCESS TO BASIC SERVICES

13 CLIMATE ACTION

17 PARTNERSHIPS FOR THE GOALS

4,000,000

tons CO_2 reduction*

*Estimated long-term impact of the project if realised. CO_2 emission reduction calculated over 10 years.

Services provided

- Assessment of CO_2-emission reductions from the substitution of fossil fuel-based electricity with grid electricity.

FINANCING PARTNERSHIPS

17.Fin.

DKK

Estimated funds to be mobilized for sustainable development

1.7 bil. DKK*

as a mix of grant and concessional credit financing.

*Estimated long-term impact of the project if realised.

Services provided

- Submission of a feasibility study.
- Submission of a draft project document for future project approval for DSIF-funding.

TRANSMISSION LINES PROJECT

The Kayes Region, Mali

DANIDA SUSTAINABLE INFRASTRUCTURE FINANCE

"The Kayes Region Transmission Lines Project" aims to extend Mali's electricity network in the south-western part of the country to provide electricity to mining industries, small and medium-sized enterprises, local industries and the population in semi-urban towns and rural villages. The area is currently not supplied by the national electricity grid, and the project will allow for an electricity supply that will boost economic development.

The Government of Mali has applied to Danida Sustainable Infrastructure Finance (DSIF) for the financing of this project which will be composed partly of grant and partly of concessional credit to the Ministry of Energy through the Ministry of Economy and Finance of Mali. The project is currently under preparation and DSIF has not yet committed to financing it. As part of the preparations, DEM led the feasibility study of the proposed project. During field missions, COVID-19 broke out which complicated the assignment. DEM was proactive in securing the well-being of the experts and ensuring the continuation of the study under difficult conditions. The feasibility study was completed to the satisfaction of the client and the Malian beneficiary.

The overall result of the project will be an expansion of the regionally interconnected electricity-grid that will establish a fundamental infrastructure for future energy infrastructures, such as solar- and hydro power plants, and future rural electrification projects in three circles in the Kayes region targeted by the proposed project. This area will reach a population of 1.5 million in 2026, which is when the project is estimated to be completed.

The project is estimated to connect 2 semi-urban towns (Sadiola and Kéniéba) to the national interconnected grid (semi-urban population in 2026: 135,000), 50 rural villages (rural population in 2026: 100,000), 8 large mining industries, 100 SMEs, and 1000 small artisanal and agricultural enterprises. It will create a condition for an increased transmission and distribution of renewable energy. The increased energy supply will improve the living and working conditions for the population – and create improved income and employment opportunities for young people and women.

If realised, the project will result in a direct improvement of government income by improving the revenues of the public electricity operator, EDM-SA. Indirectly, public income will improve through revenues and taxes generated from the increased productivity and economic activity in the area. The project will contribute to the Danish strategic objectives relating directly to SDG 1 (Poverty alleviation), SDG 7 (Sustainable energy), SDG 8 (Decent work), SDG 9 (Industry, Infrastructure and Innovation), SDG 13 (Climate action) and SDG 17 (Partnerships).

In addition the project will contribute to the Danish strategic objectives for sustainable infrastructures that build on Danish strengths in the energy sector and contribute to the objectives of the Danish private sector programme in Mali by improving the conditions for agro-businesses and youth entrepreneurship in the project zone.

Client:
Danida Sustainable Infrastructure Finance

Product delivered:
Feasibility Study, Project Sustainability Logbook and Draft Project Document

Timeframe projects:
2020-2021

DEM

FOR SUSTAINABLE IMPACT

February 2022

www.dem.dk

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