

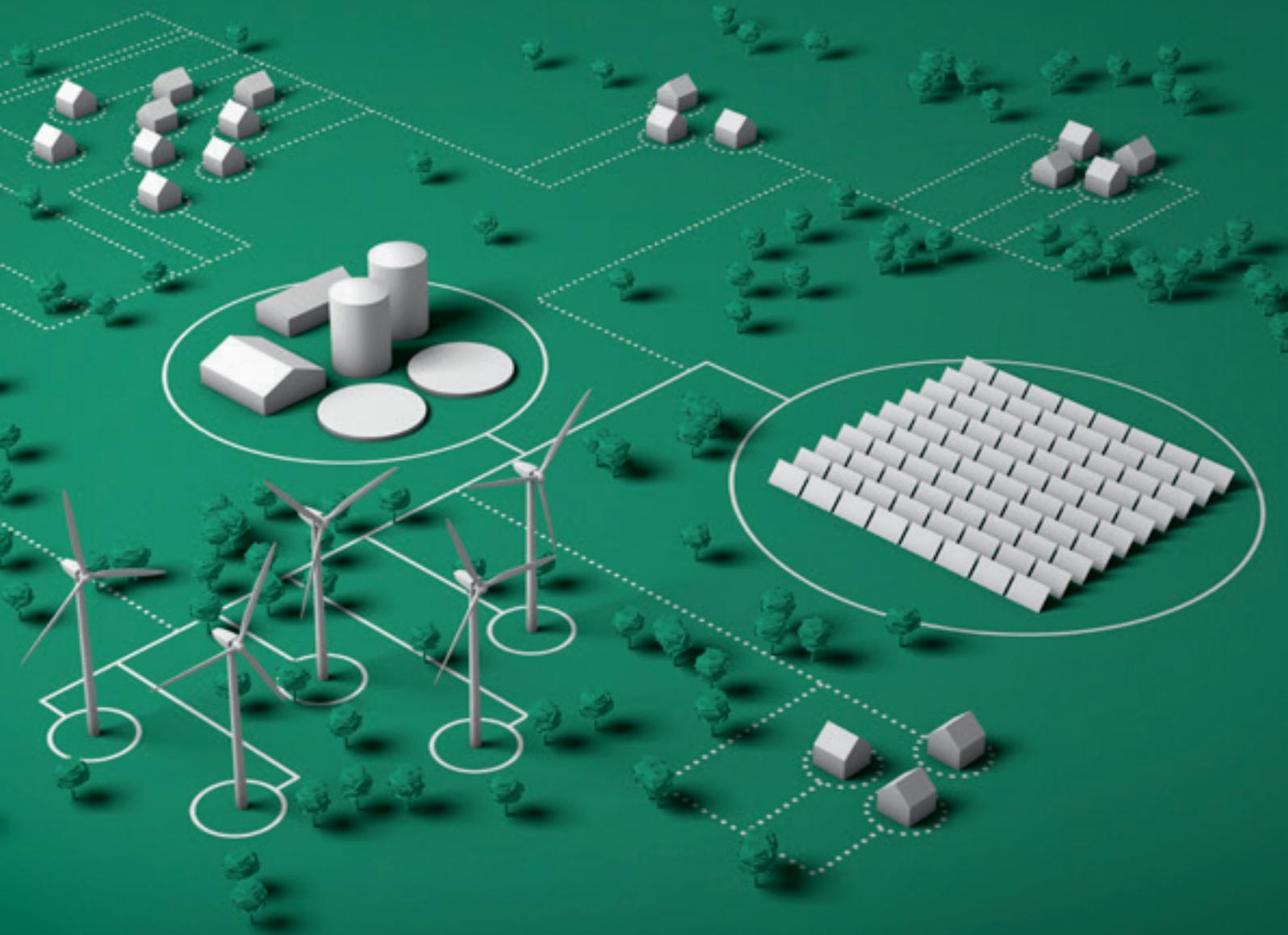
# Think Denmark

White papers for a green transition

# FINANCING THE GREEN TRANSITION

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Innovative Danish investment solutions  
pave the way for global green growth



**FINANCING THE GREEN TRANSITION**

Innovative Danish investment solutions pave the way for global green growth

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**Front page illustration**

Henrik Wedel Sivertsen

**Editor in Chief**

State of Green

**Contributors**

PensionDanmark: Tage Otkjær, [tao@pension.dk](mailto:tao@pension.dk)

Industriens Pension: Jan D. Østergaard, [jos@industrienspension.dk](mailto:jos@industrienspension.dk)

PKA: Thomas B. Knudsen, [tbk@pka.dk](mailto:tbk@pka.dk)

Danish Investment Fund for Developing Countries: Rune Nørgaard, [rno@ifu.dk](mailto:rno@ifu.dk)

EKF Denmark's Export Credit Agency: Søren Weber Stendal, [sws@ekf.dk](mailto:sws@ekf.dk)

Danish Energy Agency: Asger Garnak, [asga@ens.dk](mailto:asga@ens.dk)

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# FINANCING THE GREEN TRANSITION

***Danish institutions have played a key role in the financing of large-scale sustainable projects internationally.***

*By Troels Lund Poulsen, Minister for Business and Growth*



After the United Nations agreement in Paris in December 2015 when 195 countries adopted the first ever universal, legally binding agreement to limit global warming, investments of billions or even trillions of US dollars will be needed to implement the required solutions.

Some investment may derive from public funds, but large-scale private sector involvement is key to creating new growth and jobs based on green technologies and infrastructure. This is indeed a challenge in all countries.

Denmark started the green transition decades ago, and our aim is to make the nation independent of fossil fuels by 2050.

Denmark is regarded as a first mover globally within renewables and energy efficiency solutions. This is due to the strong focus on innovation, technology and skills in private businesses and research institutions. With our policies we have strengthened the renewable energy system - 42 per cent of our electricity consumption comes from wind energy - and technological solutions from private companies.

But internationally, Danish institutions have also played a key role in the financing of large-scale sustainable projects. And both public institutions and private equity such as pension funds have shown remarkable dedication and innovative skills when implementing new models for financing

big infrastructure projects in Denmark, in Europe and around the world.

This white paper describes how Danish pension funds and Danish government institutions have introduced new and innovative solutions to secure the financing required for a green transition. I hope that the examples presented in this report will serve as an inspiration to you.

# ABOUT THIS WHITE PAPER

The aim of this white paper is to share some of Denmark's - and Danish financial institutions' - examples on how to finance smaller or larger projects within climate adaption, energy, energy efficiency, environment and water.

Denmark has led the way in the global energy transition with national policies and technological solutions. But the green transition will not take off without financing. Danish public and private financial institutions, including institutional investors like pension funds, have been drivers for projects around the world.

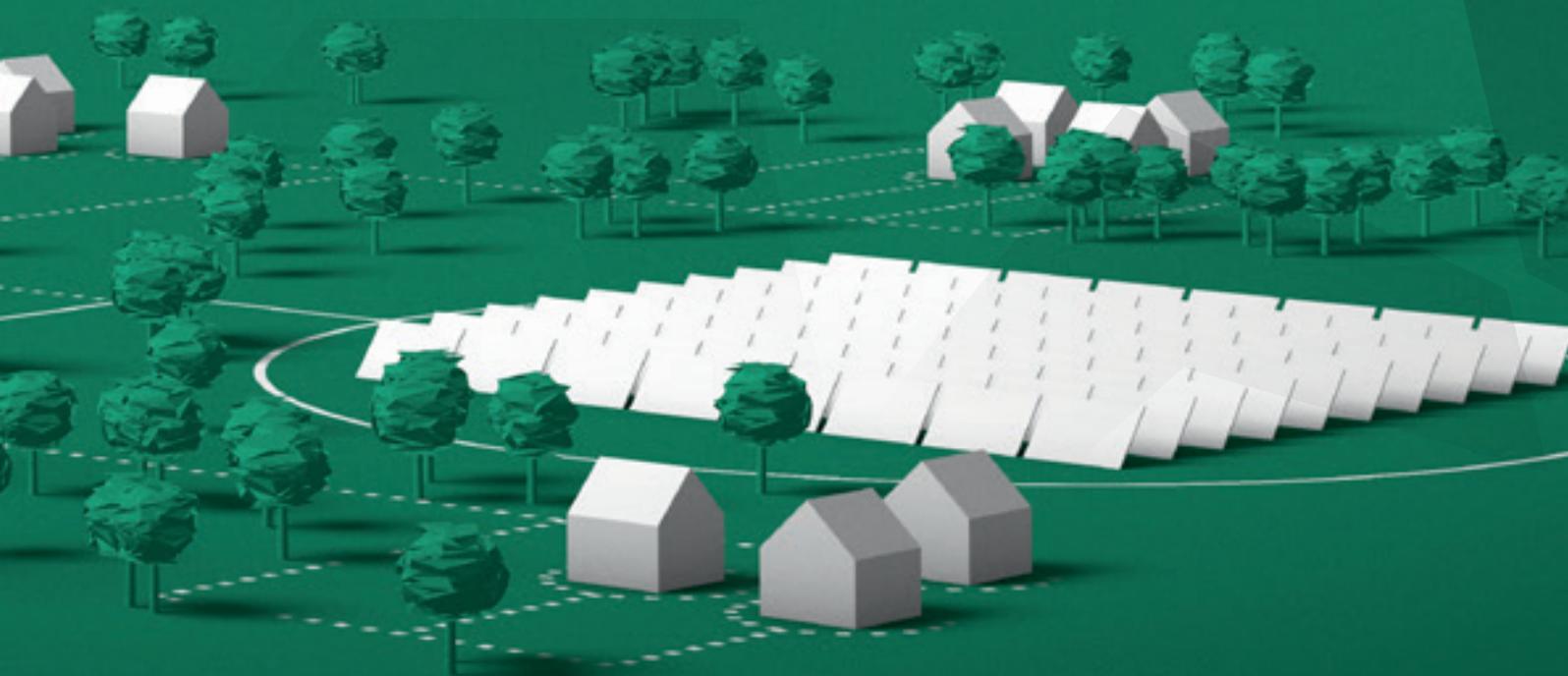
In this white paper we have gathered a selection of examples from a number of projects from all around the world where Danish investors and financial institutions have been instrumental in securing projects being realised.

Financing the green transition will be one of the big global challenges in the coming decades and we hope that this white paper will be an inspiration to help new projects to get underway.



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# CONTRIBUTORS TO THIS WHITE PAPER



## EKF Denmark's Export Credit Agency

EKF is Denmark's official export credit agency. EKF helps foreign buyers raise financing for their purchases of Danish solutions. Using its financial expertise and very high credit rating, EKF does so by issuing guarantees to banks, companies and projects thereby undertaking significant portions of the financial and political risks involved and making long-term financing possible.

EKF is an experienced financial guarantor in the global renewables business. In 2015, its guarantees in the wind energy sector alone accounted for DKK 30.6 billion (EUR 4.1 billion). In addition, EKF backs business transactions within a wide range of other renewables sectors such as bioenergy, solar energy, water, energy efficiency, district heating as well as environment and resources.

EKF participates in both small and large transactions and provides project finance solutions and financing for foreign buyers as well as for shopping lines covering multiple contracts from Danish suppliers.

**Contact:**  
[www.ekf.dk](http://www.ekf.dk)

Examples of cases involving EKF Denmark's Export Credit Agency can be found on pages: 12, 14 and 20



## The Danish Climate Investment Fund and The Danish Investment Fund for Developing Countries

The Danish Climate Investment Fund (KIF), is a public-private partnership, offering risk capital and advice for climate investments or climate-related projects in developing countries and emerging markets. KIF stands ready to co-invest with companies as well as developers wishing to supply technology to, develop or operate businesses reducing greenhouse gas emissions.

The Investment Fund for Developing Countries (IFU) is the fund manager of the Danish Climate Investment Fund.

Denmark is at the forefront in living up to the United Nations decision from 2009 to mobilise capital for climate investments in developing countries.

The Danish Climate Investment Fund has procured DKK 1.3 billion (EUR 173 million) of public and private funds.

**Contact:**  
[www.ifu.dk](http://www.ifu.dk)

Examples of cases involving The Danish Climate Investment Fund can be found on pages: 10 and 12



## The Danish Energy Agency

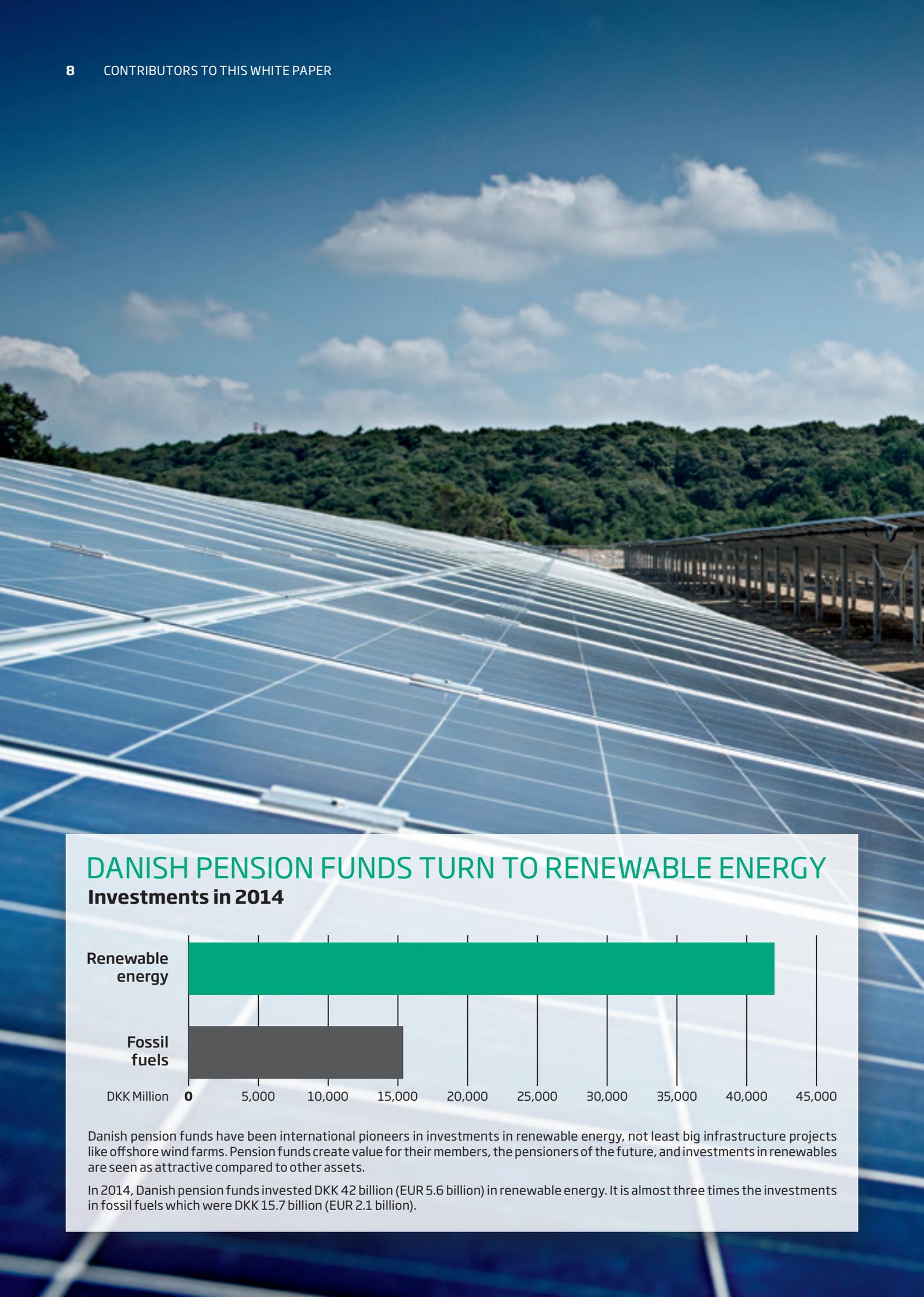
The Danish Energy Agency - part of the Danish Ministry of Energy, Utilities and Climate - supports emerging economies in combining sustainable future energy supply with economic growth.

Collaboration is based on four decades of Danish experience with renewable energy and energy efficiency, transforming the energy sectors to deploy increasing levels of low-carbon technologies.

The Danish Energy Agency is supporting the development and deployment of an innovative insurance model to de-risk investments in energy efficiency. Energy Savings Insurance (ESI) is rolled out by the Inter-American Development Bank to accelerate the development of energy efficiency markets.

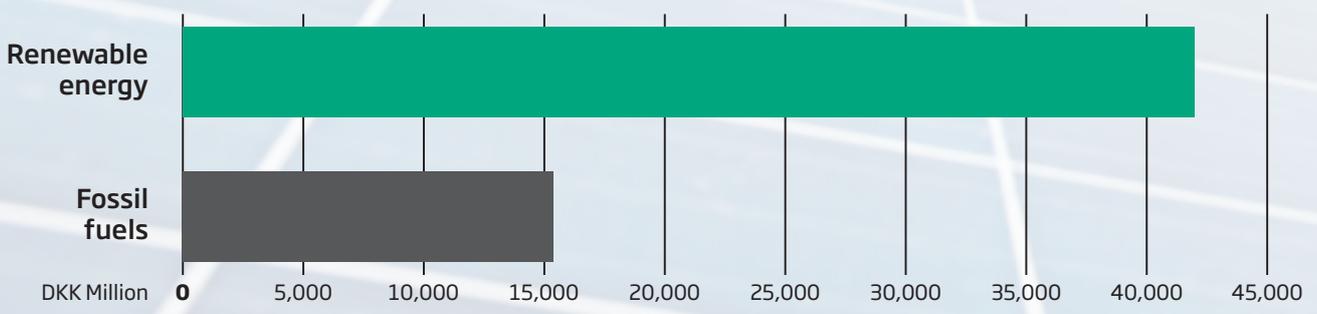
**Contact:**  
[www.ens.dk/en/policy/Global-cooperation](http://www.ens.dk/en/policy/Global-cooperation)

The project involving The Danish Energy Agency can be found on page: 26



## DANISH PENSION FUNDS TURN TO RENEWABLE ENERGY

### Investments in 2014



Danish pension funds have been international pioneers in investments in renewable energy, not least big infrastructure projects like offshore wind farms. Pension funds create value for their members, the pensioners of the future, and investments in renewables are seen as attractive compared to other assets.

In 2014, Danish pension funds invested DKK 42 billion (EUR 5.6 billion) in renewable energy. It is almost three times the investments in fossil fuels which were DKK 15.7 billion (EUR 2.1 billion).

# CONTRIBUTORS TO THIS WHITE PAPER



## PensionDanmark

PensionDanmark has acquired sustainable energy plants (wind, sun, biomass) with a total capacity of 2,500MW in annual green energy. PensionDanmark's share of the sustainable energy assets equates in terms of capacity to more than the energy consumed by PensionDanmark's 680,000 members and their families annually.

PensionDanmark is a non-profit labour market pension fund managing pensions under collective and corporate agreements and health care products on behalf of 23,000 businesses. PensionDanmark currently have DKK 180 billion (EUR 24 billion) under management and is one of the 50 largest pension funds in Europe. PensionDanmark currently has DKK 7.5 billion (EUR 1 billion) directly invested in infrastructure and a targeted allocation of 10 per cent of assets under management in direct infrastructure investments.

**Contact:** [www.pensiondanmark.com](http://www.pensiondanmark.com)

*Examples of projects involving PensionDanmark can be found on pages: 10, 18, 22 and 24*

## PKA

PKA is one of the largest pension funds in Denmark with 275,000 members and assets of DKK 235 billion (EUR 31.5 billion). PKA has invested about DKK 17 billion (EUR 2.3 billion) in climate-related projects, including wind farms, green bonds and the Danish Climate Investment Fund. The investments are part of PKA's ambition to combine stable long-term returns with investments in renewable energy.

PKA's ambition is to invest 10 per cent of the total investments in climate-related projects by 2020. PKA has invested in five off-shore wind farms in four countries: Anholt in Denmark, Gode Wind II and Butendiek in Germany, Gemini in the Netherlands and Burbo Bank Offshore Wind Farm in England. A total investment of DKK 9.6 billion (EUR 1.3 billion), which will provide renewable energy to two million households.

**Contact:** [www.pka.dk](http://www.pka.dk)

*Examples of projects involving PKA can be found on page: 14*



## Industriens Pension

Industriens Pension is a Danish labour market pension fund with approximately 400,000 members across 8,000 companies. The pension fund is managing total assets of DKK 138 billion (EUR 18 billion). Investments into renewable energy assets play an important role as part of the overall investment strategy.

Industriens Pension is taking a multifaceted approach to building and managing the renewable energy portfolio. The key components of the strategy are direct investments, where the pension fund is buying a direct ownership stake in for example an offshore wind farm, or investments in infrastructure funds where development and/or acquisition of renewable energy assets is part of the investment strategy.

**Contact:** [www.industrienspension.dk](http://www.industrienspension.dk)

*Example of project involving Industriens Pension can be found on page: 16*

## Copenhagen Infrastructure Partners

Copenhagen Infrastructure Partners K/S (CIP) is a fund management company founded in 2012 by senior executives from the energy industry and PensionDanmark. CIP is owned and managed by the five partners, Jakob Baruël Poulsen, Rune Bro Róin, Torsten Lodberg Smed, Christian T. Skakkebæk and Christina Grumstrup Sørensen. All five partners have extensive experience within infrastructure investments and mergers & acquisitions.

CIP currently manages the funds Copenhagen Infrastructure I K/S, CI Artemis K/S and Copenhagen Infrastructure II K/S. Copenhagen Infrastructure I K/S and CI Artemis K/S both have PensionDanmark as sole investor, while Copenhagen Infrastructure II K/S has 19 Danish and international institutional investors.

**Contact:** [www.cipartners.dk](http://www.cipartners.dk)

*Example of project involving Copenhagen Infrastructure Partners can be found on page 18*



***“The Danish Climate Investment Fund and the Danish Agribusiness Fund are good examples of how public and private capital can work together to address global societal challenges in a way that benefits both Danish companies and investors.”***

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*Torben Möger Pedersen, CEO, PensionDanmark*



# BLENDING FINANCE CAN MAKE RISKY INVESTMENTS BANKABLE

## Renewable energy is possible through public-private financial models

*Investing in solar power in the Maldives and wind power in Kenya will contribute to reduce the countries dependence on import of fossil fuel. For PensionDanmark they are only made possible through blended finance models.*

By Tage Otkjær, Communications Consultant, PensionDanmark

Providing drinking water to 150,000 people in the Maldives based on solar power and investing in 365 wind turbines in Kenya could seem too ambitious and far away for a Danish institutional investor like PensionDanmark. And as pure private investments they would be unfeasible. However, blended finance models have made these investments possible through the Danish Climate Investment Fund (DCIF).

### Nordic Power Partners

In the Maldives producing clean drinking water from seawater is very energy intensive and based on diesel plants, which are both costly and pollutive. DCIF has invested in Nordic Power Partners, a development company, which will build and manage the solar plants using photovoltaic (PV) solar cells, which creates electricity in a material exposed to light. The return on investment is based on a long term power purchase agreement and the solar plants will reduce energy cost and reduce the CO<sub>2</sub> emission considerably.

Similarly, DCIF has made its first big investment (DKK 87 million, EUR 11.6 million) in a wind farm by Lake Turkana, Kenya. The wind power project will be the largest wind park in Sub-Saharan Africa, and the

310MW wind farm will produce around 20 per cent of Kenya's current installed electricity generating capacity at a very cost efficient price and will replace fuel imports of approximately DKK 900 million (EUR 120 million) annually.

### Fund managed by IFU

PensionDanmark has committed DKK 200 million (EUR 27 million) to investments through DCIF. The fund is managed by IFU, Denmark's Investment Fund for Developing Countries, and the commitments to the fund is split between the Danish government, IFU and the institutional investors PKA, PBU and PensionDanmark.

Blended Finance has three key characteristics:

- **Leverage:** Use of development finance and philanthropic funds to attract private capital into deals
- **Impact:** Investments that drive social, environmental and economic progress
- **Returns:** Financial returns for private investors in line with the market rate, based on real and perceived risks

Blended finance can foster private financing for environmentally-friendly projects enabling the diffusion of climate-friendly

technology throughout the economy, and at the same time initiate projects, that under normal circumstance would involve a great degree of risk for private investors, bankable and financially sustainable. Especially the ability to reduce political and regulatory risks through the use of blended finance models are central to what makes the model relevant.

### Danish Agribusiness Fund

Alongside the investments in DCIF, PensionDanmark has also committed DKK 200 million (EUR 27 million) to the Danish Agribusiness Fund (DAF) investing in improved production, distribution and food sales in developing countries. In the two funds PensionDanmark is investing along with the Danish government, IFU, and the pension fund PKA, which has also committed DKK 200 million. The initial investments of DKK million (EUR 107 million) and DKK 775 million (EUR 103 million) to the funds, DCIF and DAF, are expected to ensure induced investments of approx. DKK 7-9 billion (EUR 1-1.2 billion) for each of the funds, due to the fund investing with local investors in the projects.

### Blended Finance:

OECD defines blended finance as the strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets. Blended finance deliberately channels private investment to sectors of high-development impact while at the same time delivering attractive risk-adjusted returns.



***“Lake Turkana is an investment having major importance for the development in Kenya.”***

*Torben Huss, Executive Vice President,  
The Danish Investment Fund for Developing Countries*



**Additional Danish financing of the Lake Turkana project**

EKF Denmark's Export Credit Agency also participated in the financing of the Lake Turkana project by providing a project financing guarantee of DKK 900 million (EUR 120 million) of the total project costs of DKK 4.5 billion (EUR 600 million). EKF's guarantee relieves the funding providers of risk. EKF's objective is to help Danish exporters by making it attractive for foreign buyers to place orders in Denmark. In this case the exporter was the Danish wind turbine manufacturer Vestas. (Photo: Jesper Heldgaard)

# LAKE TURKANA – AFRICA'S LARGEST WIND FARM

**Nordic financing has paved the way for ambitious energy project**

*Lake Turkana Wind Power sets new standards for energy production in Africa thanks to close cooperation between Kenyan government, public and private investors and Danish wind technology.*

*By Rune Nørgaard, Communication Director,  
Danish Investment Fund for Developing Countries*

When fully operational in 2017, the Lake Turkana Wind Power project will be the largest wind farm in Africa, with 365 wind turbines and a total capacity of 300 MW.

Lake Turkana Wind Power is located in northern Kenya. The site was selected due to the strong predictable wind streams between Lake Turkana and the desert hinterland, which creates the optimal conditions for producing electricity by wind.

#### **Danish wind turbines**

The 365 wind turbines will produce around 15 per cent of Kenya's current installed electricity generating capacity at a very cost efficient price and will replace fuel imports of approximately DKK 900 million (EUR 120 million) annually.

The Danish company Vestas is supplying the wind turbines, which are based on the V52-850 kW model - a three-blade rotor having a diameter of 52 meters. This model is a very robust and efficient wind turbine suitable for installation in rough locations like Lake Turkana.

#### **KIF is a very important partner**

The Lake Turkana wind farm is in many aspects a high risk project and it has taken more than eight years to connect the dots between land right issues, finding the right supplier, entering a Power Purchase Agreement (PPA) with the Kenya authorities, preparing infrastructure upgrades and establishing the financial package of approximately DKK 4.5 billion (EUR 600 million).

The Danish Climate Investment Fund has been instrumental in the deal and the fund has from the beginning worked on engaging the equity partners and securing the loan financing, in cooperation with the local developers.

The Nordic Development Financing Institutions Norfund, Finnfund and the Danish Climate Investment Fund have provided a substantial part of the equity. Loan financing has been provided by a number of development and private banks.

#### **Construction in progress**

The construction of the wind farm is in progress and the first foundations for the wind turbines have been constructed. The same applies for the upgrade and construction of a 200 km access road and various routes to be used during construction, operation and maintenance.

A crucial part of the project's realisation is the construction of a 428 km double circuit 400 kV transmission line that will connect the wind farm with the national grid in Kenya.

#### **Excellent development effects**

The project will save the environment of approximately 13m tCO<sub>2</sub>-equivalent of greenhouse gas emissions during its lifetime. Furthermore, the increased electricity production will be highly beneficial to the Kenyan population.

*Lake Turkana Wind Power is situated in a rural area and a 428 km double circuit transmission line is needed to connect it to the Kenyan national grid.*

*(Photo and animation: Jesper Heldgaard)*





*“PKA has demonstrated the ability and expertise to work with a number of different proven financing models when investing in climate-related projects nationally and internationally. However, collaboration between investors, policy makers and companies are essential if investors are to maintain the current pace of investments in climate-related projects. We encourage all relevant stakeholders to engage and take part in the discussion on how we take climate investments from niche to mainstream.”*

*Peter Damgaard Jensen, CEO at PKA*



*The Gemini Offshore Wind Farm will be one of the largest in the world, producing electricity to 630,000 households in the Netherlands.*

# OFFSHORE WIND FARMS AS ATTRACTION FOR INVESTORS

## Danish pension funds have seen the financial potential in wind

*Investments in large scale renewable energy projects like offshore wind has proved not just a positive difference to the climate, but also a good return to Danish pensioners.*

By Peter Damgaard Jensen, CEO at PKA

Danish pension funds have been instrumental in investments in offshore wind. Alone PKA has invested in five offshore wind farms since 2011. Together they will provide renewable energy to two million households across Northern Europe.

The latest projects are Burbo Bank and Gemini.

### **Burbo in the UK**

The Burbo Bank Extension Offshore Windfarm is still under construction and will be located in the Bay of Liverpool in the United Kingdom, 7 kilometres from shore. It will have a capacity of 258MW split across 32 turbines. It is expected to provide CO<sub>2</sub>-free energy to some 230,000 UK households and to be fully operational during the first half of 2017.

The windfarm is being constructed and operated by DONG Energy and will be using the MHI Vestas 8MW turbine technology. The project will contractually be split between DONG Energy and MHI Vestas.

In February 2016, PKA finalised the investment in Burbo Bank Extension. PKA's investment into Burbo Bank Extension was done alongside KIRKBI A/S (the investment arm of The LEGO Group). Each party acquired a 25 per cent stake in the asset for

a consideration of approximately DKK 3.3 billion (EUR 440 million). The seller, DONG Energy, has retained a 50 per cent stake in the asset and will act as constructor, deliver operations and maintenance services and will be power offtaker, thus ensuring a high degree of alignment. The asset benefits from the UK Contract for Difference (CfD) subsidy regime under which, a fixed offtake price is set for the initial 15 years of the investment, resulting in predictable, stable cash flows for the asset.

### **Gemini in the Netherlands**

PKA financed the construction of the Dutch offshore wind project, Gemini, together with a financing consortium in May 2014. Consisting of 150 Siemens wind turbines with a capacity of 4.0 MW each (600 MW in total), Gemini will be one of the largest wind farms in the world in terms of size and production. The site is located in the Dutch part of the North Sea, 85 km off the north coast, where it benefits from a strong wind resource. Once completed in 2017, the wind farm will supply CO<sub>2</sub>-free electricity, corresponding to the annual consumption of some 630,000 Dutch households. The developer of the project is Typhoon Offshore, who has contracted Van Oord and Siemens Wind Power on two turnkey contracts for delivering the balance of plant and wind turbines for project. In the operational

phase, Siemens is acting as the operator and service provider for the first 15 years of operation. The current equity sponsors of Gemini are the Canadian based fund Northland Power Income (60%), Siemens Financial Services (20%), Van Oord (10%), and HVG (10%).

Along with a number of banks and financial investors, PKA joined a financing consortium, which has provided a total debt facility of approximately DKK 16,5 billion (EUR 2.2 billion) to the Gemini project, of which PKA has provided a junior debt facility of DKK 900 million (EUR 120 million). The facility has a tenor of approximately 17 years and will provide a high, secure coupon rate in this period due to the revenue stream coming from the government-backed subsidy system for the first 15 years. Aside from PKA, Northland Power Income Fund has provided a junior debt facility of DKK 600 million (EUR 80 million). A number of financial institutions have provided the senior debt facility, including the European Investment Bank, EKF, Euler Hermes, and Delcredere|Ducroire.

In 2016, all 150 wind turbines are expected to be installed and most of them will also be commissioned.

### **Additional Danish financing of the Gemini project**

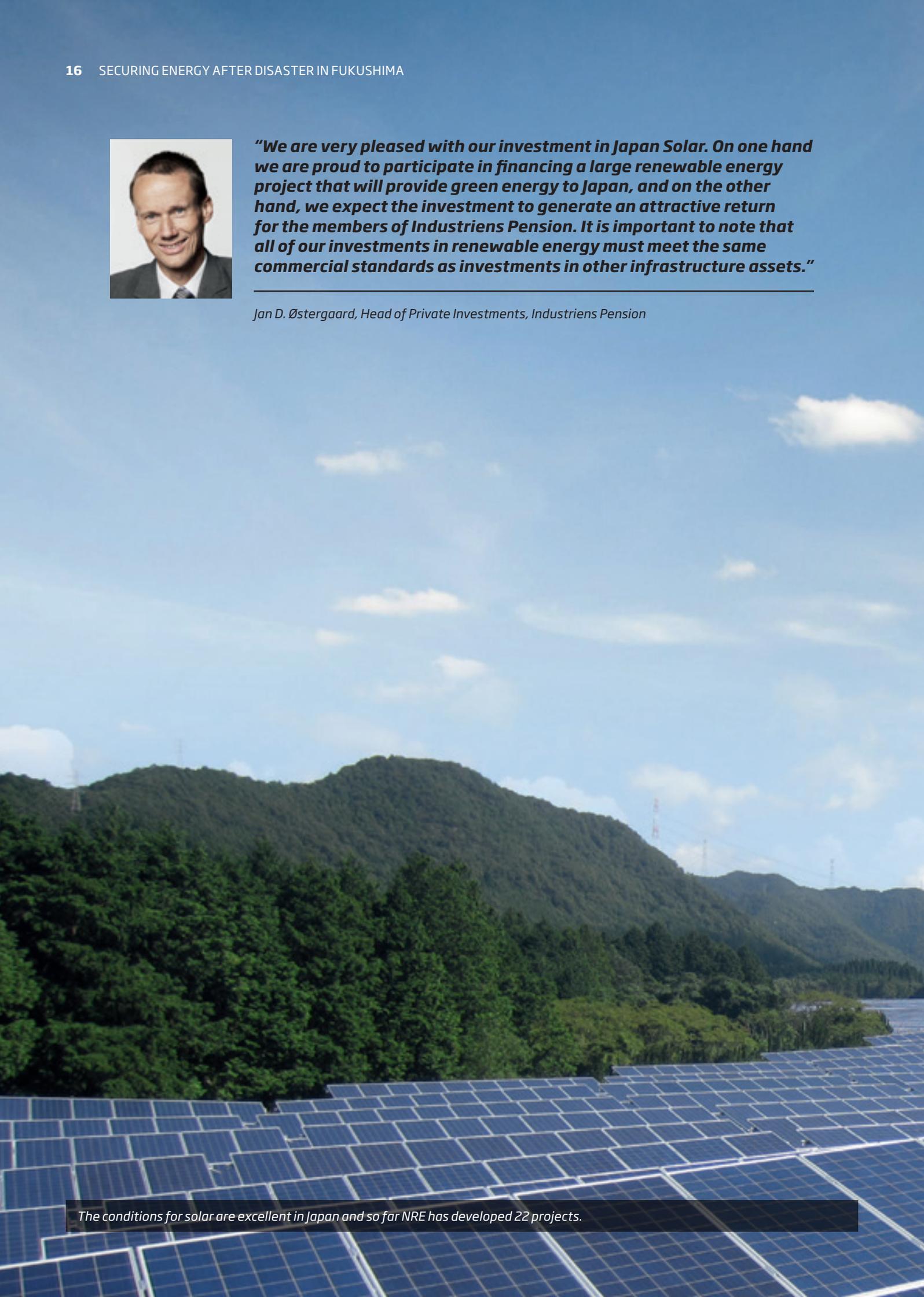
EKF Denmark's Export Credit Agency also participated in the financing of the Gemini project by providing a project financing guarantee of DKK 3 billion (EUR 400 million) or approximately 20 per cent of the total debt facility. EKF's guarantee relieves the funding providers of risk, thus enabling their participation. EKF's objective is to help Danish exporters by making it attractive for foreign buyers to place orders in Denmark. In the case of the Gemini project, the Danish economic interest is considerable as the wind turbines are delivered by Denmark-based Siemens Wind Power.



***“We are very pleased with our investment in Japan Solar. On one hand we are proud to participate in financing a large renewable energy project that will provide green energy to Japan, and on the other hand, we expect the investment to generate an attractive return for the members of Industriens Pension. It is important to note that all of our investments in renewable energy must meet the same commercial standards as investments in other infrastructure assets.”***

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*Jan D. Østergaard, Head of Private Investments, Industriens Pension*



*The conditions for solar are excellent in Japan and so far NRE has developed 22 projects.*

# SECURING ENERGY AFTER DISASTER IN FUKUSHIMA

## Solar as an alternative to nuclear power across Japan

***In Japan, the vulnerability of the energy supply was evident after the 2011 tsunami. To diversify the energy sources, investments in renewable energy are stimulated. Pension fund Industriens Pension has through commitment in the Equis Asia Fund I and through direct investment helped Japan Solar's many projects.***

*By Jan D. Østergaard, Head of Private Investments, Industriens Pension*

The March 2011 earthquake, tsunami and subsequent disaster at the Fukushima nuclear plant escalated Japan's need to diversify its energy production and led to the July 2012 establishment of a feed-in-tariff scheme for renewable energy. Japan needs sources of energy that are quick to deploy, whilst it expands its gas and coal fired capacity, making solar (and other sources of renewable energy) particularly attractive means to bolster its energy security. Another important consideration is that other than renewables, Japan has no major indigenous sources of energy, and hence needs to import fuel for its energy needs.

Equis, a team with deep experience across the Asian infrastructure space, established Japan Solar and the affiliated Nippon Renewable Energy (NRE) quickly after the new feed-in-tariff scheme was introduced to develop, construct and operate Japanese solar generation projects.

### **Solar as attractive investment**

Already in 2011 Industriens Pension had made a commitment of DKK 650 million

(EUR 87 million) to Equis Asia Fund I, an infrastructure fund that is managed by Equis. Between 2011 and 2014 the fund committed capital to eight infrastructure projects, of which six are renewable energy assets (wind, solar, hydro, biomass).

One of the investments, Japan Solar, was closed in late 2013 and has to date received a total equity commitment of DKK 4.7 billion (EUR 625 million) from Equis Asia Fund I and the funds' investors. In addition to the indirect investment via the fund, Industriens Pension decided to commit an additional DKK 325 million (EUR 45 million) to Japan Solar as a co-investment, thereby resulting in a total investment of DKK 390 million (EUR 52 million) from Industriens Pension to Japan Solar.

Today the team employs 45 professionals across four offices in Japan with experience in the development, construction and operations of solar projects, and has grown to be the largest and most successful independent developer and owner of solar projects in Japan.

### **22 projects so far**

NRE has self-developed 22 projects (448 MW) that have been approved by Japan Solar for funding, and there is an active pipeline of additional projects. Prior to operations, each solar project will enter into a 20-year power purchase agreement with the relevant prefecture's power utility to sell 100 per cent of power produced under a fixed feed-in-tariff ("FIT") price. To date, all projects have been delivered on budget and are on average outperforming the base case revenue forecasts by 5 per cent.

Japan Solar is an example of how Industriens Pension is financing attractive investments within the renewable energy sector in local markets all over the world through partnerships with a number of high quality infrastructure funds.





***“We are very pleased with the good cooperation with CIP and BWSC. With the joint venture, we have found a model that provides PensionDanmark an attractive return with limited risks. At the same time, we are helping to increase Danish energy technology exports. We therefore see strong potential in these types of partnerships.”***

*Torben Møger Pedersen, CEO, PensionDanmark*



*Straw from 40 farmers in Lincolnshire is the basic fuel for the Brigg Renewable Power Plant.*

# FARMERS SUPPLYING 70,000 ENGLISH HOUSEHOLDS WITH ENERGY

## Joint venture behind turnkey solution for biomass plant

*It took just 27 months to construct a new biomass plant. Up and running since early 2016, it is expected to be the first of several plants in North and Western Europe.*

*By Tage Otkjær, Communications Partner, PensionDanmark*

Since early February 2016 40 farmers in Lincolnshire, England have delivered straw to the biomass plant Brigg Renewable Energy Plant and thereby supplying electricity corresponding to the consumption of 70,000 households.

The biomass power plant consumes 250,000 tonnes of straw per year, which is secured from farmers in the local community. The plant has a capacity of 40 MW and an estimated annual CO<sub>2</sub> emission reduction of 300,000 tonnes.

### Joint venture

The DKK 1.6 billion (EUR 215 million) investment in Brigg is the result of a joint venture formed in 2013 by Burmeister & Wain Scandinavian Contractor (BWSC), Copenhagen Infrastructure Partners (CIP), and PensionDanmark. The joint venture intends to build, own and operate biomass power plants primarily in Northern and Western Europe and North America. Brigg is the first of these power plants up and running since February 2016.

Brigg is owned by the CIP fund, Copenhagen Infrastructure I, which has PensionDanmark as the founding and sole investor, together with BWSC. It is the first of three decided investments in biomass power plants. CIP is involved in the ongoing operation of the plant as asset manager ensuring the plants high performance regarding straw-supply and hedging strategy. Hence, Brigg is a typical alternative investment and as such an example of a direct infrastructure investment in a partnership between an industrial partner and an institutional investor.

### Construction period 27 months

Brigg is based on Danish biomass energy technology supplied by BWSC under a turnkey engineering, procurement, and construction contract. Construction of the plant was contracted in August 2013, completed and handed over to the owners on 21 January, 2016 after a construction period of less than 27 months, more than three months ahead of schedule and within the agreed budget.

The core of the plant is a boiler primarily used for burning straw from the Danish high-tech company Burmeister & Wain Energy. The steam created by the burning straw is conducted to a turbine generator, producing electricity for households and businesses in the vicinity.

BWSC is responsible for operation and maintenance of the plant under a 15-year operation and maintenance agreement, which commenced on the date of completion of the plant in January 2016. BWSC is a global leader with more than 30 years' experience in developing, building and operating power plants.

### Infrastructure projects

PensionDanmark is collaborating with CIP to increase investments in infrastructure. CIP is focused on investments in energy related infrastructure, and PensionDanmark has made a total investment commitment of DKK 14 billion (EUR 2 billion) to CIP's funds Copenhagen Infrastructure I and II.



***“Danish companies are particularly skilled in the fields of renewable energy, environment, resource management and water. At EKF we offer export credit financing for their international customers.”***

*Anette Eberhard, CEO of EKF Denmark's Export Credit Agency*

*It is still difficult to imagine that an unusual fish will find its home in the Swiss Alps. But soon lively salmon will swim in this fish farm, a project helped underway by Danish export credit financing.*

# SALMON FARMING IN THE ALPS WITH DANISH TECHNOLOGY AND FINANCING

## Danish export credit financing for Swiss buyer of aquaculture system

*The Swiss consumers are willing to pay for locally farmed sustainable fish, and in 2017 the first fish will be harvested. 600 tons will be produced per year at the site in Lostalio.*

*By Søren Weber Stendal, Senior Communications Consultant, EKF Denmark's Export Credit Agency*

A few years ago, Julian Connor, now CEO of Swiss Alpine Fish, saw an untapped potential for the production of Atlantic salmon high up in the Swiss mountains. Switzerland is a rich country with very high environmental standards, and the Swiss consumer is willing to pay a high price for locally farmed sustainable fish. Mr Connor teamed up with investors for the project and made offtake deals with supermarket chains. The first fish will be harvested beginning of 2017 from the site in Lostalio in southern Switzerland. Swiss Alpine Fish is the first company in Switzerland to farm sustainable salmon, and they will produce 600 tons of salmon per year.

### **New RAS-design from Denmark**

Mr Connor chose a new RAS-design with only one tank from Krüger A/S as part of a turnkey solution with another Danish company Gråkjær. Recirculation aquaculture system (RAS) is a known technology that solves most of the environmental

problems normally associated with fish farming. However, RAS-facilities are expensive to build and run and are mostly used for farming smolt (juvenile fish), which are subsequently moved to other types of facilities to grow bigger.

A new very compact design from Krüger A/S called RAS2020, with only one big tank structure divided into compartments, allows for a RAS-solution with lower construction and running costs and even better environmental performance. More than 95 per cent of the water is filtered and recirculated and hardly any emissions reach the local water environment. Furthermore, the design makes RAS economically viable for full-life production of fish such as salmon.

### **Export credit financing has been key**

A strong investor group is backing the project providing more than 50 per cent of the total project costs of DKK 110 million

(EUR 15 million). However, raising the loan capital was a challenge for the project as banks are usually reluctant to take risks on start-ups.

Fortunately, the Danish exporters also introduced a financial solution. The mission of EKF Denmark's Export Credit Agency is to help Danish exporters and foreign companies borrow money for their mutual business transactions. EKF takes risk on foreign start-up projects when these involve purchases from Danish companies in the form of project financing guarantees. In this particular case, EKF guarantees more than half of a loan from Credit Suisse worth DKK 50 million (EUR 7 million) which made the project possible.



*The architect's visualisation of Swiss Alpine Fish. 600 tons of salmon will be produced every year.*



***“We are very proud that this extraordinary property has received such a unique distinction. As a responsible investor, we emphasise sustainability in the properties, we invest in. Not only as a consideration to the climate, but primarily because sustainability enhances the attractiveness of the properties. In the end, this contributes to delivering good and stable returns for our members.”***

*Torben Möger Pedersen, CEO, PensionDanmark*

*The company house is based on a multi-user concept. This and a number of sustainable, environmental, economic and social parameters secure the financial sustainability of the office building.*

# A MILESTONE FOR SUSTAINABLE BUILDINGS

**New sustainability standards secure long term returns of investment**

*Due to features such as the use of recycled materials with minimal exposure to degassing, space-optimisation, and total life cycle cost, Gladsaxe Company House has as the first building in Denmark achieved the highest rating, Platinum, in the certification system of Green Building Council Denmark.*

*By Tage Otkjær, Communications Consultant, PensionDanmark*

One of the most interesting newly constructed office buildings in Denmark is located in Gladsaxe – a suburb in the northwestern outskirts of Copenhagen. Gladsaxe Company House is an office achieving top levels of environmental, social and economic sustainability.

The 15,000 square meter estate Gladsaxe Company House has as the first building in Denmark been awarded Platinum in the DGNB, the certification system of Green Building Council Denmark. DGNB is one of the world's most renowned standards in terms of the sustainability of buildings, and Platinum is the highest distinction.

## **Certification of business property**

The property has been developed and tenanted by Danish construction company, NCC, and is owned by PensionDanmark, which in the recent years has invested in

eight newly-constructed business properties that either are or will be certified, when they are completed.

The certification is based on an array of parameters. In terms of environmental sustainability, 90 per cent of the wood used for construction is Forest Stewardship Council-certified and 10 per cent is recycled wood. Furthermore, all rain water is harvested for local seepage in fascines and rain water beds. Solar cells installed on the roof delivers 50 per cent of the building's annual energy usage – which is advantageous for the environment and for the property's operating economics.

## **New aspects of sustainability**

Safety has been a specific consideration under construction with no serious accidents, as well as in the completed building. Materials with the risk of flammable drops

or toxic gas emission have been avoided. Generally, the criteria for all construction materials have been minimal exposure to degassing from paint, glue, joint filler and the like.

DGNB is integral for quality assurance of the property in a number of areas: Technology, process and location are added to the three classic aspects of sustainability: Environment, economy and the social aspect, to cover all the relevant areas of sustainable buildings. The sustainability is emphasised as much as concerns for environmental, socio-cultural and technological aspects. By taking the building's total life cycle cost into account, operation costs can be optimised early on in the process, and at the same time a low area requirement per worker and the company house's multiuser concept secures financial sustainability.





***“The cooperation between the Danish Climate Investment Fund and European Energy is a perfect match, thanks to the good synergies we can create from our complementary fields of expertise.”***

*Torben Huss, Executive Vice President,  
The Danish Investment Fund for Developing Countries*



*Maldives produce drinking water from seawater. But it is an extremely energy demanding process. By installing solar power to replace diesel engines, the process can be sustainable. Danish technology and financing has helped getting the project started.*

# SOLAR ROOFTOPS TO POWER SUSTAINABLE WATER PRODUCTIONS

## Desalination plant in Maldives replaces diesel

*The Danish Climate Investment Fund and project developer European Energy team up with Male Water and Sewerage Company to implement sustainable water production.*

*By Rune Nørgaard, Communication Director,  
Danish Investment Fund for Developing Countries (IFU)*

The Maldives has plenty of water around, but it cannot be used for drinking purposes. To secure a sufficient supply of drinking water for the population seawater must be desalinated.

Male Water and Sewerage Company provides the drinking water to the greater Male region with a population of around 150,000 people. But producing clean drinking water from seawater is very energy intensive, and the power used by Male Water and Sewerage Company is based on a number of diesel plants, which are very costly and have harming climate effects.

Ironically, the production of drinking water to sustain life thereby contributes to rising sea levels threatening the existence of the entire island state.

To solve this dilemma, Maldives has every interest in lowering the share of diesel-based energy by using more sustainable alternatives. Located in the Indian Ocean, one of the obvious choices is the use of solar power and this is also the choice,

which Male Water and Sewerage Company has made. In the beginning of April 2016 the first PV solar plant was inaugurated.

### **Developed by a Danish joint venture**

30 years ago Male Water and Sewerage Company was established in cooperation with the government of Maldives, the Danish company HOH Water Technology and IFU. Today, the Danish Climate Investment Fund managed by IFU has resumed working together with the Maldivian company to install PV solar plants on the roofs of buildings owned by Male water and Sewerage Company.

The PV solar plant project is developed by Nordic Power Partners, which is a new joint venture between the Danish Climate Investment Fund and the Danish company, European Energy.

Nordic Power Partners is established to create synergies by combining European Energy's vast experience in developing and setting up wind and solar projects in Europe with IFU's profound knowledge in assisting

and co-financing business projects in developing countries and emerging markets.

### **Assisting local developers**

In working with climate related projects one of the big challenges in developing countries is often the lack of good project developers able to transform a solid business idea to a bankable project. In that sense, Nordic Power Partners can be seen as the missing link providing the necessary capacity, knowledge and risk capital in the initial phase.

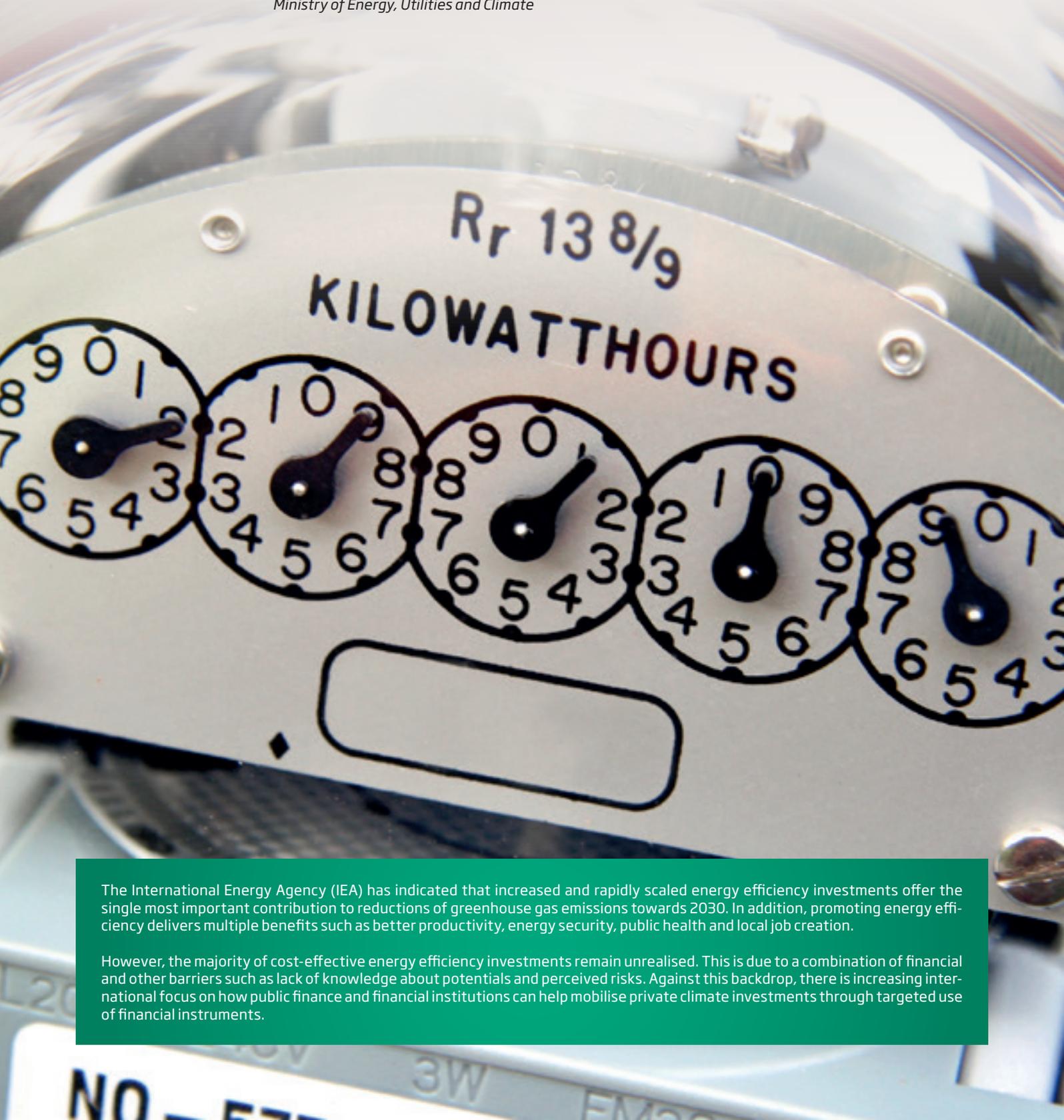
The business rationale is that Nordic Power Partners will locate and develop wind and solar projects in developing countries and emerging markets. This includes identifying potential projects, designing the technical layouts, negotiating with local authorities, securing access to existing transmission networks and making power purchase agreements with off-takers etc. When the development of a project is completed, subsequent financing is either provided by the partners or it is sold to external investors.





***“The Energy Savings Insurance program is a prime example of how the Danish Government deploys climate finance in a way that mobilises private sector investments. Private sector investments are key to realising the global low-carbon transition, and we aim to stay at the forefront of developing and deploying innovative instruments that can catalyse these investments, in particular when combined with enabling policies and regulation frameworks.”***

*Rasmus Abildgaard Kristensen, Head of International Department,  
Ministry of Energy, Utilities and Climate*



The International Energy Agency (IEA) has indicated that increased and rapidly scaled energy efficiency investments offer the single most important contribution to reductions of greenhouse gas emissions towards 2030. In addition, promoting energy efficiency delivers multiple benefits such as better productivity, energy security, public health and local job creation.

However, the majority of cost-effective energy efficiency investments remain unrealised. This is due to a combination of financial and other barriers such as lack of knowledge about potentials and perceived risks. Against this backdrop, there is increasing international focus on how public finance and financial institutions can help mobilise private climate investments through targeted use of financial instruments.

# ENERGY SAVINGS INSURANCE TO MOBILISE PRIVATE INVESTMENT

## A new risk management package is being tested in the Mexican food sector

**The Danish Energy Agency and the Inter-American Development Bank have partnered to scale up an innovative risk management package that will catalyse increasing levels of investments in energy efficiency by small and medium-sized enterprises.**

*By Asger Garnak, Chief Advisor, Climate and Energy Finance Centre for Global Cooperation, Danish Energy Agency*

Energy efficiency upgrades can make small and medium-sized businesses (SMEs) in developing countries more competitive and more productive, saving them money while reducing their emissions of harmful greenhouse gases.

However, the market for such upgrades is typically limited to those with very short payback periods, such as lighting. This is particularly true for some developing countries. SMEs and local banks often lack awareness and technical capacity to assess energy efficiency investments, and confidence that they will pay back.

Energy Savings Insurance aims to address these investment barriers by paying out if energy savings are not sufficient to pay back the project investment. The insurance instrument is the core element of an innovative “package” of interventions that together help build energy efficiency markets. It does so by addressing technical and financial risks and building confidence among SMEs, technology providers and local banks.

### Pilot project in Mexican agro-industry

With support from Denmark and the Clean Technology Fund, an ESI pilot program is now being implemented with the Mexican Agricultural Development Bank (FIRA). The pilot ESI program focuses on standardized energy efficiency solutions in the Mexican food-processing industry. The target is to stimulate DKK 160 million (EUR 22 million) of investment in 190 energy efficiency projects in the agro-industry sector through 2020.

The Danish climate envelope is further supporting a regional program to scale up and replicate ESI in the Latin America region. In parallel, consultations are ongoing with international financial institutions interested in introducing the instrument in Africa and Asia.

### ESI as driver for global investment

The ESI model has generated substantial international interest. It has been reviewed and endorsed by the Global Innovation Lab for Climate Finance as a promising instrument to mobilise private climate-friendly

investment. The Lab has estimated that if replicated on a global scale, the ESI could drive USD 10-100 billion (DKK 65-650 billion; EUR 9-90 billion) in investment and provide annual emissions reductions of 27-234 MtCO<sub>2</sub> by 2030.

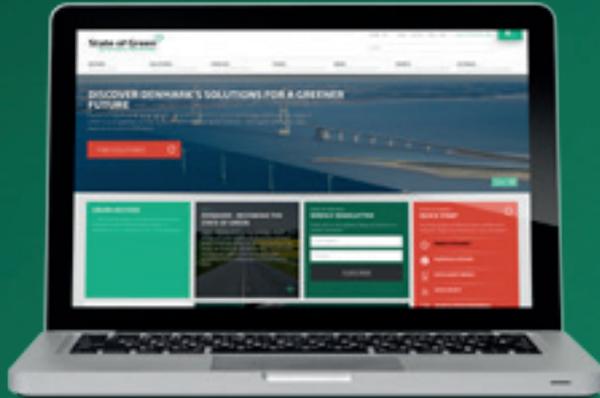
The main components of the ESI package include:

- An insurance that technology solutions providers purchase to back their contractual guarantees to SME clients relating to the performance of their energy efficiency products.
- Standardised contracts that transfer part of the risk of underperformance to the technology solution provider.
- Third party verification that ensures the quality of energy service providers and their projects.
- Access to finance on appropriate terms from local banks, made possible through credit lines and/or guarantees by national development banks.



### The ESI approach

The Energy Savings Insurance approach includes a package of measures that address financial and technical risks confronting companies considering an investment in energy efficient equipment.



Learn more about Danish solutions, find more cases from around the world and connect with Danish expertise at:

[www.stateofgreen.com](http://www.stateofgreen.com)

State of Green is a non-profit, public-private partnership founded by:



Confederation of Danish Industry



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