

# SUSTAINABILITY REPORT

2016-2017



## THE GLOBAL GOALS

For Sustainable Development

OUR FOOTPRINT | OUR IMPACT



DANISH ENERGY MANAGEMENT

**DeM**

FOR SUSTAINABLE IMPACT



# OUR WORLD IN TRANSITION

The past year has seen some dramatic changes in both awareness and action regarding sustainable development. As world leaders commit to meeting CO<sub>2</sub> reduction targets and the 2030 Agenda, and the investment potential for the SDGs is estimated at \$2.5 trillion a year, sustainable development has never been more in focus. As a company that has always had sustainable development at its core, Danish Energy Management is passionate about the role that we are playing in finding innovative solutions and delivering sustainable impact.

Our passion for delivering sustainable impact also means that we select employees, partners and clients who share our vision. We believe that together, we can create a safe and prosperous network which supports and empowers future generations. This also means that we take a cradle-to-cradle and holistic approach in all our work and actions. From design and planning, to delivery and implementation of our projects, resources are allocated to ensuring that human rights are respected, labor standards are met and environmental impact is minimized, in accordance with the Global Compact and its ten principals.

What we are witnessing today is a transition. A transition towards the shared common purpose, language, and abundant market opportunities that working towards achieving the Sustainable Development Goals has provided. In the private sector, more and more organizations now incorporate the Sustainable Development

Goals into business models and governance structures in order to capture growth opportunities, resource advantages and innovation opportunities for improving global prosperity. Investors are also increasingly steering capital towards sustainability, using a number of metrics to screen and identify impact investments. Over the past year in Denmark, we have also seen firsthand how local, regional and national governmental bodies are applying the SDGs, forming cross-party networks and signing commitments and policies, all of which increase the value to the public sector within environment, social and governance structures.

Although the challenges that lie ahead are great, we believe the opportunities for a sustainable future are even greater, and we are proud to be part of this change.



Yours sincerely

  
Jørn Lykou  
CEO





# TABLE OF CONTENTS

**03** COMMUNICATION  
FROM OUR CEO

**07** OUR FOOTPRINT

**08** HUMAN AND  
LABOR RIGHTS

**11** ENVIRONMENTAL CARBON  
FOOTPRINT REPORT

**15** ANTI-CORRUPTION

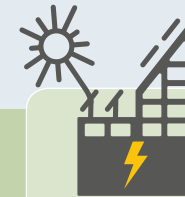
**23** OUR IMPACT

**24** SDG REPORTING  
SYSTEM

**26** CASES

# ACCUMULATED PROJECT IMPACT

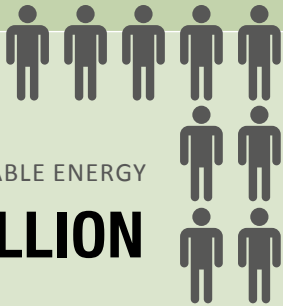
For each of the SDGs and SDG Targets that we work with directly, SMART indicators act as a report card to measure progress toward sustainable development, and also provide performance metrics that complement official data. These figures represent the collective employee contribution to specific SMART indicators across all projects calculated for the 2016-2017 reporting year.



CONTRIBUTION TO RENEWABLE  
ENERGY IN THE GLOBAL ENERGY MIX

**179 GWh\***

HEAT AND ELECTRICITY PRODUCED



ACCESS TO RELIABLE ENERGY

**34.8 MILLION**

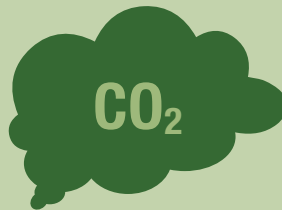
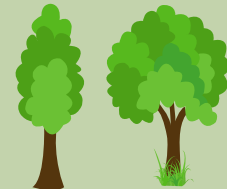
PEOPLE



CONTRIBUTION TO  
ENERGY EFFICIENCY

**185 GWh\***

HEAT AND ELECTRICITY SAVED



RENEWABLE ENERGY AND ENERGY EFFICIENCY

**32 MILLION tCO<sub>2</sub>\*** SAVED



EUR AMOUNT MOBILIZED FOR  
SUSTAINABLE DEVELOPMENT

**5.2 MILLION EUR**

MOBILIZED FOR SUSTAINABILITY  
DEVELOPMENT



\*Calculation of annual contribution,  
based on relative project lifetime





# OUR FOOTPRINT



DANISH ENERGY MANAGEMENT



**DeM**

FOR SUSTAINABLE IMPACT





# **HUMAN AND LABOR RIGHTS**



## HUMAN RIGHTS

Danish Energy Management (DEM) respects and protects all internationally proclaimed human rights, and strives to prevent any discrimination practices. In addition, we are committed to ensuring equal opportunities. We respect cultural and religious differences within our multicultural team of employees, and see these differences as a strength that allows us to achieve our vision and tailor our consultancy services to the needs and requirements of our clients.

## 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 endeavor to secure a balance between work and family and respect local traditions and needs.

## EMPLOYEE FOCUS ON SDGs

At DEM, we have been working with the Sustainable Development Goals since they were established in September 2015. As the SDGs are now gaining recognition in local communities around the world, they are also being internalized by our employees. Incorporating the SDGs into our internal activities are impacting our work in many meaningful and exciting ways.

Working with our online SDG System (see p. 24) means that we can measure the impact of each project with relation to relevant SDGs and SDG Targets. When our Project Managers meet with clients, they can now show clients how a specific project is helping to meet global goals for sustainability, which is a value that clients can pass on to their customers as well. For our employees working on projects in Denmark and abroad, they are now able to define how their work contributes to global sustainability, whether through CO<sub>2</sub> reduction, or development of clean energy in a region, or increased capacity building through partnerships in rural Africa, just to mention a few examples.

In constantly striving to be more efficient and effective with the world's scarce resources, we are on the forefront of new innovations, helping to form standards and conducting research to help solve the world's problems. The SDGs have provided DEM with the opportunity to develop new methodologies and systems for measuring and communicating sustainability. This common global language made possible by the SDGs has impacted our work in a number of very exciting projects from the European Union, to Harvard University, to local non-profit organizations in Denmark.

## EMPLOYEE HEALTH AND WELLBEING

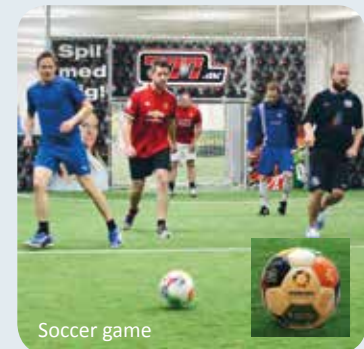
Our focus on the Sustainable Development Goals has now also translated into internal company initiatives for employee health and wellbeing. For example, all fruit and milk, which is provided to employees every day, is now 100% organic, incorporating SDG 12 – Responsible Consumption and Production.

Sustainability was also a theme at the annual summer party, where employees got the chance to be some of the first guests to visit Climate Planet – a gigantic 5-story tall globe where visitors experienced a visual presentation regarding the current state of climate change around the world. This was followed by a historical walking tour around the city of Aarhus (the 2017 European Capital of Culture), and the evening was rounded off with dinner at Aarhus Central Food Market, which specializes in using and selling local ingredients.

This year, DEM also participated in the ARK-ING CUP – an event bringing together both engineers and architects with the purpose of meeting in an informal context. With participants who are both partners and competitors, events like these contribute to strengthening mutual trust between local companies, while contributing to SDG 17 – Partnerships for the Goals.

Employees have also participated in a number of active events over the past year, including We Bike to Work, the DHL Relay Race, treetop climbing and a ski trip to Norway. All of these activities allow employees to socialize, have fun and get some exercise. Employees also arranged soccer matches this year, and now play with an official SDG ball, providing the added benefit of increasing visibility and recognition of the SDGs.

And in December, employees participated in both old and new traditions of “hygge”— aka Danish coziness. One of the oldest and most cozy of traditions is the annual Christmas event for all the companies’ employees and their families. This event is an invitation to wind down in the days before Christmas with good food, games and prizes, and socialize with the husbands, wives and children of colleagues. A new twist to another tradition was that this year, the employee lunch held just before Christmas break included an SDG-themed quiz, with prizes for both the winner and five runners-up. The questions challenged employees’ knowledge about the SDGs and 2030 objectives, as well as the way in which DEM applies them to measure our impact.





# **ENVIRONMENTAL CARBON FOOTPRINT REPORT**

## INTRODUCTION

This Carbon Footprint report has been prepared for the energy consultancy company Danish Energy Management. DEM places major focus on energy projects worldwide within the field of renewable energy, energy efficiency, demand side management, climate change, sustainable development, rural energy/ electrification, energy policy and energy legislation. This report follows *The Greenhouse Gas (GHG) Protocol Corporate Standard*<sup>1</sup>, under which DEM is classified as a service sector / office based organization. Preparation of this report was also aided by the World Resources Institute calculation tool *Working 9 to 5 on Climate Change: An Office Guide*<sup>2</sup>.

## ORGANIZATIONAL AND OPERATIONAL BOUNDARIES AND BASE YEAR

This carbon footprint report estimates the GHG-emissions caused by DEM activities in the reporting year 2016 (May 1, 2016-April 30, 2017).

The base year for reporting on verifiable emissions data is the 2015 reporting year. This year has been chosen because it was during this time that the company Esbensen Consulting Engineers merged with Danish Energy Management. In an attempt to be as transparent as possible, we have gone a step further this year by adding concrete figures where possible.

The operational boundary covers scope 1, scope 2, and part of scope 3 (business travel) with relation to all DEM offices in Denmark. Each scope is defined by the GHG protocol, and is further explained below. In addition to international offices, DEM also owns 51 percent of the company DEEP A/S (Danish Energy Efficiency Partners Sdn. Bhd.). However, the activity of this organization is also considered outside of the operational boundaries of this report.

The DEM offices included in the 2016 reporting year are:

- Aarhus
- Sønderborg
- 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 (MANDATORY):** 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.

**SCOPE 2 (MANDATORY):** All indirect emissions caused by the company's purchase of energy, including electricity and district heating.

**SCOPE 3 (OPTIONAL):** Other indirect emissions caused by consumption of products and services e.g. business travel in non-company-owned vehicles (car, plane, and train), waste produced, outsourced activities, etc.

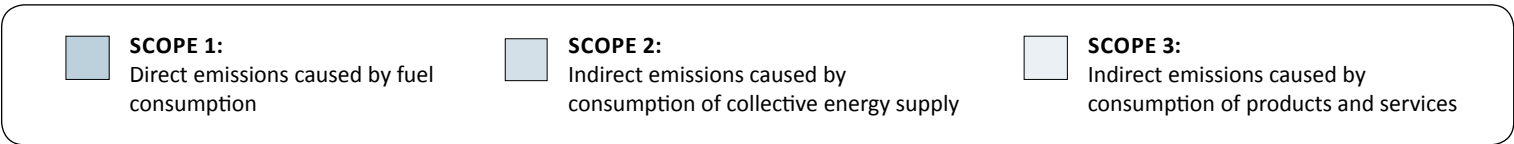
<sup>1</sup> <http://www.ghgprotocol.org/standards/corporate-standard>  
<sup>2</sup> [http://pdf.wri.org/wri\\_co2guide.pdf](http://pdf.wri.org/wri_co2guide.pdf)



Activities related to scope 1, scope 2 and scope 3 have been selected based on the operations of DEM, the accessibility to data, and the possibilities that exist for influencing emissions reduction.

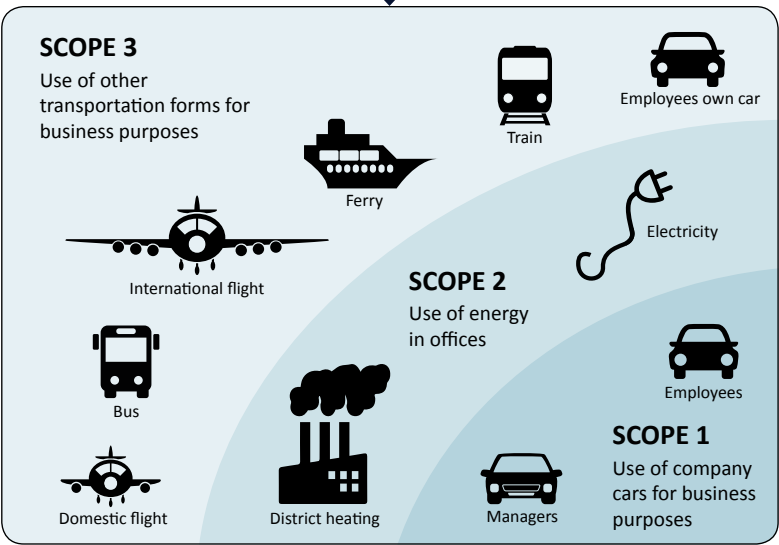
The activities included under each scope are:

- |  |   |   |
|--|---|---|
| <p><b><u>SCOPE 1</u></b></p> <ul style="list-style-type: none"> <li>• Use of company cars for business purposes – managers</li> <li>• Use of company cars for business purposes – employees</li> </ul> | <p><b><u>SCOPE 2</u></b></p> <ul style="list-style-type: none"> <li>• Electricity use in offices</li> <li>• District heating used in offices</li> </ul> | <p><b><u>SCOPE 3</u></b></p> <ul style="list-style-type: none"> <li>• Use of employee cars for business purposes (car allowance)</li> <li>• Transportation by train</li> <li>• Transportation by bus</li> <li>• Transportation by ferry</li> <li>• Domestic air transport</li> <li>• International air transport</li> </ul> |
|--|---|---|



We do not include “employee commuting in non-company-owned vehicles to and from work” in our report. However, DEM does participate in the campaign “We Bike to Work,” which encourages employees to ride their bikes to work, and includes an internal team contest and prizes. During this one-month long campaign (May-June 2016), the 34 participants biked a total of 3064 kms, and saved a total of 560 kg CO<sub>2</sub>.

As the second year that DEM produces a Carbon Footprint Report, optimizations and improvements have been made, enabling us to be more precise in our emissions reporting. This is largely due to the fact that after locating data for our base year (2015-2016), we were able to systematize our collection of data, making our data collection more robust. In future reports, we may include additional activities, old activities may be excluded, or new measurement systems and sources may be applied. In the case that these activities represent a combined 10 percent change in the base year emissions, DEM will conduct a recalculation and back-cast these data points.

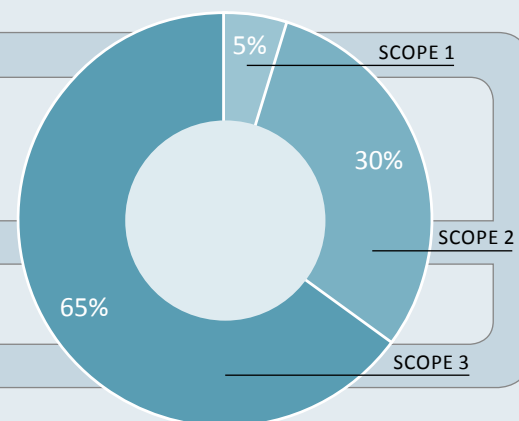


# TOTAL CO<sub>2</sub> EMISSIONS IN THE 2016-2017 REPORTING YEAR

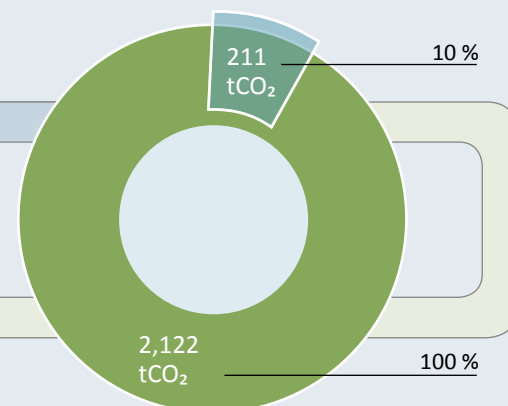
ACTIVITIES	DISTANCE (km)	ENERGY CONSUMPTION/ PRODUCTION (kWh)	CO <sub>2</sub> EMISSIONS (tCO <sub>2</sub> )
<b>SCOPE 1</b>			
Use of company cars for business purposes – managers	13,080		3.7
Use of company cars for business purposes – employees	45,249		6.5
<b>SCOPE 2</b>			
Electricity use in offices		113,259	36.4
District heating use in offices		158,814	27.3
<b>SCOPE 3</b>			
Use of employee cars for business purposes	103,810		18.9
Transportation by train	31,403		1.5
Transportation by bus	4,012		0.4
Transportation by ferry	5,002		0.7
Domestic air transport	*		10.6
International air transport	*		104.8
<b>Total</b>	<b>202,556</b>	<b>272,073</b>	<b>210.8</b>
<b>OFFSETS</b>			
Middelgrunden offshore wind farm		303,900	97.8
Hvidebæk biomass district heating plant/ solar thermal		11,771,000	2,024.6
<b>Total</b>		<b>12,074,900</b>	<b>2,122.4</b>

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

% CO<sub>2</sub> EMISSIONS 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.



**ANTI-CORRUPTION**  
**VISION AND VALUES FOR A SUSTAINABLE FUTURE**

# VISION AND VALUES

At the core of DEM's business strategy lies our vision to build a future where energy is applied efficiently and sustainably in an affordable way. This focus on a sustainable future means that we set very clear and transparent expectations regarding all aspects of our business, from respecting human and labor rights to minimizing environmental impact.

In setting clear expectations for our clients and partners, we require transparency in dealing with any ethical dilemmas such as confidentiality, bribery and extortion, collusion, or any other incentives that could provide the business with an improper advantage. Over the past year, we have focused on taking our Business Integrity Management System further, by addressing sustainability more directly through incorporating four specific Sustainable Development Goals into our company values. This way of doing business ensures that clients, staff and investors can place confidence in the company's performance, by creating a clear picture for all our stakeholders regarding how we do business, and who we do business with.

Aligning each of our company values with the United Nations Sustainable Development Goals enables a greater degree of transparency regarding what we do, and how we do it. Our motivation to provide **sustainable energy** services when and where they are needed informs our work in Denmark and abroad. For instance, in the recent Renewable Energy Market Landscape Study for Southern and East Africa, market opportunities and barriers, including market distortions,

were identified with a view to addressing the energy access challenge in rural areas. Through our commitment to strengthening peoples living conditions and contributing to the creation of **sustainable cities**, we provide technical advisory services during contract negotiation, where we facilitate a transparent definition of roles and responsibilities, helping to foster accountability.

Our ability to be innovative in combating **climate change** means that we are at the forefront of emerging sustainable solutions, where our experience in monitoring and evaluation of projects has enhanced our leading capability in developing pragmatic SMART indicator frameworks. In our own organization, the reduction and avoidance of Greenhouse Gas (GHG) emissions is now measured across all relevant projects through our online SDG monitoring system. Our desire to promote transparent **partnerships** built on mutual trust is also a value that we work with on a daily basis. For example, this value has been the backbone for creating the mapping of energy initiatives database for the African-EU Energy Partnership. This is a database that aims to improve the transparency and coordination of high-level initiatives and programs in the energy sector across Africa. It is through examples like these that our focus on a sustainable future is carried out in our daily work, helping to combat corruption through promoting transparency.



# FOR A SUSTAINABLE FUTURE

## OUR VISION

Based on a passion for energy, we strive to build a future where energy is applied efficiently and sustainably in an affordable way.

## OUR VALUES

Our values are most directly linked to four of the 17 UN Sustainable Development Goals, namely 7 – Clean Energy, 11 – Sustainable Cities, 13 – Climate Action and 17 – Partnerships:



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.



Our commitment to strengthening peoples living conditions and contributing to the creation of **sustainable cities** and communities.






Our ability to be creative and adaptable, combating **climate** change and meeting customer needs with innovative solutions.



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.

# TARGETS AND ACHIEVEMENTS

Progress:  Achieved  In progress  Delayed

OBJECTIVE	INITIATIVE	DESCRIPTION	TIME FRAME	STATUS
CO <sub>2</sub> reduction and employee health and wellbeing	"We Bike To Work" initiative	On May 1st of each year, employees compete to see which team has biked the most kilometers during the month	Achieved	
CO <sub>2</sub> reduction and contributing to achievement of 2030 objectives	Paper recycling	Separate and recycle paper as confidential material	1 year	
Employee wellbeing and positive work environment	Game nights	Social activity where colleagues meet after working hours to play board games and socialize.	Achieved	
Employee wellbeing and positive work environment	Employee association	Association that arranges activities for employees and their families at regular intervals	Achieved	
Employee wellbeing and positive work environment	Knowledge and innovation project	Three year project with the Danish Innovation Fund focusing on knowledge sharing and innovation processes	Ongoing	
Employee health and safety	Safety equipment	Provide company safety vests and helmets to be used for on-site visits	Achieved	
Employee health, safety and wellbeing	Workplace risk assessment (APV)	Screening to evaluate work environment and improvement areas	Achieved	
Employee health and wellbeing	Guideline for working with employees effected by stress	A guideline to handle stress on an individual basis, together with their nearest manager.	1 year	
Employee health and wellbeing	Private health insurance	Promoting good health by contributing to access to medicines and vaccination, and early detection of diseases	1 year	
Employee health and wellbeing	Incorporate the 6th vacation week	Employees begin getting additional time for vacation in 2016, and the 6th vacation week will be fully rolled out by the end of 2018	1 year	
Employee health and wellbeing	Pension	Pre-existing pension is being improved by automatic increase which will be fully rolled out in 2020	2 years	
Employee health and wellbeing	Access to employee shower facilities	For employees who bike to work	1 year	
Employee health and wellbeing	Sustainable working culture	A new initiative focused on work/life balance, and working with sustainable projects, teams and processes	1 year	

OBJECTIVE	INITIATIVE	DESCRIPTION	TIME FRAME	STATUS
Employee health and wellbeing	Flexible working hours	"Freedom with responsibility" – a long-standing company tradition at DEM to accommodate private appointments	Achieved	▲
Employee wellbeing	Knowledge management policy	Policy developed to inform all employees of the value that the company places on sharing knowledge	Achieved	▲
Environmental sustainability	Organic fruit and milk	Organic Fruit from okolageret.dk	Achieved	▲
Environmental sustainability and contributing to 2030 objectives	Become an active member in the Global Compact	DEM participated in the GC Nordic Network in 2016/17	Achieved	▲
Environmental sustainability and contribution to 2030 objectives	Water saving	Water saving taps, toilets, dishwashers, etc.	Ongoing	▲
Environmental sustainability and energy savings	Lighting	LED lighting and motion sensors in the offices	Aarhus & Sønderborg 1-5 years	●
Environmental sustainability and energy savings	Power savings strips	Can substantially reduce the amount of power used when combined with an awareness campaign	1 year	■
Environmental sustainability and energy savings	Shutting down of 19 servers	Expected energy consumption reduced by 25%	1 year	●
Environmental sustainability, energy savings and health	Ventilation	Regulation of existing ventilation and installation where needed, improving energy savings and employee health	3-4 year	●
Human rights and contribution to 2030 objectives	Participation in Refugees Professional Program	Participation in the Refugees Professional Program by IDA – providing refugee engineers in Denmark with an insight into the Danish job market	Achieved	▲
Reduction of CO <sub>2</sub> emissions & contributing to the achievement of 2030 objectives	Hybrid or electric car	As cars need to be replaced for offices in Denmark, replace them with electric or hybrid cars	3-4 years	●
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	1-2 years	●

■ Delayed initiatives: With relation to paper recycling, power saving strips and access to shower facilities, these initiatives are planned to be achieved within the 2017-2018 reporting year. Working one-on-one with employees affected by stress is being built into the "Sustainable Working Culture" initiative in 2017-2018. Health insurance will be provided to all employees in the spring of 2018.

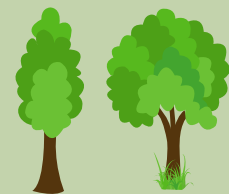
# 2016-2017

“ As a company that has always had sustainable development at its core, Danish Energy Management is passionate about the role that we are playing in finding innovative solutions and delivering sustainable impact.

Jørn Lykou, CEO



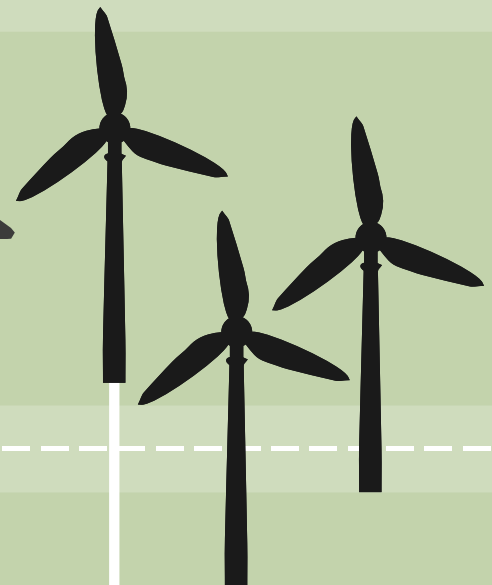
In combining social activity and exercise, employees have participated in a number of active events. For example the DHL relay race and We Bike to Work (where CO<sub>2</sub> saving was measured directly).



## Sustainable Energy production

DEM is co-owner of Hvidebæk biomass heating plant with a solar thermal system. DEM is also co-owner of Middelgrunden offshore wind farm.

**12 GWh** produced





# SUSTAINABILITY HIGHLIGHTS

Employee health and wellbeing

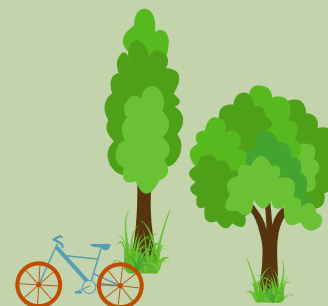
**560 kg CO<sub>2</sub>** saved



**Skype for Business**  
– reduction in transport



To reduce our environmental impact, we only travel when necessary. This means that many of our cross-organizational and international business meetings are held via Skype for Business.



**100%**  
organic fruit  
and milk

All fruit and milk, which is provided to employees on a daily basis, was transitioned to being 100% organic, incorporating SDG 12 – Responsible Consumption and Production.





# OUR IMPACT



DANISH ENERGY MANAGEMENT

**DEM**

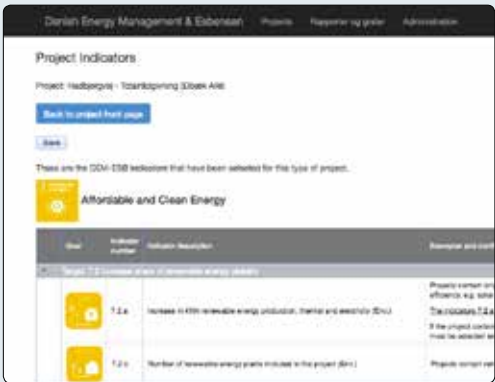
FOR SUSTAINABLE IMPACT

# DEMs ONLINE SDG REPORTING SYSTEM

Like ISO standards, the SDGs provide the opportunity for creating a robust compliance framework for sustainability, where impact can be measured easily and often, in a transparent way. And why is this so important? SDGs are important because consumers, donors, investors and nations are increasingly choosing goods and services that make a difference. There is an increasing demand for products that document sustainable impact, in addition to value chain sustainability, giving these products a competitive edge. According to the UNDP, achieving the SDGs is projected to create market opportunities worth up to \$2.5 trillion a year. The next question that many public and private sector organizations are asking is how can sustainable impact be measured?

DEM has developed an online SDG Reporting System for sustainability measurement, which can be used to track and report on progress towards the SDGs following UN standards. This journey started over 30 years ago with design, planning and implementation projects in Denmark. The focus was then, as it is now, on sustainability, which led to a range of monitoring and evaluation projects focused on the creation of SMART or RACER indicators and IT systems, and leading to assignments with the monitoring of all types of EU projects in all sectors. This experience has led to the creation of our online SDG Reporting System.

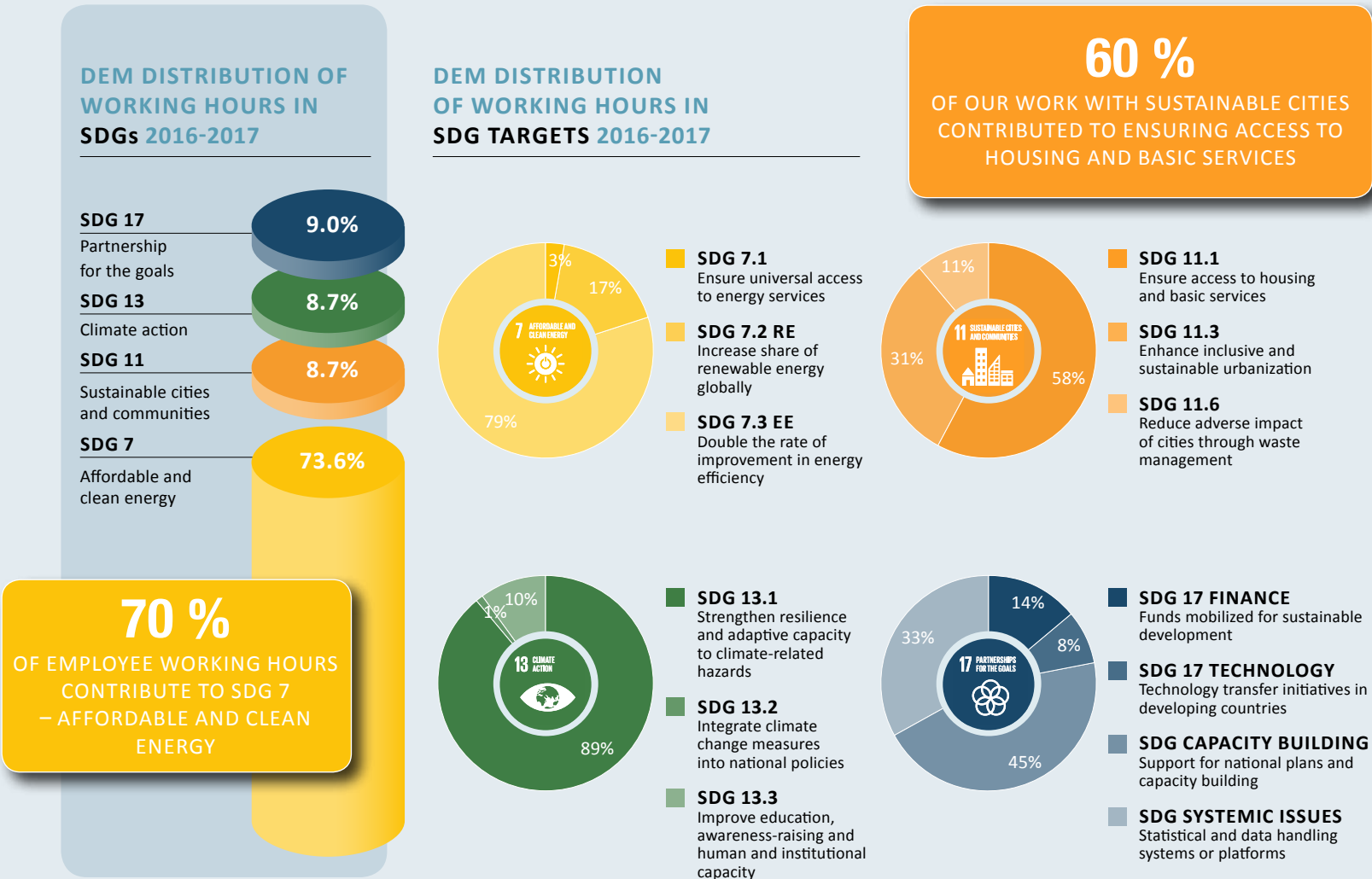
DEM now uses our online SDG Reporting System to measure the impact across all projects on an annual basis. Each relevant SDG and actionable SDG Target is connected to our financial system so that impact can be measured both in terms of dollars and cents, and in terms of hours worked. This makes our contribution to global sustainability tangible for our employees and stakeholders in the wider community. Within each SDG Target area, indicators are identified using specific national and international standards, which means that they can also be used to provide performance metrics that complement official data. Our online SDG Reporting System is now being offered to clients worldwide, as both a stand-alone system and as an option for integration into pre-existing monitoring systems.





# ACCUMULATED PROJECT SDG AND TARGET IMPACT

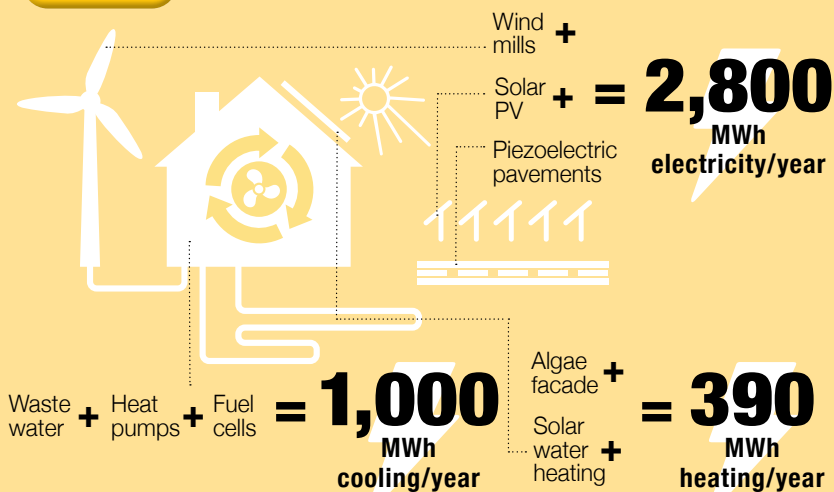
For each of the SDGs and SDG Targets that we work with directly, we measure progress toward sustainable development, and also provide performance metrics that complement official data. Here is a visual representation of employee working hours, as they relate to our primary Sustainable Development Goals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



7.2



## RENEWABLE ENERGY



### Services provided

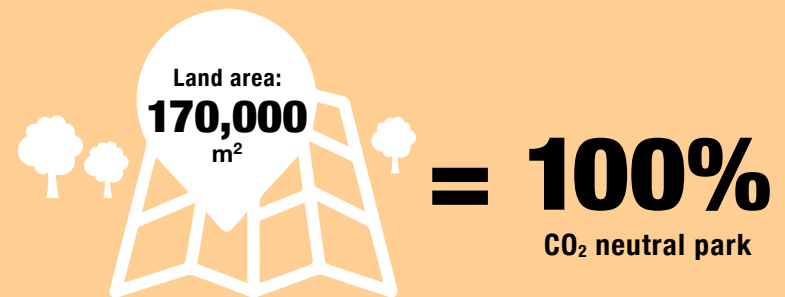
- Proposal of innovative renewable energy technologies
- Calculation of energy demand
- Energy plan for energy efficiency

7 AFFORDABLE AND CLEAN ENERGY



## INCLUSIVE AND SUSTAINABLE URBANIZATION

11.3



### Land with sustainability initiatives

### Services provided

- Systematic dialogue with stakeholders to ensure synergy between actors
- Provision of a holistic project approach
- Design of solutions that promote flexibility and resource consciousness

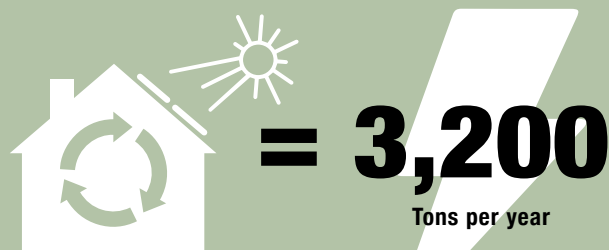
11 SUSTAINABLE CITIES AND COMMUNITIES



13.1



## CLIMATE ACTION



### Services provided

- Integrated Energy Design Process (IED) to ensure carbon neutrality
- Design of solutions that minimize the CO<sub>2</sub> footprint and increase quality

13 CLIMATE ACTION



17 PARTNERSHIPS FOR THE GOALS



## CAPACITY BUILDING PARTNERSHIPS

17.CapB



### Supporting national plans and capacity building:

Danish Energy Management's comprehensive design strategy includes a number of planning tools including, but not limited to, design guidelines for building design, material selection, mixed use building functionality, flexible design, renovation of existing buildings, and sustainable landscape design.

### Services provided

- Collaboration with partners to develop a master plan focusing on science, technology and energy

# DANFOSS UNIVERSE IN HAIYAN

Zhejiang Province, China

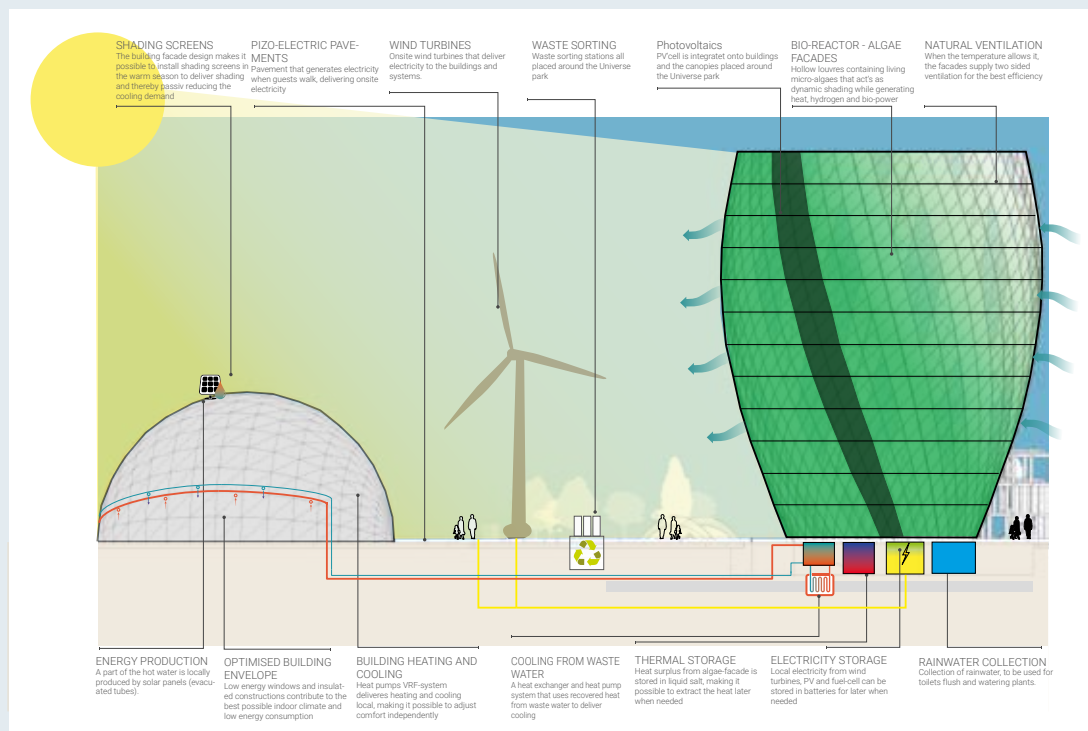


In a world impacted by enormous climatic changes, forced urbanization is having an increasingly significant impact on cities' environments and wider ecosystems. Danfoss Universe has the unique opportunity to create greater coherence between the city and the surrounding natural environment, providing interconnection between local ecosystems, culture and technology. Danfoss Universe itself will help to address global climate challenges such as moving away from typical patterns of energy consumption and production, and instead working towards achieving a greater understanding of how we impact our environment.

Sustainability has been top on the list of priorities when Danish Energy Management (DEM) has made recommendations for the design of Danfoss Universe. These recommendations include both green and blue elements, which can help create cleaner and more oxygenous air, counteract higher temperatures, and reduce consumption of energy for heating and cooling of buildings thus curbing CO<sub>2</sub> emissions. The inclusion of green roofs and trees will help to withhold substantial amounts of rain water, counteracting outflow, thus helping to preserve

the building stock and infrastructure in surrounding cities. Including natural elements in Danfoss Universe will also add social value, with recreational aspects facilitating physical surroundings, where community cohesion can emerge.

The energy producing technologies proposed by DEM include both well known renewable energy systems and other less common systems which utilize new and upcoming technologies. Significantly, DEM has proposed an Energy Central, which will be the epicenter for energy production in the park, while also functioning as a knowledge center where terms like nudging can be introduced. This center will encourage visitors to learn more about renewable energy, illustrating and explaining how various technologies such as solar water heating and heat pump technologies work. Visitors will come away with a better understanding of the key role that user behavior plays in achieving energy efficiency and a carbon footprint reduction.



Client: Wuyuan Subdistrict-Haiyan



Properties: 20 buildings



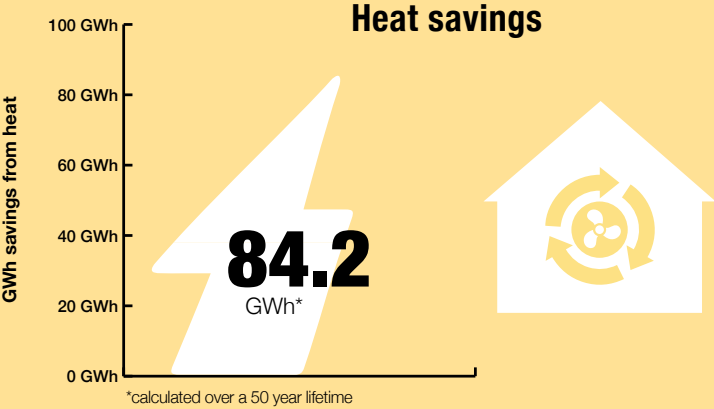
m<sup>2</sup> land area: 170,000



Timeframe: 2014-2020



## ENERGY EFFICIENCY

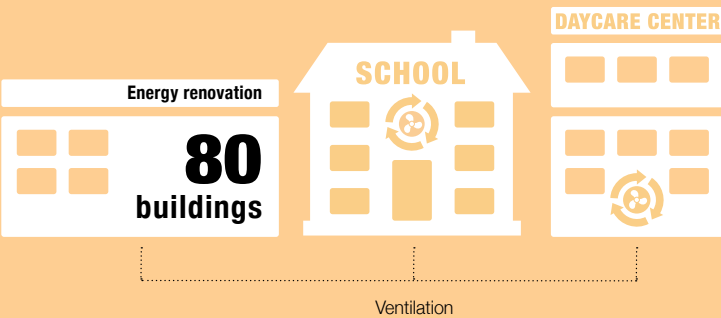


### Services provided

- Regulating and improving heating systems
- Replacing circulation pumps
- Optimization of the Building Management System



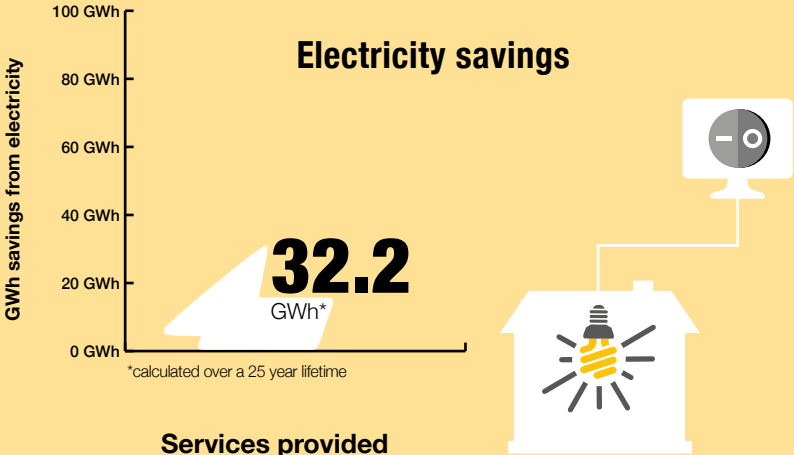
## ACCESS TO BASIC SERVICES



### Services provided

- Energy Renovation of learning institutions
- Implementing new ventilation systems that provide energy savings and improvement of the indoor environment

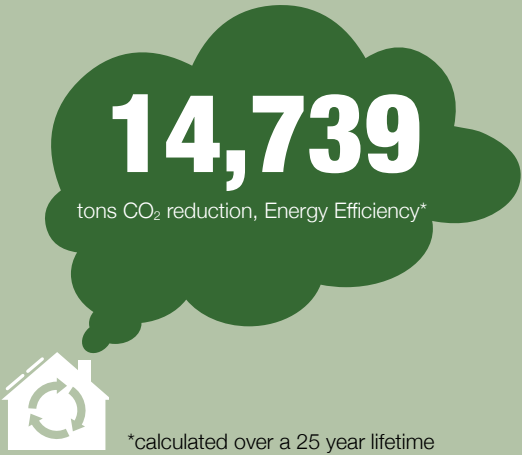
## ENERGY EFFICIENCY



### Services provided

- Replacing lighting solutions for more energy efficiency and including lighting control strategies
- Performing energy audits to procure efficient sustainable solution
- Replacing inefficient Air Handling systems

## CLIMATE ACTION



### Services provided

- Implementation of energy efficiency solutions to reduce CO<sub>2</sub> emission

# EGEDAL MUNICIPALITY

## Holistic energy renovation and indoor environment optimization

Egedal  
Kommune

Egedal Municipality has launched the program “Ready For The Future”, which will ensure that the municipality continues to provide economic flexibility through planned efficiency improvements over the coming years. Streamlining will form a solid foundation, so that the municipality will also be an attractive place to live and work in the future. Energy renovation is part of Egedal’s goal of reducing energy consumption in municipal buildings by 20-25 percent by 2020, for which Danish Energy Management (DEM) provides Lead Consultancy services. With projected energy savings of up to 5 million DKK annually, this project also secures a focus on the future through sustainability, by improving buildings’ indoor environment, reducing CO<sub>2</sub> levels and fulfilling ambitious 2020 building standards.

One of the initiatives in this large Energy Renovation is the energy audit project “Energy Renovation of Building Technologies”, where eighty buildings including educational institutions, sports facilities and club houses have been reviewed

to identify solutions for energy and indoor environment improvements. Based on the energy audits conducted by DEM, the energy renovation solutions are described in audit reports for each individual property. As part of the energy audit project, a user survey was conducted to assess the indoor environment, as well as analyze the need for energy related data in the future. The user survey was conducted based on DS 3033 guidelines regarding the mapping of indoor environment.

In addition, proposed solutions have also been considered in a holistic perspective, incorporating pre-planned maintenance activities. The total energy savings for the Energy Renovation is divided into a 15% savings on heat consumption and 22% savings on electricity consumption respectively, providing a total CO<sub>2</sub> savings of 14,739 tons over the lifetime of the renovated systems.



Client: Egedal Municipality



Properties: 80  
(Daycare centers, schools,  
administrative buildings, etc.)



m<sup>2</sup>: 178,000



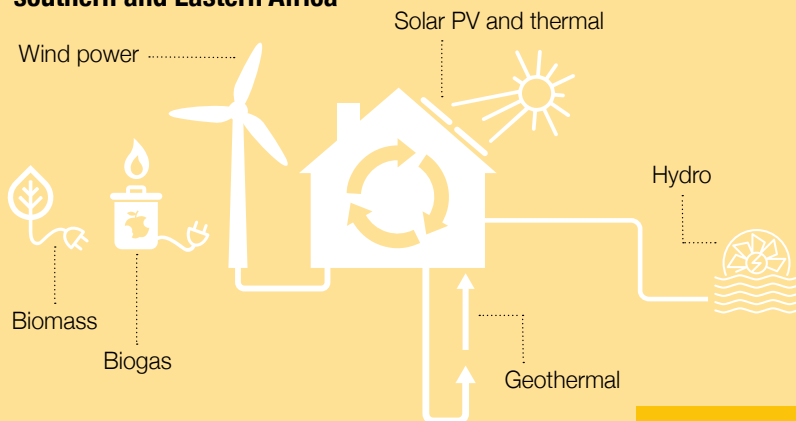
Timeframe: 5 years  
2015-2020





## ACCESS TO SUSTAINABLE ENERGY

### A political economy analysis of renewable energy markets in southern and Eastern Africa



#### Services provided

- Analyzing the barriers and opportunities in the renewable energy and energy efficiency markets in the region for private sector engagement

7 AFFORDABLE AND  
CLEAN ENERGY



17 PARTNERSHIPS  
FOR THE GOALS



## CAPACITY BUILDING PARTNERSHIPS



### Number of projects that support national plans and capacity building for sustainable development

Performing a political economy analysis to provide an overview of the strategic framework for off-grid energy access and a summary of challenges and opportunities for a vibrant off-grid market in the region.



#### Services provided

- Conducting interviews across the region
- Performing a stakeholder mapping



## CLIMATE CHANGE AWARENESS

13 CLIMATE  
ACTION



17 PARTNERSHIPS  
FOR THE GOALS



### Number of awareness campaigns related to climate change

#### Projects with climate change measures in national plans:

Setting focus on the importance of improved cook stoves, to minimize the use of wood fuel thereby reducing CO<sub>2</sub> emissions.



#### Services provided

- Providing a recommendation for the continuation of energy efficient cook stove initiatives, because these projects directly reduce carbon emissions

## FINANCING PARTNERSHIPS



### Funds mobilized for sustainable development

**188,129 EUR**



#### Number of donor organizations involved:

3 donor organizations contributed to the EEP landscape study.

- ✓ Department for International Development (DfID)
- ✓ Ministry for Foreign Affairs of Finland (MFA)
- ✓ Austrian Development Agency (ADA)



#### Services provided

- Assisting national authorities in securing engagement in renewable energy actions
- Mapping of active and planned donor financing activities

The Ministry for Foreign affairs of Finland commissioned Danish Energy Management (DEM) to undertake a market landscape study of 15 countries in southern and East Africa. The purpose of the study was to develop a snapshot of the status of energy access in the region today and identify opportunities to promote its proliferation.

The achievement of universal energy access by 2030 requires concentrated action by all stakeholders to bring about the step-change that is necessary. The unanimous acknowledgement of the importance of renewable energy access as an enabler of sustainable development highlights the scale of the challenge and requires that the private sector engages in meeting demand, providing innovative, off-grid access solutions.

The Market Landscape Study identified trends and barriers within the energy access market in southern and East Africa, as well the opportunities for the Energy and Environment Program (EEP) to support the private sector in harnessing energy access market potential. The study has supported the EEP in re-designing their approach for the next phase, ensuring that they continue to be relevant, effective and aligned to national priorities.

In line with the Fund Manager’s objectives (Nordic Development Fund), the market study provided the basis for ensuring that the support provided will promote the achievement of the SDGs targeting poverty reduction, climate change and access to sustainable energy.

This study provides a snapshot of the market situation in each target country, creating a more transparent understanding of the context.

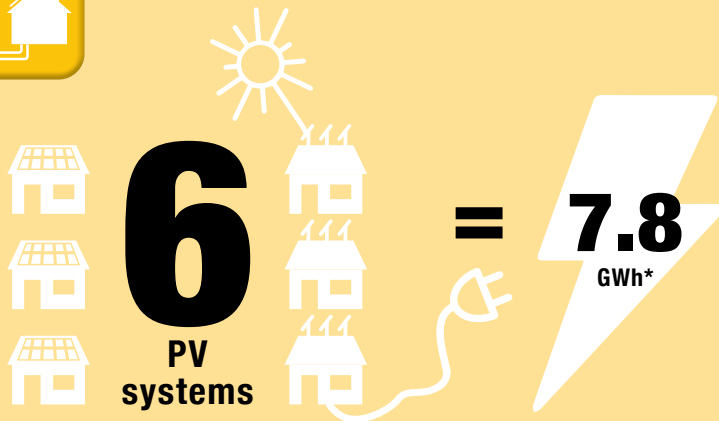




7.2

## RENEWABLE ENERGY

\*calculated over a 25 year lifetime



Roof-integrated + roof-mounted  
solar power systems

## Services provided

- Building screenings reports
- Analysis of solar power systems with relation to optimal annual electricity production
- Risk assessment for environmental impact
- Validation of specific energy savings

7 AFFORDABLE AND CLEAN ENERGY

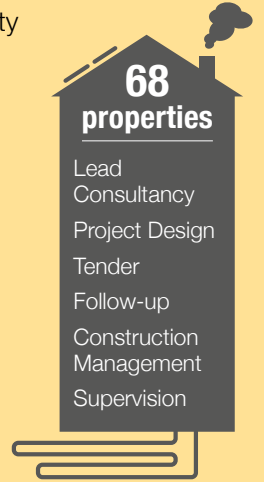
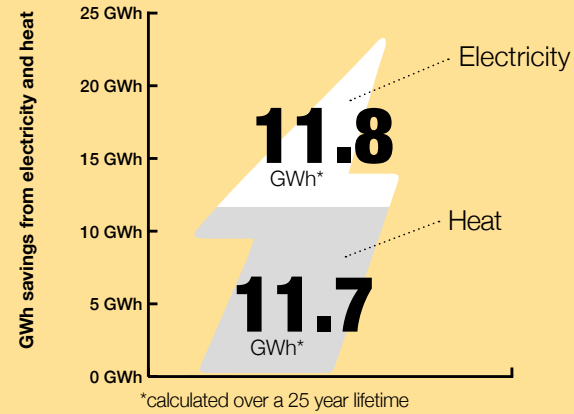


7 AFFORDABLE AND CLEAN ENERGY



## ENERGY EFFICIENCY

7.3



## Services provided

- Lead consultancy for design and building management
- Establishment of 6 solar power systems
- Identification of energy renovation measures

11 SUSTAINABLE CITIES AND COMMUNITIES

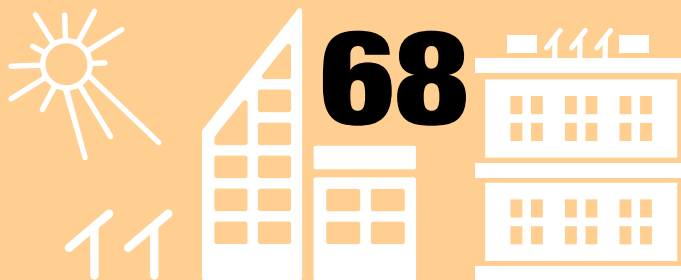


13 CLIMATE ACTION



11.1

## ACCESS TO BASIC SERVICES



Payback time

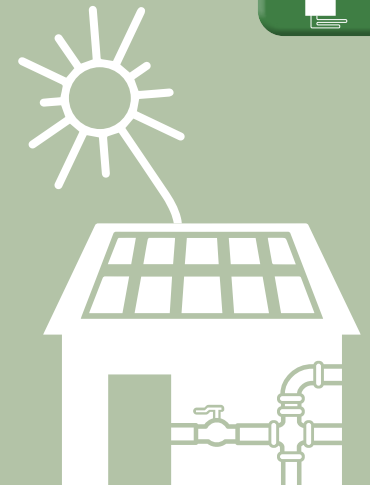
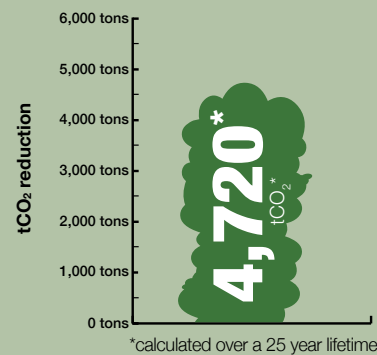


## Services provided

- Energy renovation including eg. technical installations, insulation of building envelopes and sustainable lighting systems

## CLIMATE ACTION

13.1



## Services provided

- Development of energy saving initiatives for both technical installations and building envelopes and the establishment of solar power systems



# HELSINGØR, DENMARK

## Lead consultancy for Helsingør Municipality



Helsingør Municipality has committed itself to reducing CO<sub>2</sub> emissions by 2% annually until 2025, in connection with their 2009 Climate Plan. The end goal is that Helsingør Municipality will be completely CO<sub>2</sub> neutral in 2050. As part of their CO<sub>2</sub> reduction, Helsingør Municipality has invested approx. 56 million DKK in the energy renovation of municipal properties.

Danish Energy Management (DEM), in cooperation with Bascon, has contributed to lead consultancy, in connection with providing energy savings in 68 municipal properties with a total expected payback time of approx. sixteen years. The properties primarily comprise of cultural and sports centers, daycare centers, schools and administrative buildings.

DEM also contributed to designing six large roof-mounted and roof-integrated photovoltaic (PV) systems as part of this project, with a total annual energy production of approx. 337 MWh per year. Energy renovations for the Municipality provided expertise in areas such as the improvement and optimization of technical installations, replacement of windowpanes and frames, insulation of building envelopes and energy efficient lighting systems. In addition to general construction and engineering consultancy, DEM's services also included building management, work environment coordination, start-up management, training for building operations and maintenance personnel, energy management and validation of energy savings.



**Client:** Helsingør Municipality



**Properties:** 68  
(Daycare centers, schools,  
administrative buildings, etc.)



**m<sup>2</sup>:** 180,000

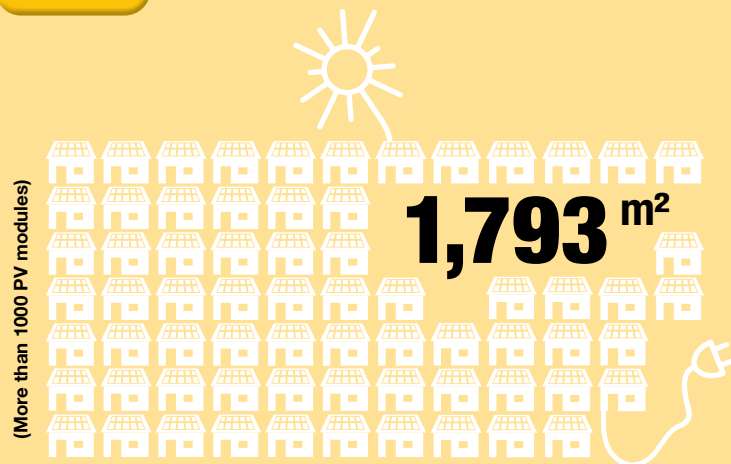


**Time frame:** 2014-2018

7.2



## RENEWABLE ENERGY



### Services provided

- Roof-mounted solar panels
- Using solar panels to cover energy from ventilation, heat pumps and lighting

7

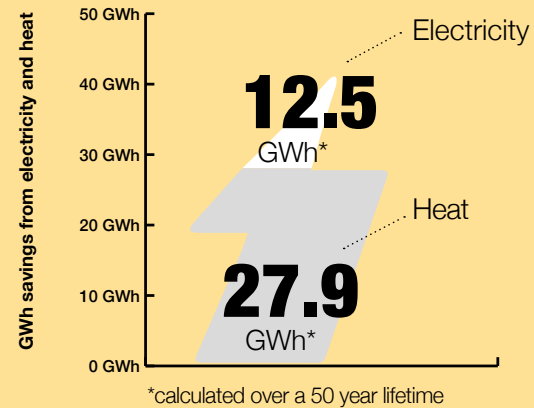
AFFORDABLE AND  
CLEAN ENERGY

7

AFFORDABLE AND  
CLEAN ENERGY

## ENERGY EFFICIENCY

7.3



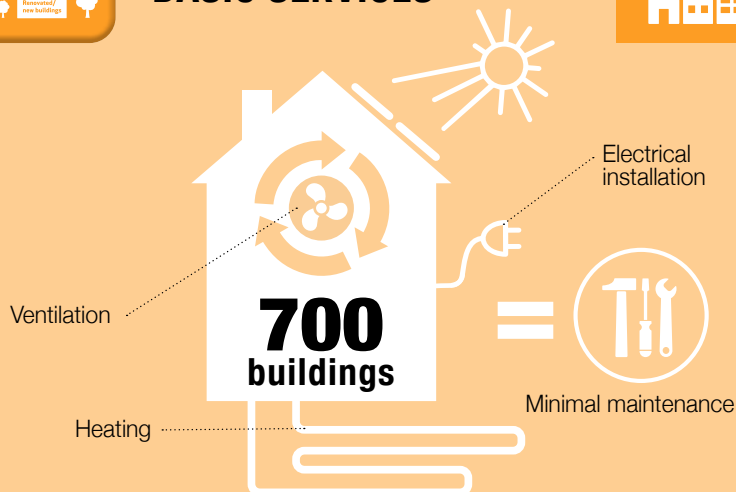
### Services provided

- Developing overall building energy concepts
- Applying Integrated Energy Design (IED)
- Securing optimized indoor environment and low energy consumption

11.1



## ACCESS TO BASIC SERVICES



### Services provided

- Technical installation design
- Design of ventilation, heating and electrical installation
- Recommendations for materials with minimal maintenance

11

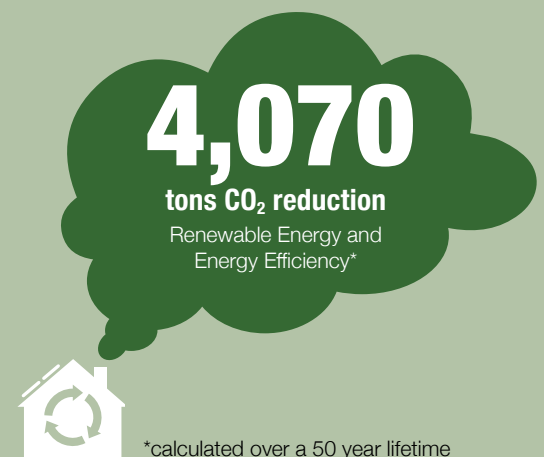
SUSTAINABLE CITIES  
AND COMMUNITIES

13

CLIMATE  
ACTION

## CLIMATE ACTION

13.1



### Services provided

- Applying energy effective technology in construction
- Applying solar panels to meet the requirements for the 2020 building standard



# ALMEN BOLIG+

## A new generation of sustainable, affordable housing



Almen Bolig+ is a project that seeks to build robust, beautiful and simple housing for families that desire to set their own mark on their home and garden. This ambitious project seeks to establish the next generation of spacious housing for a reasonable price, close to Copenhagen cities' jobs. Most housing units are constructed as low energy homes between 85-125 square meters, and target residents who want to participate in the practical maintenance and upkeep in order to keep costs down. Two hundred and fifty of these housing units are also constructed using the 2020 building standard with an energy frame of only 20 kWh/m<sup>2</sup> pr. yr.

Danish Energy Management (DEM) is providing a wide range of services that take users' experiences and needs into consideration. The building system is based on modules that are factory produced and delivered on-site.

All modules are extremely well insulated, which is important for low energy buildings. A compact ventilation system circulates heat throughout housing units, with quick and precise regulation that can adjust for passive solar heating. A primary focus throughout the building design of Almen Bolig+ has been to optimize the indoor environment, which plays a significant role in the well-being of the inhabitants.

To ensure a connection between form, function and architecture, Integrated Energy Design (IED) has been applied throughout the work process. Using Integrated Energy Design, DEM has helped ensure comfort and low energy demand in the finished project, with the highest possible passive properties, passive and active solar thermal utilization, as well as daylight optimization.



Client: Housing Company KAB



Properties: 700  
(Affordable housing)



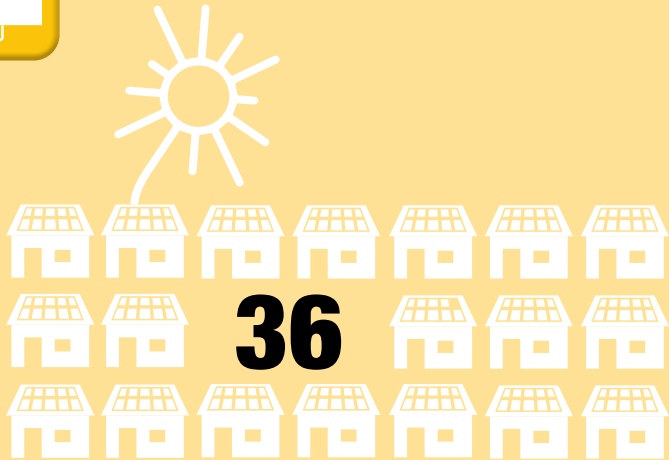
m<sup>2</sup>: 70,000



Timeframe: 2011-2021



## RENEWABLE ENERGY



36

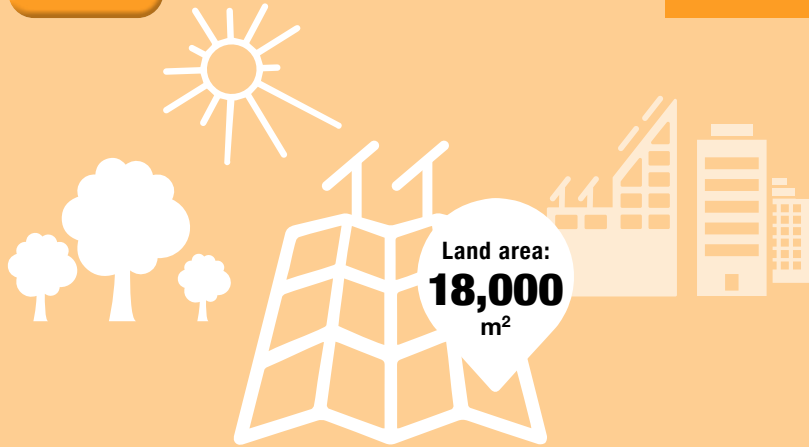
buildings with integrated solar power systems

### Services provided

- Efficient use of natural resources such as sunlight
- Design of electrical installations
- Installation of solar panels



## SUSTAINABLE URBANIZATION



Land area:  
18,000  
m<sup>2</sup>

### Services provided

- Integrated Energy Design
- Dimensioning of building integrated solar panels



## RENEWABLE ENERGY



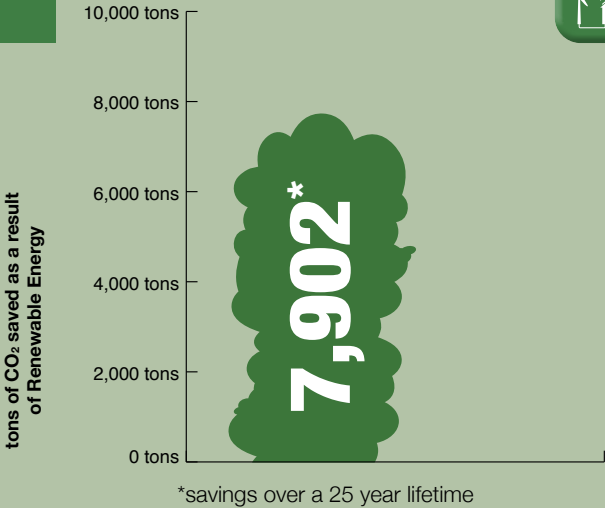
= 46.5  
GWh\*

### Services provided

\*calculated over a 25 year lifetime

- Minimizing the consumption of resources and protecting the urban and natural environment
- Energy screenings
- Size, orientation, shadows, slope, etc. is carefully analyzed, to get the most optimal facilities in regard to consumption over the year

## CLIMATE ACTION



### Services provided

- Helping to create a CO<sub>2</sub> neutral buildings

Since 2005, Danish Energy Management (DEM) has been working as consultant for Sønderborg Municipality in a number of integrated energy design projects. Each of these projects has contributed to the Municipality's ambitions target of becoming a CO<sub>2</sub> neutral. In 2014, Sønderborg Municipality awarded DEM a contract for the design and implementation of building integrated solar power systems for 36 municipal buildings.

The first step in the design process was to conduct a screening of each of the buildings, to ensure optimal functionality of the solar power systems. Next DEM dimensioned and optimized the design of the building integrated solar power systems. This was followed by the preparation of the EU procurement process for the solar cell suppliers, and the contracting of suppliers. During implementa-

tion, DEM also provided professional supervision, construction management and building accounting. Prior to the establishment of the solar power systems, DEM also carried out roof renovation projects on 17 of the municipal buildings, which involved design in collaboration with architects as subconsultants.

DEM is also an active part of Sønderborg Municipality's ambitious Project Zero, which includes a climate strategy to be CO<sub>2</sub> neutral in 2029. DEM has contributed to the development of the overall Master Plan for CO<sub>2</sub> neutrality. The Master Plan takes its point of departure from energy efficiency as a driver for business competitiveness and reducing the cost of energy for its citizens. A multi-strand renewable energy supply is included, based on local renewable energy resources including solar power systems.



7.3



## ENERGY EFFICIENCY

Expected reduction in final energy consumption of 29% by 2030 from a 2015 baseline



### Services provided

- Identification of energy savings potential in South Africa
- Prioritization of policy measures that can stimulate efficiency improvements
- Setting of sectoral targets with relation to specific energy consumption

7 AFFORDABLE AND CLEAN ENERGY



13 CLIMATE ACTION



## CLIMATE CHANGE STRATEGIES AND POLICIES

13.2



Through the identification of energy savings measures in South Africa, the projected reduction in energy consumption will positively impact climate emissions reductions



### Services provided

- Identification of policies that encourage an improvement in energy performance standards of equipment and machinery across sectors (including motors, appliances, vehicles, etc).
- Identification of policies that work towards raising the bar, including tightening buildings standards and fuel efficiency of vehicles.

13.3



## CLIMATE CHANGE AWARENESS

### Analysis of energy savings in the following sectors:

- Public
- Residential
- Commercial
- Industry
- Transport
- Agriculture



### Services provided

- Recommendation of energy savings initiatives that will encourage the uptake of Energy Efficiency

13 CLIMATE ACTION



17 PARTNERSHIPS FOR THE GOALS

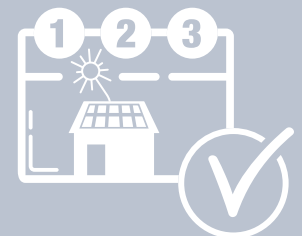


## CAPACITY BUILDING PARTNERSHIPS

17.CapB



Capacity building across the energy sector, providing a policy framework that will promote, stimulate and monitor energy efficiency



### Services provided

- Collaborating with the South African Department of Energy and government stakeholders
- Engaging with stakeholders across all sectors to develop and define energy efficiency policy measures
- Developing the monitoring framework and system to produce annual energy efficiency monitoring reports



# GOVERNMENT OF SOUTH AFRICA

## National Energy Efficiency Strategy



Energy efficiency is increasingly being viewed worldwide as a hidden energy resource that should be fully exploited before considering other sources of energy – it has often been referred to as the ‘First Fuel’. Energy efficiency measures are not only the fastest path towards a low-carbon transition, but they also contribute to economic growth, improved productivity and strengthened energy security.

Danish Energy Management (DEM) was contracted to support the Department of Energy in South Africa in developing their post-2015 National Energy Efficiency Strategy. The strategy builds on the preceding 2005 strategy, taking stock of where the country is across all sectors, and developing and prioritizing measures that will stimulate further improvement in South Africa. The vision behind the National Energy Efficiency Strategy is to embrace the concept of energy efficiency, creating socially inclusive and environmentally sustainable economic growth, and boosting job creation while leading technological innovation across the region.

The strategy aims to contribute towards reducing the final energy consumption across the economy by 29% by 2030 (from a 2015 baseline) through the implementation of a suite of measures that are catered to each sector. Specific sectoral targets have been defined, based on the proposed measures and in light of available data.

The strategy also recommends the introduction of various incentives and financing schemes that will encourage the uptake of energy efficiency by stakeholders within the key sectors, and the need for an enabling framework rooted in monitoring compliance, enforcement and periodic evaluation of progress.



Client: Government of South Africa



Product delivered:  
National Energy Efficiency  
Strategy



Strategy  
Timeframe: 15 years



Timeframe: 2012-2017





Issue date: April 2018

[www.dem.dk](http://www.dem.dk)

