PARTNERSHIPS FOR IMPACT

SUSTAINABILITY

REPORT 2019

DEM

February 2020

TABLE OF CONTENTS

PARTNERSHIPS FOR SUSTAINABLE IMPACT

In September 2019, we had the honor of receiving an award for our previous Sustainability report. The UN Global Compact Network Denmark and Danish Auditors' CSR Committee awarded our 2018 report as one of the six best reports of the year in the category "Communication on Progress-report – Global Compact (SMV-COP)".

The award is given for sharing best practices and inspiring other companies, in particular small and medium-sized businesses working with the Sustainable Development Goals (SDGs) and how this area can lead to new market opportunities.

At Danish Energy Management (DEM), we have over the past years delivered a broad range of services related to the SDGs, including business strategies, sustainability plans, marketing strategies, as well as developing cases, action plans and road maps.

We have achieved this by having dedicated employees and by working with partners who are actively engaged in providing increased sustainability within their communities – abroad and in Denmark. The preparation of our sustainability report has, above all, created the opportunity for a unique involvement of our employees. It has contributed to increased ownership, making employees aware of the fact that their daily work is part of something bigger and in addition, how reporting and working with the UN Global Goals can open up new business areas and attract new customers.

In addition to the sustainability services that we provide, and in order to walk-the-talk, we have also incorporated the SDGs into our own business strategy. Our motivation for this has been supported by our firm belief that "what gets measured, gets done". For this reason, and for the fourth year in a row, we are measuring progress towards achieving the SDGs across all projects in Denmark and internationally, based on our online SDG reporting system.

While the SDGs provide a focus on the sustainable impact of our projects, the Global Compact Initiative and its ten principles provide a clear way to evaluate the sustainability of our company's day-to-day activities, helping us to continually improve. Together, the SDGs and the Global Compact Initiative enable DEM to approach sustainability in a holistic way; the benefits of which are passed directly on to each of our partners.

Through our sister company, Danish Management, we continue to provide consultancy services to private and public institutions on how to work strategically with the SDG's – in all sectors and on all levels. In 2019 we have had the honor of helping small and medium sized companies and organizations with the SDGs as well as we became part of the consortium that is currently developing country-level SDG-indicators for Statistics Denmark.

The fulfillment of the SDGs and the 2030-agenda require concerted action on all levels and in DEM we are proud to be part of this mission.

Yours sincerely

Jørn Lykou
CEO

DEMs 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 on an annual basis based on 30 specific indicators. Each relevant SDG, actionable 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.

This year (2020) we will review our system and assess if our services within e.g. LAR (Local drainage of rainwater) and Circular Economy should become part of the system enabling us through new goals and indicators to measure impact from those and other areas.

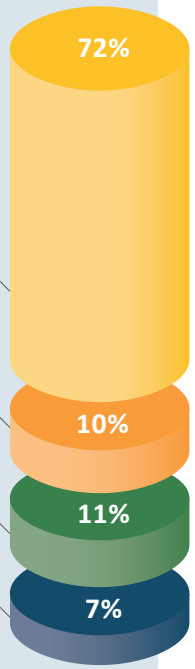
DEM MARKET AREAS CONTRIBUTING TO THE GLOBAL GOALS

- **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 2018-19



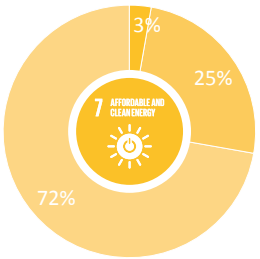
SDG 7
Affordable and clean energy

SDG 11
Sustainable cities and communities

SDG 13
Climate action

SDG 17
Partnership for the goals

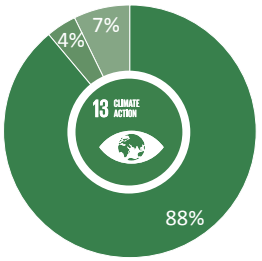
DEM DISTRIBUTION OF WORKING HOURS IN SDG TARGETS 2018-19



SDG 7.1
Ensure universal access to energy services

SDG 7.2 RE
Increase share of renewable energy globally

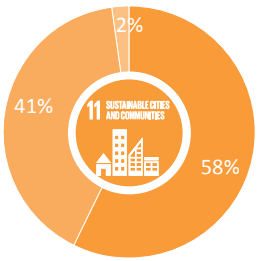
SDG 7.3 EE
Double the rate of improvement in energy efficiency



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

SDG 13.2
Integrate climate change measures into national policies

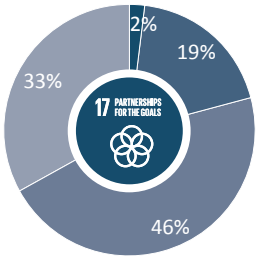
SDG 13.3
Improve education, awareness-raising and human and institutional capacity



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

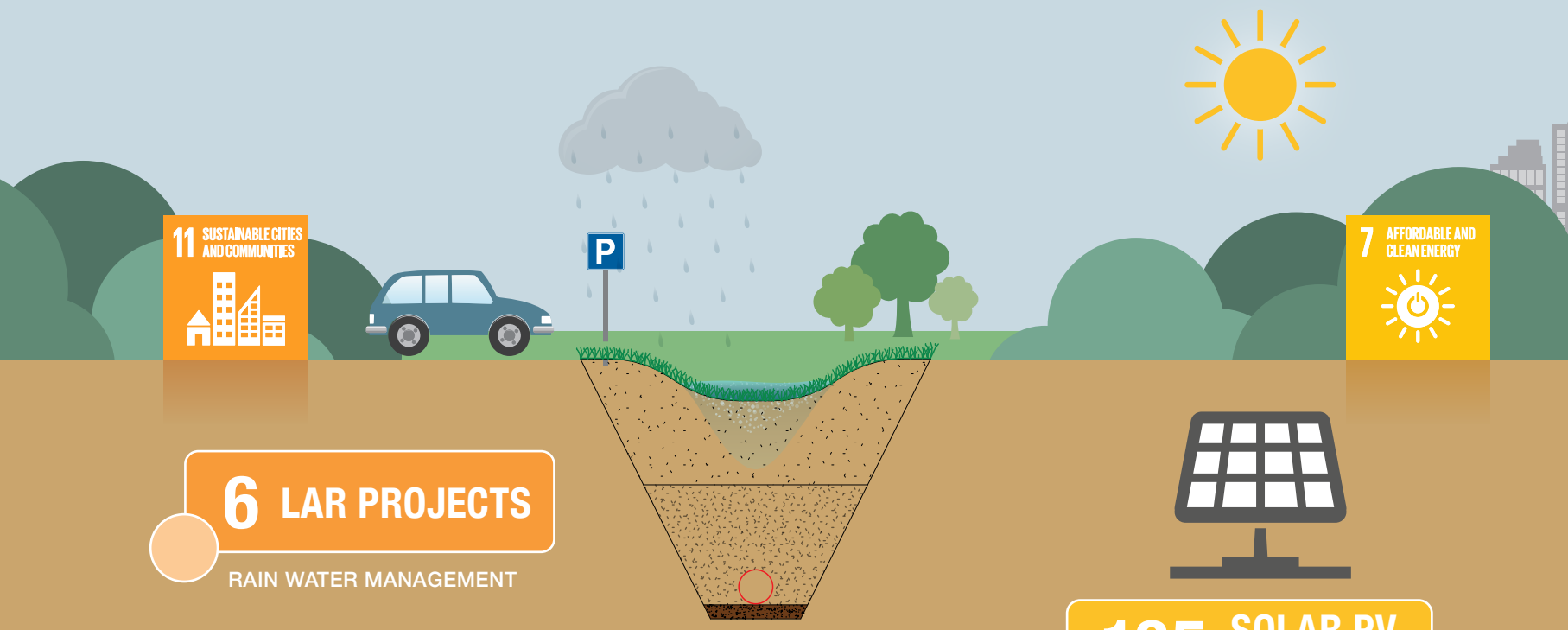
SDG 17 TECHNOLOGY
Technology transfer initiatives in developing countries

SDG CAPACITY BUILDING
Support for national plans and capacity building

SDG SYSTEMIC ISSUES
Statistical and data handling systems or platforms

OUR EMPLOYEE WORKING HOURS HAVE INCREASED ON SDG 11,13 AND 17, ALTHOUGH WE STILL SPEND MOST OF OUR TIME ON SDG 7

ACCUMULATED PROJECT IMPACT



6 LAR PROJECTS

RAIN WATER MANAGEMENT

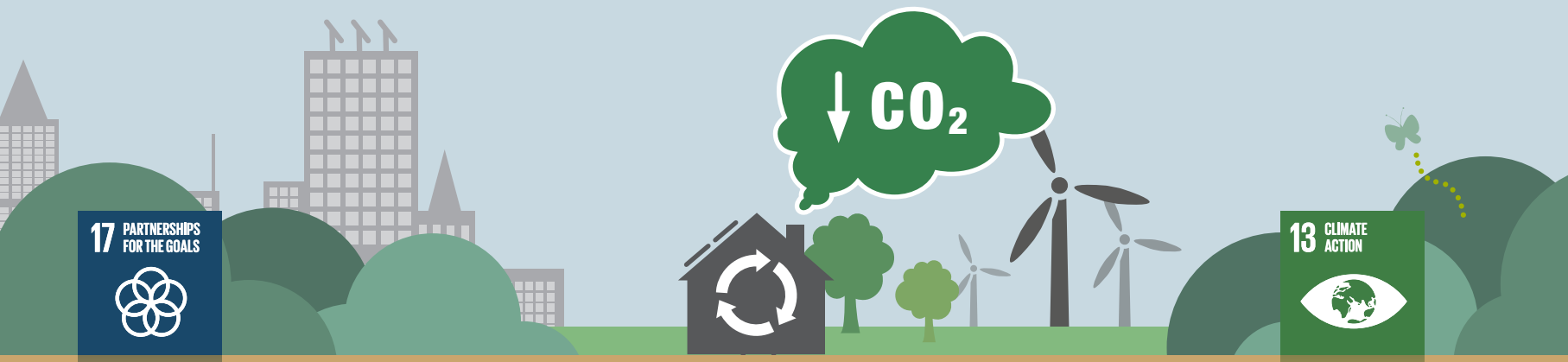
135 SOLAR PV SYSTEMS

IN RENEWABLE ENERGY PRODUCTION

240 BUILDINGS

ENERGY SCREENING ANALYSIS ACCOMPLISHED

For each of the SDGs and SDG Targets that we work with directly, SMART indicators act as a report card to measure progress toward sustainable development, and also provide performance metrics that complement official data. These figures represent the collective employee contribution to specific SMART indicators across all projects calculated for the 2018-2019 reporting year.



17 PARTNERSHIPS FOR THE GOALS

13 CLIMATE ACTION

340 THOUSAND tCO_2* SAVED

IN RENEWABLE ENERGY AND ENERGY EFFICIENCY

40 TECHNICAL TRAINING COURSES

IN RENEWABLE ENERGY, ENERGY EFFICIENCY OR TECHNOLOGY INNOVATION

27 AWARENESS CAMPAIGNS

IN RENEWABLE ENERGY AND ENERGY EFFICIENCY

*Calculation of annual contribution, based on relative project lifetime

OUR FOOTPRINT

An assignment for the Danish Ministry of Foreign Affairs. The Mid-term Review Team is posing in front of a statue of Nelson Mandela – a global symbol of Human Rights.

HUMAN AND LABOR RIGHTS

At DEM our vision is to build a future where energy is applied efficiently and sustainably in an affordable way.

Focusing on a sustainable future means setting clear and transparent expectations – from respecting human and labor rights to minimizing environmental impact.

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.

LABOR STANDARDS

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

- Fair wages reflect the qualifications of employees and the local average wage level.
- We do not accept any form of forced labor and/or child labor 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 wellbeing.
- We endeavor to ensure a healthy balance between work and family through a designated sustainable working culture group.

EMPLOYEE FOCUS ON SUSTAINABLE WORKING CULTURE

DEM has an internal work group that takes initiatives to prevent work related stress and support a sustainable working culture.

Employees are introduced to exercises that are designed to relieve mental tension and promote physical activity and wellbeing. The exercises are also combined with presentations that include topics such as sleep and mental capacity.

The sustainable working culture group will continually be promoting issues related to the good health and wellbeing of employees.

A CULTURE OF WORKING SUSTAINABLY

At DEM, a sustainable working culture is in many ways something that has always existed in the company and many of our standing traditions also promote a work culture filled with participatory activities that bring employees together.

Company party

December is the cosy 'hygge' season. Our annual Christmas lunch, holiday bingo, and winter company party all contribute to a cozy atmosphere and a culture of working in a way that is inviting and sustainable for all employees at DEM.

The annual ski trip to Norway or Sweden, where employees from the offices in Denmark are together for an extended weekend. Colleagues get to know one another on a more personal level, combined with plenty of fresh air, beautiful vistas and exercise.

Get-together activity.

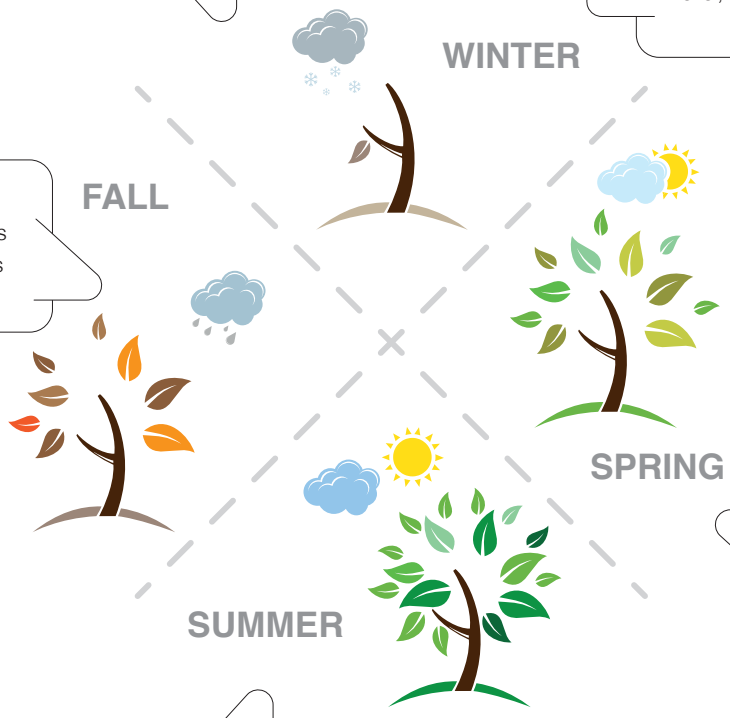
The We Bike To Work campaign begins, were employees compete in teams for prizes based on the distance they bike throughout the month.

DHL relay race 2019.

DEM participates in the annual DHL relay race with a great outdoor atmosphere, open tents for eating together and fireworks over the sea to end the event. The annual DEM summer party also invites employees from all offices to participate in activities, have dinner together, and enjoy the light Danish summer night.

Field trip to Aarhus municipality's newest office building.

Fieldtrips are planned to the projects that are currently being implemented. This gives all employees a flavor for what their work is contributing to out in the wider community.



We have experienced a greater demand for services abroad.

We acknowledge that a large part of DEM's CO_2 emissions in 2019 was related to international air transport.

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 2019 (May 1, 2018-April 30, 2019). The base year for reporting on verifiable emissions data is the 2015 reporting year. The operational boundary covers scope 1, scope 2, and part of scope 3 (business travel) with relation to all DEM offices in Denmark.

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 2019 reporting year are: • Aarhus • Copenhagen • Sønderborg

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**

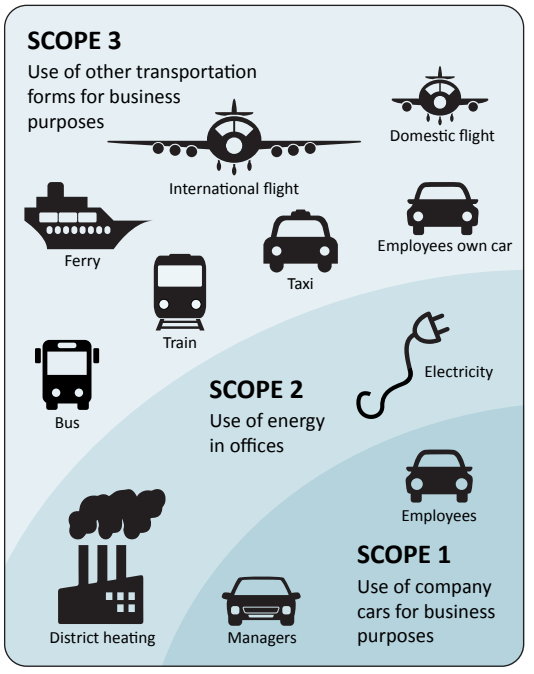
- Use of company cars for business purposes – managers
- Use of company cars for business purposes – employees

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 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



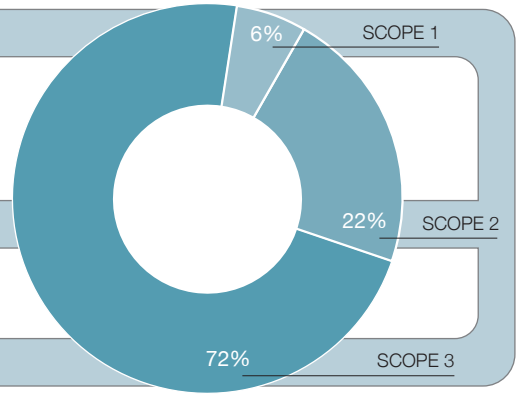
TOTAL CO_2 EMISSIONS IN THE 2018-2019 REPORTING YEAR

ACTIVITIES	DISTANCE (km)	ENERGY CONSUMPTION/ PRODUCTION (kWh)	CO_2 EMISSIONS (tCO_2)
SCOPE 1			
Use of company cars for business purposes – managers	31,173		6.53
Use of company cars for business purposes – employees	49,269		5.81
SCOPE 2			
Electricity use in offices		95,439	24.95
District heating use in offices		129,517	18.37
SCOPE 3			
Use of employee cars for business purposes	53,246		9.4
Transportation by train	81,725		4.1
Transportation by bus	4,312		0.5
Transportation by ferry	11,033		2.7
Transportation by taxi	9,305		1.4
Domestic air transport	**		2.6
International air transport	**		124.5
Total	**240,062**	**224,956**	**200.94**
OFFSETS			
Middelgrunden offshore wind farm		249,095	65.11
Hvidebæk biomass district heating plant/ solar thermal		13,680,000	1,940.36
Total		**13,929,095**	**2,005.00**

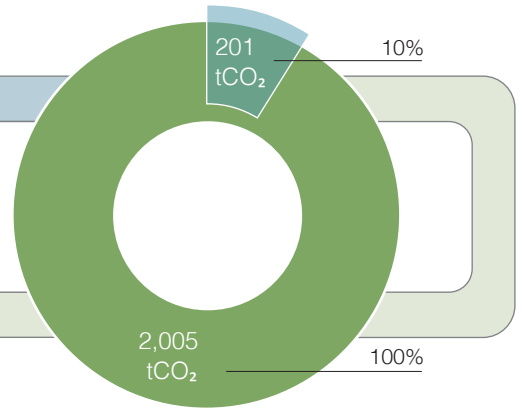
10%*

** Number of kilometers flown is not provided because our calculation methodology takes point of departure in take-off and landing destinations.

% CO_2 EMMISSIONS DISTRIBUTED BY SCOPE



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



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 company cars used by managers as their personal car only registers the kilometers driven to and from work, and to and from clients for business purposes.

* Since 2018 the electricity and heat savings are 10%. Since 2017 the savings are 17%

In 2018-19 we provided the EU with analysis of energy projects in Africa. This picture is from a project in Uganda that combines access to energy initiatives with tree planting.

Credit: Church of Sweden, Uganda. 2018

LIVING BY OUR VALUES

DEM follows the OECD's Guidelines for Multinational Enterprises*, using these as a standard for business practice. These guidelines are multilaterally agreed, providing principles and standards for responsible business conduct in a global context. For us it is about knowledge sharing and not knowledge transfer. DEM is also committed to working towards sustainable development with a systematic approach, and in line with the Global Compact and its ten principals. Within DEM, this approach ensures that human rights are respected, labor standards are met, environmental impact is minimized, and a zero-tolerance policy is practiced with regard to corruption, collusion and bribery.

It has now been four years since DEM incorporated the Sustainable Development Goals into our company vision and values, creating an even stronger foundation for transparency in all our work around the world. The first of our values is linked to SDG 7 – Clean Energy, highlighting our motivation to provide sustainable energy services when and where they are needed, increasing energy efficiency and the share of renewable energy in the global energy mix.

The second of our values is linked to SDG 11 – Sustainable Cities, underlining our commitment to improving people's living conditions and contributing to the creation of sustainable cities and communities. The third of our values is linked to SDG 13 – Climate Action, emphasizing our ability to be creative and adaptable, combating climate change and meeting customer needs with innovative solutions. Last but not least, our fourth value is linked to SDG 17 – Partnerships, demonstrating our willingness and desire to foster cooperation and mutual trust within all of our partnerships, maintaining a high standard of social responsibility and business ethics in a transparent manner.

In practice, these four values mean that all of our partners, employees, clients, and investors can place confidence in the company's performance, with a clear understanding of what we are doing and why we are doing it. 'Living by our values' means that each individual at DEM holds themselves to the highest ethical standards and can clearly communicate this through their work and behavior.

*www.oecd.org/daf/inv/mne/48004323.pdf

TARGETS AND ACHIEVEMENTS

Progress: ▲ Achieved ● In progress ■ Delayed

OBJECTIVE	INITIATIVE	DESCRIPTION	TIME FRAME	STATUS
Sustainable energy & contributing to the achievement of 2030 objectives	Solar panels	Solar panel on the roof of HQ to cover a percentage of the energy consumption. We are currently looking at new low-energy main building on neighboring grounds	Delayed	■
CO_2 reduction and contributing to achievement of 2030 objectives	Hybrid or electric car	For offices in Denmark, replace company cars with electric or hybrid cars. The Copenhagen office now has a hybrid car	1-2 years	●
Environmental sustainability and contributing to achievement of 2030 objectives	Become an active member in the Global Compact	Ongoing active participation in the Global Compact. In 2019, DEM was awarded Global Compact's prize for best SMV sustainability report	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 contributing to achievement of 2030 objectives	Paper recycling	Paper is now being separated from general waste on all offices. New agreement with cleaning company to ensure recycling planned in 2020	1-2 years	●
Environmental sustainability	Organic fruit and milk	Organic Fruit and milk is delivered on a regular basis every week.	Achieved	▲
Environmental sustainability and energy savings	Lighting	LED lighting in the offices and motion sensors. Achieved for the Copenhagen office	Aarhus 1 year	●
Environmental sustainability and energy savings	Optimized temperature regulation	Copenhagen office has new, intelligent thermostats for temperature control and optimization	Achieved (for Copenhagen office)	●
Environmental sustainability and energy savings	Power savings strips	Can substantially reduce the amount of power used when combined with an awareness campaign. Copenhagen office now uses power saving strips.	Ongoing	●
Environmental sustainability and employee health and safety	Ventilation	Regulation of the existing ventilation and installation where it is needed, improving energy savings and employee health. IC-Meters have now been installed at Copenhagen office to measure and improve indoor climate.	2 years	●
Environmental sustainability and contribution to achievement of 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 and their families at regular intervals. This is now being formalized to a greater extent in an employee association	Achieved	▲

TARGETS AND ACHIEVEMENTS

Progress: ▲ Achieved ● In progress ■ Delayed

OBJECTIVE	INITIATIVE	DESCRIPTION	TIME FRAME	STATUS
Employee well-being and positive work environment	Knowledge and innovation project	Three-year project in connection with the Danish Innovation Fund focusing on DEM knowledge sharing and innovation processes.	Achieved	▲
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 2021	Achieved	▲
Employee health and well-being	Employee stress-prevention initiatives	The Sustainable Working Culture group is implementing initiatives for stress prevention across the organization	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	Employees began getting additional time for vacation in 2016, and the 6th vacation week was fully rolled out by the end of the reporting year 2018-2019	Achieved	▲
Employee well-being	Pension	Pre-existing pension is being incrementally improved, and will be fully rolled out in September 2020	1 1/2 years	●
Employee health and well-being	Access to employee shower facilities	Shower facilities established at Aarhus office in 2019. Copenhagen office has shower facilities.	Achieved	▲
Employee health and well-being	Sustainable working culture group	Group established with a focus on work/ life balance and working with sustainable projects, teams and processes. Company-wide well-being activity every week.	Achieved	▲
Environmental sustainability and energy savings	Shutting down of servers	In 2018, 19 servers were shut down. Further 3 servers have been turned off in 2019 with an expected 30% reduction of energy consumption.	Achieved	▲
Employee well-being	Update of employee handbook	Sustainable Working Culture, 6th vacation week, knowledge sharing policy and private health insurance included in the employee handbook.	1 year	■
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	Moving employees to a cloud based, administrator driven file structure and accompanying information sharing platforms	0ngoing	●

WASTE SEPARATION

AT THE COPENHAGEN OFFICE WE NOW SEPARATE WASTE IN SEVEN CATEGORIES, CONTRIBUTING TO THE REDUCTION OF CO_2 EMISSIONS AND THE ACHIEVEMENT OF 2030 OBJECTIVES.

WALK AND TALK MEETINGS

WHEN WE HAVE INFORMAL INTERNAL MEETING, WE OFTEN COMBINE IT WITH A WALK – AMAZING WHAT A TOUCH OF FRESH AIR CAN DO.

BAGS OF WASTE MATERIALS

WHEN WE BRING OUR COMPUTER AND MATERIALS HOME OR GO TO MEETINGS OUT OF THE OFFICE – WE HAVE A SMALLER AMOUNT OF BAGS-TO-SHARE. THE BAGS ARE MADE OF WASTE AND LEFT-OVER MATERIALS, SUCH AS OLD BICYCLE TUBE AND TRUCK TARPAULIN, PLASTIC BOTTLES AND SAFETY BELTS.

2019 SUSTAINABILITY HIGHLIGHTS

SUSTAINABLE WORKING CULTURE GROUP

WE CONTINUE TO FOCUS ON WORK/LIFE BALANCE. WE HAVE WEEKLY WALKS AFTER LUNCH AND WE DO A SHORT 'PULS SNACK' BEFORE OUR MONDAY MEETINGS.

NO GIFT WRAPPING

OUR ANNUAL CHRISTMAS PRESENTS IS NO LONGER WRAPPED IN FANCY PAPER AND RIBBON. THEY COME IN REUSABLE BAGS.

In our EU Monitoring & Evaluation project in Burkina Faso access to electricity is combined with access to water.

OUR IMPACT

CLIENT SDG SERVICES PROVIDED ACROSS SECTORS:

INFORMATION TECHNOLOGY | FOOD SERVICES | HIGHER EDUCATION | GOVERNMENT AGENCIES | REAL ESTATE DEVELOPMENT | TRANSPORT | FASION AND TEXTILE | MUNICIPALITIES AND REGIONS

4 examples from very different sectors, 2 public institutions (State and Regional) and 2 private companies (Transport and Service):

NETHIRE

A private company providing services to entrepreneurs and construction sites by leasing tools and machinery facilitated by a community-based on-line platform.

We have advised NetHire on how the SDGs can help anchor, measure and promote efforts for resource and energy efficiency improvements in their value chain. In addition, we have identified their CSR and sustainability priorities and developed strategies relevant to the company's SDGs, with a particular focus on their energy and resource efficiency.

ICT LOGISTICS

A private transport cargo company operating in Denmark and internationally in providing transport and logistic services within road, train and river transport. We assist ICT Logistics by screening and coupling their sustainability efforts to the SDGs and by preparing a Sustainability Report to expand reporting on CSR and environmental efforts.

Our solution provides economic, social and environmental added values to ICT Logistics.

CENTRAL DENMARK REGION

The largest regional authority in Denmark outside the capital covering 19 municipalities with +1,3 million inhabitants.

The region is responsible for the hospital sector and for highly specialized social areas, the regional public transport, prevention of soil pollution, tourism and a number of growth initiatives aimed at creating growth in both rural and urban areas.

The Regional Council has considered the SDGs as the strategic framework for development in Central Denmark Region from 2019 and onwards. We assist the Regional Council to anchor the SDGs across sectors, management and employees. Our assistance includes SDG implementation guides and tools supported by capacity building activities and workshops.

STATISTICS DENMARK

A state-owned entity responsible for Denmark's national statistics. With the 17 Global Goals, 169 targets and 232 indicators, Denmark is committed to protect the planet, improve living conditions and social development. In order to measure progress on the SDGs in a Danish context it is necessary to establish supplementary Danish indicators that defines a Danish baseline.

We are a part of a consortium assisting Statistics Denmark under the project "Vores Mål" (our goals) in promoting and initiating a public debate which should lead to the creation of new and specific indicators to supplement the UN SDG indicators enabling Statistics Denmark to generate a national base for yearly monitoring of impact.

See a debate example here →

SUSTAINABILITY (SDG) MANAGEMENT SERVICES

All companies – private or public – should apply the Sustainable Development Goals (SDG) to improve and measure the impact from their actions. Current polices and strategies should be reassessed since the SDG Goals will be a driving force to opening-up new "business" opportunities to meet the growing sustainability demand of consumers and our planet.

As a leading consultancy working with the UN Sustainable Development Goals, Danish Management (DEM's sister company) assists private companies and public institutions in Denmark and abroad in translating the Sustainable Development Goals into new business opportunities. Last year we e.g. assisted The European Commission in measuring SDG impact from the Energy Facility II program.

More and more companies and organizations are asking for our assistance to implement the SDGs in business strategies and ESG reporting to be able to document their sustainability efforts.

Our services within DEM and DM provide tools for unlocking a vast number of innovation and market opportunities, helping organizations to: identify current and future business risks & opportunities; make contributions toward global sustainability tangible for employees and stakeholders; measure sustainable impact easily over time; maintain visibility for sustainability internally and in the wider community, and; generate key performance metrics that can complement official data and statistics.

DEBATE EXAMPLE:

= WE MAKE GLOBAL GOALS OUR GOALS

FACT:

29% OF YOUNG DANES ARE SMOKING

Should we just accept that so many young people are smoking – or should we as a society take initiatives to do something about it?

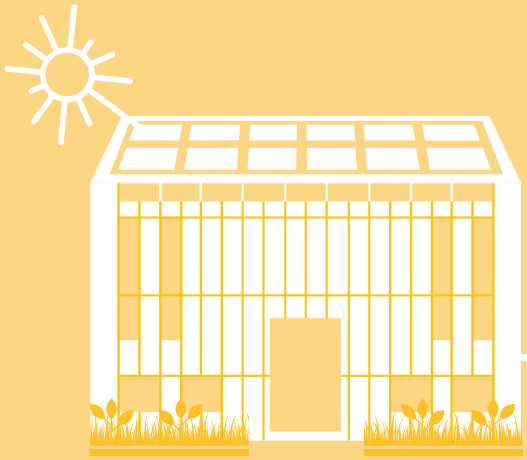
This is one of many questions that this project is asking the Danes. Our results are handed over to the Danish Government 2030 panel.

As the first population in the world, the Danes are consulted when the Global Goals are to be written into a Danish context.

CASE STUDIES

7.2

RENEWABLE ENERGY



Roof-integrated
solar power systems

19 m²

Services provided

- Installation of 19 m² solar PV panels.

7 AFFORDABLE AND CLEAN ENERGY

7.3

ENERGY EFFICIENCY

= 121,729
kWh saved electricity*

*In the project lifetime

Services provided

- Energy efficient lighting solutions.
- Energy efficient heating, cooling and ventilation systems.
- Refurbishing of building to meet building code classification, e.g. re-insulation of the entire existing building envelope.

7 AFFORDABLE AND CLEAN ENERGY

11.6

SUSTAINABLE URBAN DEVELOPMENT

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

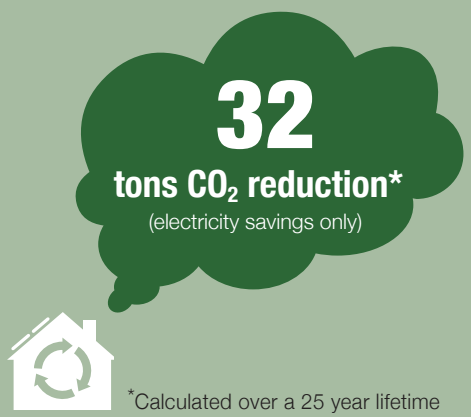
= 1824 m²
Luxury hotel
in central Copenhagen

Services provided

- Reduction of environmental impact through reuse and sustainable waste management.

CLIMATE ACTION

13.1



*Calculated over a 25 year lifetime

Services provided

- Introduction solar PV-panels that produces electricity to cover part of the building's energy consumption.
- Reuse of existing building mass, thus avoiding emissions from production of potential new building.

HOTEL HERMAN K

From electrical transformer station to energy efficient boutique hotel

Dansk Ejendoms Management
En del af Danish Management Group

At Bremerholm, in the inner city of Copenhagen, a former industrial building has been transformed into a fascinating, energy efficient boutique hotel in concrete and bronze. As neighbor to some of the city's most famous and busiest streets, the original brutalist building, constructed in 1962, used to have a relatively anonymous life as an electrical transformer station. Now, after a complete reconstruction, the building houses a 5-star luxury hotel with 31 rooms, a lobby of 12 meters in height and a high-end restaurant with public access. DEM has had the responsibility for energy counseling, sustainability and technical installations, as well as construction management and technical inspection in the implementation phase.

A central focus of the project has been to create something unique based on the qualities of the existing building. The sustainability potential of rebuilding and reusing, rather than demolish and construct, has produced very tangible results. Walls and ceilings have been preserved, and the facade has been dismantled, cleaned and reworked off site, and later been put back in place with open sections in front of the new window holes, allowing sunlight to reach the hotel rooms and the lobby. By reusing existing building mass, a considerable quantity of CO_2 emission has been avoided.

The reworking of the high-strength concrete building has been a laborious task, which has involved great attention to ensuring low energy consumption in the 'new' building. In addition to adding extensive interior and exterior insulation, a range of energy efficient systems have been installed, including automatic LED fixtures, an efficient heating system, an optimized ventilation system with diffuse inlet and heat recovery as well as solar panels mounted on the roof of the building. The installations contribute to large energy savings, making the building meet the energy requirement of the Danish building regulation.

By not compromising on neither design, indoor climate nor energy efficiency, Hotel Herman K has been awarded the 2019 RENOVER (renovation) prize by Realdania and Grundejernes Investeringsfond.

Client:
Danish Property Management

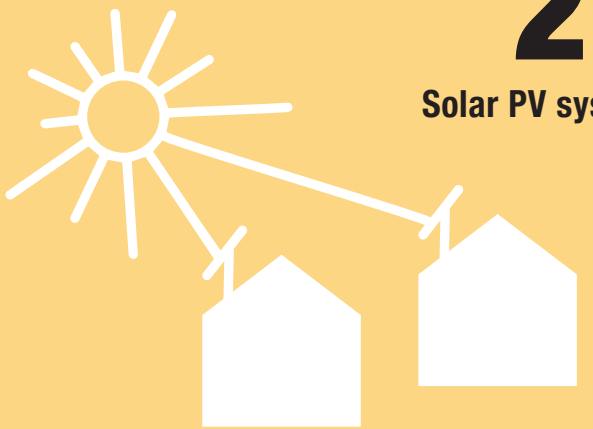
Properties: 1

m²: 1824

Timeframe: 2016-2018

7.2

RENEWABLE ENERGY



2

Solar PV systems

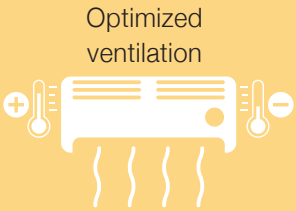
Services provided

- Installation of solar PV systems for increasing proportion of renewable energy in the energy mix.

7 AFFORDABLE AND CLEAN ENERGY

7.3

ENERGY EFFICIENCY



Across 12 buildings

= 15% energy savings*

*Compared to previous baseline consumption

Services provided

- Installation of optimized ventilation, heating and cooling systems. Replacing windows for more energy efficiency.
- Implementation of a state of the art building management system.

7 AFFORDABLE AND CLEAN ENERGY

7.3

ENERGY EFFICIENCY

Operational commissioning

Services provided

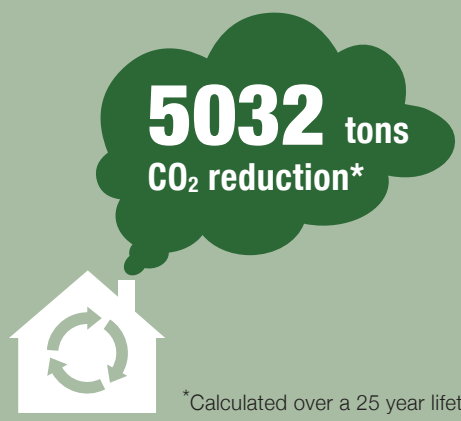
- Ensuring the operability and energy performance of the installed energy saving technologies through an integrated application of commissioning procedures to check, inspect and test every operational component of the renovation.

7 AFFORDABLE AND CLEAN ENERGY

13 CLIMATE ACTION

13.1

CLIMATE ACTION



*Calculated over a 25 year lifetime

Services provided

- Optimising existing building mass to reduce energy consumption by 15% thus contributing to EU goal of reducing building's greenhouse gas emissions with 20% by 2020 relative to 2005.

BYGNINGSSTYRELSEN (The Danish Building and Property Agency)

Renovation and commissioning ensure energy savings in public buildings

With the purpose of reducing energy consumption, the Danish Building and Property Agency has carried out energy saving investments in 12 public buildings from 2015 to 2018. As main contractor, DEM has been responsible for the renovation of various technical installations, including optimization of ventilation systems, installation of energy efficient heating and cooling systems, improvement of indoor climate, replacement of inefficient windows and implementation of building related changes. To assure that all systems are designed, installed, tested and operated according to the planned energy savings, DEM has applied a commissioning process throughout all phases of the renovation. As a result, energy consumption has been reduced with at least 15%.

The entire assignment includes the renovation of 12 locations with a total building stock of approximately 143,000 m^2. The buildings involved in the project are mainly used for offices, education and exhibition facilities. Several of the buildings are either listed and/or preservation worthy – particularly notable are the Ministry of Foreign Affairs and the District Court of Copenhagen. The project has therefore required a continuous dialogue with the public authorities to clarify relations between the renovation and the buildings' architecture and cultural history.

A key aspect of the project has been to facilitate flawless performance tests of the implemented energy saving installations. Performance tests are essential for ensuring that intended energy optimizations are effectuated. For this reason, DEM has applied the quality control principles from commissioning – a tool that ensures the optimum functionality of complex technical installations – during all three phases of the project, i.e. design, execution and operation. The successful commissioning process has helped to develop and improve the performance test of the Danish Building and Property Agency so that the implemented systems meet the designed requirements for energy- and indoor climate efficiency.

Client: Bygningsstyrelsen (The Danish Building and Property Agency)

Properties: 12 public buildings

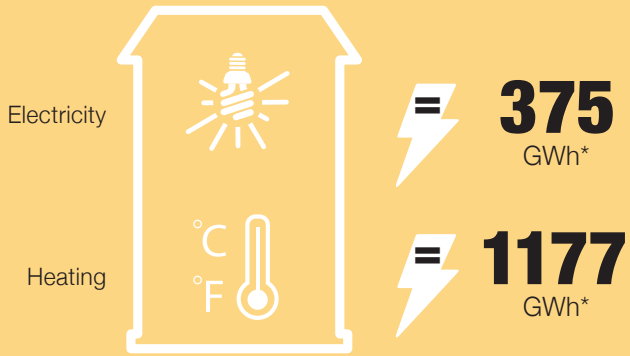
m^2: 143,000

Timeframe: 2015-2018

7.3

ENERGY EFFICIENCY

Energy saving goal: **5%**



*In the project lifetime

Services provided

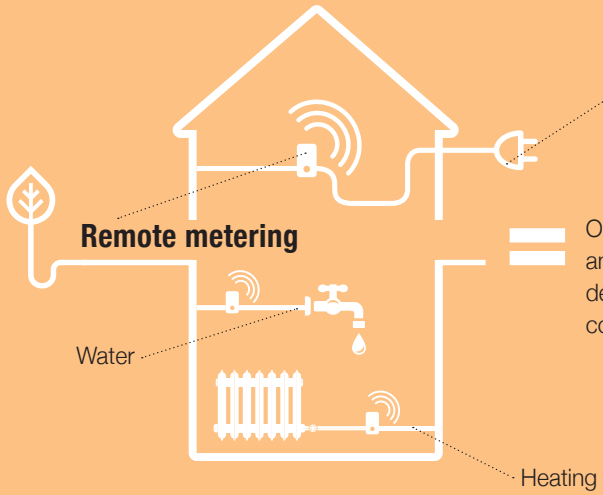
- Benchmarking of building's energy consumption
- Development of operational tools

7 AFFORDABLE AND CLEAN ENERGY

11 SUSTAINABLE CITIES AND COMMUNITIES

SUSTAINABLE CITIES

11.1



Services provided

- Data driven energy management based on ISO50001
- Development of a structure for data collection using data loggers

13 CLIMATE ACTION

17 PARTNERSHIPS FOR THE GOALS

13.1

CLIMATE ACTION

193,000
tons CO_2 reduction*

*Calculated over a 25 year lifetime

Services provided

- Active application of loggers for energy screenings
- Reduction of unnecessary energy consumption
- Identification of faulting technical installations

CAPACITY BUILDING PARTNERSHIPS

17.CapB

Supported by
the Danish Energy Agency with:
793,491 kr.

Partnership:

- ✓ Aarhus Municipality
- ✓ Viborg Municipality
- ✓ DEM – Danish Energy Management

Services provided

- Public Private Partnership
- Knowledge sharing
- Scalable model – accessible to all

IDEVA

Intelligent Database Energy Management in Viborg and Aarhus

DEM is partnering with the Municipalities of Aarhus and Viborg in the IDEVA project which, aims to exchange experiences and results from work on data-based energy management in municipalities. The project is supported by the Danish Energy Agency.

IDEVA refines the structure for collecting consumption data by mounting data loggers on technical installations in the buildings. This expands the possibilities for analyzing energy consumption and for benchmarking comparable buildings and identifying energy-reducing measures at technical plants. In parallel with this effort, the consumption data are also used to inform building owners and users about the importance of monitoring energy consumption; for example, how monitoring energy consumption can help avoid a possible penalty payment for poor cooling of district heating services.

Through data-based energy management, technical systems such as ventilation and mixing loops are identified when faults occur after which restorative measures can be initiated. This reduces unnecessary energy consumption and optimizes building operations. The goal of IDEVA is to reduce annual energy consumption by 5-10% in the 14 test buildings involved.

The city of Aarhus has worked with energy management for a number of years. An energy management team develops and implements energy management tools and workflows in close collaboration with the operating staff at the municipality's properties. The Municipality of Aarhus has established remote monitoring of energy and water in 900 buildings. Approximately 5,000 remotely measured measuring points enable current energy consumption to be analyzed.

The municipality of Viborg is a medium sized Danish municipality with approximately 100,000 inhabitants. The municipality is currently developing a new Climate- and Environmental strategy that focuses on local- as well as national priorities and targets within energy and sustainability. The project supports the municipality's current efforts towards a "greener direction".

In IDEVA, there is a focus on scalability. Developed tools must to the extent possible be disseminated and used by both municipalities and companies who wish to initiate or develop energy management. IDEVA, therefore, has a strong focus on dissemination internally and across both municipalities, and externally in relevant forums and network groups.

Client: Aarhus Municipality and Viborg Municipality

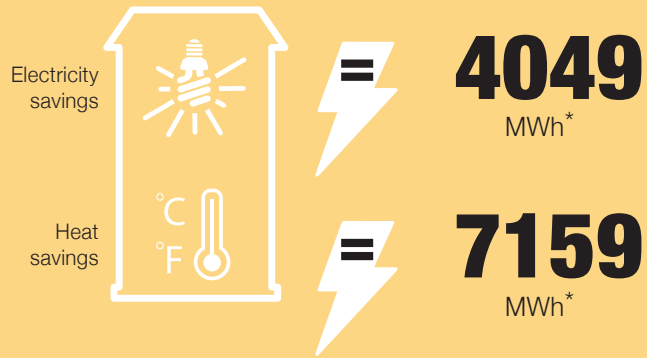
Properties: 14 buildings

Knowledge sharing: Internal and external communication of knowledge and tools

Timeframe: 2018-2020

7.3

ENERGY EFFICIENCY



*In the project lifetime

Services provided

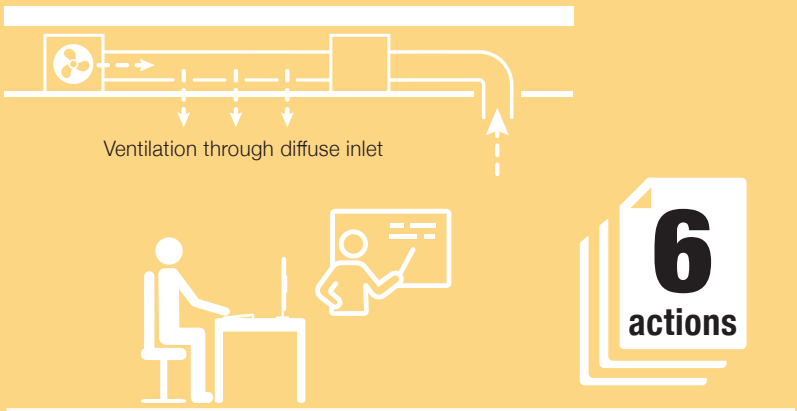
- Integrated energy design – design of all technical installations – technical supervision – commissioning, optimized operating assistance.

7 AFFORDABLE AND CLEAN ENERGY

7 AFFORDABLE AND CLEAN ENERGY

ENERGY EFFICIENCY

7.3



Services provided

- Sustainable Urban Drainage Systems – low pressure diffuse ventilation – natural ventilation in common areas – night cooling – advanced daylight control – dynamic external solar shading.

11.3

land area

ACCESS TO BASIC SERVICES

11 SUSTAINABLE CITIES AND COMMUNITIES

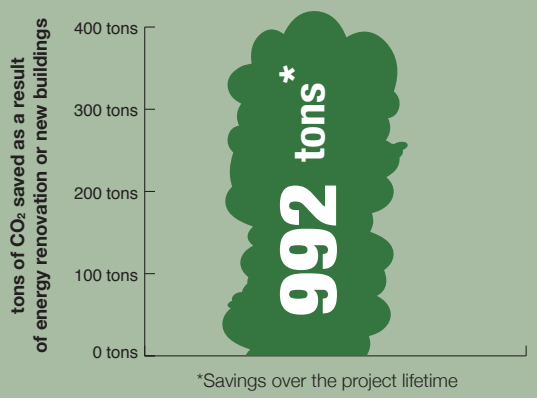
13 CLIMATE ACTION

Services provided

- 1 new low energy public school. School yard facilities open for public use, giving the neighborhood access to a football field, a playground and indoor facilities.

CLIMATE ACTION

13.3



Services provided

- Introduced an integrated energy design that make use of all passive qualities of the building to create an energy friendly building with the best possible indoor climate. The low energy consumption helps reduce the CO_2-emissions of the building.

KALVEBOD FÆLLED SCHOOL (Kalvebod Common School)

The new school is a beacon for sustainability

Kalvebod Common School is Copenhagen Municipality's newly built public school, nominated for the 2018 School Building Award. With a total area of approximately 11,500 m^2, the school has room for 750 pupils, up to 336 children in after school care and 168 children in youth club. The new building includes many aspects of sustainability. A key element lies in its integrated energy design, which comprises of a compact building design, automatic lighting control, optimisation of daylight, energy efficient windows and, not least, an optimised ventilation system with low energy consumption, night cooling, diffuse inlet system and no need for active cooling. These components contribute to large energy savings.

With a school profile in sports and movement, another important element of the project has been to construct a building that places movement at the centre of children's schooldays. To do this, the project has been rethinking the traditional design of public schools. Kalvebod Common School stands out as a circular building with a modern sports hall placed right at its core. The highly modern physical environment animates sports, exercise and movement, making the school a pioneer for physical well-being.

An additional goal of the project has been an ambitious plan to create better coherence between the architecture of the building and its surroundings. Constructed in Arenakvarteret, on the edge of the Ørestad's plains and nature, Kalvebod Common School has been designed to integrate the urban and rural elements of its surroundings without boundary fences to neither nature nor city. By breaking down the boundary between school, leisure and the local community, the school contributes to sustainable urbanization.

As a fundamental design parameter of the project, sustainability has been given specific attention throughout all stages of the project. DEM has had the overall responsibility for energy counselling, sustainability, indoor climate and all mechanical installations as well as the technical inspections during the construction of the building. DEM has furthermore been commissioned to advise the building's operational staff on how to operate the building more efficiently. Meeting all the requirements of the Low Energy Class 2015 in the Danish building regulation, the building appears as a beacon for sustainability.

Client: Copenhagen Municipality | **Properties: 1** | **m^2: 11,500** | **Timeframe: 2014-2019**

7.1 7.2

ACCESS TO SUSTAINABLE ENERGY

Introduction of Assessment Tools for District Heating to

100,000
people

3 National Energy Outlooks

4 National Energy Scenario Modelling

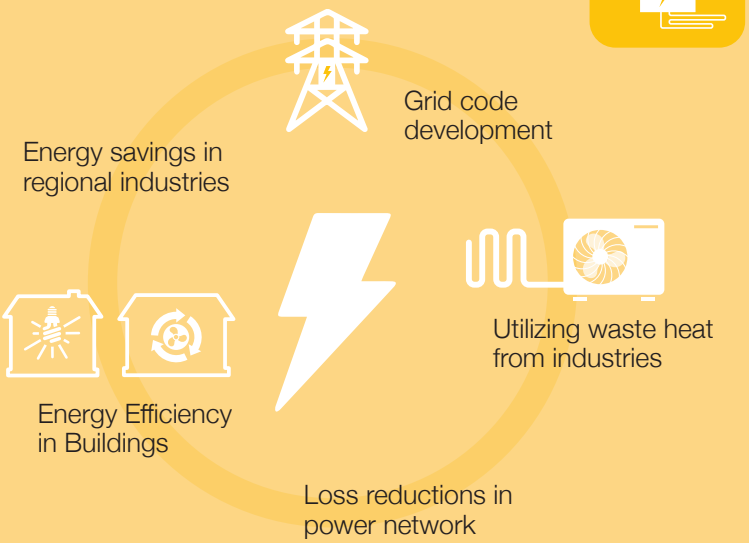
Services provided

- Assessment of renewable energy plans and their integration into the national electricity grid, energy policy, planning and regulation.

7 AFFORDABLE AND CLEAN ENERGY

ENERGY EFFICIENCY

7.3



Services provided

- Assessment of energy efficiency planning and regulation.

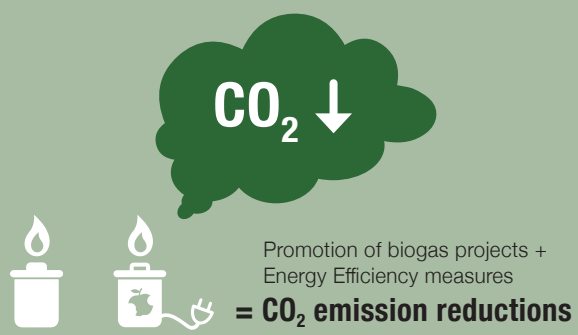
7 AFFORDABLE AND CLEAN ENERGY

13.3

CLIMATE ACTION

13 CLIMATE ACTION

Support to government's implementation and updates of Nationally Determined Contributions to the Paris Agreement



Services provided

- Assessment of general climate change mitigation measures.

17 PARTNERSHIPS FOR THE GOALS

CAPACITY BUILDING PARTNERSHIPS

17.CapB

Governmental Partnership Capacity Building in 4 countries

Services provided

- Assessment of capacity building in the energy sector through partnership with governments in China, Vietnam, Mexico and South Africa.

DANISH ENERGY PARTNERSHIP PROGRAMME (DEPP II)

Mid-term review

UDENRIGSMINISTERIET

DEM has assisted the Danish Ministry of Foreign Affairs by carrying out a mid-term review of the Partnership Programme, which involves corporation between the Danish Energy Agency and related authorities in four partner countries: China, Mexico, South Africa and Vietnam. The total expenditure for the programme was nearly 100 million DKK which was sourced from the Danish Climate Envelope, that was established in 2008 with the aim of addressing the global challenge of climate change.

The programme focuses on specific topics in the energy sector where Danish competences are present and where there has been a demand from partner institutions. The programme involves 10 individual development engagements in the four countries focusing on:

- renewable energy and its integration into the national electricity grid,
- energy policy, planning and regulation with a special emphasis on renewable energy,
- energy efficiency planning and regulation, and
- support to general climate change mitigation measures.

In terms of program relevance, it was found that in the overall policy context, the cooperation with Denmark through DEPP II remains relevant within the Danish strategies for development cooperation and DEPP II is well within the overall framework as indicated in the Guiding Principles for the Climate Envelope.

The overall national commitment to the sustainable energy agenda was also generally found to be strong in the four countries, although the level of ownership among the various partner institutions varied.

The Danish Embassies in the four partner countries appreciate DEPP II and see it as a strategically important programme for Denmark, and as a possible platform for introducing of Danish technologies and creating linkages between national stakeholders and Danish companies. The overall indicators in the Climate Envelope include the reduction in GHG emission, measured as tons of carbon dioxide equivalent reduced.

Only in relation to the specific projects in energy efficiency and renewable energy, a GHG reduction can be calculated.

Client:
Danish Ministry of Foreign Affairs

Product delivered:
Mid-term Review Report, including Country Assessment Notes

Timeframe: Jan-May 2019

DANISH ENERGY MANAGEMENT

DEM

FOR SUSTAINABLE IMPACT

www.dem.dk

February 2020