

ISSUE 1 2020

NORWAY | ASIA BUSINESS REVIEW

The **M**agazine of the **N**orwegian **B**usiness **A**ssociations in **S**outh and **S**outheast **A**sia

China's New Law of Business

The Need for Women in the
Digital Age

Starboard and Siam Cement takes the
Lead in Circular Economy

S P E C I A L R E V I E W

Norway-Asia Business Summit 2019



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Cover Story

The Norway-Asia Business Summit was back in Shanghai nine years after its inception in 2010. Dan Bjørke and Dilek Ayhan and their team pulled off the most successful ever summit with close to 1,000 delegates from Norway, China and the rest of Asia. Photo: NBA China. Page 8

Editor: Axel Blom

Journalists: Anton Bentzon, Cheyenne Hollis, Larry Jagan, Henri Viiralt and contributions from guest correspondents

Cover Photo: NBA China

Operational Management: Yanin Srathongnoi

Art Director: Pansak Chintanapakdee

Production: Graphics-Related Co., Ltd.

Concept Design: Spaulding & Associates

Published by: Thai-Norwegian Chamber of Commerce in co-operation with Norwegian Business Association (Singapore) and other Norwegian Business Associations in Asia

Editorial & Advertising:

Norway-Asia Business Review, Thai-Norwegian Chamber of Commerce Mahatun Plaza, 14th FL., 888/142 Ploenchit Road, Lumpini, Pathumwan, Bangkok 10330, Thailand

Norway-Asia Business Review reaches Norwegian-related business executives and decision makers throughout the region including the diplomatic missions as well as government ministries in Norway and Norwegian sector-based organisations.

Business Review is a quarterly business magazine and the contents reflects this. Each magazine has a main theme and the articles are centred around this theme. The magazine focuses on Norwegian-related stories from the region and issues that have impact or interest for Norwegian related businesses. Business Review is available in print as well as digital form through [Issuu](#) and [Pressreader](#).

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BUSINESS REVIEW**

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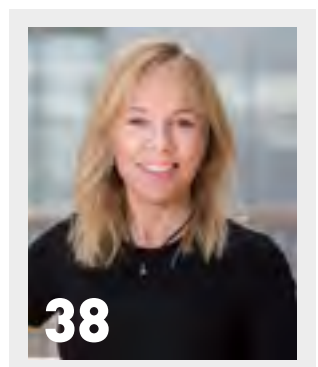
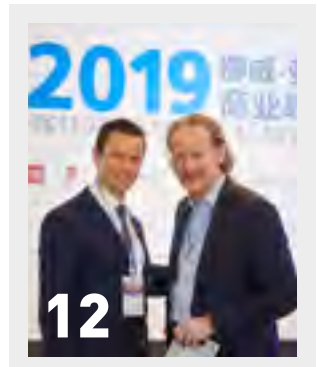
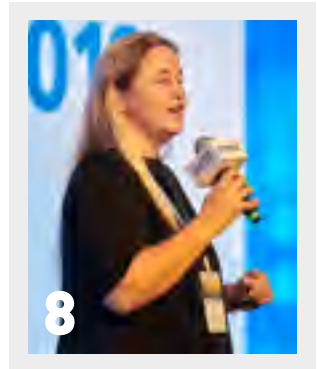
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SPECIAL REVIEW

Norway-Asia Business Summit 2019 was the biggest ever summit in Asia. With close to 1,000 delegates from Norway, China and the rest of Asia, the 2019 summit was a huge showcase of ocean technology and energy solutions both from Norway and from Asia. The interest shown from both Norway and Asia proves that collaboration between Norwegian companies and their Asian counterparts have huge potential. Pages 6-33.





Taking a position in the energy transition

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Dogger Bank

The illustration shows one of the two Creyke Beck converter platforms that Aibel will deliver for the world's largest offshore wind farm – the Dogger Bank Offshore Wind Farm.

The modules will be constructed at the Laem Chabang yard in Thailand.

The Biggest Ever



PHOTO: THAI-NORWEGIAN CHAMBER OF COMMERCE

First organised in 1998, the Norway-Asia Business Summit has evolved over time to become a landmark summit for Norway in Asia. In 2019, we marked the return to Shanghai.

The 2020 summit will be hosted by the Norway-Malaysia Business Council at the Mandarin Oriental Hotel in Kuala Lumpur from 22 to 24 September. Looking back at the past ten years, the summit has been hosted in Shanghai (2010 and 2019), Singapore (2011, 2016 and 2018), Jakarta (2013), Bangkok/Yangon (2014) and New Delhi (2015). Following the summit in Malaysia, the Norwegian Chamber of Commerce in Japan has received approval to host the 2021 Summit.

You may ask why these summits are important and what the takebacks are. In short, the summits have become the most important meeting venue for Norwegian export industry in Asia, a place where companies showcase the pinnacle of exports from Norway. At the summit you meet stakeholders such as government ministers, both from Norway and their Asian counterparts, in addition to representatives from government organisations, industry leaders, the Norwegian diplomatic corps in Asia, academia, research institutes, customers, colleagues and finally friends from both Norway and within the region. The summit is our chance to put Norway in the mind of the many foreign delegates at the summit and also to put Asia on the map in Norway.

The 2019 Summit, focusing on Ocean and Energy Technologies was highly successful with more than 1,000 delegates from Norway, China and the rest of Asia. Most larger Norwegian companies with businesses in Asia were represented at top management level. In addition, there were numerous interesting Asian companies with business ties to Norway present. The subjects covered at the summit were so many and so varied, all interesting and timely topics, forcing us as participants to prioritise, even if we wanted to participate in competing parallel sessions. I'd like to especially thank Dilek Ayhan and Dan Bjørke as well as their teams for a job well done in connection with the 2019 summit and finally also the many sponsors for their continuous support.

From Bangkok, we are looking forward to Norway-Asia Business Summit in Kuala Lumpur in September and we wish Ambassador Gunn Jorid Roset and the President of the Malaysia-Norway Business Council, Thomas Alexander Sjøberg the best of luck with the preparations.

Axel Blom

*President
Thai-Norwegian Chamber of Commerce*



Norway-Asia Business Summit (NABS) returned to Shanghai, the city where the conference first started, for the eighth edition of the event.

The Road to a Cleaner, Collaborative Ocean

CHEYENNE HOLLIS

This year saw more than 1,000 delegates attend the two-day Summit that was the largest and most ambitious event to date.

The ocean was at the forefront of NABS 2019 and it is something of paramount importance for both Norway and China. Business leaders, government officials and leading experts from each country came together to learn more about how they could collaborate in ways that will accelerate the energy transition and contribute to a healthier ocean environment.

Mr Morten Sten Johansen, Chairman of the Norwegian Business Association China, opened the Summit by expanding on that idea, “Our objective is to provide a meeting arena for decision makers to deliver a sustainable ocean

economy. Maintaining a clean ocean environment is a pre-condition for business and this event can strengthen trade between Norway and Asia.”

Asia is the second most important export market for Norway behind only Europe, but Norwegian Minister of Trade and Industry, H.E. Torbjørn Røe Isaksen, pointed out that the relationship should not focus solely on business during his speech at NABS 2019.

“Our oceans are under strain. So while we strive for business opportunities, we must also work towards sustainability. The Norwegian government has placed oceans high on

our agenda. We need technology and new solutions, but business has to be committed to helping us find these,” he said. “Norway will continue to be a leading ocean nation, but we must be even more environmentally conscious and work towards digitalisation since this is the future.”

There is potential for these efforts to support China’s attempts build its green economy. The country has already initiated a few initiatives as part of this movement.

“In China, we began thinking about green finances in 2014. It started with the 14 steps to build a green financial eco-system that were adopted by the government in 2016. At the time it was the only over-arching green financial system in the world,” Mr Ma Jun, Chairman of Green Finance Committee of China Society of Finance and Banking and Member of the Monetary Policy Committee of the People’s Bank of China, explained.

China’s energy transition was a key topic throughout NABS 2019 and Madame Li Yalan, Chairperson of Beijing Gas Group and Chairperson elect of International Gas Union, noted that there were a lot of opportunities for the two countries to work together.



PHOTO: NABS 2019

"There are no limits on foreign investment in the LNG market and we welcome greater Norwegian involvement," Li told the NABS 2019 audience. "Norway also has experience with new energies, like wind, where we still have a lot to learn. We hope to better understand by collaborating with companies in the renewables sector."

Madame Li's keynote speech was followed by H.E. Rikard Gaarder Knutsen, Norwegian Vice Minister of Petroleum and Energy, who stressed the importance of the energy transition.

"We want to use our energies in the most sustainable way possible. Our history has given us experience in this. We are also moving forward in the petroleum sector. Emission reduction and new technology investment to accomplish this must be incentivised," Minister Knutsen said.

This comment came during a panel discussion that looked into new business opportunities that could come about because of the energy transition. All the panellists thought China could reach zero carbon emissions and find ways to reduce its dependence on fossil fuels.

"China shares a sustainable vision with many countries. The EU has targeted zero carbon emissions by 2050

and China will soon submit its own zero carbon emission strategy. However, we have a lot to learn from Norway in order to reach this target," Mr Li Junfeng, Secretary General, China Renewable Energy Industry Association, noted.

These potential partnerships and knowledge sharing opportunities will have a strong foundation to build upon with China already starting the energy transition process.

"We are already seeing China leading the way when it comes to the energy transition. Coal usage will decrease, oil demand will decrease while LNG will stabilise and be a part of the energy mix. Eventually two-thirds of electricity will be powered by renewables," Liv Hovem, CEO, DNV GL – Oil & Gas, reported.

The second major session at NABS 2019 focused on sustainable ocean business with Norway's Special Envoy to the Ocean, Mr Vidar Helgesen, touching on both the dangers of climate change and the benefits China and Norway could realise by collaborating on solutions to this problems.

"Climate change is impacting the oceans in unpredictable ways. This causes challenges, but we now know that the ocean and ocean businesses hold the solutions," Mr Helgesen pointed out. "We know the ocean holds a lot of benefits when it comes to renewable energy, fishing and a host of other sectors. What we need to do is maximise these benefits. Norway and China can use our expertise in the individual fields to create ocean-centric solutions."

NABS 2019 then broke into smaller sessions focusing in on various topics covering energy, shipping, technology, digitalisation and business. China's growing use of LNG was mentioned at multiple seminars.

"LNG is a solution for water transportation and China started building up an LNG fleet in 2012. The government is providing incentives for LNG and we will hopefully see more movement towards LNG in the future," Mr Ji Yongbo, Director, China Shipping Technology Research Center of China Waterborne Transport Institute, Chinese Ministry of Transport, reported.

The use of LNG in shipping is part of China's goal to reduce emissions and clean up its coastal areas.

"Roughly eight percent of China's emissions comes from shipping and we have already worked on LNG shipping and hybrid shipping to help reduce this. The government implemented the Domestic Emission Control Areas in 2015 with the goal of cutting emissions starting with core ports. In 2019, the program will be assessed and possibly expanded," Mr Xu Guoyi, Director General, Commission Office of Shanghai

Combined Port (COSCP), said.

But using LNG is just a start. According to Mr Egil Haugsdal, President of Kongsberg Maritime, digitalisation has an important role to play when it comes to creating sustainable ocean solutions.

"In Norway, 99 percent of cows are connected, but nowhere near that amount of ships are connected. We need the next generation of shipping so we can start enacting positive changes. Digitalisation in shipping can solve environmental issues. We already have the technologies in place elsewhere, it is just about connecting them," he pointed out.

Offshore wind is another sector where both China and Norway are leaders. A special session hosted by Innovation Norway and the Chinese Wind Energy Association, provided a look into what both countries were doing in the field.

The second day of NABS 2019 began with a look at China's role in the global economy organised by The Economist.

"It is possible that there is a push for a friendlier business environment and greater reforms that support investment in China which would have a positive impact. These reforms need to address the concerns of the international business community. The Foreign Investors Law will help ease some of these concerns," Ms Mary Boyd, Director at The Economist Corporate Network in Shanghai, told the audience.

On the first day of the NABS 2019, there was signing between Confederation of Norwegian Enterprise (NHO) and Confederation of Danish Industry (DI) to launch entry services into China for Norwegian companies via DI Asia Base. On the second day, the two organisations spoke more on the importance of having a local footprint.

One of the most poignant sessions hosted during this year's NABS covered how women can become more involved in leadership as we enter the digital age.

"Women remain underrepresented in digital sectors and we must work to reduce it. Having more female representation in the digital arena can bring much needed insights and a new perspective to businesses," Ms Heidi Wiig, Associate Dean BI-Fudan MBA Program and Professor at BI Norwegian Business School, explained.

The NABS 2019 was the largest in program history and showcased both the strength of the relationship between Norway and Asia as well as the potential to further cultivate it. With the tools and technologies required to achieve a cleaner, sustainable ocean already available, greater collaboration will ensure it is implemented swiftly. ■



PHOTO: NABS 2019

Norway Asia Business Summit 2019 Co-Chairs Ms Dilek Ayhan and Mr Dan Bjørke had their work cut out for them when it came to organising the event.

Building NABS 2019

CHEYENNE HOLLIS

Ultimately, their hard work paid off and more than 1,000 attendees from China, Norway and Asia had a chance to connect and learn more about business with the ocean being a key focus point.

The sheer size and scope of NABS 2019 presented Co-Chairs Ms Dilek Ayhan and Mr Dan Bjørke with some unique challenges. They knew the objective of the event very well. It was to strengthen both trade and investment between Norway and Asia by encouraging cross-border cooperation amongst leading institutions, companies and technology clusters.

But turning that mission statement into a tangible two-day Summit in Shanghai required a holistic approach that incorporated the viewpoints of all stakeholders. In total, it took the pair 18 months to bring everything together.

"We invited some of the key stakeholders, important companies, business clusters and organisations to co-organise the 2019 Summit program as a joint effort," Ms Ayhan and Mr Bjørke explained. "Our main goal was to bring together the relevant parties to discuss opportunities and cooperation.

We started with an ambition of having 250 high level delegates attending the summit. In the end, about 1000 leaders in business, academia, diplomacy and politics joined us in Shanghai."

The duo tapped into their unique backgrounds to help build the foundation for NABS 2019. Ms Ayhan was State Secretary in the Ministry of Trade, Industry and Fisheries for more than four years and she now serves as a Special Advisor to the President and management team of BI Norwegian Business School. Meanwhile, Mr Bjørke is Business Development Manager of International Programmes at BI Norwegian Business School.

Both admit that the Summit is not about the organisation or themselves. Instead, the focus is on those attending the summit as they wanted to ensure attending delegates had a platform to meet integral people that support Norwegian and Asian business

collaboration and development in the region.

To build that platform for the 2019 Summit, the Co-Chairs travelled around the region as part of the NABS Road Show where they met with Team Norway representatives as well as Corporate Members of various Norwegian Chambers of Commerce. Their goal was to learn more about how they could increase the relevance of NABS 2019 for everyone involved.

"It is important to acknowledge the joint effort from some of Norway's most prominent companies and organisations to strengthen the Norway Asia Business Summit's position as the most important platform for valuable encounters between leaders of Asian and Norwegian businesses," the Co-Chairs pointed out. "We made this summit through a close dialogue with our key partners to ensure the topics discussed brought value and fuelled the ongoing discussion in the different industries with useful input."

NABS 2019 was the second time the event had been hosted in Shanghai, but the latest version was far larger and more ambitious than the first go-round some ten years prior. The initial event was seen as a chance for Norwegian businesses to gather and discuss topics that were more internally focused.

The event has since evolved to be a more encompassing affair that covers a spectrum of industries, countries and viewpoints. Ms Ayhan and Mr Bjørke were proud to have hosted such a diverse

range of people with high-level delegates and leaders in business, academia, diplomacy and politics all choosing to take part.

"We had the honour of welcoming business and industry leaders; government representatives; technology innovators; business support organisations; experts and academia; international organisations; and media," they stated. "By inviting businesses and organisations with deep industry experience and knowledge to join us as co-hosts of the Summit, we provided all delegates with valuable encounters and relevant discussions."

There were 21 sessions and seminars during NABS 2019 along with many other meetings and talks as well as the opening reception. H.E. Torbjørn Røe Isaksen, Norwegian Minister of Trade and Industry, Mr Ma Jun, Chairman of Green Finance Committee (GFC) of China Society of Finance and Banking, and Madame Li Yalan, Chairperson of Beijing Gas Group, were just a few of the many memorable speakers.

Embracing the topic

NABS 2019 centred around the theme of OceanTech. In their opening remarks, Ms Ayhan and Mr Bjørke noted that maritime, energy and other ocean-based industries will be vital in meeting many of today's global challenges. And with the oceans already under significant pressure as a result of climate change, overfishing, and pollution, developing sustainable solutions will be necessary.

"(NABS 2019) is to provide a meeting arena for decision makers to deliver a sustainable ocean economy.

Maintaining a clean ocean environment is a pre-condition for business. This event can strengthen trade between Norway and Asia and we appreciate the support we received from China," Mr Morten Sten Johansen, Chairman, Norwegian Business Association China, declared during his speech at the Summit.

China and Norway are in a unique position when it comes to OceanTech and this, in part, made Shanghai the perfect host for NABS 2019. The knowledge and information exchanged and partnerships formed during the event could have a major impact moving forward.

"China's efforts to cut emissions, its big market, industrial value chain and manufacturing capabilities combined with Norway's technology position in the global maritime industry could pave the way for fruitful cooperation and joint development to transform the maritime sector to a zero-emission future," the Co-Chairs explained.

Mr Vidar Helgesen, Norwegian Special Envoy for Ocean, explained the potential of the ocean and just how OceanTech could help bring industries and countries closer together.

"We know that the ocean holds a lot of benefits when it comes to renewable energy, fishing and a host of other sectors. What we need to do is maximise these benefits. It is possible to combat climate change if we follow best practices using ocean-centric solutions. Industries across a wide variety of economic sectors can contribute to this as long as they collaborate and work together," Mr Helgesen told the audience at NABS 2019. "Offshore wind farms can be combined with coral reef

creation where fishing zones can be incubated. These separate fields can be interconnected. Norway and China can use our expertise in the individual fields and bring them together."

The Co-Chairs are not only happy with how the event turned out, but also believe the impact of NABS 2019 could be significant if everyone works together.

"The key takeaway for the conference attendees was that innovation and the diffusion of new technologies are indispensable for sustainable economic growth. The business sector; research and education; employees; and authorities have to join forces to deliver tangible results," Ms Ayhan and Mr Bjørke said.

The big picture

Providing context for all this information was also important for attendees. The organisers ensured there were other connected topics being discussed, such as the US-China trade war and the country's role in the global economy. Ms Mary Boyd, Director and The Economist Corporate Network in Shanghai offered insights on these issues during the Summit.

Another key topic was the importance of women's leadership during the digital age. A special seminar hosted by BI Norwegian Business School provided Asian and Norwegian female leaders a platform to share their own stories and offer ideas on what more needs to be done.

Another thing the NABS organisers needed to do was ensure guests could take part in different experiences, including food and entertainment, they wouldn't be able to enjoy otherwise. The 2019 Summit had several Chinese music and cultural performances throughout the event while Norwegian pop-band Marcus & Martinus performed as well. All of these added a different element to NABS 2019 and provided attendees with a glimpse beyond business. ■



PHOTO: NABS 2019

Above left: Co-Chairs Ms Dilek Ayhan and Mr Dan Bjørke speak to the crowd at NABS 2019. It took 18 months to plan the event. Above: The NABS 2019 Co-Chairs together with Jotun CEO Morten Fon and Norwegian Deputy Minister of Petroleum and Energy, Mr Rikard Gaarder Knutsen.

Facts

- Planning for NABS 2018 took 18 months
- More than 1,000 people attended NABS 2019 making it the largest Summit ever
- Attendees were leaders in business, academia, diplomacy and politics
- Ms Dilek Ayhan and Mr Dan Bjørke were Co-Chairs for NABS 2019
- The Co-Chairs conducted a road show where they visited several Norwegian Chambers of Commerce
- OceanTech was the theme from NABS 2019
- The Co-Chairs worked with Norwegian companies and organisations to find relevant topics
- NABS 2019 had a total of 21 sessions and seminars as well as several other events



PHOTO: ZHONG LUN LAW FIRM

With China's new Foreign Investment Law taking effect, experts are hoping that it will achieve its goals of creating a uniformed legal framework and level playing field for overseas firms.

China's New Law of Business

CHEYENNE HOLLIS

Foreign businesses already operating in China, or ones that had looked into entering the country, know just how convoluted things could be from a legal standpoint.

With three FDI laws governing corporate establishment and structures, the country's evolving economy is in need of greater clarity.

In the first quarter of 2019, the Chinese government revamped the laws covering foreign investors and foreign-invested enterprises that operate in the country. The end result of these efforts was the Foreign Investment Law (FIL) that is designed to improve the overall business environment for foreign investors while also ensuring foreign-invested enterprises are able to compete equally in the Chinese marketplace.

Ms Audrey Li, Partner at Zhong Lun Law Firm points out there will undoubtedly be more uniformity of legal framework under the new law with the trio of existing FDI laws being gradually

phased out after a five-year grace period. This clarity is something China wants as much as the foreign business community.

"There has been a desire in China to have this new law. In fact, the first draft of the FIL was introduced in 2015," Ms Li says. "After the first draft was introduced four years ago and followed up with a few rounds of comments, it was put on hold until recently. The government knew there was a need for uniformed foreign investment laws and the push for changes has come from China itself."

The biggest concern many experts have about the new FIL is the fact it is still being filled out. Due to the rushed nature of the law's passing, the government needed to create additional implementation regulations in the following months with certain areas still

being opaque.

"The main issue with the new law is that it is still general, some regulations are not specific. There are implementation rules we are still waiting to be enacted although the draft implementation rules have recently been published. It is totally unclear yet how everything will work out," Ms Li explains. "How the new law will be implemented needs to be further clarified and more information on future regulations are still needed."

One example of this uncertainty is the fact that the exact definition of foreign investment hasn't been clearly defined. Ms Li noted this is a question her firm receives a lot and is just one aspect that needs to be addressed.

"I think people agree that the new law signifies progress and it is needed, but more clarity is required. For example, the new law doesn't have a Variable Interest Entity (VIE) structure," Ms Li states.

It is not just the law that is changing. The kind of investment needed in China is rapidly shifting as well. According to the United Nations Conference on Trade and Development (UNCTAD), China is the world's second largest FDI recipient with the total figure of accumulated FDI exceeding USD 2 trillion. But recent investments are in more forward looking industries.

"From a legal perspective, we are seeing a continued effort from the government to encourage foreign investment. However, the kind of

investment needed is at different than what was of use in the past. There are opportunities, but they are changing,” Ms Li says. “Today, investments in eco-friendly and tech-friendly sectors are more welcomed. In many ways, this makes it a good time for Norwegian businesses to come to China since many of them have products and knowledge focused on sustainable growth and development that are in real demand in the market here.”

She adds that if foreign investors think there is a genuine need for their products in China and those are not in the negative list of sectors, they do not have to worry much about the legal aspects of investment.

Future of forced tech transfers

Forced technology transfers have long been a sore spot for overseas businesses operating in China. A survey conducted by the European Union Chamber of Commerce founded that 20 percent of European companies doing business in China were subject to a forced technology transfer. This was nearly double the total from its 2017 survey.

When Mr Wang Shouwen, a Chinese Vice Commerce Minister, announced the new FIL would end the practice, it was met by generally positive reviews from the foreign business community even if the law hasn't been released in its entirety with detailed implementation rules.

“Forced technology transfer is a big area of concern and while it currently doesn't happen a lot, it is something businesses think about. The new law will be the first to have the guiding principles protecting free technology transfer clearly written into law,” Ms Li

reports. “It makes it a business decision, not a government decision. There are still some areas of the law where things aren't entirely clear, such as establishing a clear system of compensation for infringement of intellectual property, but these will likely be reviewed. Ultimately, more companies will be protected as a result.”

She explains that Zhong Lun Law Firm is comfortable about how the regulations regarding encouraging voluntary tech transfers will be applied due to a government change in relevant laws that ensure there is no confusion. The new FIL also puts into a place more robust framework for international businesses to challenge the government on decisions they do not agree with.

“The new law puts into place mechanisms where businesses can challenge government decisions. There will now be a clear legal framework for foreign businesses to bring complaints against authorities through various means should they deem it necessary,” Ms Li notes. “Additionally, companies unhappy with decisions of the government may also consider whether to try international investment arbitration.”

New structures

At the moment, Zhong Lun Law Firm is fielding a lot of questions from businesses about what they need to do to adjust to their current structure. The FIL is includes some changes that existing firms might need to adjust to during a five-year transition period.

“Under current FDI laws, the board of directors is the highest authority, but the new FIL makes shareholders the highest authority to comply with the Company Law of China. Companies may need to change to meet this requirement. Corporate governance will also change

under the new law,” Ms Li points out. “It will be important for companies to revisit their current structure and make sure they comply with the new laws after this transition period passes.”

For new businesses entering China, the existing FDI laws covering joint venture structure have also changed as a result of the new law and Ms Li believes this brings with it several benefits if you are a majority shareholder in a joint venture company.

“Currently, minority shareholders have a larger say under the existing laws covering foreign investment since full consent of all shareholders is needed in cases such as share transfer. Under the new law, this will be reduced to more than half of the shareholders' approval and now will be deemed to have approved if no response is made within a 30-day period after receiving the notice of share transfer. This makes the entire process much more manageable and flexible for businesses. There will also be changes to the dividend payments to bring it in line with global standards,” Ms Li details.

Ms Li points out that the FIL highlights China's willingness to further open its doors to overseas businesses and should provide a greater level of comfort for investors. That being said, it doesn't remove all the obstacles facing foreign firms in China.

“It is very important to have good lawyers that understand the complex laws and regulations in China as well as the culture of both sides. Communication is important and something that is required when traversing complicated landscapes,” Ms Li says.

However, it is another step in the right direction according to Ms Li who has observed the business landscape during her time at Zhong Lun Law Firm.

“Our firm has grown a lot in the 13 years I've been here. This growth matches the growth of the Chinese economy and international interest in investing here. We hope these new laws will attract more foreign investment since it should make it easier to do business in China,” Ms Li concludes. ■



PHOTO: DONG FANG

Above left: Ms Audry Li noted the new foreign investment law is a step in the right direction, but more clarification is needed. Above: China's National People's Congress passed the new Foreign Investment Law in 2019.

Facts

- China's new Foreign Investment Law took effect at the start of the year
- The government still needs to create additional implementation regulations for the FIL
- There is a five-year grace period for the three former laws governing corporate establishment structures
- FIL contains guiding principles protecting free technology transfer
- Clear legal framework for foreign businesses to bring complaints against authorities part of FIL



PHOTO: NABS 2019

Being at the very first summit in 2010 provides Mr Geir Sviggum, Chairman at Wikborg Rein, with an interesting perspective on its growth after the event's return to Shanghai.

Reflections on China

CHEYENNE HOLLIS

He shares his thoughts on the NABS through the years along and reflects upon his time in China.

When Mr Geir Sviggum, Wikborg Rein Partner and Chairman, and Mr Vidar Andersen, Head of Corporate Banking International at DNB, shared the stage at the Norway-Asia Business Summit 2019 to discuss the very first event nearly a decade earlier, their conversation turned to an amusing anecdote about the panel Mr Sviggum was on during the first event.

"I remember someone on stage talking about how they believed investment in China had reached its peak level at that time," Mr Sviggum told the crowd. "Of course, as I look around the room now and see so many people interested and active in China, that prediction may have been a little off."

Indeed it was. With more than

1,000 people in attendance at NABS 2019, it was the biggest Summit to date and showcased both the growing interest Norwegian companies have in China and the need for such events.

"We thought it would be very meaningful for the Norwegian business community in Asia to gather once a year and share experiences. In 2010, Shanghai hosted the magnificent World Expo, the largest ever. We therefore started with Shanghai as a venue for the first NABS," Mr Sviggum explained. "It felt as the epicentre of all excitement at the time. I remember that there was so much going on in Shanghai at the time that we had to compete for speakers who were also invited elsewhere at conflicting

happenings."

The most recent event brought with it a who's who of speakers from the business and government sectors with both Norway and China thoroughly represented. Many of those who spoke at NABS 2019 was something that left a lasting impression on Mr Sviggum.

"Many speakers at the event impressed me. Cilia Holmes Indahl CEO at Katapult; Therese Trulsen, Senior Lawyer and Chief Representative at Wikborg Rein China; Mary Boyd, Director and The Economist Corporate Network in Shanghai; and Mr Vidar Helgesen, Norwegian Special Envoy for Ocean, were just four of them," Mr Sviggum said. "It was also really nostalgic for me to be on stage again with my old friend, the very impressive Mr Andersen of DNB."

Another thing to come out of NABS 2019 was the continued evolution of the event. The Summit in Shanghai during 2010 and the following year in Singapore happened to be much smaller affairs where the focus was more internal. Even in the following years as the Summit moved across Asia, the focus remained on gathering the Norwegian community

with roughly 100 to 200 people attending during any given event.

The 2018 Summit, which returned to Singapore for a second time, saw a notable increase in both interest and attendance with more emphasis placed on strengthening Norwegian industry in the region through networking and knowledge sharing. That would serve as a springboard for NABS 2019.

"I was impressed with the number of people gathered, and not least the level of people in attendance. The concept has changed somewhat since 2010. There was a time where we focused on gathering the Norwegian community in different Asian hubs, but this was more of a platform for Chinese and Norwegian business leaders to meet and interact," Mr Sviggum noted. "I would like to compliment everyone who attended on their interest in China. Understanding China is so important in order to understand the world in the 21st century."

Chinese Homecoming

For Mr Sviggum, NABS 2019 was also a chance for him to return to the country where he was based for the best part of six years with Wikborg Rein. In some ways, the change in the Summit mirrored the change he saw in the host country.

"I lived in China from 2008 until 2013. I had the privilege of traveling to 21 Chinese provinces during my time there," Mr Sviggum recalled. "China is changing extremely rapidly, but I am happy to see that the Chinese characteristics still remain. It is also important to note that China has so many things. There are great diversities in China, still, six years after I left."

There have also been noticeable

changes in Wikborg Rein's Shanghai operations since Mr Sviggum moved to a different position with the firm earlier in the decade. Of course, this is to be expected with growing interest in the country from the Norwegian business community.

"Our practice has grown a lot since 2008. We handle disputes, transactions, compliance work and other forms of advisory," Mr Sviggum pointed out. "I believe a trend we have seen is that assignments are getting larger and more complex."

Part of that shift owes itself to a more diverse business mix. When Mr Sviggum lived in China, he estimated that 75 percent of Norwegian businesses active in the country were related to energy and maritime activities. That has changed in the past few years and the business mix is currently much more diverse.

One question people want to know the answer to is just how different the business environment is today than when he was working in China. Mr Sviggum believes the picture is mixed with some things being easier now than they were when he lived in China. On the other hand, new challenges have arisen that businesses must consider.

In terms of the most common challenges Wikborg Rein clients in China have faced over the years, the firm continues to see some old problem rear their ugly head while new issues also come up.

"Many clients have struggled with cultural aspects. There have been many examples of challenges related to unhappy business marriages and Norwegian investors choosing the wrong partner in the first place. There have

been intellectual property challenges as well," Mr Sviggum stated. "I must also emphasise confusion due to fast-paced development of legal framework and sometimes lacking predictability in regulatory circumstances. I believe there are few challenges faced by Norwegians in China we have not been involved with in one way or the other!"

He continued, "If you are working in China or considering it, prepare very well and use an advisor with a mixed cultural background, meaning that they understand both the culture you are coming from and going to."

The entire relationship needs to be looked at as a two-way street. Both China and Norway can learn and partner with each other on multiple levels. For example, there are opportunities for knowledge sharing between the two countries with Mr Sviggum citing China's technology transformation coming out of Xinghua University and other hubs being something that is worth watching and learning from. Inbound investment to Norway must also be considered.

"Norway has in recent years been one of the most attractive destinations for Chinese investment in Europe. We see large interest in our energy and maritime industries. We also see keen interest in our northern areas and the Arctic," Mr Sviggum stated.

Looking back to the first NABS and the panel he sat on, Mr Sviggum isn't ready to make any proclamations about investment peaking on either side. In fact, with relations between Mr Sviggum improving, it could be some time before we do see that peak.

"I believe there is still lots of potential. It is simply incredible to see the level of business interaction that took place during the years with a challenging bilateral relationship. Now, after normalisation of bilateral ties, we see further development in the complexity and magnitude of Sino-Norwegian relations," Mr Sviggum concluded. "A free trade agreement will contribute to further growth. We have much to learn from one another, and I do not believe we are close to the peak still." ■



PHOTO: NABS 2019

Above left and above: Mr Geir Sviggum, Chairman of Wikborg Rein with Mr Vidar Andersen, Head of International Division at DNB. The two gentlemen together with Erik Borgen (above), Chairman of Singapore-Norway Chamber of Commerce and at the time Chairman of Norwegian Business Association Singapore were instrumental in organising the summit in 2010 and in 2019 they were again participating at NABS 2019 in Shanghai.

Facts

- Shanghai served as host of the first Norway-Asia Business Summit in 2010
- Competition for speakers at the first NABS was one of many challenges organisers faced at the time
- Singapore and Shanghai are the only cities to have hosted multiple NABS events
- Geir Sviggum works as Partner & Chairman at Wikborg Rein having previously worked for the firm in China
- Historically, Wikborg Rein clients have struggled with some of the cultural aspects in China



PHOTO: DNV GL

One of the key findings from DNV GL's 2019 Energy Transition Outlook was that gas and variable renewables will be the only energy sources for which demand is higher in 2050 than today.

The Future of Energy

CHEYENNE HOLLIS

But this won't be enough for climate goals to be reached by 2050. In order for that to happen, work to decarbonise the energy mix, along with a greater uptake of carbon capture and storage (CCS) in particular, must be implemented faster than currently expected.

According to research from DNV GL's ETO, a report that provides an independent forecast of developments in the world energy mix to 2050, demand for oil will peak in 2022 while gas is expected to overtake oil and become the world's largest energy source by 2026.

The report also notes global energy use will peak by 2030 due to improved energy efficiency along with electrification powered by renewable sources. It can be tempting to think the use of fossil fuels will be a barrier to a rapid energy transition. However, gas will

be a key enabler for the world's shift to a lower carbon energy mix in the coming decades.

Yet this alone won't be nearly enough to reach international and national emissions targets. The 2019 ETO found that emissions will not fall sufficiently by 2050 to bring global warming to well below 2° Celsius. The transition from oil to gas does provide a net positive, but it is not the answer in and of itself.

"For gas to realise its true potential in helping reach international and

national emissions targets, its production and consumption must be decarbonised," Ms Liv A. Hovem, CEO, DNV GL – Oil & Gas, states. "We have to act faster to shape the clean energy system moving forward. This requires more support from all stakeholders, more investment into decarbonisation, more renewables and greater energy efficiency."

Ms Hovem adds that the technology to improve the world's energy system is readily available for the most part meaning decarbonisation efforts will come down to development and policy.

"In the long run, the cost of the energy source tends to wins. If energy sources are cost competitive, they will out compete others on the market," Ms Hovem says. "Decarbonised gas holds huge potential to become an abundant source of clean energy. The challenge is that all major routes to removing carbon from oil and gas use rely on the large-scale uptake of carbon capture and storage (CCS)."

Speeding up CCS
CCS can prevent up to 90 percent

of the carbon dioxide emissions produced by electricity generated via oil and gas from entering the atmosphere. Despite the environmental benefits, widespread usage of CCS is still decades away.

According to the ETO, CCS will not be implemented at scale until at least the 2040s unless governments change policy and set a higher carbon price than the cost of the technology. Industry must also play a role in stimulating quicker adoption of the technology by finding ways to reduce the cost of implementing it.

"The technology for CCS is already here, but it isn't cost efficient. Until the cost of implementing CCS goes down or the cost to emit carbon rises, it won't be a real choice," Ms Hovem explains. "If CCS is applied more frequently, we can accelerate the entire implementation process. In order for that to happen, support to push these technologies is required."

It was noted that DNV GL expects CCS to enter cost learning curves similar to the solar and wind industries. For CCS, this would see costs reducing by 13-15 percent per doubling of capacity.

"So, how do we get going? Well, it's a bit of a chicken-and-egg situation. We won't move down the cost learning curve, unless we start rolling out the technology. And we don't foresee a rollout of technology, before the costs have come down," Ms Hovem says.

Perhaps the easiest way to get the process moving is for governments to

place taxes on carbon emissions. Ms Hovem points out that uptake in CCS won't begin in earnest until businesses need to utilise it or face paying taxes for not doing so.

"At the moment, 85 percent of global emissions are currently untaxed. The remaining 15 percent of emissions costs less than USD 10 per tonne of CO₂ to emit, according to last year's World Bank's State of Trends of Carbon Pricing. If the cost of emitting carbon into the atmosphere increases, the speed at which industry will deploy CCS technology will also increase," Ms Hovem states.

She continues, "If there was to be an increase of the carbon price by 30 percent, you would likely see the utilisation of CCS increase sevenfold. Of course, questions about this persist, namely the feasibility of achieving a global carbon price. The European Union managed to do something in this regard through its EU Emissions Trading Scheme and is beginning to see results."

Once the utilisation of CCS begins, another wave of benefits will be unlocked. Ms Hovem cites synergies between hydrocarbon and renewable energy technologies that could work together to decarbonise the energy mix as one potential opportunity.

"There are opportunities, such as power-to-gas, where existing gas pipelines could be used to transport hydrogen produced from electrolysis of seawater, or offshore-based methane reformers. This can be used to heat homes and businesses with carbon-free forms of gas through existing gas networks," Ms Hovem says.

However, some regions may be better equipped to tap into these benefits in the short term.

"The United Kingdom and the Netherlands have potential to realise the benefits of power-to-gas arrangements since they already have most infrastructure in place. As we look for the potential in decarbonising, we must also create more value for business," Ms Hovem notes.

DNV GL has a unique role in all of this as it looks to provide much-needed knowledge regarding new potential value points as well as studying and testing decarbonisation opportunities, such as hydrogen.

"Now DNV GL is working with our customers as they look to decarbonise their assets by conducting analysis and laboratory tests on hydrogen and other new gas blends to ensure their stability and safety. We want to ensure everything is as safe and environmentally friendly as possible," Ms Hovem details. "The energy transition can exemplify our role as we can help put everything together. We can add perspective, see the impact and understand what is required moving forward. Our goal is to put facts into

the debate and support our customers and the industry with technology and expertise."

Asia's energy transition

When it comes to the energy transition, Asia finds itself in a state of flux as different countries chart different courses. Unlike other regions, Southeast Asia will not see a significant reduction in the use of oil and coal until closer to 2040 despite the massive potential of renewables.

According to DNV GL's ETO, this is because energy demand in Southeast Asia will keep growing until 2050 due to population growth and an increase in income per capita. However, a lack of energy infrastructure will see some areas jump immediately to newer, more efficient technologies.

"Where you come from can help determine your route. If you are a country that has an established energy infrastructure, you are going to need to move away or build upon the old technology and find a path forward," Ms Hovem notes. "If you're a country that doesn't have that infrastructure, you aren't beholden to what came before you."

In China, the Blue Sky Policy is an example of how the government has acted quickly to implement regulations. The country is also one of the biggest investors in renewable energy while hydrogen is also on the agenda for transportation.

And while DNV GL's ETO highlighted the fact the country is targeting at least 35 percent of power consumption to come from renewables by 2030, other issues may now stand in the way of the country's clean energy goals.

"China will need to import a lot of gas to reach its clean energy goals. The on-going trade war with the US and other geopolitical factors can complicate these efforts," Ms Hovem states. "The energy system is complex and matters not directly related the system can have a negative impact on it." ■



PHOTO: DNV GL

Above left: DNV GL provides carbon capture, utilisation and storage (CCUS) expertise for technical assurance, testing, advisory and risk management.

Above: Ms Liv A. Hovem, CEO, DNV GL – Oil & Gas, believes more businesses will utilise CCS if they face paying taxes for releasing carbon emission.

Facts

- Gas and variable renewables are predicted to be only energy sources that see an increase in demand by 2050
- CCS can stop up to 90 percent of carbon dioxide emissions produced by electricity generated via oil and gas
- DNV GL's report found that CCS use isn't expected to be widespread until 2040
- Energy demand in Southeast Asia will keep growing until 2050
- A way to increase CCS implementation is for governments to place taxes on carbon emissions



NHO and Dansk Industri Asia Base tied up an agreement during the Norway-Asia Business Summit 2019 that provides companies from Norway with access to a Chinese entry service.

Boots on the Ground

CHEYENNE HOLLIS

One of the biggest challenges facing Norwegian companies wanting to enter China is getting started. The market is brimming with potential, but the road to realising it requires businesses to navigate early difficulties that can quickly derail the entire process.

"It is rather challenging for companies who try to enter China on their own. Even big firms with lots of resources aren't always able to successfully deploy. The issues are really multi-level," Mr Tore Myhre, NHO International Director, said. "You have administrative procedures, such as registering a business, that aren't simple. Then you have recruiting challenges. There are lots of practical challenges and the process can be costly. And if you don't do it correctly, you could incur delays which lead to even more costs."

With more and more companies digitising how they operate, there is a big

temptation to move into China without any physical presence. And while this may work in other markets, Mr Myhre is of the opinion that mainland success requires a commitment that goes beyond digital.

"Having a physical presence is a definite advantage in order to be taken seriously by the local market. It shows your long-term commitment. Having a presence in China is really the first obstacle you must overcome when entering the country," Mr Myhre stated.

It is that understanding of the market that led to NHO signing an agreement with DI Asia Base that will

provide Norwegian companies with access to the Danish organisation's China entry services.

"When I first heard about the idea, I thought it was fascinating. The NHO leaders were very supportive about the collaboration and we had their backing since day one. It is something we're very excited to launch," Mr Myhre proclaimed. "DI Asia Base is our sister organisation and we are obviously quite sure of their quality. We know this program works as DI Asia Base has been doing for more than 15 years and has had many success stories. We have also visited the offices and had meetings with the team from DI Asia Base."

Mr Glen Mikkelsen, DI Asia Base Managing Director, explained that Norwegian firms have access to two distinct services the company provides.

"The first service is to hire staff through us to get 'boots on the ground' in the Chinese market without having to spend time and tie up capital in a company registration. This pre-registration service can be started with a few days' notice if the company has a candidate they'd like us to hire. Otherwise, it usually takes two to three months in



PHOTO: DI ASIA-BASE

order for use to go through the recruiting process and hire staff," Mr Mikkelsen said. "The other service we provide is Outsourced Administration, which is where we assume the management of a client's subsidiary in China. That is to say everything to do with Finance, HR, tax and things of that nature."

When it comes to the hiring of local staff, businesses will have the final decision and are free to lean on DI Asia Base to oversee the recruitment or use a head-hunting agency.

"Clients approve the candidates that are selected and they themselves come out for the final round of interviews with the final candidate field," Mr Mikkelsen noted. "We cannot guarantee that companies make a good choice or that we find only amazing candidates. Recruitment is far from an exact science after all. But we do have a very good track record over the past 15 years and very high staff retention compared to the norm in China."

Keys to a successful entrance

DI Asia Base began its China entry service in 2004 and approximately 100 companies have come through the

program since then. Mr Mikkelsen reported that some participants end up forming standalone operations in China once they reach a certain level while others stay with the program as they don't require more than what's provided.

"The program could really work for companies in any industry. It is sector agnostic. Even big companies have used the service since it allows them to have that first presence where they can scale up accordingly. It is the medium-sized companies that benefit the most from the program, however," Mr Myhre pointed out. "It could also be interesting to smaller enterprises, especially those involved in technology. Ultimately, companies need to have a certain level of commitment and maturity to enter the Chinese market so that is something to factor into the decision."

Mr Myhre believes businesses must be prepared before entering China. This includes doing all the necessary homework and having a deep understanding of the situation in regards to business. From there, the key is to find trustworthy partners who understand both sides of the culture and can make life easier, both of which the DI Asia Base entry service can assist with.

"By joining the program, companies are able to focus on business development and strategy instead of day-to-day tasks. Building the business and focusing on why you want to be in China, as opposed to the how, has a great deal of value, both in terms of time and financial costs," Mr Myhre noted.

According to Mr Mikkelsen, most of DI Asia Base's 50 current clients focus mostly on the business development/sales aspect of operations since they are taking care of virtually all other practicalities.

"The important thing for clients starting out in China is to have capable, dependable local staff who truly understands the local market and who feel at ease with having them represent the company," Mr Mikkelsen said. "In order to have success here, you need to be represented in the market and genuinely know what is going on. We provide that security and environment in which such staff can thrive and you can feel at ease that there are dependable control mechanisms in place as well as some measure of oversight."

Understanding the local market and being able to see the situation in real time is also something Mr Myhre found to be a key to success.

"Things can change very quickly here. And the only way to understand and identify this change is to be here. The digital transformation is quick and having the presence in China means it won't pass you by. You can see first hand how and why the change happened and

develop a solution that fits," Mr Myhre stated. "Norwegian companies must understand the local situation and know the market since potential clients will value this. Having an understanding of the situation can also help build trust between a foreign business and the local market."

The right time

While China is a notoriously difficult market to enter, now may be as good of a time as any for Norwegian companies to make their move. According to Mr Myhre, as long as they understand the dynamics of the market and can get boots on the ground, businesses from Norway are in a good position to succeed.

"There are great opportunities in China and there is a great interest around Norwegian businesses. This came after the two high level visits to China, one by the Royal Couple and one by the Prime Minister, where there was a record-high number of Norwegian companies involved," Mr Myhre explained. "A free trade agreement between Norway and China would help create an even more positive environment for future collaboration."

Additionally, several Norwegian sectors are strategically poised to assist China in its future development.

"Norwegian sectors are very compatible with the needs of China. There is lots of technology and knowledge we can deliver to China's value chain," Mr Myhre reported. "There are also products and services that Norwegian companies have which are a high-priority for Chinese development. This is a win-win scenario where both sides can really benefit." ■

Left: From the Dansk Industri Asia-Base office in Shanghai.

Facts

- Norwegian companies will have access to China entry services provided by Dansk Industri Asia Base
- It is the first time the Confederation of Norwegian Enterprise has reached this type of partnership
- Businesses are offered help with administrative procedures as well as hiring staff
- The China entry service was started in 2004
- DI Asia Base has assisted more than 100 companies
- The organisation currently has 50 clients in the program
- Participants can use the service to eventually build standalone operations in China
- The Chinese market moves very quickly making a physical presence necessary



PHOTO: XINHUA NEWS AGENCY

Rainbowfish Ocean Technology wants to help man reach one of the few remaining places on earth it has yet to explore, the Hadal Zone.

Exploring the Deepest Depths

CHEYENNE HOLLIS

These funnel shaped areas at the bottom of the ocean are located at least 6,500 metres below the surface. Species yet to be discovered and even information about the origins of Earth are just a few of the things that could be hiding here.

For scientists, the Hadal Zone is the final frontier for oceanology. Places such as the Mariana Trench, located more than 10,000 metres deep, contain a treasure trove of information. Mr Chi Chen, Senior Project Manager at Rainbowfish Ocean Technology, believes every deep-sea research voyage provides scientist a chance to discover new living species and helps us better understand the history of the ocean.

"Hadal Zones are funnel shaped which means they are accumulators. Additionally, the current in Hadal Zones are slow and steady which allows sediment to record the history of the ocean. For example, by analysing the carbon content of individual layers, we can find the biomass of different ages," Mr Chen details. "We can also learn a lot from creatures in the Hadal Zones,

especially the microbes living in such extreme conditions. These have become very important for the pharmaceutical industry."

Rainbowfish has already organised two exploration voyages to the Mariana Trench. The company sent research vessels that launched full ocean depth landers capable of reaching the bottom of the sea. The landers were able to film the deep depths of the ocean and collected water, sediment and creature samples.

The development of that technology was all part of the company's plan to build a manned vessel capable of reaching depths of 11,000 metres. The goal is to take scientists to the Mariana Trench in 2023. But with harsh conditions not like anything recorded on the surface, Rainbowfish has found itself in uncharted waters.

"I think sending a manned vehicle to the extreme depths of the ocean is like sending a manned spaceship to Mars. Although humans have already sent many probes to Mars, we still want to be the first to step on the red planet. However, the challenges of going from an unmanned mission to a manned one are great," Mr Chen explains.

He continues, "From a technical aspect, a manned submarine is basically an unmanned vessel equipped with a much stronger cabin sphere; a robust and reliable life support system; and a well-functioning wireless communication and positioning system. However, none of these added systems are easy to design or assemble."

The Rainbowfish Project was initiated by Chinese scientist Prof. Weicheng Cui who began his journey as the deputy director of a manned submersible that reached a depth of 7,000 metres. From there he launched Rainbowfish in 2014 with the goal to build a full ocean depth vessel that was capable of sending scientists from all over the world to the deepest points of the ocean. However, this is only part of the firm's vision.

Deep sea solutions provider

The manned submersible capable of reaching the extreme depths of the Mariana Trench may get most of the headlines, but Rainbowfish is developing what it calls a Movable Laboratory of Hadal Science and Technology.

According to Mr Chen, the company is working on two research vessels; two manned submersibles; an autonomous and remote-operated vehicle; and servable landers. It is all part of the company's plan to become a deep sea solutions provider.

"We would like to be the Ocean X of China. Not only are we building a submersible vessel capable of reaching the deepest part of the ocean, but we wish to provide a whole set of solutions for underwater research, engineering and entertainment projects," Mr Chen noted.

Prof Chui wasn't alone in launching Rainbowfish. He was joined by Dr. Xin Wu, a PhD classmate of his, who has focused on commercialising the deep sea technological advancements that Prof. Cui is developing.

The company has launched deep-sea intelligent equipment solutions where it provides vehicles to scientists interested in studying deep-sea science and technology; offshore marine geophysical resource companies wanting to reach materials; and even tourists interested in seeing what lies at the bottom of the ocean.

In addition to this, Rainbowfish has established business units for ocean big-data services and deep-sea bio-technology. Commercialisation is important for the company as it looks to reach its ambitious goals without taking any capital from state-owned enterprises. Instead, the company has been thinking outside the box in order to establish a wide range of mutually beneficial partnerships.

Built to last

The company is one of a few working on the relatively new "State Support + Private Capital" model that is

being used to support high-tech project development in China. Instead of being funded by state-owned enterprises, Rainbowfish has focused on private capital and commercialisation with government support coming by other means.

"The government, no matter central or local, only supports us with policies. All of our shareholders come from the private sector. This has meant that commercialisation of our technology and what we acquire is our top priority," Mr Chen explains.

One policy implemented by the government was the creation of the Lingang Oceanic High-Tech Industrial Park inside the New Special Area of the Shanghai Pilot Free Trade Zone. This area is home to the Rainbowfish research and development centre and provides companies engaged in deep sea exploration, ocean engineering equipment, marine resources development and marine medicine with various benefits including assistance with rent and talent recruitment.

Rainbowfish also has a close relationship with several domestic institutes. Prof. Cui established the Hadal Science and Technology Research Centre at Shanghai Ocean University and is the chair professor at Westlake University as well. According to Mr Chen, his research team at the both institutes helps power research and development for the project.

"China is emphasising the integration of industries, academia and R&D. We are proving this idea is possible by transforming high-end research to be commercialised," Mr Chen states. "Although we are not a big company, we do have support from many sides, including the government. What we are doing is not only about reaching

the deepest part of the ocean, but also building a new model for the scientific research and its commercialisation."

Additionally, the firm continues to seek out more partners across all backgrounds including technology, research or capital.

Mr Chen explains, "We want all of our partners to share the same goal as us. There are many challenges in having so many collaborators. It is the same for all business or research cooperation. However, these challenges and new opportunities go hand in hand. Ultimately, we are all working together for a win-win situation."

In 2019, Ms Kristin Iglum, Consul General of the Norwegian Consulate General Shanghai, visited Lingang and met with government representatives. Local officials promoted Rainbowfish as example of what Chinese companies were accomplishing in the marine industry and discussed how Norwegian businesses could become more involved with domestic firms.

For Rainbowfish, international cooperation beyond capital is vital for its success. Since the company does not produce or manufacture its vessels, it needs to partner with suppliers from around the globe. Not only to further business goals, but also build a lasting understanding of the ocean.

"What we are doing brings attention to the ocean. It raises public interests when it comes to the ocean. Our company has even become a certificated science centre for the youth in Shanghai and many students visited us. We are happy to show them the cool side of marine science and technology. Our hope is to plant a blue seed in their mind to ensure they think about the ocean for the rest of their life. Those kids and teachers who visit are quite fascinated by what they learn. It adds excitement to the project and may even help us create a greater positive impact," Mr Chen concluded. ■



PHOTO: RAINBOWFISH

Above left: Rainbowfish developed the RV Shenkuo and carried out a mission in 2018 that sent unmanned landers to the Mariana Trench. Above: Prof. Weicheng Cui, seen here aboard RV Zhangjian, founded Rainbowfish in 2014 after working on other deep sea expeditions

Facts

- Rainbowfish has sent two unmanned vessels to the Mariana Trench
- The company has plans to send a manned vessel to the Mariana Trench by 2023
- Water, sediment and creature samples from the Mariana Trench were collected during non-manned missions
- Work continues on multiple vessels capable of reaching depths of at least 6,500 metres
- Prof. Weicheng Cui founded Rainbowfish in 2014 after serving on a deep sea expedition
- Rainbowfish does not receive capital for the government and works under the "State Support + Private Capital" model
- Commercialisation of the technology is a priority for the company



PHOTO: OCEAN DATA FOUNDATION

Collection used to be the biggest factor preventing ocean industries from using data. These days, the issue is collaboration and data sharing.

Can Ocean Data Save the World?

CHEYENNE HOLLIS

The recently launched Ocean Data Foundation hopes to provide the platform that liberates ocean data once and for all.

Mr Bjørn Tore Markussen, CEO of the Ocean Data Foundation, recalls a common problem facing the shipping industry, “Vessels still hit whales and when they do, it can kill these magnificent creatures, damage ships and even injure passengers. Right now there potentially is a lot of information about where whales are and where they are going that can be collected but the data is not shared in a way that allows scientists to effectively pinpoint whales and share this information with ships.”

He adds, “If we have could aggregate key whale data, analyse it and provide that information to shipping companies, they could then incorporate that into their own knowledge base and find their own creative ways to solve the issue. It could be through better route planning or knowing when and how to avoid whales in real time. These shipping companies

could then turn around and share these findings with others thus contributing more data, building the knowledge base.”

In many ways, the Ocean Data Foundation sees itself as a matchmaker of ocean data producers and users. A business, researcher or even the public should have a place where they can add data or explore what’s available. Mr Markussen believes the value of data always comes from the application of it and is hoping that by streamlining the process of data accessibility, application of data to decision making becomes much easier.

“They say you don’t know what you don’t know and that’s true. But the goal of the Ocean Data Foundation is to make it possible to have access to greater amounts of what we do know - data and information,” Mr Markussen states. “Currently, if you ask a question, such as

‘where are whales?’, and don’t have the data in-house to answer it, you kind of reach a dead end.”

He continues, “The Ocean Data Foundation is being built to be a place where you can ask a question, find the necessary data resources and apply what you now know towards a solution without hitting a dead end. Using data from various collection points to solve an issue has far-reaching ocean benefits. We think this approach will create a new era of ocean synergy.”

Creating smart oceans

Mr Markussen is no stranger to the ocean having grown up close to Tromsø in northern Norway. His professional career saw him work in Asia at DNV GL and build up www.veracity.com, DNV GL’s industry data platform. These experiences helped him better understand what was needed for the Ocean Data Foundation.

“The one thing I realised is that idealism alone won’t fix the ocean’s problems. The solution needs to be a mix of idealism, capitalism and industrialism to ensure success,” Mr Markussen says. “For me, this is a chance to go back to my roots. I’m very passionate about the ocean and sustainability. We want to assist everyone who is also committed to this cause by empowering them with the data necessary for solutions.”

The Aker Group in Norway and REV Ocean back the Ocean Data

Foundation. It is also supported by the Aker Group-owned Cognite, one of the fastest growing software companies in the Nordics. As such, the platform and newly recruited core team has previous ocean industry or ocean science ventures allowing it to hit the ground running.

Created as a non-profit, non-compete entity, the goal is for the foundation to build and host a platform where everyone can contribute and be involved because that is what will have the greatest positive impact on the ocean.

Understanding the supply and demand of ocean and maritime data is required before that impact can be achieved. At the moment, supply is plentiful, but demand is limited yet growing. Mr Markussen attributes that to the fact most data are siloed, hard to find, and even harder to fuse together.

“Creating a central hub doesn’t mean just serving up all of the world’s ocean data. The challenge for us is to understand what data has value and to liberate what is in demand. If we can successfully do this, it’s possible to add value to ocean-related fields, such as shipping and energy, as well as education and science,” Mr Markussen reports. “Data probably has more value than we understand. But today people are unaware of how they can share their data and find other sources of data.”

The Ocean Data Foundation has identified three key data sources to begin its work: science, industry, and citizens. Each source has a wealth of information available, but liberating it is not without challenges. Science data, in particular, needs to be handled with care.

“In academia, promotion is a matter of getting credit for your work. Data provenance is very important for

scientists and that is why we have put data lineage, entitlement, and citation at the top of our list of challenges to solve. Usually in academics, when research is done, the results aren’t made public until a paper is published. This is a time-consuming way to do things,” Mr Markussen details. “We’re setting up the Ocean Data Foundation in such a way that allows scientists and researchers to publish their results to ensure they receive credit for it before needing to publish a paper.”

Ocean-focused industries obviously collect a lot of data. According to Mr Markussen, even when they are willing, sharing data is easier said than done for industrial data owners. Meanwhile, citizen-science data is useful, non-standardized, and also a bit overwhelming since there are so many potential sources.

Finding partners

The Ocean Data Foundation has already reached partnership agreements with The Norwegian University of Science and Technology, Sintef Ocean, Global Fishing Watch and the World Wildlife Fund and is looking for more. Mr Markussen notes the project requires partners who understand the true potential of what can eventually be accomplished with data.

“Partners ultimately need to share our passion and vision for a better ocean environment. They need to be instinctively curious. They must have a desire to constantly be learning about how they can improve,” he points out. “At the end of the day, what is good for the environment is good for business and policy, so our partners must share that mindset.”

Of course, sharing and storing

data presents a unique set of challenges that are different for each partner. With heightened awareness regarding data security, the Ocean Data Foundation understands the responsibilities that come with the project.

“Data liberation is important, but it can’t be done at any cost. We will comply with all local and international rules and regulations regarding data collection and storage and we have legal partners to advise us every step of the way,” Mr Markussen says. “That is a key factor in building trust for the platform.”

Igniting the revolution

Environmental and social governance (ESG) is another area being carefully watched by the Ocean Data Foundation. With businesses and policymakers now prioritising environmental reporting, there is a needed for greater support when it comes to managing ESG data.

“Our work is less about a data revolution and more about a transparency revolution. Companies need to show what they are doing and how they are doing it. Especially when it comes to environmental impact,” Mr Markussen notes. “We also know policymakers, asset owners and financiers want the data as well. It allows them to make faster, more informed decisions. The platform can help remove the guesswork and reduce waiting times when it comes to ESG.”

But just like any start-up, Ocean Data Foundation needs proof of concept before it can scale and accelerate. It is something Mr Markussen is aware of as he looks to build trust and contribute to a healthy ocean eco-system.

“We are extremely enthusiastic about what we can accomplish, but the first thing we must do is demonstrate that we can solve problems and help in a meaningful way,” Mr Markussen proclaims. “Data can help the ocean, but only if it is shared and used. This is a vision I strongly believe in.” ■



PHOTO: OCEAN DATA FOUNDATION

Above left: Above left: HRH Crown Prince Haakon of Norway (far left) at the Ocean Data Foundation launch. Above: The Ocean Data Foundation core team has previous ocean industry or ocean science ventures experience.

Facts

- The Ocean Data Foundation was launched in October 2019
- Partnership agreements have been reached with The Norwegian University of Science and Technology, the World Wildlife Fund and others
- The Ocean Data Foundation is backed by the Aker Group and REV Ocean
- Information will be collected from a global network of public and private partners
- Ocean data is mostly siloed making it hard for firms to find information outside their own
- Mr Bjørn Tore Markussen was named as one of the top 10 global leaders in ocean technologies by Lloyds List in 2018
- The Ocean Data Foundation will work with science, industry and citizen data



DESIGN FUTURES

elc International Schools are places where children are active protagonists in their own learning. They comprise a family of unique schools where students base their research, discovery, and experimentation within the context of contemporary culture and learning. Those within strive to resolve dilemmas of individual and shared importance in their quest for knowledge, and understanding but most importantly, imagine possibilities for a better future.

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662-7654, 391-4866
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THE PURPLE ELEPHANT at 39

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*digital bicycles for enjoyment in the park using
arduino technology*
designed by Pop and Anna (ages 8 to 9 years)



*automated solar and wind-powered street cleaner
using arduino technology*
designed by Caden, Fabian and India (ages 10 to 11 years)

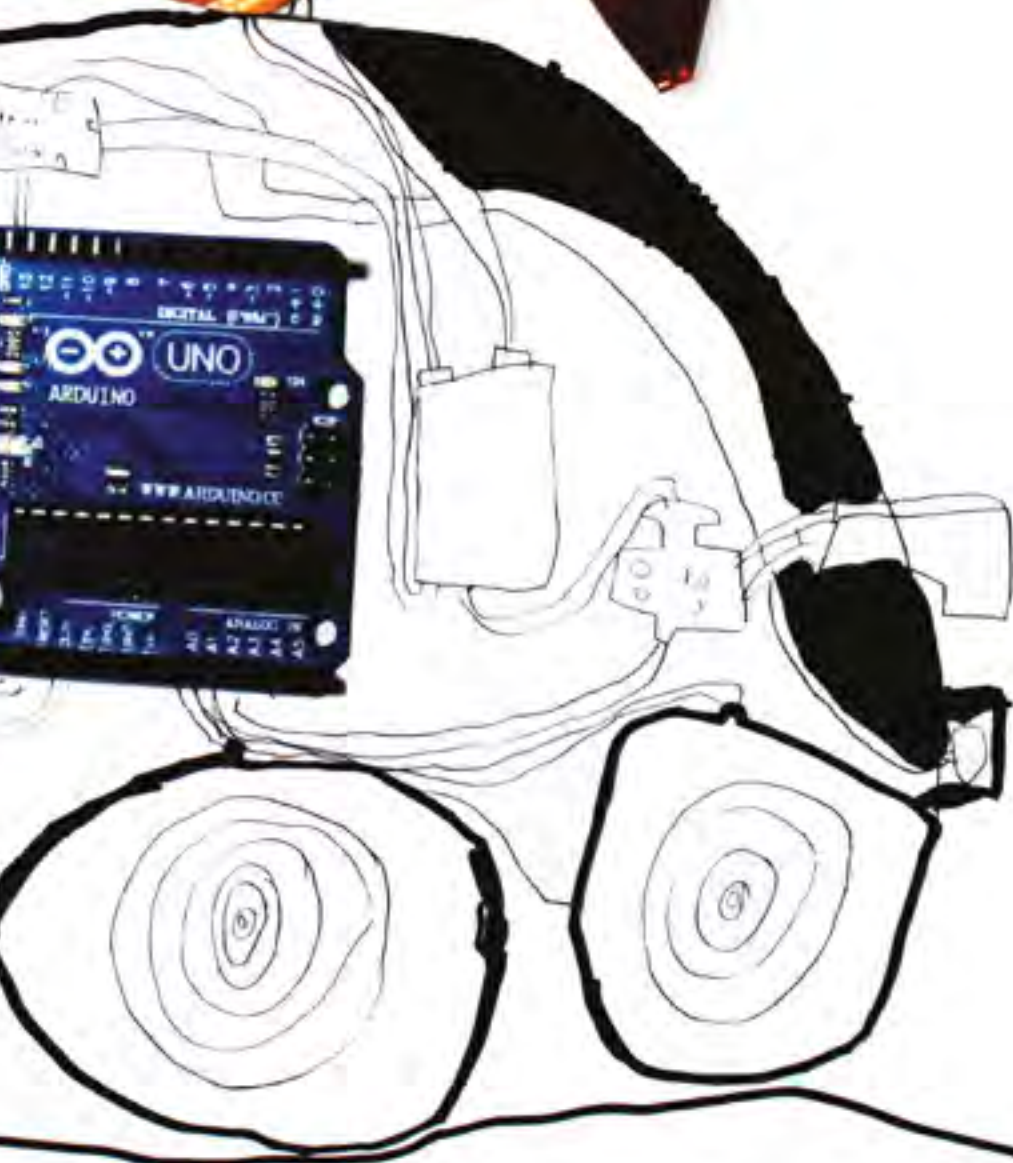




only elephants should wear ivory



elc international schools





Norway has
perfect living conditions.

For salmon.

SEAFROM
FROM
NORWAY
NORD

Norway-Asia Business Summit 2019 was a great success with more than 1,000 delegates present. The summit was held at W Shanghai - The Bund, a stone-throw from the historic river front, from 31 October to 2 November 2019.

The Biggest Ever

Summit featured many fantastic cultural performances, both from Norway and from China. That in addition to wealth of business presentations and panel discussions and finally the grandest ever Gala Dinner with mouth-watering dishes of Norwegian seafood flown in for the occasion. [Photos](#) by the NABS 2019 team.





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1. The biggest Scandinavian pop phenomenon in years, Marcus & Martinus, performs at NABS 2019.
2. The Norwegian Minister of Trade and Industry, HE Terje Røe Isaksen together with Fu Chengyu, Executive Vice Chairman of Beijing Energy Club.
3. Minister of Trade and Industry, HE Terje Røe Isaksen addresses the delegates
- 4-5/9. Other cultural performances were given by Norwegian violinist Eldbjørg Hemsing, the Manao Drummers of China and the Norwegian National Wushu Team
6. Jotun CEO Morten Fon with organiser Dilek Ayhan
8. The summit featured many prominent Chinese delegates.
10. The organising team consisted on many dedicated helpers; here the registration desk
11. The Economist's Mary Boyd gave insights into China in a Global Economy
12. The organising team for NABS 2020 headed by Ambassador Gunn Jorid Roset asked delegates to mark their calendars for Kuala Lumpur 22-24 September 2020 where the next summit takes place



While the impact of China's green initiatives are noticeable on the surface level, they are backed by something equally as impressive.

Eco-Friendly Economy

CHEYENNE HOLLIS

The country has built up a green economy which is now backed the government and helping support wide ranging environmental policies.

In 2015, the National Bureau of Statistics of China found that the country needed CNY3 trillion (USD434.6 billion) to CNY4 trillion (USD579.5 billion) of green investment annually in order to achieve its environmental goals and international carbon emission commitments.

The following year, the People's Bank of China and six government agencies issued the Guidelines for Establishing the Green Financial System that gained the approval of the State Council. The high-level backing ensured China's green investment and financing aims could be scaled up rapidly and allowed for a swift transition to a green economy.

"In China, we began thinking about green finance in 2014. It started with 14 steps to build a green financial eco-system that were adopted by the government in 2016. At the time it was the only over-arching green financial system in the world. China has initiated even more initiatives as part of a green economy," Mr Ma Jun, Chairman of

Green Finance Committee (GFC) of China Society of Finance and Banking, pointed out.

Mr Ma, who also serves as a Member of the Monetary Policy Committee of the People's Bank of China, added that the focus on the building of a green economy wasn't solely a domestic exercise. When China held the G20 presidency in 2016, the country launched the Green Finance Study Group which it co-chaired alongside the United Kingdom. And when the country hosted the G20 summit in Hangzhou, a focus was placed on green finance.

"In 2016, China was head of G20 and we emphasised green finance. We wanted to create a consensus on green finances which we eventually accomplished. This was an important milestone completed at a very high-level," Mr Ma noted.

The Belt and Road Initiative is another area where China is incorporating its green economy into the global system. According to research from New Climate Economy, taking action against climate

change as opposed to a business-as-usual strategy could produce a direct economic gain of USD26 trillion between 2018 and 2030. Additionally, there would be a net employment gain of 37 million jobs. China believes it can help the world achieve these benefits and is looking for partners willing to contribute as well.

"We launched green investment principals as part of the country's Belt and Road Initiative. A total of 33 financial firms have agreed to these principals, but there is still room for growth," Mr Ma said. "We are looking for participation from Norwegian financial institutions and companies as they can help play a role in the building of a green economy."

A total of USD57.4 billion worth of green bonds were issued in Belt and Road Initiative countries last year. China accounted for nearly 40 percent of the green bonds issued in the countries, the highest amount globally, according to research from Refinitiv Data. However, green bonds are just one area of China's green economy plans.

The four pillars

Mr Ma explained that the Chinese green economic movement can currently be broken down into four pillars: taxonomy, incentives, disclosure and green financial flows. Each one has been developed since 2016, but the speed of this has differed for the four pillars.

According to Mr Ma, having formally recognised taxonomy allows for universal standards to be established.



PHOTO: MOE RSCHY

This is important for a number of reasons. Firstly, financial institutions have a clearer picture that allows them to focus on making correct investments. Additionally, an agreed upon taxonomy can prevent greenwashing where some businesses try to circumnavigate the system by falsifying information. At the moment, China currently has three sets of taxonomy.

With taxonomy in place, it allows for the government to begin incentivising the shift towards a green economy which is something Mr Ma stressed, "The government needs to provide incentives to make projects worthwhile. This includes low-cost funding and easily accessible financing."

In its Exploring Green Finance Incentives in China report, PwC China suggested the country's banking regulators introduce short-term programs to banks that entices them to provide preferential rates to green industries or possibly provide higher flexibility in their capital arrangement should they participate in increased green finance lending.

The goal of these incentives is to stimulate investment in green projects, but Mr Ma noted greater disclosure would be required. It is something China has been working on and could soon roll out.

"Everything needs to be reported when it comes to environment, both the benefits and negatives. In 2020, China will introduce mandatory reporting for all listed companies. We believe we

are the only country in the world that requires this," Mr Ma stated.

However, some concerns regarding disclosure remain. Even with China launching mandatory reporting this year, it will need to work to develop the knowledge and tools that ensures its effectiveness.

"Disclosure of environmental performance information remains insufficient. Within the financial sector, environmental risk analysis capabilities need to be developed," Ms Wang Yao, Director General of the International Institute of Green Finance, Central University of Finance and Economics, Beijing, told The London School of Economic and Political Science. "At the same time, due to the lack of tools for environmental risk identification and quantification, some financial institutions underestimate the risks that polluting industry investments may bring. Moreover, most practitioners lack professional knowledge of green industries."

The final pillar of the Chinese green economic movement is to establish and grow green financial flows. This is something already happening in China, but the scope is somewhat limited.

"China has developed a system of government green loans, ETFs and other financial flows to stimulate this activity. A total of 21 Chinese banks now have outstanding green loans while 500 green funds have been launched in the past year," Mr Ma said. "Mostly, these funds have targeted infrastructure, but now they are moving into other sectors, such as technology. There is an opportunity here for Norwegian companies to become more involved."



PHOTO: NABS 2019

Above left: Funding environmental projects, such as ones to eliminate smog in Shanghai, is part of the reason green finance is emphasised by the government. Above: Mr Ma Jun explained to the crowd at NABS 2019 that Norwegian financial institutions and companies could help with the green economy.

Green support

And while these are the four pillars driving green finance in China, there are several other aspects contributing to the green economy. For example, the Chinese Emissions Trading Scheme (ETS) is expected to oversee its first trades after being announced in 2017. Experts hope it can encourage power utilities and manufacturers to reduce their reliance on coal while China's Ministry of Ecology and Environment is already exploring ways to expand the scope of the programme.

There is also the compulsory green insurance system recommended by the People's Bank of China in 2017. The bank explained this insurance could make investment in high environmental risk products less appealing to shareholders and could eventually be a key element of the green finance system.

In 2018, Shenzhen instituted mandatory environmental pollution liability insurance requirements for more than 1,000 businesses in ten industries. It remains the largest city in China to have enacted a mandatory green insurance system.

For China's green economy ambitions to fully succeed, more work will need to be done. In particular, the law will need to keep up with green finance.

"Improvement of key laws and regulations are critical next steps. It is necessary to strictly implement the Environmental Protection Law and promote the Regulations on Compensation for Ecological Protection to clarify how the financial system should manage environmental externalities," Ms Wang proclaimed. "At the same time, legislative amendments in the financial sector also need to be promoted, such as the inclusion of green elements into the Commercial Banking Law, Securities Law, Insurance Law, and pension fund regulation." ■

Facts

- China needs USD434.6 billion to (USD579.5 billion of green investment annually to support environmental goals
- In 2016, the Guidelines for Establishing the Green Financial System were approved by the government
- The country launched the Green Finance Study Group when leading the G-20 in 2016
- China accounted for nearly 40 percent of the green bonds issued in in Belt and Road Initiative countries
- The four pillars of the Chinese green economic movement are taxonomy, incentives, disclosure and green financial flows
- Shenzhen instituted mandatory environmental pollution liability insurance requirements in 2018



PHOTO: GUANGDONG DAPENG LNG

China is working on a 35-year plan to transition from fossil fuels to gas as the country's primary energy source with LNG-to-power a playing a key role.

New LNG Superpower

CHEYENNE HOLLIS

This will only add fuel to the fire that is China's ever-increasing demand for LNG. For Norwegian businesses, it will create several new opportunities.

According to Norwegian Energy Partners (NORWEP), it is only a matter of time before China becomes the largest importer of LNG. When it happens remains uncertain, but most experts believe that it will take place during the decade.

"China will be the largest importer of LNG. It is not easy to say when this will happen, but estimates assume that China will be the largest importer in a few years," Mr Eirik Melaaen, Director for Midstream and LNG NORWEP, says. "China has a growing consumption of energy and the increased demand will be covered by a large number of coal power plants. Depending on governmental regulations and the requirement of greener solutions, coal could be replaced by powerplants utilising natural gas."

Demand for LNG in China will come from multiple sectors. LNG-to-power will be important as the country

looks for clean energy sources. However, industries such as shipping are also contributing to the increase in demand for LNG. This means production and importing of LNG will become even more important.

"The demand for LNG in China is expected to be larger than production, so it could be a challenge. But within 35 years we expect there will be a differentiated energy market consisting of several energy sources. Hydrocarbons, including gas, wind, solar, nuclear and hydrogen, will be important. Focus for the future will be low carbon solutions and emission could be captured as carbon capture storage (CCS)," Mr Melaaen states.

He continues, "Since it is easier to use different energy sources and low carbon solutions onshore, I assume shipping will prioritise LNG as fuel. But within 35 years there will be several

propulsion alternatives including hybrid solutions, hydrogen, batteries and fuel cells."

Chinese shipping and LNG

According to Mr Xu Guoyi, Director General at the Commission Office of Shanghai Combined Port, 8.4 percent of China's emissions come from shipping while 30 percent of all emissions are generated by transportation. The Chinese government implemented a domestic emission control area (DCEA) in 2015 to help curb pollution at core ports.

The program has been seen as a success and may soon be expanded to all coastal areas of China as the government wants to further encourage LNG shipping and hybrid shipping. The latter in particular is something that could have a greater impact on this moving forward.

"Hybrid solutions will have a large impact on local pollutions in coastal area and rivers. But all types of low carbon emission solutions will influence on the total carbon footprint," Mr Melaaen explains. "In general, the infrastructure and availability of LNG is necessary to get increased use of LNG in the shipping. This is now improving around the world and there is now demand for getting increased use of LNG in Chinese local shipping."

However, China's push to embrace LNG in the shipping industry has hit some choppy waters. The country has

even had to create incentives for LNG usage in order to quicken adaptation.

"The country started building up an LNG fleet in 2012, but the process has been slow. About half of LNG ships in China are new builds and the other half are retrofit. China has also built 21 LNG bunker stations but only three are operational. There are 21 LNG terminals in the country with 11 more in the planning stage," Mr Xu explains. "The government is providing incentives for LNG and we will hopefully see more movement towards LNG in the future."

Mr Melaaen points out that with infrastructure in place, the shipping industry in China could be closer to moving past these "chicken and egg" challenges when it comes to LNG usage.

"If the infrastructure is not in place, shipowners will keep building vessels operating on fuel. Now the infrastructure is ready with 21 bunkering stations and hopefully shipowners follow up with vessels operating on LNG," Mr Melaaen says.

Can Norway help?

As China looks to reduce the role of fossil fuels, it will need partners that have experience with renewables and other energy sources. The fact Norway has that experience could bring the two countries close together.

"China shares a sustainable vision with Norway. The EU has targeted zero carbon emissions by 2050 and China will soon submit its own zero carbon emission strategy," Mr Li Junfeng, the Secretary General of the China Renewable Energy Industry Association, states. "We have a lot to learn from Norway in order to reach this target. We want high-quality,

sustainable growth and free ourselves from fossil fuels. We can look towards Nordic companies and see the vision they had to achieve sustainability goals. These can help Chinese companies work towards our own goals."

This will create new opportunities for Norwegian companies in China when it comes to LNG. An example of this is the work Equinor is doing in the country.

"Norway has a lot of experience and technology when exploring for LNG. We've already worked with Equinor and we are now looking at ways we can explore LNG in third countries. Historically, our two countries have worked together and Equinor's agreement with China shows what can be achieved," Madame Li Yalan, Chairperson of Beijing Gas Group and Chairperson elect of International Gas Union, says.

With China in a strong position when it comes to the LNG business, the country can serve as a financier of new projects or a stakeholder in existing projects as well as being a potential supplier of solutions, such as vessels, according to Mr Melaaen. The country is actively looking to play a role in LNG, but also understands it needs support from other countries.

"There are no limits on foreign investment in the LNG market. We welcome greater Norwegian investment. We aren't a major country for LNG production, but we look for further collaborations with LNG importers. One goal is to try to find ways to develop offshore LNG exploration," Madame Li notes. "We hope to better understand best practices by collaborating with companies in the LNG sector."

Norway has a long history and lots

of experience when it comes to LNG and LNG solutions so there are several additional opportunities for businesses to explore in China. Case in point, Norwegian firms have begun installing FSRUs along China's coastline.

"Norway has a wealth of experiences with LNG carriers, FSRUs and FLNGs," Mr Melaaen says. "There are several restrictions on building an onshore terminal. There is the long wait time to get permission and the long construction time. FSRUs are quicker to get up and running which makes them desirable."

Uncertainty in 2020

Mr Melaaen believes many other opportunities for Norway exist in the Chinese LNG sector. These include the development of a supply chain with environmental solutions and the implementation of optimised and digitalised LNG solutions. And while all these will certainly help in the future, they won't impact 2020.

Currently, LNG infrastructure needs to be built up in several areas of China with parts of the country currently not connected to existing LNG pipelines. In order to fulfil demand in some of these areas, Japanese gas companies have begun shipping unsold inventories to Chinese clients. Nikkei Asia Review reports that these shipments are a fraction of the amount of traditional LNG deliveries.

A report from China National Petroleum Corp. found that LNG imports are expected to rise 9.5 percent in 2020 when compared with the previous year. However, where exactly it will all come from remains to be seen. And, in fact, even more LNG could soon be making its way to the mainland in the short term.

Phase 1 of the tentatively agreed upon trade deal between China and the USA calls for the country to buy USD50 billion more in energy supplies. Analysts told Reuters that this would have to include LNG shipments from America, which would impact both current exporters and China's future plans for LNG development. ■



PHOTO: SHUTTERSTOCK

Above left: Guangdong Dapeng LNG terminal was the first LNG terminal in China. The country is predicted to be the largest LNG importer in the next decade. Above: LNG Tanker in operation.

Facts

- Chinese LNG imports are expected to rise 9.5 percent in 2020
- China will become the largest importer of LNG sometime in the next decade
- LNG demand will come from multiple sectors including energy and shipping
- The country has built 21 LNG bunker stations but only three are operational
- China is looking for partners to explore LNG in third countries
- Shipping accounts for 8.4 percent of China's pollution



PHOTO: SERVOGEAR

Within the next ten years, zero-emission fast ferries capable of reaching speeds of 40 knots will be operating in Norway.

More Speed, Less Emissions

CHEYENNE HOLLIS

Advancements in propulsion technology are helping drive development forward with hybrid and fully electric vessels already in operation. There is also interest from Asia in importing the technology.

When the Green Coastal Programme went into effect in 2015, the goal was to ensure further collaborations between private and public authorities that focused on the development of environmentally-friendly vessels. Ferry operators in Norway were among the first to adapt.

Some of that was born out of necessity. Ferry operators were competing for routes overseen by federal and municipal agencies. They were requiring operators submitting tenders to serve these routes to include low or zero emission vessel investment as part of their bid. This regulation helped speed up progress which some operators had begun working on years ago.

"Fast ferries started being optimised 15 years ago in Norway. They were made smaller and more efficient. In the last five years, there has been a drive to get

hybrid vessels up and running. Now we are seeing hybrid and some fully electric vessels already operational. The energy storage limits mean speeds only reach 18-20 knots, but progress is being made," Mr Torleif Stokke, Managing Director at Servogear, says.

Servogear is committed to developing optimised propulsion systems that reduce energy consumption as it looks to lend its expertise to a rapidly evolving space.

"Our focus has been to design and optimise propulsion for high-speed ferries. We have continuously developed the technology so efficiency is increased and performance at high speeds improves," Mr Stokke notes. "Energy sources are also changing to electric which has meant we needed to develop new ways of driving propellers. This has opened up other possibilities

since electrical energy sources allow us to utilise the propulsion system even better."

Servogear and its partner, Brunvoll Mar-El, developed a plugin hybrid propulsion system that is now being used in the world's first diesel-electric hybrid fast-ferry. The vessel, Fjordled, began operations last year and highlights what propulsion technology is capable of. According to Mr Stokke, time and further requests from those agencies overseeing ferry routes are needed to take the next step.

"We know now that it is possible to have a zero-emission fast ferry that can reach speeds of 40 knots. It just needs time for the technology to be implemented and tested. We expect the government to ask for tenders for zero emission fast ferries in Norway," Mr Stokke explains. "Within ten years, fast ferries in the country will be zero emission vessels and there could be as many as 70-80 in operation."

Of course, there is also a business element to the innovations being developed by Servogear. The company wants to cultivate technology that reduces emissions and improves performance while also providing a cost savings to operators.

"If you can reduce fuel consumption, you can reduce emissions. In some ways, this is building on our motto. We hope we can make a small contribution to fighting climate change. It motivates us

to keep going. And there are business opportunities for the company and ship operators as well. We can be successful in both areas," Mr Stokke points out.

He continues, "We have been investing in the business and moving it towards solutions that could support hybrid and zero emission vessels. Customers are asking for these projects, but there are clients who are still working with diesel mechanics and that remains our core business. There is a shift coming and nearly half of our propulsion systems will be on hybrid or zero emission vessels in the next six to eight years. Hopefully, this builds our reputation and allows us to continue our business."

Looking overseas

While the impact of Servogear's propulsion advancements can be seen in Norway, the company has also started making inroads in Asia as well. In addition to participating in the Norway-Asia Business Summit 2019, the firm travelled to Hong Kong, Singapore and Malaysia in order to meet local partners and explore future endeavours in the region.

"In Asia, the timing is good for us. There is interest in technology that lowers fuel consumption and reduces environmental impact. Our words are not falling on deaf ears here," Mr Stokke notes. "It is possible for us to grow in the Asian market. We have several proposals from companies in the region and the response in general has urged us to work harder."

Servogear technology is currently being tested on workboats in China's Special Autonomous Regions. According to Mr Stokke, the initial feedback has been positive, and the company hopes it is in a position to expand the partnership

in the future.

The company has also found success in providing solutions for windfarm support vessels. Servogear has provided energy-efficient propulsion technology for more than twenty of Windcat Workboats' vessels, and a total of more than 80 vessels in the European Winfarm CTV market. The propulsion system of these vessels requires special characteristics in order to keep them stable against the floating turbine. This experience could help the company in China where the offshore wind industry is growing rapidly.

"China is currently building a lot of offshore wind parks and they will need many vessels to support these operations. By opting for hybrid vessels, they could be eliminating a potential source of additional pollution in coastal areas which has been an area of concern for the government," Mr Stokke points out.

And these are just a couple areas Servogear can contribute to in Asia. A glance across the Huangpu River while Mr Stokke was in Shanghai revealed the true potential energy-efficient propulsion could have in the region.

"When I was in Shanghai, I saw a lot of vessels on the water. You had ferries, sightseeing ships, catamarans, coast guard boats and more. You could retrofit these vessels with more efficient propulsion systems as well as hybrid or zero emission technology. They just have to make the decision to do so," Mr Stokke says. "We want to contribute to the proliferation of low and zero emission ferries and ensure that it becomes viable. But we also want to help clients improve profitability and reduce operating costs for vessels."

Servogear has completed retrofit projects in the past and these have been

found to pay shipowners back quickly.

"If a vessel is operational let's say 3,000-6,000 hours a year, reducing fuel costs can be a huge source of savings. Since fuel is usually the largest cost in a ship's OPEX budget, reducing that is important. We see in many projects 30 percent or more reductions. And if you are reducing the amount of fuel being used, obviously the amount of emissions being produced drops as well," Mr Stokke states. "This is an area where we need to share our knowledge and show what type of savings can be achieved."

With local pollution in many parts of Asia regularly reaching unhealthy levels, finding new ways to reduce emissions is becoming increasingly important. Especially in coastal and river areas that are highly dependent upon fast ferries and other forms of water transportation.

"In Norway, reducing pollution from fast ferries was an important topic. They are energy demanding vessels and emissions per passenger can be significantly higher than a bus. But that also doesn't factor in that the bus needs infrastructure, such as roads being built and maintained, to operate. All of these create additional emissions," Mr Stokke notes. "The sea doesn't require all this infrastructure. If you can reduce the emissions fast ferries produce, they can contribute quite a bit to solving pollution caused by transportation in some areas."

Ultimately, the speed of the shift from polluting vessels to low or zero emission ones will be determined by the willingness of countries in Asia to enact regulations that emphasises the use of this technology.

"We need regulatory authorities and decision makers to support this. The technology being used to support low or zero emission vessels will be risky before it matures because of the price. But if regulation supports low and zero emission vessels over traditional ones, the shift happens more quickly," Mr Stokke proclaims. "The price of polluting needs to be higher in order for adaptation to be incentivised." ■



PHOTO: NABS 2019

Above left: Fjordled, the world's first diesel-electric hybrid fast-ferry, uses a plugin hybrid propulsion system developed by Servogear and Brunvoll Mar-El. Above: Mr Torleif Stokke, Managing Director at Servogear, seen at NABS 2019. The company has received positive feedback from clients in Asia

Facts

- Servogear and Brunvoll Mar-El helped develop a propulsion system used in the world's first diesel-electric hybrid fast-ferry
- Zero emission ferries are now capable of travelling at speeds of 20 knots
- Technology for zero-emission fast ferries that can reach speeds of 40 knots is being ready
- Servogear technology is being tested on workboats in China's Special Autonomous Regions
- More government regulation is needed to encourage the development of low and zero emission vessels



PHOTO: STARBOARD

A recently announced partnership between Starboard and Siam Cement Group (SCG) will see the two companies work together to address environmental challenges.

Dynamic Duo

CHEYENNE HOLLIS

And while on the surface it may seem like an unlikely pairing, the duo actually shares a common vision.

Starboard's commitment to the environment is as well known these days as its surfboards. It was one of the first companies to become carbon positive, a commitment that will see the business balance its current carbon footprint as well as the footprint created during Starboard's entire 25-year history.

The world of stand-up paddle boards, windsurf boards and other water sports products may seem miles away from SCG's core business of concrete, building material and chemical manufacturing, but the pair did recognise each other as industry leaders. When discussions took place, both sides saw a desire to find new ways where they could innovate sustainability. This led to the signing of an MOU.

"The partnership developed very organically. The dialogue is very open. We spent a lot of time exploring capabilities and how we could learn from one another. The scope of the agreement is a testament

to that," Ms Tasmin Chilcott, Starboard Eco Project Coordinator, says. "When you think about a large corporation, the stereotype is that they are very rigid and slow moving, but SCG wasn't like that at all. This has allowed us to create a very meaningful partnership."

When Starboard and SCG looked at building a partnership, the key was to find a holistic approach where they could contribute at all levels and in places where it was possible to make a real difference. According to Ms Chilcott, the current arrangement provides both companies with a chance to build something meaningful for the environment as opposed to a quick fix or press opportunity.

"I think we both understand the challenges facing the environment require engagement and a willingness to dedicate resources," Ms Chilcott states. "Innovating sustainability requires teamwork. Even together, it won't solve

everything. However, reducing our carbon footprint and virgin material usage is important. And if we can help SCG set the standard in this regard, our belief is that other companies will follow suit. It will also allow us to gain more visibility for our environmental efforts, something we hope others see and are inspired by."

Green plans

One area SCG is looking to become involved with is Starboard's mangrove tree planting efforts. A single mangrove tree can absorb up to one tonne of carbon over 20 years. The company created the Starboard Mangrove Project and works with World View international (WIF) to plant trees at the Thor Heyerdahl climate park in Myanmar.

"SCG is considering different options for planting trees, but the Starboard Mangrove Project with Worldview International Foundation is something they are very interested in," Ms Chilcott notes. "Even if they decide to go with another planting project to offset carbon emissions, we are still able to share what we have learned through our own experiences to ensure they create something with a long-term positive impact."

Starboard has been very active in planting mangrove trees to offset their own carbon output. They also do the same when sponsoring events or competitions. The company will work

with event organisers to absorb the emissions of electric usage and those travelling to attend. In addition to taking carbon dioxide out of the environment, mangrove trees create a healthy ocean habitat for several species.

The mangrove tree planting is only one part of the agreement between Starboard and SCG. Several other areas have been identified as potential synergy spots between the two companies.

"The partnership with SCG motivates us to explore all avenues. We want to keep pushing what is possible. We see opportunities to work directly with their scientists to develop new materials for our boards that allow us to reduce our reliance on virgin materials. That's exciting for us," Ms Chilcott proclaims. "They can share knowledge in terms of what's possible on how we can improve in building our products."

No specifications have been made yet as Starboard and SCG investigate what can be done regarding production. This includes listing every element in all Starboard boards including the performance standards they have to meet. Ms Chilcott hopes that together they can eliminate some virgin plastic usage and include more recycled products in future Starboard releases.

"Our goal is to be 100 percent sustainable. We aren't there yet, but working with SCG can help us get closer to this dream. All of our boards use renewable materials, but finding ways to incorporate more without sacrificing performance is important to us," Ms Chilcott reports. "Having a partner like SCG gives us more freedom to find solutions and test them out much faster than on our own. A lot of what we do is

now is trial and error, so having that SCG expertise is an incredible asset."

The partnership is multi-faceted and not simply related to the activities of each company. For example, SCG will be contributing to Starboard's efforts with the Ambassador of the Planet environmental education program.

"Ambassador of the Planet is another aspect of the partnership we're excited about. By working with SCG, they can help us get the curriculum to more children who will now have the opportunity to learn about sustainability and caring for the environment," Ms Chilcott says. "We are currently adapting the curriculum so it is tailored to a Thai audience with relatable examples. SCG will then assist us with rolling out the program through their connections with schools and youth groups."

The way forward

Starboard's desire to be a leader in both sustainability and quality is well known, but Ms Chilcott admits it takes resources and knowledge that can be difficult to obtain. On the other hand, SCG has both these, but benefits from practical experience to improve its sustainability efforts.

"The flow of knowledge goes both ways. We can share information on things like the mangrove planting and sustainability activities that SCG may not have access to. Meanwhile, we have a chance to learn new methods and create new solutions with their help," Ms Chilcott states. "By coming together, we are stronger, quicker and have the ability to develop more powerful solutions to help the environment."

Looking ahead, both companies

believe there is an opportunity to create standards and practices other companies can duplicate. While the MOU is between SCG and Starboard, Ms Chilcott sees no reason that more businesses can't be included assuming they share the same vision and determination.

"The agreement is truly open-ended in terms of what we can do and accomplish. Sustainability is a part of who we are as a company and it is also very important to SCG. This is why we want to share everything, not just with each other, but to anyone who may be interested," Ms Chilcott details. "Even if businesses aren't interested in working with us directly, they can still utilise what we have learned. When it comes to helping the environment, there is no reason to keep information a secret."

Starboard hopes to get things started as soon as possible and is already working closely with SCG. Long-term, the goal is to find and develop new ways to reduce both companies' carbon footprint and reliance on virgin materials.

Ms Chilcott recognises the fact that other companies may see the issues facing the environment and may not know where to start with their own sustainability efforts. The key is not to be overwhelmed by the size and scope of the issue. Instead, action should centre on small, positive changes they can make at home.

In fact, this is how Starboard started its journey towards sustainability. The company took small steps, such as eliminating plastic usage in the office and providing vegetarian lunches to staff, before tackling larger issues. Eventually solar panels were installed at its Bangkok headquarters to help reduce its footprint through production and electricity usage.

"The focus should be on taking little steps. Things like banning straws in the office or installing water dispensers may not seem big, but can get the ball rolling. It helps develop habits and makes people realise change is possible," Ms Chilcott points out. "From there, it becomes easier to build efforts and try more ambitious activities. If it wasn't for our small, early steps in sustainability, we wouldn't have been able to accomplish things such as being carbon past positive." ■



PHOTO: STARBOARD

Above left: Starboard installed solar panels at its Bangkok headquarters as part of its efforts to be carbon past positive. Above Starboard and SCG signed an MOU that will see the two firms investigate a range of sustainability opportunities.

Facts

- Starboard and SCG signed an MOU that will explore potential sustainability opportunities
- SCG may become involved with Starboard's mangrove tree planting efforts to offset carbon emissions
- Starboard was among the first companies in the world to become carbon past positive
- SCG will support the Ambassador of the Planet environmental education program in Thailand



PHOTO

The concept of the circular economy continues to gain traction across the globe.

Closing the Loop

CHEYENNE HOLLIS

The idea of extracting the maximum value from resources while keeping them in use for as long as possible is increasingly important as resources dwindle and the environment suffers.

A 2015 paper published in the academic journal *Science* estimated the amount of plastic in the world's oceans ranges from anywhere between 4.7 and 12.8 million metric tons. This caused alarm among the science community, but did not totally resonate with the public until a story broke about a dead whale washing ashore in Spain with 64 pounds of plastic debris in its stomach. Meanwhile, similar occurrences in Norway and Thailand hit closer to home.

"The pictures of the whales with a stomach full of plastic as well as other injured animals was a real eye opener for the public," Dr Tine Rørvik, Global

Director Circular Economy at SCG, says. "Both businesses and people saw this and started to fully understand the magnitude of the problem. This awareness led to a push to more sustainable options and has helped accelerate the circular economy movement."

Dr Rørvik admits there are quite a few definitions of circular economy currently being promoted but as it relates to SCG, the focus is on the recirculation of resources within the value chain. Ultimately, the minimising of resource usage should still provide maximum benefits to all stakeholders as well as the nature.

The conglomerate has been at the forefront in order to evolve its business in a sustainable manner. Earlier this year, SCG hosted its annual Sustainable Development Symposium in Bangkok where much of the emphasis was placed on circular economy. The event brought together collaborators from the government, private sector and civil society and touched on how the circular economy model could be applied in daily life and finding ways to improve waste management strategies. Additionally, Dr Rørvik was appointed to her new role to be a part of the team guiding SCG's efforts.

"We want to constantly improve and our goal is to develop our strategy in order to stop the leakage of materials into nature. We don't want to see valuable materials ending up as waste in the land or sea," Dr Rørvik explains.

She adds that it is important to work throughout the value chain from feedstock, through raw materials, products, all the way to the consumer. For instance in recycling plastic food packaging, the entire system needs to

be engaged to be successful. Perhaps, the most difficult challenge in creating a circular economy is waste infrastructure, part of this is somewhat lacking in regions like Southeast Asia.

"In Europe, we already have several pieces of the infrastructure in place especially when it comes to the collection and sorting of plastics," Dr Rørvik states. "In Asia, we need to focus on building a more extensive system for collection and sorting of plastic. If we can get improved infrastructure created in the region that encourages recycling, it will make it easier for more companies to become a part of the circular economy. These efforts can start small and be built up over time."

However, this requires significant investment as new technologies need to be implemented and even developed and current methods improved upon. Dr Rørvik points out this takes time, especially in places where the collection of recycled materials is inefficient or non-existent. In these cases, the local government needs to help stimulate this activity through rules, regulations and cooperation with the industry.

SCG is working on multiple fronts to spur the movement towards becoming a circular economy. It is connecting with many industries and disciplines as well as governments. Some of these efforts are already starting to bear fruit. For example, the company showcased circular economy-based environmental innovations to communities and attendees at its SD Day 2018.

Innovations include floating

solar solutions, both ground-mounted and rooftop solar installations, the vermicomposting fertilisers from organic sludges, the reuse of gas waste in the manufacturing process and fish homes made out of marine debris and municipal waste to preserve marine ecology.

SCG also revealed its Recycled Plastic Road, a pilot project produced by collaborative efforts between SCG and Dow Thailand Group. Plastic waste, such as plastic bags, was collected at SCG offices and communities throughout Rayong's Map Ta Phut Municipality and placed into an asphalt mixture to make roads in the RIL Industrial Estate.

"SCG has an open mindset when it comes to finding solutions and new innovations," Dr Rørvik explains. "Both business and corporate social responsibility are important to us and we want to take the lead in the development of the circular economy."

Economical decision

Corporate social responsibility is one aspect companies need to consider when it comes to the adaptation of the circular economy. But, there is a business element to it as well.

"It is important for these efforts to have value. There is money in garbage believe it or not," Dr Rørvik states. "But who is going to capture this value? Businesses must approach this with long-term thinking and an understanding of the market."

She adds business leaders can't afford to ignore sustainable solutions since more customers want products that are made from recycled materials. This is something SCG is witnessing first hand where demand is shifting from single-use items driven by the linear economy to more sustainable products.

"Large international companies are heading towards a sustainable product mix and there isn't really a choice," Dr Rørvik explains. "We have to offer what the clients ask for. Business and sustainability go hand-in-hand and thinking circular has become a key strategy."

This means it is also necessary for SCG to work with clients when designing recyclable solutions in new products and highlights another challenge of the circular economy; putting raw materials back into use instead of simply discarding them after a single use.

Dr Rørvik believes there will always be demand for our raw materials, but finding ways to maximising these into reusable resources with value beyond a single use is necessary to reduce waste.

Key contributions

SCG status as a global conglomerate places it in a unique position when it comes to the building

of a circular economy. It wants to put its resources behind the movement while also encouraging others to do the same.

"We can really make a difference. We are a global company with more than 50,000 employees so we have the size and scale to take the lead on the circular economy. But we can't do it alone. Everyone from governments to businesses and even individuals must be working towards the change," Dr Rørvik details.

In order to close the loop, everyone must contribute by sorting their waste and stop littering. Dr Rørvik adds that all over the world it is important to set up a good waste management system and educate the public on why it is needed and how they can help.

"As we have seen with the recent ocean plastics news, people want to be a part of this positive change, but they may not always know how to go about it. Especially in countries where there hasn't been a lot of emphasis placed on recycling and environmental care until now. Everyone from the larger industrial corporations to individuals needed to join this effort in order to save our oceans," she notes.

After the Symposium, a number of large corporations approached SCG wanting to know how they could get involved. This cooperation is vital as it allows all parties to share current practices, avoid overlapping development and get the whole value chain from raw materials to products in circle. Dr Rørvik points out there is no need to invent what already exists and sharing knowledge guarantees everyone makes progress and works towards completing the circular economy.

"In order to be successful, the circular economy needs everyone to participate and collaborate. This includes people recycling, businesses like SCG finding new ways to maximise the usage of recycled materials, companies offering products made from these materials and so on. It truly is all connected," Dr Rørvik concludes. ■



PHOTO

Above left: SCG'S Recycled Plastic Road project saw plastic waste placed into an asphalt mixture to make roads in the RIL Industrial Estate. Above: Dr Tine Rørvik was recently named Global Director Circular Economy at SCG to help lead the company's efforts in this field

Facts

- SCG wants to focus on the recirculation of resources within the value chain to build circular economies
- The company hosted the Sustainable Development Symposium in Bangkok earlier this year
- Waste infrastructure is one area somewhat lacking in Asia that needs to be improved upon
- SCG is seeing demand shifting from single-use items to more sustainable products
- Large corporations have approached SCG wanting to know how they can get involved with the circular economy



PHOTO: NORSI

The impact of diversity cannot be understated. Estimates from McKinsey found that if women were working to their full potential, the global GDP would increase by USD28 trillion by 2025.

The Need for Women in the Digital Age

CHEYENNE HOLLIS

But there is perhaps no bigger challenge to reaching equality this than in the startup space.

According to research from Crunchbase, only 12 of the unicorns born in 2018 had at least one female founder. The trend has continued into 2019 with ten female-founded companies becoming unicorns during the first half of the year. And while 2019 was the second-best year on record when it came to money invested in female-led startups, the playing field remains uneven for women entrepreneurs.

A study conducted by Boston Consulting Group in conjunction with MassChallenge, a US-based global network of accelerators, showed true discrepancy remains. Investments in companies founded or cofounded by women averaged USD 935,000. This was significantly less than the USD 2.1 million invested in companies founded by male entrepreneurs on average.

Despite the difference in

investment, women-founded startups were more successful on average. The same report found that the female-led startups collected ten percent more in cumulative revenue over a five-year period.

"Startups with women as founders are less likely to receive funding than male-founded companies, but they are equally as likely to generate revenue. That is amazing when you think about it," Ms Charlene Liu, Co-Founder of Ladies Who Tech China and Women in Science, Technology, says. "There is no logical reason for female-founded startups to not receive equal funding. In fact, many investors are likely hurting their bottom line by not investing in female-led startups."

According to Ms Liu, one reason for this is that men usually oversell their vision and projections, which can be

enticing to potential investors. On the other hand, women are far less aggressive when it comes to their business outlook and in some cases are content to accept less than their male counterparts.

But this is only part of the story. Understanding why this remains a problem and finding a solution requires a much deeper look at the situation.

Women in the digital age

Ms Heidi Wiig, Professor in Innovation and Entrepreneurship at BI-Norwegian Business School, told the audience at the Norway-Asia Business Summit 2019 that Norway is gender equal, but this has not translated to an increase in female entrepreneurs. She added that China is much further down on the gender index and also suffers from a lack of female entrepreneurs.

And despite progress being made elsewhere, the challenge of the traditional gender gap is compounded with other issues as the world moves further into the digital age.

"We are seeing an increase in female education levels and women are participating more in science, technology, engineering and mathematics (STEM) disciplines. But women are still underrepresented in the digital sectors," Ms Wiig explains. "This has created a digital gender gap that we must strive to reduce. If it is allowed to grow, women will find it more difficult to not only gain a foothold in both the

digital-first technology and startup space, but also other areas.”

She continues, “That is because the digital gender gap is laid over the traditional gender gap. We still see a lack of female CEOs and middle managers globally. The combination of the two gaps is making it harder for a transition to take place.”

Ms Wiig points out that most women who currently make it to the management level work in support management functions. Meanwhile, strategic management functions are male dominated. The story is very similar when you look towards entrepreneurs.

“We are seeing constraints that prevent women from even trying when it comes to being entrepreneurs and startup founders,” Ms Wiig states. “For example, getting finance for a female-led startup is more difficult than for a male one. Additionally, women must fight stereotypes that remain pervasive. Progress is being made, but we must keep working towards equality.”

Ms Liu was upbeat about the fact gender diversity in STEM is increasing. But she warned that even when women enter these, or any other, workforces, they face challenges.

“The corporate ladder is more difficult for women to ascend. Even if women manage to climb the ladder, they are faced with a gender pay gap,” Ms Liu says. “But this doesn’t make sense, especially in STEM disciplines. Resources here are sorely lacking and there is a growing need for talent in these fields. This is just one of many obstacle we must remove.”

The digital age is offering female entrepreneurs new ways to overcome traditional challenges that have created the various gaps. This can help empower

women with solutions that had been unavailable in the past.

“Despite the challenges, we are seeing a new wave of opportunities for female entrepreneurs. For example, businesses can be founded at a lower cost and with greater flexibility than in the past,” Ms Wiig says. “The ‘old boys’ way of networking and financing can be bypassed as women have greater access to new networks and markets. It is much easier to connect to business growth today than in previous years.”

As society moves further into the digital age and technology advances, new opportunities will emerge. This new wave of opportunities for female entrepreneurs must be cultivated to make sure gender isn’t a factor in determining who can act on them.

“Technology creates challenges and opportunities, some of which we know and some of which we won’t realise until later. That means the digital transformation will favour those who are best prepared to capture value. Capturing this value must be open to everyone, not just one group,” Ms Wiig notes.

Awareness with action

As work towards closing the digital gender gap, the traditional gender gap and the gender gap progresses, there remains a need to shine a brighter light on each one. Awareness is something many women don’t even realise until they are presented with professional challenges caused by one, or all, of the gaps.

“I didn’t really consider gender growing up in Norway. I could always do what I wanted. Even in law school, gender diversity wasn’t something I recognised. It didn’t hit me until I entered the workforce and saw a lack of gender diversity with my own eyes,” Ms Therese

Trulsen, Senior Lawyer and Chief Representative at Wikborg Rein China In Corporate Law, recalls. “I remember walking into a meeting with over 20 colleagues and being the only woman in the room. More than 50 percent of the law students in Norway are female, but it wasn’t accurately represented in corporate law.”

She cited the support she received at Wikborg Rein as well as the company’s gender equality targets as being important measures that ensured women were getting a fair shot.

“One of the key things businesses can do is set targets. Awareness is important, but it also needs to be actionable. It has to be more than just talk,” Ms Trulsen states. “Of course, we don’t want quotas to select candidates based on gender alone. You don’t want to be hired because you’re female, you want to be hired because you are the best candidate for the position. This isn’t a question of being male or being female, it is an equality issue. Right now women don’t always have equal opportunities in business. We must find ways to ensure everyone has a level playing field.”

As Ms Liu notes, women have a rich history when it comes to inventing, business, technology or anything else when provided a level playing field. This includes being successful entrepreneurs when given the chance. Women can also bring a much-needed perspective that can provide needed insights for businesses.

“We need diversity. We need diversity in thinking and in doing. At the end of the day, we need diversity because it affects everyone,” Ms Liu proclaims. “These efforts start at home. They then need to continue into schools. This is a time when awareness can be built. The movement must carry over into the workplace. And finally they will be seen in society. This is something everyone can contribute to and something we can all make actionable.” ■



PHOTO: NABS 2019

Above left: Ms Heidi Wiig believes more progress is need to close the digital gender gap. Above: According to Ms Charlene Liu, investors hurt their bottom line by not investing in female-led startups

Facts

- The global GDP would increase by USD 28 trillion by 2025 if women were working at their full potential
- Women who reach the corporate management level usually work in support functions and not strategic functions
- New ways of networking and financing provide women with greater access to new markets
- Startups with women as founders are less likely to receive funding than male-founded companies
- Only 12 unicorns born in 2018 had one or more female founders
- Startups with a female founder collected ten percent more in revenue over a five-year period



PHOTO: 7PEAKS SOFTWARE

7 Peaks was named after the mountains that surround Bergen, the birthplace of the company's three Norwegian founders.

Reaching the Peak

CHEYENNE HOLLIS

These days, the company is hoping to reach the business mountaintop by rethinking outsourced tech services.

Founded in 2014, 7 Peaks recently celebrated its fifth anniversary. The international software and design agency provide end-to-end services to enterprise clients in Norway and Thailand and counts some major companies, such as Telenor, among its satisfied customers. However, the company's success seems improbable when Mr Jostein Aksnes, 7 Peaks CEO, reflects on coming to Thailand.

"When I was first sent to Thailand as an expat in 2010, I wasn't keen on coming out here. When the company I was working for wanted me to move back three and a half years later, I didn't want to leave," Mr Aksnes recalls. "It was around that time my former university classmate from Bergen, Mr Roy Ivar More, came to Bangkok. We ended up starting 7 Peaks Software as a production company."

Mr Moe would become 7 Peaks'

Chief Technology Officer joining with Mr Aksnes and Mr Leiv Fasmer who managed the Norwegian entity Apphuset. The trio started 7 Peaks with the goal of serving Norwegian enterprise clients with high-quality, cost-efficient outsourced software development from their office in Bangkok.

From there, 7 Peaks expanded its services towards UI/UX design, an area where demand has been growing rapidly, by bringing Mr Andrew Watts onboard as Head of Design. In the same year, the company increased its offerings even further and now provides web development services, cloud solutions and quality assurance in addition to native mobile application development services.

The company's primary business focus is on providing dedicated development teams to local and international clients. 7 Peaks can also

deliver turnkey projects to enterprise clients that improve internal business processes across all sectors, including banking, insurance, oil and gas and retail.

"We aim to solve real business problems that can improve a company's processes and efficiency. In order to do this, we usually start with a discovery process," Mr Aksnes explains. "This initial consultation lets us better understand the issues a business is facing and quickly identify pain points. We then collaborate with them on how best to build a customised software solution."

In order to find and solve the clients' issues and demands, 7 Peaks provides businesses with personalised teams created with the specific requirements and goals of the company in mind. The software agency takes into account several aspects, such as technical and non-technical profile and current in-house capabilities and availability, to ensure the right fit.

Mr Aksnes notes that a company lacking in-house skills, staff capacity or even office space to host its own development team no longer has to worry about falling behind. They can instead work with 7 Peaks to gain a competitive advantage that's also cost effective.

"We look at ourselves as a long-term partner instead of a vendor, which allows us to build a close relationship with our

clients. We can help and consult actively during the engagement. Our goal is to deliver the best possible solution where everyone is happy with the result. This is something we are passionate about," Mr Aksnes explains.

From Bergen to Bangkok

From the snow-covered mountains of Bergen to the skyscrapers of Bangkok, the two locations could not be more different. And while 7 Peaks has found success with its services in both markets, the differences have meant the company had to adapt.

"One key difference between Thailand and Norway or other western countries is where they are at from a technological standpoint. A lot of firms in Thailand are now going through digital transformations, where cloud providers are an important piece of the solution. Physical, on-premises applications versus cloud applications is still a real debate for businesses in Asia, while in the west more companies are more used to and comfortable with building cloud solutions. This is an area we can really help local businesses in Asia with," Mr Aksnes states.

"Most software projects in Southeast Asia are run in an old fashion way based on waterfall methodology. We find ourselves needing to convince here of the benefits running software projects in a lean and agile way with rapid deployment and shorter iterations," Mr Aksnes explains. "A lot of clients in Thailand and Asia want agile development, but their organisations are usually not ready for it. This creates a lack of understanding about agile between the executive management and

working teams."

7 Peaks takes pride in offering high-quality services and is always working hard to improve their processes to ensure the quality and efficiency of their services.

But this is something potential clients don't always see. Mr Aksnes notes you start off with this type of trust in Norway, but in Thailand you start with no trust and have to build it up. Ultimately, the quality of 7 Peaks has been recognised by firms in Thailand and this has played a key role in the company's growth.

Scaling up

After finding success with Norwegian clients, 7 Peaks Software gained a foothold in Thailand by establishing collaboration with leading management consulting companies that would bring the company several big enterprise projects.

"The expansion of 7 Peaks in Thailand came mostly from repeat business and referrals along with inbound requests. Working with big management consulting companies allowed us to work with large, publicly traded clients in Singapore and Malaysia in addition to Thailand," Mr Aksnes says.

The organic growth of 7 Peaks meant the firm needed a team capable of handling the extra work. Proper strategies, additional exposure and the scaling up of a local, Thai team with skilled designers and project managers were just a few items the firm had to address.

"Building our team was a very important part of this. But it was not easy. Finding and retaining talent is a challenge. You can't just hire people.

You have to build a culture where people want to come to work every day," Mr Aksnes details. "It was necessary to create a foundation that could help us scale up. It was only then that we could grow the business."

With a solid infrastructure in place, 7 Peaks has been able to take on even bigger, more complex projects. For example, the firm recently completed a project for a major oil and gas company that wasn't feasible in the past. Mr Aksnes adds the company finished a successful project for Telenor as well where a product was delivered and deployed in 13 countries.

"In our first three years, we worked exclusively with Norwegian clients. However, we have scaled that up. We now speak more than 15 languages and have employees from around the world which allows us to serve a very diverse clientele," Mr Aksnes points out.

But Norway remains an important part of the company's business and the same owners of 7 Peaks are running one of the leading software development agencies in Scandinavia, Apphuset.

"We provide the best of both local development as well as outsource development for our Scandinavian clients. This means having local UX designers, project managers, software architects and key account managers that work closely with the clients locally while carrying out production work at 7 Peaks in Bangkok," Mr Aksnes reports.

He continues, "The local team in Bergen provides a personal touch for the company's outsourced services in Norway which allows us to provide clients there with a model we have found to work very well."

The ascent to the top is a long journey and Mr Aksnes understands 7 Peaks is still scaling up. It is all part of the company's desire to take 7 Peaks to the next level. ■



PHOTO: 7PEAKS SOFTWARE

Above left: 7 Peaks CEO and Founder Jostein Aksnes with partner Roy Ivar Moe.
Above: 7 Peaks has built an international team capable of working with clients from anywhere.

Facts

- 7 Peaks was founded in 2014 by Mr Roy Ivar Moe, Mr Jostein Aksnes and Mr Leiv Fasmer
- The company offers outsourced software development for global companies, focusing mostly on Norwegian and Thai clients
- UI/UX design, native mobile application development, web development services and cloud solutions are all offered by 7 Peaks
- During its first three years in business, 7 Peaks worked exclusively with clients in Norway
- Firms in the telecom, banking, insurance, retail, oil and gas and property sectors have worked with the company
- The majority of 7 Peaks' Thai business has come through repeat clients and referrals along with inbound requests



PHOTO: AF CONSULT

Norway and ASEAN have announced a three-year energy project that could help solve some of the region's power issues.

Power Partnership

CHEYENNE HOLLIS

The project also provide insights on how each of the countries are doing to maintain their commitment to the Paris climate accord.

It took a long time to put the recently agreed upon energy project Norway and ASEAN together, but this was not surprising to the Norwegian Ambassador to ASEAN, Mr Morten Høglund. That's because energy is an ever-changing sector and it is vital for a project like this to be up-to date.

However, both sides wanted to get this project over the line. According to Mr Høglund, energy is one of the sectors Norway can positively contribute to in the ASEAN region given the country's history, technologies and knowledge in the field.

"This is an interesting time in regards to energy. Hopefully this partnership can help make a difference. We believe that it could be a critical part of a regional energy solution," Mr Høglund explained.

The partnership will see significant cooperation between the ASEAN Center for Energy and the Norwegian Institute of International Affairs (NUPI), which will supply knowledge on power, climate

issues, policy and other issues facing the region.

"The project is partly a study of energy policies and then recommendations on how to make current practices more sustainable. It is also important to look for new ways to build additional capacity in the ASEAN energy policy," Mr Høglund said. "We can utilise our strengths in renewable energy to address some of the challenges, such as electrification, facing ASEAN countries. We have lots of expertise and knowledge in terms of renewables and look forward to sharing our Norwegian experiences and solutions with our ASEAN partners."

This agreement comes at a critical juncture for energy in ASEAN. With both the population and economic power of the region expected to grow in the coming decades, energy production will need to follow suit.

"The population is young and demand for power is likely to keep growing for the foreseeable future," Mr

Høglund stated. "We want to play our part in that growth by making sure the solutions are sustainable, and, ideally, renewable whenever it is feasible. We also want to achieve more sustainable use of existing energy output."

Mr Høglund added both Norway and the members of the ASEAN understand the need for being climate friendly and the new project can help build momentum for clean energy in the region. However, this understanding and the actions of the countries don't always match up.

Research from the International Energy Agency found that 85 percent of new coal power developments will be built in Asia with Southeast Asia leading this charge. There are currently plans in place to build 40 gigawatts of new coal power in Vietnam alone.

"There needs to be a sense of urgency when it comes to clean energy in Southeast Asia. This isn't about telling the countries to change energy sources, but ensuring everyone has enough energy. And finding ways to make sure this energy comes from sustainable or cleaner burning sources," Mr Høglund proclaimed.

He continued, "There continues to be innovation in the renewable energy industry. It is not as costly as it has been in the past. Price will always be a determining factor for governments when choosing energy solutions and these innovations means price is no longer

restrictive when it comes to adopting renewables.”

Diverse challenges

ASEAN spans ten countries and each one is unique when it comes to energy sources, electrification rates and other matters. While there are some similarities, the Norway and ASEAN energy project is more focused on a few common goals than trying to solve every issue each country is facing.

“The region is diverse. You have countries in different stages of development. The energy industry is at different levels of development. The project is aimed at addressing the big picture issues facing the members of the ASEAN as a whole,” Mr Høglund pointed out.

One of the largest common issues facing the region is meeting its commitment to the Paris climate accord. All of the countries in ASEAN subscribe to the pact. Mr Høglund noted that it is necessary to look at the policies in place and see if the countries are on track to meeting their commitments while also exploring what can be done to improve their work.

As mentioned earlier, the countries that comprise the ASEAN are all at different stages of development which presents some unique situations. For example, Brunei and Singapore are the most industrialised countries in ASEAN but face different problems in reaching energy goals. Singapore is a leader in energy efficient buildings and grids powered by renewable sources meaning the country will likely have no issues meeting its emissions reducing targets.

On the other hand, Brunei is dependant upon the oil and gas sector which means the country needs to

find ways to reduce the greenhouse gas emissions caused by industrial activity along with cutting energy consumption.

Indonesia, Malaysia, the Philippines, Thailand and Vietnam are each dealing with individual challenges in addition to common problems. And while the project can't find solutions for each and every issue, it does hope to bring energy and carbon dioxide emission output throughout the region in line with global standards.

This is simply one of a few areas where the project can have its greatest impact. Another challenge facing some of the governments is the integration of renewables. This is something lacking in many ASEAN countries.

“There needs to be a regulatory framework in place as well as a welcoming of these new power sources from national utilities,” Mr Høglund stated. “These are very complex issues, but we will study this thoroughly and hope to propose some possible solutions.”

Mr Høglund also believes that there are industries where there is room for a reduction of emission production and energy can be used more efficiently. There are already a few examples of this happening in ASEAN.

“We will look to identify specific sectors where we can find ways to improve energy usage. An example of this would be green shipping like what we are seeing in Singapore. We have to look at energy usage as well, not just production. There are many parts to the challenges and we must consider them all,” Mr Høglund said.

Partner input

According to Mr Høglund, there are some interesting new opportunities to work with a long time partner on

energy-related matters as Thailand is scheduled to take over the ASEAN chair in 2019. The country's place along the Mekong River, along with its central location within the region, means there could be some exciting developments on this front.

Additionally, Norway is home to many companies involved with energy and renewables. This is something that will be leveraged during the project as these companies can bring valuable insights to the partnership.

“Maintaining a dialogue between relevant stakeholders on both the ASEAN and Norwegian sides is vital for the success of the project. There will be a number of chances for companies to discuss opportunities as we move forward,” Mr Høglund noted. “We must have input from businesses and we will look for ways to get them involved. There will be moments for them as speakers as well as time for them present what they do and how they can assist the relevant parties.”

The project is likely to present some businesses with a chance to grow or reach interested agencies they may not have otherwise been able to link up with.

“Businesses operating in a few Southeast Asian countries may have a chance to expand their presence elsewhere in the region,” Mr Høglund explained. “The project could provide some Norwegian companies with access to markets they may not have had otherwise while also ensuring they are contributing to the region's energy solution.”

The project is currently set to run for three years, but there is room for it to continue longer if both sides are happy with the results.

“We have many aims with this project but ultimately the main one is to help ASEAN reach its energy goals. We hope the governments and energy ministries will subscribe to our recommendations and turn them into actionable policy. The legacy of the project will be if it becomes relevant to the countries and contributes to solving the region's energy problems. There is a lot of promise, but also hard work to be done,” Mr Høglund concluded. ■



PHOTO: ASEAN

Above Left: The Babelan CFB Power Plant in Indonesia is one of several coal facilities to have opened during the past few years. Above: Norwegian Ambassador to ASEAN, Mr Morten Høglund, meets with ASEAN Secretary-General Dato Lim Jock Hoi

Facts

- Norway and ASEAN will participate in a three-year energy project
- Agreement will see significant cooperation between the ASEAN Center for Energy and the Norwegian Institute of International Affairs (NUPI)
- The project will include study of energy policies and then recommendations
- Government will reach out to companies involved with energy and renewables for input



As global energy supply is becoming more diverse, entirely new models of power generation are emerging.

Fractal Future

HENRI VIIRALT

Developing renewable energy has become increasingly cheaper and more viable than ever before, which in turn has triggered an ongoing paradigm shift, forcing many stakeholders to re-examine how to approach this new era in global energy generation.

International Renewable Energy Agency's (IRENA) annual renewables report, reveals that renewable energy now accounts for a third of global power capacity with growth in all regions of the world, albeit at varying speeds.

According to the report, Asia accounted for 61% of new renewable energy installations and grew installed renewables capacity by 11.4%, with growth being fastest in Oceania, which witnessed a 17.7% increase in 2018. Africa's 8.4% growth put it in third place just behind Asia. In total, nearly two-thirds of all new power generation capacity added in 2018 was from renewables, led by emerging and developing economies.

IRENA's analysis also contrasted renewables to non-renewable energy,

focusing predominantly on nuclear and fossil fuels. It found that while non-renewable generation capacity has steadily decreased in Europe, North America and Oceania since 2010, it has increased in Asia and the Middle East over the same period.

"Through its compelling business case, renewable energy has established itself as the technology of choice for new power generation capacity," said IRENA Director-General Adnan Z. Amin in a press release. "The strong growth in 2018 continues the remarkable trend of the last five years, which reflects an ongoing shift towards renewable power as the driver of global energy transformation. Renewable energy deployment needs to grow even faster, however, to ensure that we can

achieve the global climate objectives and Sustainable Development Goals."

Aside from Iceland, which generates the most clean electricity per capita on earth, with nearly 100% of its energy coming from renewable sources, several other countries have recently joined Iceland in leading the charge towards a cleaner future.

For several years, Costa Rica has been able to run on around 95% renewables for an average of 300 days per year. While there are several factors behind this, such as an abundance of geothermal renewable sources, a small population and a lack of heavy industry, another key reason is that for the first time in history, new renewables projects can be deployed without governmental support.

One of the biggest industry news stories last year covered Hollandse Kust Zuid, an offshore wind farms project, which will be situated 20 km off the coast of The Hague. Hollandse Kust Zuid phases I and II are expected to generate 750MW - enough to supply around 1 million households with green energy. It will be the world's first offshore wind farm to be built entirely without public subsidy.

Many European countries



PHOTO: EQUINOR/JAN ARNE WOLD

are now looking to get rid of subsidies for renewable energy projects. Beijing, too, has recently announced that China will give priority to the construction of subsidy-free renewables projects. This comes on the back of the central government's pledge last year in ensuring that renewables will become grid competitive with traditional energy sources, after a surge in capacity left the finance ministry with a subsidy payment backlog of around USD 17.9bn.

"The cost reductions in renewables have actually been happening since the 1970s, but prices were kept high because of the demand through subsidies, which overwhelmed the supply chain. At the same time investments kept pouring in, and once there was enough of investment, it started to push the prices down very quickly. The cost curve was really quite consistent," says Mr Michael Liebreich, CEO of Liebreich Associates, through which he provides advisory services and speaks on clean energy and transportation, smart infrastructure, as well as climate finance, technology and sustainable development.

"We're now living in a world where wind and solar have not only become grid-competitive, but they've blasted right through it. Nevertheless, it is

imperative to keep in mind that these are variable resources and we need to come up with a completely different way of thinking about how to deliver electricity moving forward," Mr Liebreich adds.

Prior to renewables, he says, the only consideration for delivering energy was baseload power, which was cheap, and peaking resources such as gas, gasoline and diesel that were considerably more expensive and were reserved for times when the grid was unable to cope with demand. The difference today, is that due to the variable nature of renewables, everyone is trying to get their hands on as much renewable energy as they possibly can, which essentially creates a "surplus budget" to offset peaking resources.

"A lot of commentators seem to find it very difficult to understand that this can be just as resilient, just as cheap, but much cleaner than the alternatives."

Looking at Southeast Asia, Mr Liebreich sees ample opportunity for growth, but considers the region's rich renewable energy potential largely untapped. He also envisions a future where energy delivery systems around Mekong and elsewhere will be far more fragmented and intricate than they currently are.

"People who think we'll just slap a few solar panels on the roofs and call it a day, that's not how this will work because it would only cover a part of a single household's energy needs. Instead, we'll have a fractal design where we'll take the solar from your roof, but also the wind from the coast nearby and perhaps more solar from a neighboring country."

Seasonality also plays a big role in power generation capacity in both wind and solar, so an additional emphasis needs to be placed on data and mapping of resources."

There are a fair share of opposers to the development of renewables, with the main criticisms centering mainly around the environmental impact on wildlife due to the large landmass required for the projects, and even the aesthetic impact on the landscape in the case of wind energy and its enormous turbines.

"It's true that one of the downsides of renewables is that they require a large amount of space to develop. They are not going to be as dense as gas, coal or nuclear-fueled power stations, but that's why floating solar panels in reservoirs and offshore wind are such interesting prospects, especially for many land-starved countries like Japan, UK, Singapore or Hong Kong."

Mr Liebreich also points out that an emerging trend in solar is mounting higher up, which means that the ground beneath it could be used for agriculture, giving it a dual purpose.

"The truth is that developing any type of energy will have an impact, but these are not unsurmountable challenges.

Once you have local consent and buy-in, the good thing about renewables in that they will be consumed locally. It's not as if there will be a massive wind farm in Thailand and all that power would be shipped to Saudi Arabia."

He points out that two hundred years ago, we had a very different relationship with energy – everyone knew that you don't heat the house when it's not in use, and partial heating for most used rooms was how people survived winters.

"While I'm not advocating going back to that type of stoicism, it's clear that everybody had a relationship with energy that was very different. We're now witnessing a very odd period of human history where you flip a switch and you don't even know where the power station is that is powering the lights. At the same time, renewables with local community ownership models or even switching to LED light bulbs for energy efficiency are forcing people to have a more direct relationship to the homes and take back ownership."

The Three-Third World, a term presented by Mr Liebreich at an EMEA summit in 2017, that represents an outlook of a world where 1/3 of electricity would come from wind and solar, 1/3 of vehicles be electric and the economy would be 1/3 more energy productive by 2040.

"If we manage to achieve that by 2040, I will be happy not happy. I'll be happy because it certainly outstrips my expectations when I founded New Energy Finance in 2004. The reason I would be not happy is because we have a real climate problem and although a Three-Third World would cap emissions from growing, it's nowhere enough. We need to go far beyond that, which means we need to do more wind and solar alongside other renewables, nuclear if we can, more electric vehicles and figure out how to decarbonise the rest of the economy – industry, chemicals, aviation, shipping, and heat."

The energy delivery infrastructure needs to be fractal and while grids aren't going anywhere, we need to manage power consumption on a microgrid level because that will force us grab the clean resources and integrate them, which is good for reducing overall emissions but it's also very good for resilience, which is something I'm very concerned about because we're rushing towards integration on transportation, energy, and telecommunications and you can see how a failure in one part of that network might cascade and bring the whole thing down.

I'm really quite bullish on microgrids." ■

Above left: Dudgeon Offshore Wind Farm in the North Sea.



PHOTO: NORSK ELBILFORENING/STÅLE FRYDENLUND

For more than three years, Thailand has looked to stimulate investment in electric vehicle (EV) production.

Follow the EV Roadmap

CHEYENNE HOLLIS

And while there has been some movement in this regard, the government is now working on a roadmap it hopes will shift things into overdrive.

In 2017, the Thailand Board of Investment (BoI) proclaimed 13 EV manufacturers were eligible to apply for privileges. These incentives included a multiyear period where taxes would be waived or significantly reduced along with import duty exemptions for cars and machinery. Much like Bangkok's streets during rush hours, the plans have been dealing with gridlock.

Despite the application period for the program lapsing at the end of 2018, the Bangkok Post reported that BoI is still reviewing several applications from the approved list of EV manufacturers. While many companies have taken advantage of the privileges, which were for hybrid EVs, plug-in hybrid EVs and battery EVs, the scale of investment hasn't been as large as the Thai government had hoped for, especially in terms of fully electric vehicles.

Toyota and Honda launched

manufacturing facilities for hybrid EV projects which are now in operation. Nissan announced plans to invest THB11 billion (USD352.3 million) in a hybrid EV production facility at the end of the last year, but no other details about the project were revealed.

Additionally, the BoI approved plans from a quartet of plug-in hybrid EVs with Mercedes-Benz and BMW having proceeded to the production stage. However, neither firm invested more than THB1 billion (USD32 million).

Things have moved much slower when it comes to battery EVs, the only form that doesn't require fossil fuel of any sort. Thailand lacks the infrastructure and technology required to build these locally. Currently, battery EVs are not available commercially in Thailand on a wide-spread basis.

Under the BoI incentive program, battery EV manufacturers can import

completely built cars without facing an import duty for two years in order to test the local market. Companies that participate are then expected to begin manufacturing battery EVs within two years should they wish to continue selling battery EVs. This has left most battery EV plans stuck in park.

"The BoI allows us to import a small volume, which is not large enough to market in Thailand," Mr Roland Folger, Mercedes-Benz Thailand President and Chief Executive, stated. "We have been investing heavily to start the battery EV market in Thailand, while our 34 dealers have to bring their staff for training in a bid to support this new EV business, such as after-sales services and charging stations."

The limited investment in all forms of EVs hasn't helped the country's struggling automobile industry. Car production in Thailand dropped 7.1 percent in 2019, according to the Federation of Thai Industries. Both local sales and exports fell and are expected to remain flat in 2020.

In an attempt to give the auto sector a jolt, the Thai government is drafting a roadmap for EV production and usage that will be finalised sometime this year. The hope is that the plan puts the country in pole position when it comes to EVs.

But it needs to overcome a major

roadblock in the form of scepticism from the car manufacturers themselves who want a clear government policy, investment criteria and incentives before investing further in EV production.

Thailand Finance Minister, Mr Uttama Savanayana, told local media that the EV roadmap should build confidence and could be enacted within the next three years. In November of last year, the Thailand Automotive Institute (TAI) called on the government to look at its own EV roadmap after hearing car manufacturers had seen little to convince them that EV adoption was feasible in Thailand.

The TAI EV roadmap set a goal of producing 2.5 million cars in Thailand by 2030 with 60 percent those being sold domestically. In order to reach these figures, the TAI believes a strong push from the government is required that makes EVs more appealing to both make and purchase in Thailand.

"Thailand aims to be a production hub for EVs in the long term in order to maintain the country's automotive competitiveness in Southeast Asia," Mr Adisak Rohitasune, TAI Acting President, told the Bangkok Post. "The government should emphasise the EV industry with attractive privileges and incentives for both demand and supply."

On the road

Enticing car manufacturers to build more EVs is just one piece of the puzzle. Those cars must be purchased and driven by the local population which has been slow to embrace EVs because of the cost. But things are slowly changing.

Prices for EVs are expected to fall below THB1 million (USD32,000) as soon as 2020, according to the Electric Vehicle Association of Thailand (EVAT). Even with prices above the THB1 million,

a shift is starting to occur.

EVAT found that the number of EVs, including hybrid and plug-in hybrids, registered in Thailand last year rose significantly. There are now 153,184 vehicles on the road, but less than 1000 were fully electric. Data from the Thailand Department of Land Transport showed that 25,180 EVs were registered in Thailand last year with 20,056 receiving paperwork in 2018.

For the second January in a row, Bangkok was shrouded with dust and unhealthy PM2.5. The Thai government even went as far to mull banning private cars, but nothing came of it. Instead, the Department of Land Transport unveiled incentives to promote the use of clean energy vehicles in the country.

This may help on a smaller scale, but it does all come back to the cost of EVs. This is why the government's EV roadmap will seek to address issues from the consumer side as well.

"To encourage consumers to shift to EVs on a broad scale, EV prices, which are more expensive than fuel-powered vehicles, must be addressed in the master plan," Mr Uttama stated. He added that the Hong Kong model of offering discounts to consumers buying EVs could be an example for the Thai government to consider.

Other mooted changes to promote EV usage in Thailand proposed by EVAT in a 2019 report include requesting the Airports of Thailand Limited and Industrial Estate Authority to purchase EVs and setting aside of a portion of the government's vehicle budget to go towards EVs. These could be included in the government's roadmap in some form. Mr Uttama did not confirm any specifics, only saying some parts of the plan had already been drafted.

Power supply

The EV roadmap will also need to address a third key area: infrastructure. While charging stations and EV charging logistics are being developed, the government is keenly aware that a clear plan is needed to ensure demand is met on this front. The BoI has stated that it expects 7,000 EV charging stations to open during the next few years with an estimated 500 currently in operation.

"There are many charging models in the world, such as those from Japan, Germany and the US, but any model that is picked must meet Thailand's safety standards, Mr Uttama noted. "The country's electricity supply must also be taken into consideration. Car makers stand ready to invest in EV charging stations in Thailand, but they want to know what kind of support the government will offer."

Batteries also present a unique challenge, but one the government has already prepared for. The Excise Department announced that it will charge a fee for the tracking of battery demolition or recycling. The fee, which will be passed on to consumers, is set to take effect in 2021 and will be refunded after the vehicle owner has returned the batteries to a car distributor.

Regardless of the challenges, some experts think it is only a matter of time before Thailand embraces EVs.

"The technological advances in power storage together with the urgent need to improve air quality in the cities to compensate for the consequences of urban development will fuel the growth of EV's popularity tremendously," Mr Paul Flipse, Head of Climate Change and Sustainability Services at KPMG Thailand, said in a report. "It can be anticipated that the market penetration of EV in Thai society is undeniable and inevitable. Auto industry and power industry have to reassess their business model and prepare for the technological and behavioural changes." ■



PHOTO: NORSK ELBILFORENING

Above left: Norway is the world's most successful country in terms of electric vehicle penetration. 50% of all new cars are currently EVs. Above: There are currently 500 EV charging stations in Thailand with the BoI predicting some 7,000 will be online in the next few years. Above picture from Norway.

Facts

- The Thai government is drafting a roadmap for EV production and usage which could be released this year
- In 2017, the Thailand BoI announced EV manufacturers were eligible for special incentives
- 153,184 EVs are on the road in Thailand, but most are hybrid or plug-in models
- The price of EVs in Thailand could drop below THB1 million (USD32,000) for the first time this year
- Automobile production in Thailand fell by more than 7 percent in 2019
- An Excise Tax to cover the tracking of battery demolition or recycling will take effect in 2021

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The Graphs

In order to give the readers an understanding of where the Asian countries are in their development, we have assembled an overview of various indicators for Norway, USA and the most important South and Southeast Asian markets. The graphs in the two right columns are the result. Countries are listed by their two-letter [ISO 3166-1](#) code. The data is assembled from a number of sources. See below for a full list.

Basic Figures Norway (2019)

GDP Growth 2018	1.3%
GDP Growth 2019	1.2%
Export Growth 2018	-0.2%
Export Growth 2019	1.5%
Trade Balance	NOK 148.3 bill
Current Account Balance	NOK 23.0 bill
Int'l Reserves (Jan20)	NOK 613.7 bill
Unemployment	3.8%
Corporate Income Tax	28%
Value Added Tax	25%

Norway's Top 10 Exports 2019

	%/value	NOK bill
Petroleum	34.2%	308,772
Gas	20.9%	188,531
Seafood	11.5%	104,121
Non-ferrous metals	5.7%	52,013
Organic chemicals	2.1%	18,598
Industrial machines	2.0%	17,749
Electrical machines	1.9%	16,826
Other chemicals	1.8%	16,289
Transport machinery	1.7%	16,188
Others	18.2%	164,821
Total	(-9.4% vs 2018)	903,909

Geography

Geographic Area:	385,199 sq. km
Highest peak: Galdhøpiggen	2,469 m
Inland water areas:	16,360 sq. km
Coastline:	25,148 km

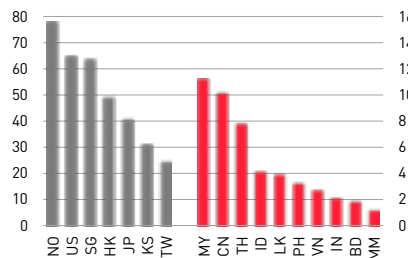
Demographics 2017

Population Norway:	5.4 mill
Population Oslo (Urban):	1,000,467
Life expectancy M/F NO:	81/84
Inhabitants per sq. km land area:	14.4
Population Growth:	0.84%

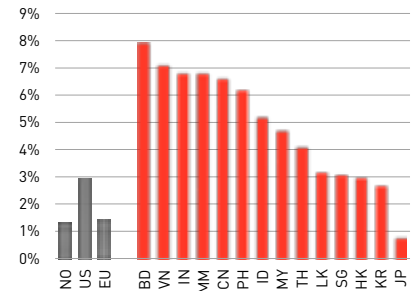
Sources:

GDP/Capita: Wikipedia/IMF; GDP Growth: Wikipedia/CIA Factbook; Global Competitiveness: World Economic Forum; Inflation 2015: CIA; Ease of Doing Business and Days to Start a Business: World Bank; Corruption: Transparency International; Democracy Index: Economist Intelligence Unit; Mobile Telephone Penetration: World Bank; Electric Consumption: International Energy Agency; Basic Figures, Norway: Statistics Norway. Data was downloaded from sources on 11 February 2020.

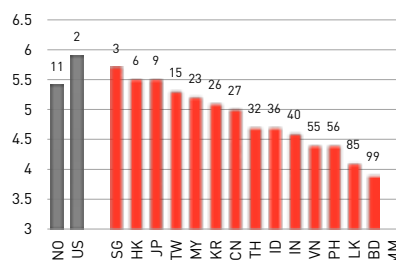
Nominal GDP/Capita 2019 (TUSD)



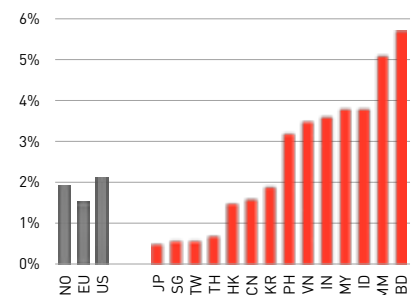
GDP% Growth 2018



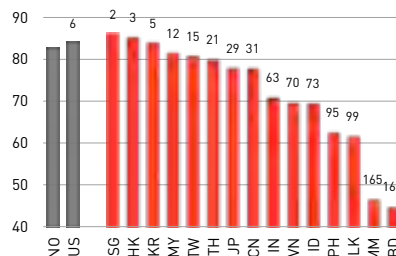
Global Competitiveness Ranking 2017-18



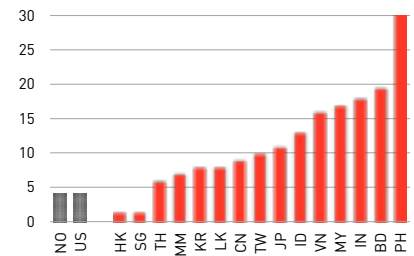
Inflation 2017



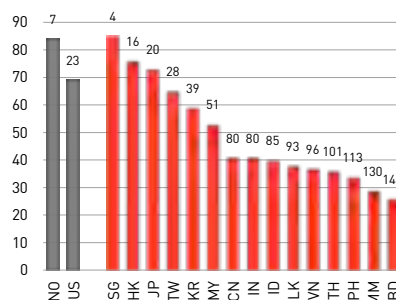
Ease of Doing Business Ranking 2020



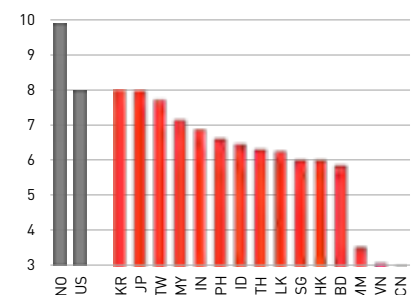
Doing Business 2020 Days to Start a Business



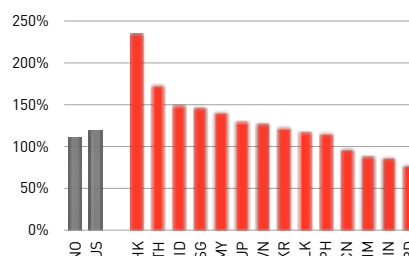
Corruption Ranking 2019



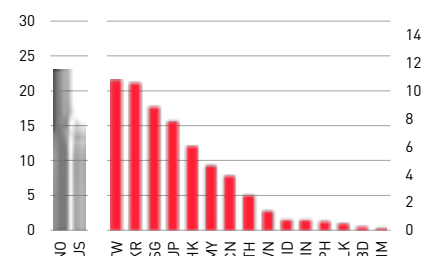
Democracy Index 2019



Mobile Telephone Penetration 2016



Electric Consumption kWh/Capita 2015



Norwegian Chambers of Commerce and Business Associations are established in most major Asian countries. The organisations work to create venues and channels for exchanging and sharing information, to improve local business conditions and opportunities for Norwegian companies and to increase trade between their respective host countries and Norway.

Norway in Asia

Indonesia Norway Business Council

c/o Royal Norwegian Embassy
Menara Rajawali Building, 20th Floor
Mega Kuningan District,
Jakarta 12950, Indonesia
W: www.inbc.web.id
E: execsec@inbc.web.id
T: +62 21 2965 0000

Malaysia Norway Business Council

c/o Royal Norwegian Embassy,
P.O. Box 10332,
50710 Kuala Lumpur, Malaysia
W: www.mnbc.com.my
E: malaysianorwaybc@gmail.com
T: +60 3217 10000

Myanmar-Norway Business Council

c/o Royal Norwegian Embassy
Nordic House
No. 3, Pyay Road, 6 Miles
Hlaing Township
Yangon, Myanmar
W: www.myanmar-norway.com
E: contact@myanmar-norway.com

Nordic Chamber of Commerce and Industry

c/o GraphicPeople Ltd.
3rd Floor, Plot 76/A,
Road 11 Block M, Banani,
Dhaka 1213 Bangladesh
W: <http://nccib.com>
E: info@nccib.com
T: 88017 777 00752

Nordic Chamber of Commerce Cambodia

#30 Preah Norodom (corner st. 148) Bred
Bank Building, 3rd Floor
Khan Daun, Phnom Penh, Cambodia E:
info@eurocham-cambodia.org
T: +855 023 964 141

Nordic Chamber of Commerce Vietnam

Petroland Tower, 17th Floor
No. 12 Tan Trao Street,
Tan Phu Ward, District 7
Ho Chi Minh City, Vietnam
W: <http://nordcham.com>
E: contact@nordcham.com
T: +84 85 416 0922

Norwegian Australian Chamber of Commerce

c/o Schweizer Kobras Lawyers
Level 5, 23-25 O'Connell Street,
Sydney NSW 2000, Australia
W: <https://norwegianchamber.com.au>
E: contact@norwegianchamber.com.au
T: +61 416 246 946

Norwegian Business Association China

Rm. 1701, Bund Center,
No. 222 East Yan'an Road,
Huangpu District,
Shanghai 200002, China
W: <http://norbachina.com>
E: administration@norbachina.com
T: +86 1391 7839679

Norwegian Business Association (India)

c/o Innovation Norway
92, Golf Links
New Delhi 110 003, India
W: <http://www.nbai.in>
E: nbai@nbai.in
T: +91 1149 099200

Norwegian Business Association (NBA), Korea

Royal Norwegian Embassy
13th fl. Jeong-dong Building
21-15 Jeongdong-gil Jung-gu
Seoul 100-784, South Korea
W: <http://www.norway.or.kr>
E: yky@mfa.no
T: +82 0272 77157

Norwegian Business Association (Singapore)

c/o The Royal Norwegian Embassy
16 Raffles Quay #44-01
Hong Leong Building
Singapore 048581
W: <http://nbas.org.sg>
E: admin@nbas.org.sg
T: +65 9780 9674

Norwegian Business Association Sri Lanka

c/o Tiqui
201, Sir James Peiris Mawatha
Colombo 02, Sri Lanka
T: +47 95923712

Norwegian Chamber of Commerce, Hong Kong

Room 3003, 30/F, The Centrium
60 Wyndham Street, Central,
Hong Kong SAR
W: <http://www.ncchk.org.hk>
E: info@ncchk.org.hk
T: +852 6502 1630

Norwegian Chamber of Commerce, Japan

c/o Innovation Norway, Tokyo,
5-12-2 Minami Azabu, Minato-ku,
Tokyo, Japan 106-0047
W: www.nccj.or.jp
E: contact@nccj.or.jp
T: +81 3344 09935

Philippines Norway Business Council

c/o The Royal Norwegian Embassy
DelRosarioLaw Centre, 12th Floor, 21st
Drive corner 20th Drive
Bonifacio Global City,
1630 Taguig City, Metro Manila
Philippines
W: <http://www.pnbc.ph>
E: info@pnbc.ph
T: +63 2317 2700

Singapore-Norway Chamber of Commerce

W: www.sncc.no
E: secretariat@sncc.no
T: +47 930 54 259

Thai-Norwegian Chamber of Commerce

14th Fl., Mahatun Plaza
888/142 Ploenchit Road
Bangkok 10330, Thailand
W: www.norcham.com
E: contact@norcham.com
T: +66 2650 8444



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689 Unit 2709-2713 27th Floor,
Sukhumvit Road, Klongton Nuea,
Vadhana 10110 Bangkok, Thailand
Tel. 02-261-3242
Email: yth.marketing@yara.com



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