IF'S RISK
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CONSTRUCTION
ISSUE

Risk Consulting

Enabling renewable energy projects

Content

Project insurance in a nutshell

In this issue of Risk Consulting Magazine, we take a deep dive into construction and erection all risk insurance, also known as CAR/EAR insurance, to understand how clients can protect their projects and investments from unexpected delays and surprises.

First, let's look at the definition of a project. Generally, a project is defined as a time-limited, independent entity which normally includes resources and machinery, buildings and infrastructure. Project parties may include a client, a supplier with subcontractors, as well as designers, supervisors and investors.

All projects will aim to be completed in accordance to planning, achieving the desired results within a specific time period and within budget. Projects can be defined further, in accordance with their nature, for example, a replacement investment, a capacity increase investment or a totally new investment.

HOW CAN YOU PROTECT YOUR PROJECT AGAINST POTENTIAL LOSSES?

As with most ventures, there is always a possibility that something can go wrong. A rare or unexpected event can cause damage and potentially create delays in a project. In the worst case, such events can lead to a standstill on-site.

The exposure to unexpected risks and their impact on your business or service are normally assignable to an insurer by way of purchasing Project Insurance. This can be done through construction and erection insurance, appropriate for projects. Some examples of this includes Advance Loss of Profits (ALOP) or Delay in Startup (DSU) coverage.

ALOP/DSU insurance provides financial stability against financial losses incurred as a result of a delay in project completion arising out of a valid claim under your CAR/EAR policy.

Read the articles in this special issue to learn more about how If P&C Insurance helps clients mitigate risks and protect their investment.

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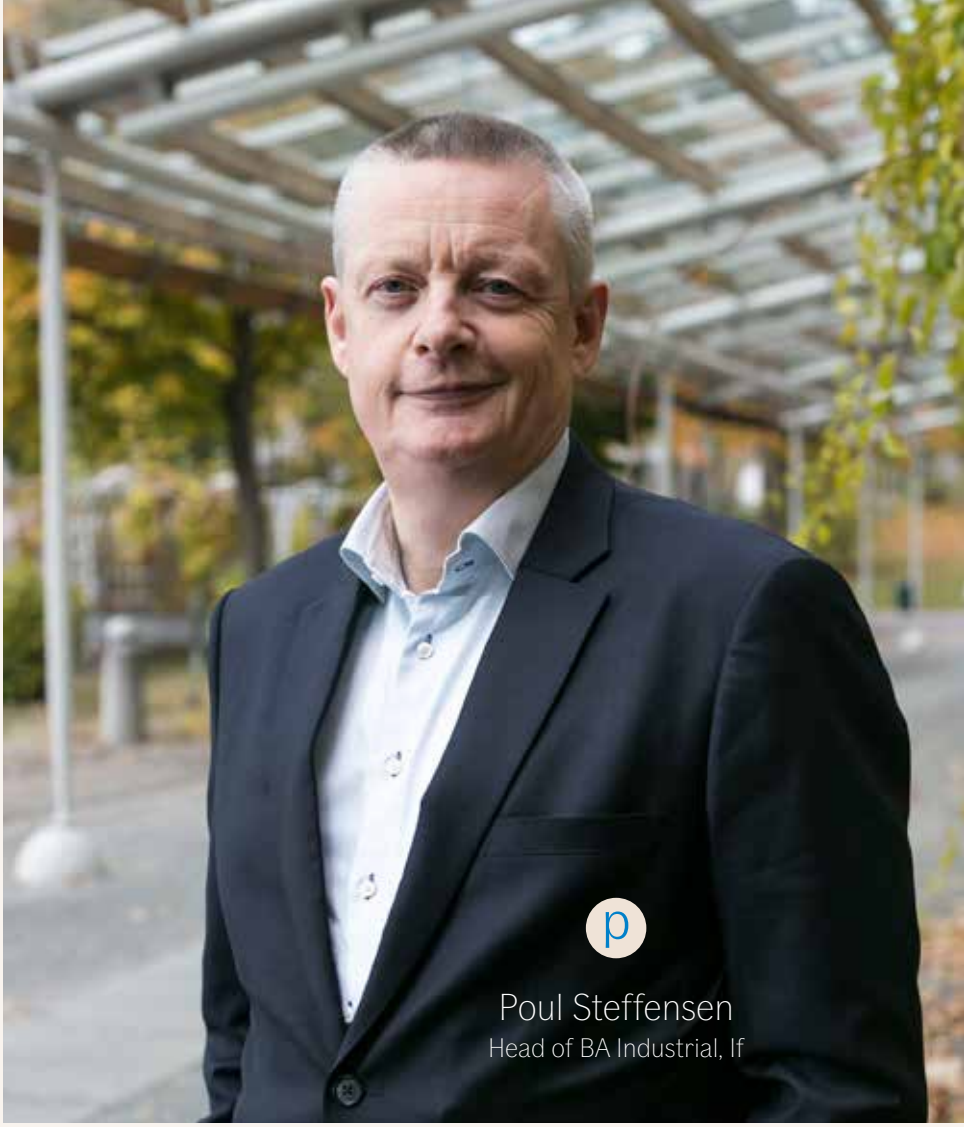
Editorial letter

Construction - an industry in transition



When we look at the trends impacting the Construction industry over the past years, we see new eco-friendly building materials, the rise of prefabrication, as well as increased digitalisation. Meanwhile the industry is vulnerable to market fluctuations and challenged by a lack of skilled workers, as well as the availability of raw materials.

Digitalisation is bringing in new ways to measure performance, as well as helping to automate tasks to help ensure the safety of a project. In this issue of Risk Consulting, we highlight how digital solutions are adding value, by way of robotics, digital modelling and virtual reality. Read the Skanska article to learn more.

Clients are making use of digital solutions and data to better understand their risks, manage quality and deliver their projects on time. This also applies to reporting, where more data is gathered to measure performance on the work being completed.

A RELIABLE PARTNER

At If P&C Insurance, we do our best to provide the coverages that offer our clients the best possible protection. Whether big or small, construction projects often face multiple risks. Often, bringing your insurance partner along early on will ensure that you get the best coverage for your construction project.

Clients benefit from our expertise in the project as well. If's Risk Engineers work together with clients to ensure that projects are mitigating risks, progressing in accordance with initial planning and taking all the relevant details into account. From working safety to utilising the best possible building materials, having our risk management team involved early on will provide additional protection for your investment.

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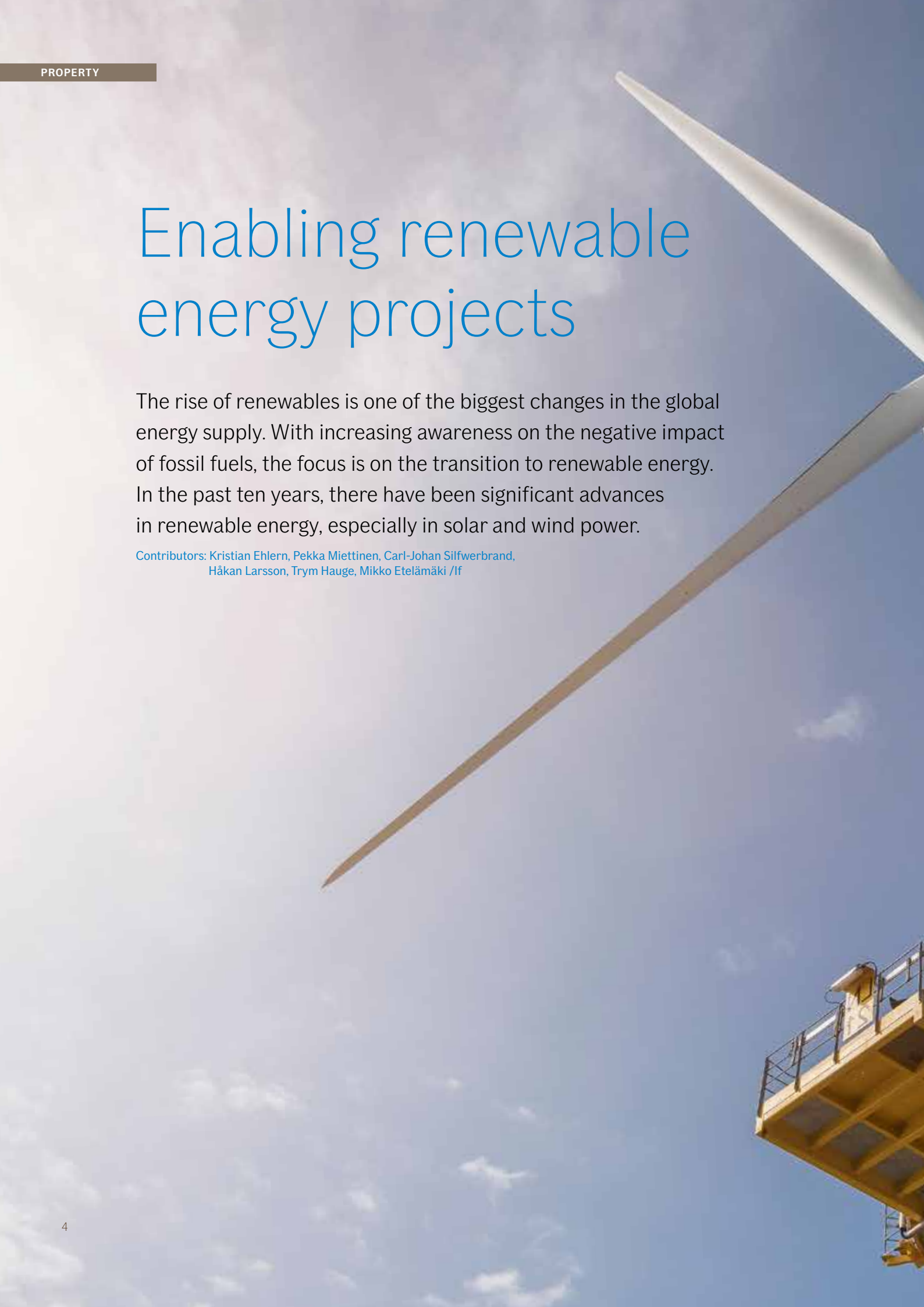
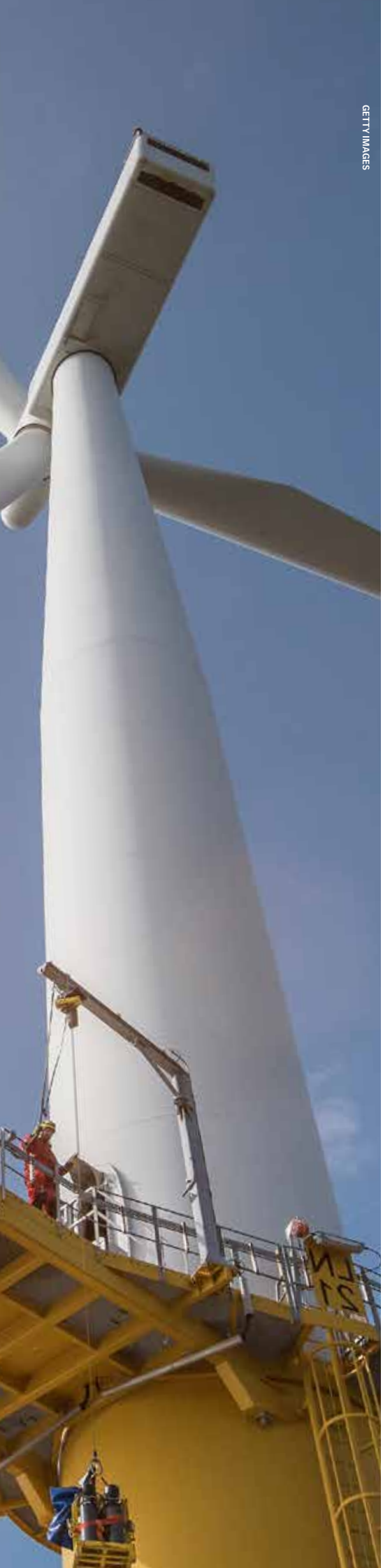
Enabling renewable energy projects

The rise of renewables is one of the biggest changes in the global energy supply. With increasing awareness on the negative impact of fossil fuels, the focus is on the transition to renewable energy. In the past ten years, there have been significant advances in renewable energy, especially in solar and wind power.

Contributors: Kristian Ehlern, Pekka Miettinen, Carl-Johan Silfwerbrand, Håkan Larsson, Trym Hauge, Mikko Etelämäki /If

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In Europe, and more specifically in the Nordic countries, companies and governments have made strong commitments to invest in renewable power and the infrastructure required to support this. Today, as the cost of producing wind and solar energy is decreasing, the investment case is increasingly attractive.

The stormy weather over the oceans has become an asset and offshore windfarms can be found all around the world capturing the energy of the wind and converting it to electric energy with a turbine. Subsea cables then transport this power to the onshore grid to serve millions of consumers with renewable energy.

Constructing these offshore windfarms out at sea requires special know-how in offshore risk management. Currently, there are many complex renewable energy projects under construction, completed or in the planning phase in Northern Europe and in the Nordics. To realise these projects, there are multiple efforts that are underway to ramp-up renewables. For example, many countries will need to re-design the electric grid and the production of subsea cables is in top gear as they are in high demand, providing an integral part to renewable energy production by way of interconnecting nations with new offshore wind turbine parks.

As an example, National Grid and Energinet.dk are working together to build the Viking Link, a 1,400 MW HVDC submarine power cable that will connect Bicker Fen in Lincolnshire in the United Kingdom with Revsing in southern Jutland, Denmark.

DEMAND FOR INFRASTRUCTURE GROWING

The Nordic region has a long history in renewable energy and has a unique, long-standing co-operation in the energy field.

Of the Nordic countries, Denmark is leading the way on electricity generated by wind, with 40% of its total electricity created by wind power. Currently, the largest operational wind farm in the world is the 659MW Walney Offshore Wind Farm located in the Irish Sea. In fact, this project is currently being extended.

Two of the world's largest wind energy projects are the Hornsea 1 and 2 projects. Hornsea 1 is currently under construction and will be the first gigawatt-scale offshore wind farm, which will (upon completion) deliver 1.22 GW using 174 wind turbines off the coast of Yorkshire. Putting this into perspective, Hornsea 1 will produce the same amount of power as a nuclear power plant. As for Hornsea 2, this project is expected to be completed in 2022, producing 1.39 GW of power and will be the world's largest offshore wind project when operational.

Renewable energy will continue to grow. From turbines to electric interconnectors, the future energy mix demands that the required infrastructure is developed and

Overview of grid-connected offshore wind power projects at the end of 2018

Country	No. of wind farms connected	Cumulative capacity (MW)	No. of turbines connected
United Kingdom	39	8,183	1,975
Germany	25	6,380	1,305
Denmark	14	1,329	514
Belgium	7	1,186	274
Netherlands	6	1,118	365
Sweden	4	192	79
Finland	3	71	19
Ireland	1	25	7
Spain	2	10	2
France	2	2	2
Norway	1	2	1
Total	**105**	**18,499**	**4,543**

Source: Wind Europe

installed to ensure the most efficient distribution of renewable energy.

To install and transport, as well as ensure efficient use of offshore wind energy, new infrastructure is needed. The scale and amount of investment is enormous as energy companies are moving away from fossil fuels and investing billions in new infrastructure in renewables, estimated to be as much as fifteen billion euros by 2025.

According to Siemens Gamesa, offshore wind farms provide up to 40% higher output than onshore wind farms.

> *Offshore wind farms provide*
> ***40% higher***
> *output than onshore wind farms"*

OFFSHORE PROJECTS CARRY RISKS

As the cost of wind power production is decreasing rapidly, the competition is also increasing. While state-sponsored funding is declining, the industry is growing. Simultaneously, the technologies involved are pushing ahead as well. Turbines are getting bigger, and overall wind energy is becoming a powerful force in the energy mix. As more and more projects head out to sea, it is important to consider the risks involved.

The construction and erection phases of offshore wind projects face multiple risks. When undertaking a complex project in a harsh environment, the exposure to unexpected risks is high and if something goes wrong the possible impacts are both severe and expensive. From worker safety, to the reliable supply and transportation of materials, to the installation of cables on the sea bed, as well as the maintenance and care of these installations carry many risks.

Generally, working with wind turbines already carries certain risks, including working in a confined space and at great heights, both onshore and offshore. However, offshore projects face increased hazards from powerful winds and stormy weather, posing a threat to both personnel and equipment. Even a small task in an offshore environment carries higher risks in comparison to onshore execution of the same task.

For personnel, risks include exposure to noise, appropriate safety equipment including ear protection is critical to reduce the risk of hearing loss. Slips, trips and falls are a serious risk when conducting operations at sea, slippery surfaces and working at height are just some of the immediate points of consideration for staff working in an offshore setting.

Another risk lies in transportation to and from the work site. Whether travelling to the location by ship or helicopter, employees must be trained and wear the appropriate gear when facing the hazardous conditions during their journey to work and when returning to shore.

Perhaps the most significant risk is access to medical treatment when things go wrong. All personnel must be trained to support first aid as the nearest hospital services are onshore and will take considerable amounts of time to reach if there is an emergency.

There are also significant risks when it comes to the equipment itself. As **Mikko Etelämäki**, Complex & International Claims at If P&C Insurance notes, "When installing a windfarm, the risk of losing a single wind turbine is not a major concern. The real risk lies in losing power altogether when there is a fault in the subsea cabling which has been laid on the sea floor. One bad subsea cable can knock out the entire farm from production."

"Wind energy is a global trend, which continues to grow," says **Pekka Miettinen**, Chief Underwriter, CAR/EAR, Property at If P&C Insurance.

"Today, wind and solar have reached the point where they just make good business sense. These projects are profitable and less dependent on government support. In the end, we are talking about providing a cleaner, greener energy future for Europe and the world, at an affordable price to the consumer. Offshore projects pose significant challenges and many of these risks can be assigned to an insurer. Having Project Insurance will add an extra level of protection to the investor's project and any ensuing financial losses resulting from possible damages."

GETTY IMAGES

Government subsidies are going down as the wind energy business is becoming increasingly profitable, accelerating the shift from traditional oil companies to renewables.

Sources: Wind Europe and OECD

Are you prepared for the worst-case scenario?
Do you know what the worst-case scenario is?

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When the work stops

Although many CAR/EAR projects are delivered smoothly, construction projects can face delays and unforeseen challenges that impact construction or erection works.

Contributors: Kyösti Korventausta, Pekka Miettinen, Jan Roald Olsen /If

Standstills and the temporary suspension of work on any project can lead to serious losses. Whether these are caused by financial reasons or natural hazards, project delays can stem from disputes between project stakeholders to changes in the political environment. Projects can grind to a halt in the wake of economic challenges or financial reasons, or a result of delays in the delivery of materials and equipment. Potentially, a project will be temporarily suspended, or in the worst case abandoned altogether, depending on the severity of the cause for interruption.

In some cases, the aforementioned can fulfil the conditions of a 'material change in risk' which will trigger the insurance policy protecting the project. Although these terms and conditions can be modified, insurers and reinsurers must work closely with clients to overcome such challenges.

Often, the role of the insurance company has more to do with the identification and management of risks than with negotiating policy agreements alone. Clients benefit from the expertise of Risk Engineers who have expert knowledge across projects of various scale and size, over a wide range of industries.

Top tips from your insurance partner

TRANSPARENCY WILL SAVE COSTS

By working together with your insurer on the risks relating to your project, you may uncover new information relating to risks. Getting your insurer involved early will help ensure that your project has been thoroughly reviewed for potential risks, you will also benefit from recommendations and information the insurer can provide from design to construction to erection.

"To make sure clients are provided access to all the insurance services that are relevant to their project, it is important to make sure insurers are involved in the project, preferably already in the planning stages," says **Kyösti Korventausta**.

"Beyond Property Insurance, it is important to have discussions about how materials and equipment will reach the construction site, for example. By getting involved early, insurers will have knowledge of the entire history of the project, something that may be difficult to collect in the later stages of the project." Kyösti adds that, "Insurers can add value to your project, providing input on risk management, which contributes to project completion and can help save on costs."

KEEP THE LINES OF COMMUNICATION OPEN

Understand the financial and economic risks that may impact your venture. To truly stay on top of things there must be open and honest dialog between partners, authorities, and other stakeholders. This includes the lines of communication between you and your insurer. It is important to keep the team up-to-date on developments happening on-site.

DISASTER PLANNING AND CRISIS PREPAREDNESS GO A LONG WAY

Having plans in place for various crisis scenarios with clear responsibilities and roles is vital. How will your project manage earthquake, fire or other natural hazard events if the site is impacted? What if your key supplier is unable to deliver materials? Are you and your partners prepared for potential cyber-attacks? How will you resume construction or erection if there is an unexpected interruption in the project revenue?

HAVING A PLAN IS JUST THE BEGINNING

Preparedness also includes actions such as investing in backup generators, having a list of alternative suppliers, access to emergency response equipment and training workers on site through practice fire drills for example, to ensure they know what to do and where to go in the event of a natural disaster.

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Protecting your project from start-up delays

When does a project need Delay in Start-Up (DSU) cover? Are you prepared for unexpected delays in your project? Learn how you can protect your project and ensure that DSU risks are properly managed throughout the project.

Article by Pekka Miettinen /If

Projects come in all sizes, and they carry various types of risks. For successful completion, principals need to carefully select their contractors and suppliers, but also buy the right insurance cover to mitigate losses. To help ensure that profit targets are met, clients can mitigate risks by purchasing insurance that protects them against physical losses during a project. This insurance is called Delay in Start-Up (DSU).

WHY TAKE OUT A DSU POLICY?

DSU insurance can be purchased by a company that has a financial interest in the loss of profit in case the project confronts a physical indemnifiable loss during the project due to a delay in completion. Contractual penalties or liquidated damages are not covered by DSU insurance.

The objective of DSU insurance is to indemnify the principal for the actual loss sustained due to a delay in the completion of the insured works. One condition of the indemnification is that all project works are also insured, and that the direct physical loss is covered according to the insurance conditions of the works cover.

The indemnity follows the normal loss of profit calculation principle, where the basis of the sum insured, and the maximum indemnity, is equal to the gross profit. The insurance period of DSU coincides with the project works and testing period, terminating with the commencement of the operational phase.

It is worth noting that DSU insurance does not include the maintenance or defect liability period, as the operational phase already has normal business interruption or loss of profit insurance cover which applies to losses during normal operation. The principal can extend the DSU coverage to include losses during the transportation of supplies to the construction and erection site.

The indemnity period commences on the day the handing over would have taken place, had the loss not occurred and it ends on the day commercial operations begin; or at the latest at the end of the maximum period of indemnity agreed with the principal and insurer beforehand.

In cases where physical loss has delayed the commercial start day, the principal still has a deductible period as their own retention per loss. The Deductible Period is agreed in the negotiations between the principal and the insurer.

The normal calculation of the sum insured adds the fixed costs to the net profit, meaning gross profit. Another way of calculating the sum insured, which gives the same result, is to deduct variable costs from turnover. The sum insured also has to reflect the gross profit value of the indemnity period. In some cases, the sum insured as well as the fixed daily value can be calculated, when the start of operations has the nature to produce steady and constant output, without seasonal variations.

DSU indemnity and loss settlement are based on the principal's actual loss sustained, not on the sum insured. However, the loss settlement should be based on the same kind of calculations as those on which the sum insured has been specified.

PROGRESS REPORTS AND RISK MANAGEMENT

Active risk management measures are required from the principal who is insured, which must focus on the project work phases to prevent possible losses. Insurers can also demand that the principal provides information on a regular basis, regarding actual work progress including different phases of the project, updating the scheduled date of hand-over and information on material damages that may contribute to a delay.

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DSU cover can be extended to include losses during the transportation of supplies to the construction site.

Site visits can be performed to inspect the level of risk management at the site and progress of the project. Insurers oftentimes involve external experts or consultants to follow up on what is happening on the insured site and the progress of the project.

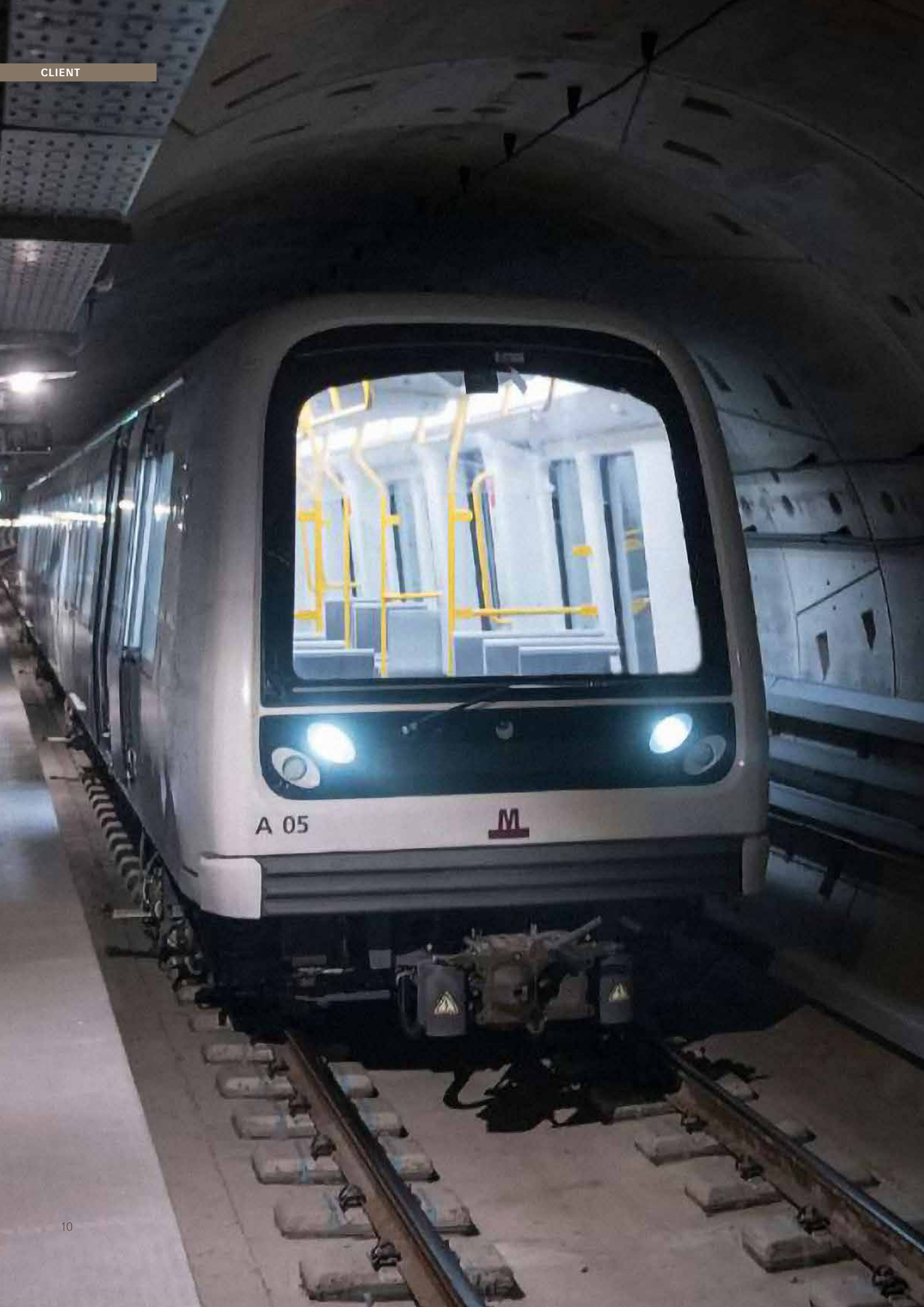
PROTECTING YOUR PROJECT

Although DSU is known by many names, such as Delayed Start-Up, Delayed Earnings, Delayed Opening of Business and Advanced Loss of Profits, they all mean more or less the same thing. The differences between them are limited to the definition of the terms 'Profit' or 'Earnings' and the definition of the principal's self-retention.

When it comes to any project, partnering with reliable contractors and suppliers is important. Similarly, principals need to be prepared for potential issues and delays. Having the appropriate cover helps mitigate losses when the project takes an unexpected turn. In the end, it is important for client's to be aware of DSU cover and make sure their works site is protected and potential risks are managed in the best way possible.

MANAGING RISKS TOGETHER

Did you know that If P&C offers it's clients Risk Management services?
As an example, when loading critical land or sea freight, If's Cargo RM specialist can help you manage the risks involved with barge, off-shore or project shipments, as well as extraordinary shipments such as towing large pre-fabricated building parts.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Delivering the ‘Cityringen’ project

The ‘Cityringen’ project in Copenhagen was completed with the opening of the new M3 Cityringen line in September of 2019.

Article by Kristian Orispää
Contributors: Fredrik Holmqvist/If & Metroselskabet

The Metro is an important part of the urban mass transport system in Copenhagen. At an estimated cost of approximately 25 billion kroner (3,3 billion euros), connecting 17 new stations with 15 km running underground, the Cityringen connects Vesterbro, Frederiksberg, Nørrebro, Østerbro with the inner city. As the biggest infrastructure project in Copenhagen since the 17th century, this massive construction project is helping Copenhagen reach its target of being the world’s first carbon-neutral capital by 2025.

CONNECTING COPENHAGEN

Cityringen is an underground railway connecting the centre of Copenhagen to the surrounding inner-city areas. The project will continue with further exten sions to the urban quarters Nordhavn and Sydhavn, totalling 24 new metro stations by 2024.

The Metro Company (Metroselskabet) will run two new lines on Cityringen – one circle route (M3) running around the entire track and one pendulum line (M4), which will run between Sydhavn and Nordhavn via the city centre. This new line provides extra services for the additional passengers on the busiest part of the route.

As with the existing Copenhagen Metro, the M3 Cityringen includes driverless train units and operates within gaps of less than two minutes during peak hours.

Plans for the Cityringen construction were ap proved by the Danish Parliament on 1 June 2007, and the initial contract was awarded in January 2011, with the main construction work commencing the follow ing summer. The contract, which covers 15 km twin bored tunnels, 17 stations and 5 shaft structures, was awarded to Copenhagen Metro Team. The construc tion consortium consists of three Italian companies: Salini-Impregilo, Tecnimont and SELI, and in addition the building consortium has some 250 subcontractors and suppliers.

HISTORIC CONSTRUCTION SITE

If P&C Insurance has been part of the group of insur ers providing cover for the construction project (CAR Insurance), which includes public liability insurance and insuring physical damage due to the construc tion work and cover for the Tunnel Boring Machines (TBMs) used in the tunnelling project. The sheer number of contractors involved in the construction consortium highlights the complexity associated with large building projects like this.

Large infrastructure projects in dense urban areas create major challenges, such as a considerable num ber of changes to Copenhagen city’s utility grid, which had to be implemented before the actual construction work could be started. Around the same time, archae ologists from the Museum of Copenhagen worked on what the museum terms “Northern Europe’s largest archaeological excavation to date”. The archaeologists discovered some remains of the ancient city gate and wall, as well as other finds that resulted in the revision of Copenhagen s early history.

The city is noted for its historic buildings, which had to be addressed in the planning and construction phase. Even though it is a challenge to build a metro in a dense city, with the narrow streets of Copenhagen, only two existing buildings have had to be demolished to make room for the new metro line and its stations.

MANAGING RISKS

According to **Russell Saltmarsh** (Seconded to Metroselskabet from engineering firm Arup, via COWI Arup Systra JV), responsible for the risk management of the civil works at Metroselskabet, the project has several risks that need to be mitigated. One of the big gest risks associated with any tunnel work in a dense urban environment is the impact on the existing buildings due to settlement caused by the tunnelling, especially considering that nearly half the tunnelling

is in mixed soil conditions which can be very demanding and challenging for the contractor.

This was a focus area early on in the project with an assessment being carried out on all buildings within 200m of the alignment to identify sensitive or historic buildings that might be at risk of damage. Once the contractor was appointed it carried out a more detailed assessment of the buildings within a 50m corridor of the tunnel alignment.

The assessment, based on predicted settlement contours from the tunnelling, follows an internationally accepted three-stage process. For each stage of assessment, a progressively more detailed analysis is carried out until it can be demonstrated that the work will not cause damage to existing buildings, as defined in the contract; or the assessment is used to determine the mitigation measures required. In several locations, the tunnels are only a few meters below the foundations of existing buildings, or operational metro stations.

To mitigate the possibility of excessive settlement of the ground causing damage to existing buildings, specialist techniques, such as compensation grouting, have to be applied under some buildings. A sleeved pipe is grouted into a predrilled hole beneath a foundation. Cement is injected at strategic locations, which results in a controlled heave of the overlying soil and structures, mitigating the effects of settlements when the tunnel machines passes through.

For sensitive buildings, 3D analysis of the ground and building structures has been carried out, and the results of this analysis are constantly compared with the results obtained from automatic monitoring systems installed on buildings to ensure that unexpected movements can be identified immediately.

NATURAL HAZARD RISKS

Natural hazard events are other risks to consider when engaging in infrastructure construction, and "in the Copenhagen Metro construction the flood risk is the dominant natural hazard risk," says **Fredrik Holmqvist**, Head of Property RM Services Denmark at If P&C Insurance. Flooding events have been thoroughly analysed both for the construction phase and the operational phase. Consideration of the flood risk started during the preliminary design phase with hydraulic modelling of the entire city to model flood events.

This allowed the engineers to set flood threshold levels for both the temporary and permanent conditions, which were included in the contract requirements. This, together with the contractors' own risk assessment and mitigation measures, has mitigated the flood risk as far as possible.

SAFETY STANDARDS

Risk assessments and day-to-day risk mitigation are managed by the internal risk management organisation, following contractual requirements to comply with international best practice and standards. Contractors' all risks (CAR) insurance coverage provides cover for rare and unexpected events that can't be otherwise mitigated.

There are two codes of practice for risk management on tunnelling projects, one produced by the British Tunnelling Society (BTS) and one produced by the International Tunnelling Insurance Group (ITIG). "Both documents are very similar, but we reference A Code of Practice for Risk Management of Tunnel Works (ITIG) in our contract," says Russell Saltmarsh.

The objective of the code has been to promote and secure best practice for the minimisation and management of risk associated with the design and construction of tun-

METROSELSKABET PRESS OFFICE

> *The flood risk is the dominant natural hazard risk.*
>
> *says Fredrik Holmqvist, Head of Property RM Services Denmark at If P&C Insurance*

nels, caverns, shafts and associated underground structures, including the renovation of existing underground structures. It sets out practices for the identification of risks, their allocation between the parties to the contract and the contract insurers; and the management and control of risks through the use of risk assessments and risk registers.

EVERYONE IS A RISK OWNER

Each project team and contractor are a risk owner, and the management team at Metroselskabet has ensured that the key skills, sustainable working practice and risk management – as well as industry best practices – are promoted throughout the organisations. Internal risk management and risk registration are an inherent part across all stages of the project, from the Project Development Stage, through the Construction Stage to the final Operational Stage. The risk register and assessments have been carried forward to the next project stage.

The risk registers are required to identify and clarify ownership of risks and details, clearly and concisely, and how the risks are to be allocated, controlled, mitigated and managed. "It's a highly complex job," says Russell, "with multiple risks and owners that needed to be addressed on a daily basis." The project management of the new Cityringen has faced many challenges during the construction phase, but given the extensive experience of the project team, there were well-developed risk management structures in place to tackle any challenges.

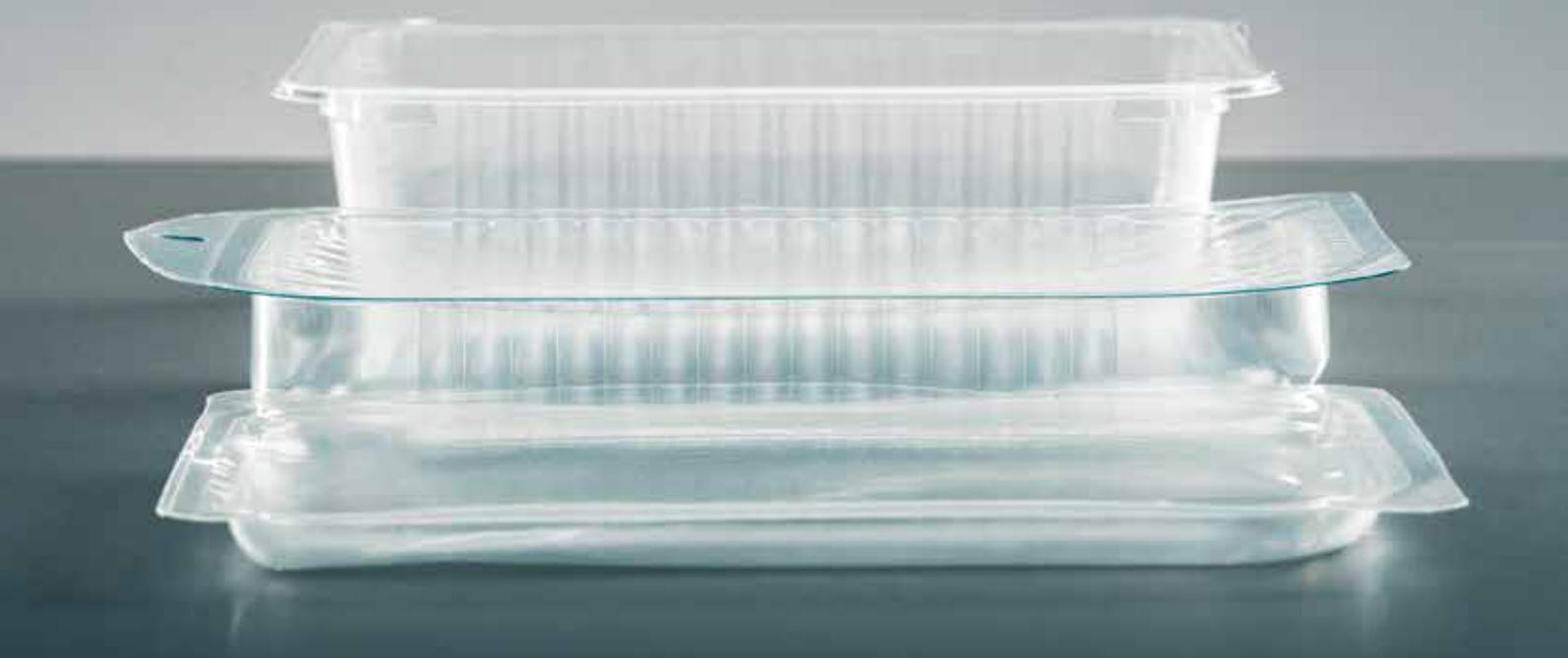
The main civil works construction phase was completed in the first half of 2017, followed by a testing phase, which was completed in the summer of 2019. The average travelling speed of the trains through the city will be 40 km/h, including stops at stations. It is estimated that by 2025, 130 million passengers will be travelling on the Copenhagen Metro system annually.

Infrastructure development is critical to support social progress and economic growth. Currently, large building projects in energy, transport, water supply and telecommunications are taking place throughout the Nordic Region, and If P&C Insurance and the insurance industry as a whole support these enormous investments as risk consultants and risk carriers.

Wihuri Group minimises fire risks at the planning stage

The packaging business of the Wihuri Group, comprising Wipak in Europe and Asia and Winpak in North America, is one of the world's leading producers of packaging materials for the food and medical supply industries. The company is investing in production plants around the world. If's Risk Engineers give credit to Wipak and Winpak for the opportunity of being involved in the plant planning process from the very beginning.

Article by Harry Nordqvist & Ari Ahonen/If, Petri Leskinen/Wihuri Group



Wihuri is a global Finnish industry and trade conglomerate engaged in oper ations in four different business sec tors. One of them is the packaging business with an annual turnover of approximately one billion euros. Packaging produced by Wipak and Winpak is used in the food and medical supply industries.

Packaging plays a key role in many sectors, including the foodstuff production chain, preventing foodstuff degradation and, thereby, forestalling the generation of much more harmful waste – food waste. Food supply chains are one of the main contributors to several pressing environmental problems such as climate change, eutrophication and loss of biodiver sity. Food production and consumption comprise more than one-fifth of global CO_2 emissions. The energy consumption of the industrial processing of food and their transportation have minor impact for carbon footprint. The amount of packaging material also has a low environmental impact, as long as pack aging waste is recycled

Packaging protects the product during transport, storage and retail sale. It also preserves the product so that it is fit for use. Stringent requirements govern cleanliness and hygiene.

Applied to foodstuffs, multilayer film materials produced by Wipak and Winpak enable a reduction in the amount of food additives used to preserve the food for a longer time.

A MULTITUDE OF THINGS HAPPEN DURING THE PLANNING PHASE

Wipak and Winpak place a premium on quality and risk management, a fact that is clearly evident in the fire safety of the production facilities around the world.

"Wipak has put in place the latest technology at their plants. This will protect the personnel and property against loss caused by accidents, ensuring continued operation in a sector that is extremely vulnerable to smoke and impurities," comments **Ari Ahonen**, Risk Engineer, If P&C Insurance (ret.).

In addition to cutting-edge technology, employees play a key role. The provision of regular training for motivated and skilled personnel in handling first-aid fire extinguishing equipment and similar technology, is an important part of Wipak's and Winpak's fire safety system.

Engaging If's risk engineers in the planning process at the earliest possible opportunity made also economic sense, as installing automated extinguishing equipment after the facility is completed would be expensive and difficult. By taking account of fire safety from the planning stage onwards, major accidents can be prevented and securing official permission to continue operations from local authorities can be ensured in situations where a fire has damaged only a small section of a production facility. If there was a major accident event, local authorities may be hesitant to grant a license for the plant, which may jeopardise the continuation of operations.

In 2012 - 2014, while planning fire safety at Wipak's packaging facilities in Poland and China, If's risk engineers highlighted that the installation of piping and fire detectors as well as the division of the production premises into fire compartments is significantly easier when these aspects are taken into consideration in the planning stage of the project.

In addition to Poland and China, Wipak has production plants in Finland, Germany, France, Holland, UK, Spain and Italy. Winpak has facilities in the United States, Canada and Mexico.

According to **Petri Leskinen**, Treasurer at the Wihuri Group, which owns Wipak, collaboration with If's risk management has been a very positive experience.

> *Building materials play* ***a crucial role*** *in fire protection.*

"We are satisfied with the services offered by If's risk management and with the professional competence of their risk engineers. With regard to plant projects like this, beginning collaboration as early as possible is extremely fruitful, both from the viewpoint of the enterprise and the insurance company," he says.

Risk management provides excellent support to enabling quality work, which is vital in the production of medical packaging.

"True, much remains to be done in our risk management, but generally speaking, since we are engaged in international competition, investments in this area constitute part of the development of our operations and, through this, part of the development of our competitiveness," comments Leskinen.

EVERY EFFORT TAKEN TO ENSURE SAFE OPERATIONS

At Wipak's plant in Poland, every effort has been made to take all relevant factors into consideration. If there is an unexpected interruption in the plant's power supply and the electric sprinkler pump stops functioning, an automatically started diesel pump will provide the sprinkler system with a sufficient amount of water.

The large 680 cubic metre water tank of the automatic extinguishing system and the pumping station are located in a separate building. A water tank sufficiently large in size and efficient pumps enable the expansion of the extinguishing system when the production facilities are expanded.

In addition to the sprinkler extinguishing system, the storage and handling premises for flammable liquids have been protected using a carbon dioxide extinguishing system, and the server room has been equipped with a gas extinguishing system.

A major goal in fire protection is to prevent the fire and combustion gases from spreading beyond the fire compartment. The key passive protection method lies in dividing a building into smaller parts by means of structures forming fire compartments. Wipak's production plant in Poland is divided into four major fire compartments: the office, the printing hall, the slitting department and the storage area. In addition to this, the technical facilities such as the premises for electric equipment and flammable liquids comprise their own fire compartments.

Fire doors must provide the same level of fire safety as the wall in which they are installed. They have also been equipped with a mechanism that automatically closes the doors in the event of a fire alarm. The cable and pipe penetrations between the various compartments have been sealed in a proper manner. The compatibility of the smoke ventilation system with the sprinkler system has been ensured.

Wipak production facility in Nastola, Finland

Building materials play a crucial role in fire protection. These must be of a type that is not conducive to the spread of fire. Wipak's production plant in Poland has a concrete construction, rendering it resistant to the spread of fire. The inner part of the wall structures that insulates temperature is made of mineral wool, making it considerably safer from the viewpoint of fire safety than wall structures constructed using combustible insulation materials like XPS, PUR and PIR.

When defining the protection level for the packaging manufacturing plant, account was taken of normal planning criteria (including the use of flammable liquids and the manufacturing process) as well as the speed at which a fire would spread. If the estimated fire development at the site is so rapid that fire-fighting crews would be unable to contain or extinguish the fire, the plant should be equipped with an automatic fire-extinguishing system. This will prevent the comprehensive flashover of the fire compartment and avoid the related property and personal risks.

> *Managing fire risks will give the manufacturer an* ***important*** *competitive edge.*
>
> *says Ari Ahonen, Risk Engineer, If P&C Insurance (ret.)*

In China, the fire risks of Wipak's new production facility have also been brought under control. All imaginable risk factors have been taken into consideration by putting in place smoke detectors and an automatic sprinkler extinguishing system, by dividing the facility into fire compartments, and by using other structural solutions.

THE SIGHTS ARE SET ON A FLAWLESS FIRE SAFETY SYSTEM

In collaboration with If's risk engineers, Wipak's and Winpak's experts are exploring means by which the fire safety systems of production facilities can be made as flawless as possible.

"One of our duties is to support our customers representing the packaging industry in building safer production facilities," Ahonen explains.

"Managing fire risks will give the manufacturer an important competitive edge which will become all the more important if one bears in mind the volumes manufactured and the high-quality standards set for the packaging industry."

Despite changes in production technology, the principles of fire protection remain unchanged.

"Effective fire protection methods do exist. Structural fire prevention as well as a fire alarm system and an automatic extinguishing system form the foundation for all of this. Wipak was prepared to fully address these considerations, although the regulations issued by the Polish and Chinese authorities did not require such solutions," Ahonen states.

In a packaging plant making use of flammable liquids, an automatic extinguishing system plays a key role.

"The primary element in fire safety is an automatic extinguishing system, or sprinkler, designed and installed in accordance with the rules." Ahonen comments. "A well-designed and properly installed sprinkler system will not allow the fire to spread but contain or extinguish it where it breaks out."

A look into 2020 with Skanska

Karl-Johan Rodert, Insurance Manager at Skanska provides insights into the opportunities and challenges the construction industry faces today, and what lies ahead for 2020.

What were the opportunities and the challenges in the construction industries in 2019?

Current global trends, such as urbanisation and demographic change, are increasing the need for new and more sustainable construction solutions. This drives investments in infrastructure, health care, housing and education, which means opportunities for Skanska to create value as well as build a better society.

How is digitalisation changing the industry and ways of working in construction?

There's much to be done. Construction is among the least digitised industries, due to traditionally conservative approaches and fragmented ways of working. But as the world goes increasingly digital, construction has begun to catch up. Now, delivering projects increasingly relies on smartphones and digital models that preview what will be built, sometimes through virtual reality. Skanska is working intensively with further developing the digitalisation of work methods throughout all project phases, from procurement and design through construction and handover to the customer. Through digitalization, we want to make work more efficient, green, safe and inclusive – and even more fun.

What do you believe to be the key trends for construction in 2020?

Looking ahead, urbanisation will continually be taking place more or less in all our markets. In addition to this, the need for sustainable offices, homes and public facilities will increase and that is something we at Skanska are experts on delivering.

Ørsted wins top honours in Global 100

This year the renewable energy company Ørsted has been ranked as the world's most sustainable company in the Corpo rate Knights' 2020 index of the Global 100 most sustainable corporations in the world. Competing against more than 7,300 global companies, Ørsted is the first energy company to ever top the prestigious Global 100 list.

As Chr. Hansen Holding A/S took second place, and Neste Oyj held on to third place, the top three positions in the Global 100 list were taken by Nordic companies. A fourth Nordic company also made the top 10, as Novozymes A/S from Denmark climbed to 6th place, from 58th in 2019.

In a recent press release, Henrik Poulsen, CEO of Ørsted, stated; "We're immensely proud to rank as the world's most sustainable company. From our origins as a traditional fossil fuel-based energy company, we've transformed into one of the largest renewable energy companies in the world. Every day, we deliver green energy solutions at scale to combat climate change, the defining challenge of our time.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Short news

Insights into Global Risks

In January of 2020, the World Economic Forum has published its 15th Global Risks Report. Among many significant highlights, one key insight from the report notes that: "For the first time in the survey's 10-year outlook, the top five global risks in terms of likelihood are all environmental."

The report compiles the greatest concerns of over 750 global experts and decision-makers and provides forecasts on the likelihood and impact of these events. Overall, 78% of people surveyed believed that "economic confrontations" as well as "domestic political polarization" will stand to increase in 2020.

Excavator sales growth in China

Early indicators of growth for the construction sector in China include the sales of excavators and other construction equipment.

According to China Construction Machinery Association, the sales of excavators has seen year-on-year growth of up to almost 22%.

This suggests that the Chinese government efforts are taking effect as pressure to spur on growth is mounting amidst a slight economic downturn. These efforts are expected to continue in the coming year.

Robots enter construction sites

The construction industry continues to evolve. New technologies from software to robots are becoming increasingly common at work sites around the world.

As contractors struggle to find laborers, robots provide a viable option. They do not get sick or experience fatigue and can work without breaks in a reliable and cost-efficient manner. However, the use of robotics is in its early stages with many tasks (such as electrical work) still demanding human involvement.