ISSUE 3

digital INSIDER

GIVING NEW IDEAS A HOME

CHOPPY WATERS IN OFFSHORE WIND

THE ENERGY TRANSITION ISSUE

Advisian digital
Worley Group

Contents

Welcome to Digital Insider, my first edition as editor since I joined the Digital team earlier this year. One of the most exciting parts of my new role is the opportunity to support new digital solutions that tackle one of the biggest challenges facing the world today: the energy transition.

We have a world that's changing. A population increasing. And a fundamental need for energy that's conservatively projected to increase by around 10 percent by 2030.

But how do we produce more energy while lowering our carbon emissions? How do we scale up our renewables to the levels and reliability required? How do our heavy industries decarbonize? How do we create a sustainable industry for our future workforce? And, how do we do all of this as quickly as possible?

The answer is, technology.

Because without technology, there's no way we will achieve the scale required for a low carbon future.

Take the offshore wind industry for example. The International Energy Agency estimates that offshore wind could generate more than 18-times today's global electricity demand. But this estimation is all but impossible without technology and automation to make the industry safer and more cost-effective **[page 14]**.

The very nature of technology is to disrupt positively. To constantly improve. And to make things more efficient. That's why the energy transition and digital go hand-in-hand.

Whether it's to bring renewable infrastructure together and make it more reliable using distributed energy systems **[page 10]**. Or helping a heavy industry like mining to transition to a low carbon future **[page 28]**.

Digital and enabling technology is the only way forward.

We are creating space for our people to continue to devise new solutions to the world's biggest challenges. To foster innovation and make the impossible, possible **[page 18]**.

It's one of the most pivotal times in our industry. We have all seen the challenges ahead of us with recent world events, and the immediate and long-term changes already underway. The world we know today will be considerably different to the world we will operate in the future. An increased focus on diversity, disruption and technology is what will put us on the pathway to success.

The time to start thinking differently is now and I, for one, couldn't be more excited to work with some of our greatest minds to solve these challenges.

GEETA THAKORLAL

President, Digital

"THE VERY NATURE OF **TECHNOLOGY IS TO POSITIVELY DISRUPT. TO CONSTANTLY IMPROVE.** AND TO MAKE THINGS MORE EFFICIENT. **THAT'S WHY THE ENERGY TRANSITION AND DIGITAL GO HAND-IN-HAND**."

Without digital there will be no energy transition

Tony Frencham, Group Director, Energy Transition at Worley, explains how digital will help us overcome the enormous energy transition challenge

By now, most of us have settled into the idea of an energy transition. We all know that we need to move away from fossil fuels and towards a sustainable energy future. And that part of this process will be working out how to navigate our way through the changes to rebuild our current global energy systems.

These changes could take decades. But the only way they'll be possible is through digitalization.

The Paris Agreement has committed all countries to work together to limit the warming of the planet to no more than 2°C, with a target of 1.5°C. But in the last hundred years or so, we've already warmed the planet by around 1.1°C. If we don't act now, we're going to blow past the Paris targets.

You only need to look at how the climate is changing, and the severe global weather events that are increasing in frequency and severity, to understand the need for a change.

But it's not all doom and gloom. If we put on our positivity pants and take the view that we can all get our act together, there's a future full of possibility.

Rebuilding global energy systems

It will require trillions of dollars of investment, but financial markets are starting to understand that the cost of inaction, such as insurance costs, adaptation costs and biodiversity loss, is greater than the cost of funding the energy transition.

So, let's assume we find a way to direct those dollars for best effect. Can we be sure the technology exists to deliver a lower carbon energy system that's reliable, affordable and available to all?

The answer today is, partially.

Driving down the cost of renewable energy technology

Many renewable-based technologies like solar, wind, batteries and electric vehicles have become cost effective. Other essential technologies, like hydrogen and carbon capture, aren't there yet. But with volume, we expect they will be.

Existing technologies such as hydro power, nuclear power and even gas as the transition fuel, will have a critical role to play.

So again, let's assume we will nail the tech.

Overcoming the energy transition challenge

The energy transition challenge is enormous.

If we want it to be a transition for everyone on the planet, then by 2040, it will need to cater for a global population increase of approximately 20 percent, and a doubling of the world's GDP. What's more, we'll need to drop carbon dioxide emissions by 50 percent compared to now.

How, on this heating earth, are we supposed to manage this?

The key is increasing efficiency and embracing digitalization

Modern energy systems are inefficient. As an example, the US only uses a third of the energy it produces, with the other two thirds being wasted as heat, noise, friction and supply and demand misalignment.

"DIGITAL TECHNOLOGIES WILL ENABLE US TO MAKE THE **ENERGY WE NEED, WHEN WE NEED IT**. IT WILL ENABLE US TO BETTER MANAGE ENERGY DEMAND, STORE ENERGY, AND ESSENTIALLY, TIME-SHIFT ENERGY GENERATION."

To commit to an energy transition fully, we need to tackle this global inefficiency. The key drivers to achieve this will be electrification and digitalization.

Electrification will deliver energy in a more effective manner, and digitalization will make the entire energy system as efficient as possible.

Digital technologies will enable us to make the energy we need, when we need it. It will enable us to better manage energy demand, store energy, and essentially, time-shift energy generation.

What does 2040 look like?

By 2040 we expect that no-one in the world will live in energy poverty. We also expect to be meeting our Paris Agreement ambitions in a rapidly decarbonizing world.

Best of all, we'll be using more energy but demanding less – all because we have a more efficient and effective global energy system enabled by digitalization.

Join us as we navigate the energy transition. ●

OLD DIVIDES AND NEW FRONTIERS

How digital transformation and the energy transition can elevate underrepresented groups in our industry

WORDS BY TRISTAN CLARK

It's no secret that there's a lot of change happening in the energy industry. Whether it's the energy transition or digital transformation, we're constantly being reminded that we need to adjust, adapt and adopt.

Because if we don't, we'll be left behind.

This is no small task. Especially when it seems almost impossible to keep track of what's happening, why it's happening, or whether you'll be able to attract and retain the right talent for your business in five or 10-years' time.

But as technology changes the way we work, and the energy transition redefines our old metrics for success, one thing is certain; a diverse and capable workforce is the only way to buy a ticket to a successful future.

"As important as technology is to organizations today, it all comes back to people," says Jennifer Lee, Global Strategy and Development Manager at Worley. "Their creativity and knowledge are what will drive our industry and the energy transition forward. That's why it's so important to understand the needs of the future workforce and identify the critical gaps and how to manage them.

"Because if we don't, the industry will face bigger problems than which assets to digitize."

Automation could threaten any progress we've made in closing the gender gap

A recent study by the UK's Office for National Statistics found that more than 70 percent of jobs under threat from automation are held by women.

The study explains that in both advanced and emerging economies, women are more prone to the effects of automation for a variety of reasons.

"While we can't be sure of the types of jobs that will be created in the future, we need to start thinking about how we can plan for this disruption in a more focused way," explains Lee. "A way that meets changing workforce requirements, leverages the talents of women, and brings their perspectives into the industry.

"Otherwise, any progress we've made to close the gender gap could be in jeopardy."

But it's not just the gender gap that's cause for concern

It's the widening generational gap, too.

Millennials and Gen Z are the fastest growing portions of the global workforce. But attracting people from this connected and environmentally conscious generation is proving more difficult than anyone expected.

"MILLENNIALS AND GEN Z ARE THE FASTEST GROWING PORTIONS OF THE GLOBAL WORKFORCE. BUT **ATTRACTING PEOPLE FROM THIS CONNECTED AND ENVIRONMENTALLY-CONSCIOUS GENERATION IS PROVING MORE DIFFICULT** THAN ANYONE EXPECTED."

"Surveys are showing that younger people are moving away from industries like oil and gas," says Lee. "There's already an aging workforce across the energy, chemicals and resources industry, with many of the baby boomers starting to hit retirement. One of the biggest risks is a chronic shortage of talent to fill these roles for the long-term."

But while the industry is still digitally transforming – and will be for a while – younger generations see technology and innovation as a given. In fact, according to a study by EY, the opportunity to use the latest technology didn't even make it into the top three drivers for millennials. Salary, work-life balance and on-the-job happiness did.

Millennials want to engage in more meaningful work.

Bringing young people back to the energy industry to solve humanity's biggest problem

The energy transition is urgent and it's massive. It also excites a diverse range of people. And it's why Lee believes it can bring young people back into the fold.

"The fulfilment from solving the world's most complex problems go hand-in-hand with on the job satisfaction," says Lee. "Every organization in the energy industry will play a role in the energy transition. If we talk more about those types of contributions in a truthful and compelling way, it will help retain the talent the industry has while attracting job-seekers in demographics that have gravitated away from the industry.

"It won't solve the imbalances overnight, but it's going to set the course for the industry going forward and create a clear connection to the betterment of the world.

"But for all this to fall into place, we need to get serious about diversity. Solving the world's energy challenges in a just and sustainable way will require the brightest minds and different perspectives.

"Of course, it's more than just articulating your company's contributions to society. Progress can easily come undone if you don't walk the talk," says Lee.

This is where digital transformation can help.

Digital transformation can add more momentum in the pursuit of a more diverse workforce

As an industry struggling with diversity, John Pillay, Digital Transformation Director at Worley, says we have a responsibility to make use of digital tools and give underrepresented groups the flexibility they need to join, and then progress, within the industry.

"Emerging technologies enable better access to a broader range of talent," explains Pillay. "This is already happening through digital collaboration and flexible working tools, which make it easier for people to work remotely to suit their family circumstances and their overall priorities in life."

And we shouldn't be afraid of automation. While it may take away some jobs, it'll create other jobs that we haven't even thought of yet.

"The systemic and cultural issue, which we must take an urgent leadership role in, is enabling women to move into more senior, more creative and more value-add roles across the industry," says Pillay.

"Training, both inside and outside of the digital space, is part of the progression to strategic problem-solving roles. I'm not just talking about formal training. This is equally about exposure to new working environments, new ways of working in digital, different projects, mentorship and so on."

And what of the role of digital in attracting younger people?

"In energy, chemicals and resources, although we have many outdated processes, there are also things that we take for granted that are actually at the forefront of new technology and are at the cutting edge of what 'digital' can offer anywhere," suggests Pillay.

"We also know that younger generations see technology as transformative. And they need to be backed up by a culture that encourages fabulous ideas and gets them funded and put into practice. A workplace that lets you unleash ideas is a powerful magnet for new talent looking for opportunities. That demands a culture that allows experimentation.

"That's what the digital transformation is all about, and that's exactly the environment that newcomers to the workplace need."

The burning platform

Lee offers a final piece of advice for companies sailing into the uncertainty.

"Be bold and proactive, rather than waiting to board a burning platform," recommends Lee. "You'll only fall victim to the rate of change if you don't pay attention to what's going on and you aren't scanning for opportunities to reskill or upskill your workforce.

"Humans are problem solvers. It's what we do best. Equipping people from diverse backgrounds with the right skills will be critical to the success of the energy transition." ●

"A WORKPLACE THAT LETS YOU UNLEASH IDEAS IS A **POWERFUL MAGNET FOR NEW TALENT** LOOKING FOR OPPORTUNITIES."

DISTRIBUTED ENERGY SYSTEMS:

what they are and why they're set to change the energy industry

Distributed energy systems might not be as catchy as blockchain, or as sci-fi as artificial intelligence. But they're powerful, and they could change the world.

WORDS BY MEHREEN YUSUF

For over 100 years, electricity has been generated by large, centralized power stations and transmitted to people's homes through the grid. But this centralized model is starting to break down because it's not agile or reliable enough, and it's often too dependent on fossil fuels.

Paul Ebert, Group Vice President of New Energy and Networks at Worley, has over 20 years' experience in renewable and digital solutions, and explains.

"The reasons for decentralization are many and varied, but behind it are a group of technologies that allow small-scale electricity generation, at the point where the electricity is used," explains Ebert. "For example, these could be small wind turbines or solar panels that are attached to small-scale energy storage at a site or household, with a computer that runs it all."

This decentralized technology is what we call distributed energy systems.

Demand is due to double by the year 2023

According to a recent Deloitte study, an increasing number of businesses are focusing on emerging technologies over traditional ones. Among the most popular are distributed energy systems.

"When I first started out, we used to talk about renewable electricity generation from a single point of view," explains Ebert.

"But over the last 10 years, that's become a smaller part of a much more complex energy transition. And as the renewable energy proposition has grown, and become more complex, it's also become harder to use. This is where distributed energy systems come in. It provides easy optimization for complicated, multi-streamed energy systems."

Basically, distributed energy systems are the key to the success of the energy transition.

They're cheaper, they give the user control, and they make energy more resilient

Distributed energy systems offer much more than the centralized systems of the past.

"One of the biggest benefits is that they supply more resilient energy, particularly in locations that have natural disasters," explains Ebert. "The big, centralized grids tend to break down during catastrophic events, but distributed energy systems keep the electricity supply intact." ▸

"THE BIG, CENTRALIZED GRIDS TEND TO BREAK DOWN DURING CATASTROPHIC EVENTS, BUT **DISTRIBUTED ENERGY SYSTEMS KEEP THE ELECTRICITY SUPPLY INTACT**."

And we're not just talking about small distributed energy systems, like solar panels on homes. A recent project completed in Oregon, US saw us install two battery energy storage systems (BESS) and integrate an existing 25 kW rooftop solar photovoltaic system and a new emergency water well system, at Howard Elementary School. The result of this project is that local communities have electricity and fresh drinking water during power outages that occur in times of inclement weather.

"There are larger companies in industrial and commercial settings who use these systems in their warehouses and shopping centres," explains Ebert. "They get the benefit of generating their own electricity, when they need it, and in any way they want. And, they can control their energy costs and environmental impact."

Interest in distributed energy systems has also increased as companies around the world bid for more sustainable ways to produce energy. This is partly to combat climate change and to reduce dependence on fossil fuels.

Demand for distributed energy systems will only increase as it becomes cheaper to produce energy from renewables

Solar is already one of the cheapest ways to generate electricity. And there are several emerging technologies within solar that will make it even cheaper to generate energy.

"New solar technologies, like tandem cells, are all about getting more energy out of the same panel," says Ebert.

"INTEREST IN DISTRIBUTED ENERGY SYSTEMS HAS ALSO INCREASED AS **COMPANIES AROUND THE WORLD BID FOR MORE SUSTAINABLE WAYS TO PRODUCE ENERGY**."

Solar cells that are commercially available now are around 20 percent efficient. This means that only 20 percent of the energy that hits the panel is converted into electricity.

"There are cells in the laboratory that are double that but aren't double the price," says Ebert. "Now, we're a long way from those being a commercial product, but you can see where it's headed."

As it becomes even cheaper to produce renewable energy like solar, demand for it will increase. This increasing demand will result in more people diversifying their energy sources. Increased diversification will mean that more people will need solutions to optimize their distributed energy portfolios. So, as demand for solar increases, so too will demand for distributed energy systems.

One distributed energy system can't change the world, but thousands can

As an individual or business, your distributed energy system might produce too much electricity for you to use, so what do you do with the excess?

You could export it back to the grid, but Ebert notes that a better way is to trade electricity with another distributed energy system provider. Regulations are still catching up with this idea, and there are trials underway in Australia, sanctioned by the regulator.

"What's emerging is something called the virtual power station," explains Ebert. "A virtual power station gathers the energy produced by individual distributed energy systems and forms a network. This network is made up of decentralized power generating units, flexible power consumers, and energy storage systems. The goal of a virtual power station is to open trading lines between users. You can also present these connected systems to an electricity market as a single power station."

It's an interesting concept, and one that gives a more positive outcome for smaller distributed energy users.

This is because the smaller users get access to deals that might have only been available to larger users. Being part of a virtual power station lets them meet the minimum bid size that's sometimes required to trade in markets.

What's more, by being networked in a virtual power station, the individual energy users can trade like one single power plant. That way, fluctuations that are characteristic with renewable energy generation can be smoothed out by balancing individual units.

For all the benefits, there are still challenges

One of the challenges is to do with how fragmented the industry currently is, with many small users generating energy, selling energy, and looking for energy solutions.

"People and businesses who want renewable electricity end up looking at hundreds of different providers to supply them with equipment," says Ebert.

"This complicates the process and makes it harder to create optimized solutions that meet differing needs. Consolidating the fragmented process is really important."

That's easier said than done.

The complexity of distributed energy systems, especially when you have thousands, means that you need digitized solutions because there are too many variables for human minds to process alone.

For these systems to work we need innovative business models

"Several companies are working on digital business models to optimize these distributed energy systems," says Ebert. "Worley is starting to do that too. We've launched a new digital business called VECKTA, which is a joint venture with a company called XENDEE.

"VECKTA is a virtual marketplace, where people and companies who want a distributed energy system can design it, choose the technology, locate someone who can build it, and finance it," explains Ebert. "It's a revolutionary way to deal with the fragmentation in the industry."

Distributed energy systems will play an essential role in bringing together renewable infrastructure and helping everyone along the energy transition journey. Chances are you'll be seeing a lot more of them. ●

Read more about VECKTA on page 34.

"THE COMPLEXITY OF DISTRIBUTED ENERGY SYSTEMS, ESPECIALLY WHEN YOU HAVE THOUSANDS, MEANS THAT **YOU NEED DIGITIZED SOLUTIONS**."

CHOPPY WATERS IN OFFSHORE WIND

Delving into the crests and troughs of an industry that's taking bold steps into the unknown

WORDS BY TRISTAN CLARK

You've probably heard predictions about exponential growth in offshore wind, particularly in Europe and China. Indeed, the International Energy Agency (IEA) predicts the generating capacity of offshore wind to grow 15-fold over the next two decades spawning a trillion-dollar behemoth that can resign the long-held dynamics of the power industry to history.

Sound a bit far-fetched? You wouldn't be alone in thinking that. These estimations are all but impossible without digitization and automation deployed in the right ways, by the right people, both of which can offer far more than the industry has tapped into.

And yet, progress is still being made on these predictions. Naturally, the output of offshore wind varies according to the strength of the wind.

However, in comparison with solar photovoltaic and onshore wind, its variability is lower and fluctuates within a narrower band.

For operators, this means turbines are generating more of the time akin to baseload electricity from a combustion power plant. However, it's about so much more than money and reliability.

To meet the goals of the Paris Agreement and avert irreversible damage to the planet, we need offshore wind to help us rapidly leave emission-intensive baseload electricity behind. The future of power, and the climate, rests on ocean winds propelling tens of thousands of offshore wind turbines across the globe.

But first, we'll have to navigate some rough seas to power these bold, carbon-free ambitions.

Today, lives are at risk

Health and safety are critical considerations in offshore wind, and there's still plenty of progress to be made.

Even as the industry advances, the process of generating electricity offshore is putting people in harm's way too often in the quest to keep wind farms operational.

Worley's Global Lead for offshore wind, Eoghan Quinn, pinpoints where the health and safety risks lie.

"Just like offshore oil and gas platforms, offshore wind farms are difficult to access. Maintenance trips involve long helicopter flights to remote locations and once personnel arrive, servicing activities are inherently dangerous. They generally involve working at heights in precarious positions, which is naturally more likely to cause more problems the more trips you make."

Drawing on Worley's learnings from oil and gas, Quinn elaborates on how these risks can be minimized.

"In the context of an offshore wind farm, operational optimization processes can help predict how and when failures will occur. Just like oil and gas, we can use data to draw predictive trends and lessons to identify which parts of a wind turbine or substation will fail less than a traditional maintenance schedule suggests. With that information, we can reduce the number of maintenance flights where people are put in harm's way to carry out an inspection that isn't needed.

"Looking further into analytics, predictive applications from oil and gas such as SaltGrid can foresee safety outcomes and mitigate risks in offshore wind before they occur.

"We want to reduce the risk by negating the need for a visit, and if the risk must occur, it's essential to mitigate it using technologies that can process large quantities of data to draw insights that save lives."

It's about opex, too

Costs are plummeting as the scale of offshore wind expands. However, tens of millions of dollars are at risk of being squandered unnecessarily over the next two decades.

Graham Hacon, Vice-President of Business Development Offshore Wind O&M at Worley, and former CEO of 3Sun Group, an offshore wind operations and maintenance specialist acquired by Worley last year, explains why.

"WHEN YOU SHUT DOWN A WIND TURBINE, **YOU'VE LOST THAT WIND FOREVER**. FOR THAT REASON, MINIMIZING DOWN TIME IS CRITICAL."

"It all comes back to operational expenditure. Once an offshore wind farm is in place and working, you will generally plan for a certain number of maintenance visits per year. If you can optimize your maintenance strategy using data, and reduce the number of visits to turbines or substations, that can unlock huge cost savings over time.

"It's not like oil and gas where if you shut the well, it's still in the ground. When you shut down a wind turbine, you've lost that wind forever. For that reason, minimizing down time is critical. If you shut down a turbine three times more than you need to, you're looking at a loss of anywhere between £10,000 to £25,000 per day per turbine when it's not operational." ▸

Hacon explains the path to curtailing this spend.

"The answer to this comes from technologies we've used in oil and gas, and the stories data can tell us that don't require climbing up the wind turbine itself. If you can create a digital twin of your asset, in this case a wind farm rather than an offshore rig, that allows you to complete some of the analysis without shutting it down. This keeps the money coming in while reducing the cost of sending people into remote locations to access it unnecessarily."

Sorry, we're sold out

If we can make offshore wind cheaper and safer with technologies we already have, we're going to need a lot of equipment.

As capacity swells, the offshore wind supply chain will come under siege as a growing number of projects get the green light. The struggle will be for equipment suppliers to keep pace with demand.

Quinn hypothesizes about a future where they can.

"The answer to the supply chain squeeze lies in figuring out how to optimize the supply chain. The best way to do that is to digitize it.

"Many companies have spare parts for offshore wind infrastructure that are not being used in their facilities or being held as surplus inventory. In those cases, they need an easy way to sell equipment, giving developers of other projects access to a legitimate product that lessens pressure on equipment suppliers struggling to meet expansions in capacity.

"AS CAPACITY SWELLS, **THE OFFSHORE WIND SUPPLY CHAIN WILL COME UNDER SIEGE** AS A GROWING NUMBER OF PROJECTS GET THE GREEN LIGHT."

"The last thing we want to do is reinvent the wheel. That's where the need for a digital trading platform comes in. Spare parts need to be accessible, and that requires buyers and sellers to be able to come together and fill these gaps while equipment suppliers catch up on their orders. If we can't do that, we won't meet the scale the world needs now."

Learning on the go

Offshore wind is not only running short on equipment. It's running short on people.

This is an industry feeling the weight of enormous opportunity while grappling with whether it can possibly be fulfilled. After all, this is uncharted territory, with even the most veteran offshore experts learning on the job.

Sundus Ramli, Asia-Pacific Regional Director for New Energy at Worley, explains the challenge of finding the right people to expand this capacity.

"The sector requires 200,000 capable experts to take the industry forward in both Asia and Europe. We're all feeling the pressure. We need to recruit people from many different industries including hydrocarbons, mining, digital and aeronautics among others. We need as many different perspectives as we can get.

"Even for people who are coming into offshore wind from more traditional areas of the power sector, we're going to need to retrain them. Not to mention the people actually conducting the maintenance, because the last thing we want to do is put lives in danger. With such demand, the temptation will be for new players to enter the industry and place unqualified people into dangerous positions. But that will very quickly devastate the sector.

"The only way to overcome this shortage is to digitize the search for people, which can mobilize talent where it already exists in other industries. And where it doesn't already exist, we need to get people trained. We can't afford to have geography-based lags, so once we find the right people, our only choice is to digitize the training process through a proper academy-type structure in a similar vein to what 3Sun had set up."

Investment is flooding into offshore wind from large energy companies and start-ups alike. But its share of the global energy mix currently tallies a mere 0.3 percent of electricity generation despite falling costs, growing electricity demand and the immediacy of the changes we need to make.

There is no certainty, other than a digitized pathway to sustainability

No one knows what the offshore industry will look like 10, 20 or 50 years' time. However, the technology is available to reach a scale large enough to earn the rewards that can no longer be found in combustion power.

The waters are ready to welcome tens of thousands of wind turbines to power our future sustainably.

It's our move. ●

GIVING new ideas A HOME

How Worley created a culture of innovation in the depths of a downturn

WORDS BY TRISTAN CLARK

In late 2014, the price of oil was in freefall. New, unconventional production in North America was transforming the traditional dynamics of oil markets. Meanwhile, demand for oil from the world's biggest consumers of energy was slipping.

Most, if not all, of the world's oil producers slashed investments in new projects, leaving professional engineering services firms scrambling to win work.

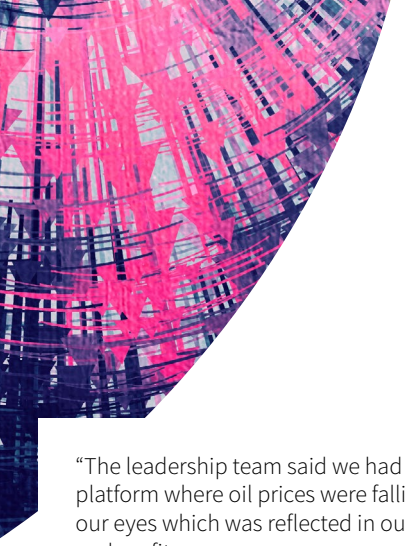
It was the perfect storm.

However, the ideas didn't stop. Thousands of Worley engineers continued to conceive ideas that pushed the energy, chemicals and resources sectors forward despite a dwindling pipeline of projects.

The problem was, their ideas didn't have anywhere to go once the work was complete.

The catalyst

Worley's Group Innovation Manager, Nuria Ruiperez, recalls an urgent need to think about the future amid a prolonged downturn in oil prices.



"The leadership team said we had a burning platform where oil prices were falling before our eyes which was reflected in our revenue and profit.

"If we were going to compete on price for the engineering work we do, we would be filtering ourselves down to the bottom. That meant we weren't going to have a sustainable business, and our leaders knew we had to do something different to guarantee our survival."

Why innovation?

The question was what to do.

Ruiperez continues.

"We knew we had so many brilliant engineers who are inherently problem-solvers and consistently overcome the most complex challenges our customers face every day. What we needed was a way to create offerings out of the fabulous work they were doing out in the field and on projects. We needed to capture what was being lost."

"WHAT WE NEEDED WAS A WAY TO CREATE OFFERINGS OUT OF THE FABULOUS WORK OUR ENGINEERS WERE DOING OUT IN THE FIELD AND ON PROJECTS. **WE NEEDED TO CAPTURE WHAT WAS BEING LOST**."

"WE **SPENT A LONG TIME ESTABLISHING THE CULTURE**, BUT WE STILL NEEDED A WAY TO PROGRESS IDEAS MORE QUICKLY AND IN A MORE TRANSPARENT WAY."

The early days

Ruiperez recalls the ups and downs of embedding innovation into a large engineering business amid an unprecedented downturn.

"Innovation was never going to create revenue from day one, but we hoped it would over time. In our case, asking people to come up with ideas was the easy bit. We're a business that thinks, and we quickly realized we have lots of people who are keen to put forward their own ideas and help improve the ideas of others.

"The struggle was to house these ideas and sort them in a meaningful way. We spent a long time establishing the culture, but we still needed a way to progress ideas more quickly and in a more transparent way."

Enter the Innovation Hub

Innovation had grown steadily since its origins in the depths of the oil price downturn, and the next big step happened a couple of years later.

"We needed a new home," recalls Ruiperez. "We started out by doing a lot of research into the different digital platforms and formed a strong brief about what we needed it to do. It needed to be transparent, enjoyable to visit and able to break down the ideas into insights.

"We eventually chose a platform called Spigit, which now powers our Innovation Hub. It's been a game-changer for us, and the advantage has been its analytics. People can see what has happened to their ideas, who has commented and how it's performing in real time.

"It's transparent, and the crowd makes a lot of the decisions about which ideas progress through our framework. This allows us to move ideas through this process a lot faster. It's much simpler and it enables more collaboration than we had before."

The journey of an idea

From an engineer to an administration assistant, anybody at Worley can submit an idea at any time.

Ruiperez explains how it works.

"If you have an idea, you enter it into our Innovation Incubator on the Innovation Hub. Once it's submitted, the crowd quickly lets us know whether something is new through the comments they make and the links they share.

"Once we can see that the idea is unique and of interest, it gets funded. That funding goes toward building an early stage prototype, which is generally a four-to-six-week process. The person with the idea will then tell us how that went, which informs a decision about whether the idea is progressed further.

"THE SUCCESS STORY EVERYBODY COMES BACK TO IS OUR CATALYST REMOVAL ROBOT, CAROL, WHICH HAS **WON MULTIPLE AWARDS**."

"IT'S THE BRILLIANCE THIS BUSINESS HAS. THAT **STILL BLOWS MY MIND TO THIS DAY**."

"From there, an idea can go directly to a business owner who can help to take it forward. For example, an automation idea may go directly to a digital leader. Alternatively, it may also go to the Capital Allocation Committee where it competes against the other projects vying for funding in the business."

Bringing the business together

We spoke to Ruiperez only hours before the launch of the latest Global Innovation Challenge, this time relating to the energy transition.

These challenges are a big deal at Worley, sometimes attracting upwards of 600 ideas accompanied by thousands of likes and comments.

Ruiperez explains how they work.

"We go to the leadership team and present them with a couple of examples of themes we're seeing talked about in the business. We identify these themes by grouping together common topics gleaned from the ideas submitted on the Innovation Hub.

"Once we decide on a topic, we come up with a question and run the challenge. When the submission period ends, the total number of likes and comments are collated to determine which ideas progress to the next stage.

"However, the beauty is that you don't need to have an idea to be involved. For any given challenge, we get around 11,000 people commenting and voting on ideas."

The innovation alumni

Innovation has an appreciable impact at Worley, and many ideas have graduated through the innovation process into offerings for customers.

"The success story everybody comes back to is our catalyst removal robot, CAROL, which has won multiple awards and is now generating strong revenue for the business. However, we've had at least 10 to 15 of these success stories, many of which have become Advisian offerings."

We asked Ruiperez what the differentiator is between the ideas that succeed and those that don't.

"It's the passion of the person driving the idea. You can have all the data, processes and infrastructure in place, but the passion behind it makes all the difference. Chris Jansen, the person who submitted CAROL into the Innovation Hub, is a perfect example of that. Chris kept pushing the idea the entire way. It's the people who can tell the story to customers in a passionate and compelling way who take their ideas the furthest."

The learnings

Ruiperez offers some advice to companies wanting to establish an innovation function.

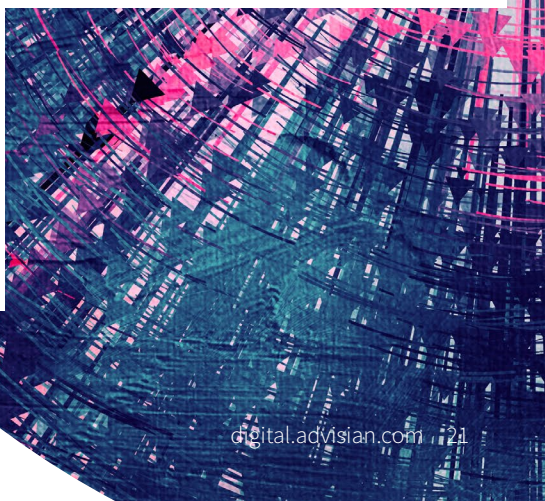
"First and foremost, you need to communicate that you're serious about progressing ideas. If you can crack the nut of communication to get people involved and wanting to shape your business' response to the biggest trends in your industry, the opportunities are endless.

"Innovation should also have a home, and ideally, that's going to be some sort of digital platform that offers total visibility into how ideas are treated. If somebody puts a lot of effort into submitting a high-quality idea, they deserve to see what happens to it and why. That's why having a transparent Innovation Hub accessible to all our people has made such a difference."

After five years of building Innovation at Worley and seeing thousands of ideas submitted, does anything still surprise her?

Nuria offers a knowing smile.

"It's the brilliance that this business has. That still blows my mind to this day." ●



The women at the forefront of the ENERGY TRANSITION *and* TECHNOLOGY

For the world to meet the goals set out in the Paris Agreement, renewable energy needs to be scaled up six times faster. Technology will play a critical role – but so will people. We speak with four women at the forefront of the energy transition and technology

WORDS BY HAYLEY SUTTON

The aerospace engineer turned intrapreneur

Andrea Ruotolo, Global Lead, Distributed Energy Systems, Worley

Andrea Ruotolo was attracted to the field of engineering by her aspiration to work with NASA. After she finished her undergraduate studies in aeronautical engineering in her home country of Argentina, she went to Madrid Polytechnic University in Spain for her master's degree in aerospace engineering. There, she began working in a wind tunnel, analyzing wind turbine blades.

Getting hands-on with renewable generation technologies, rather than rockets, was when her passion for the energy transition took off.

"Working in Spain, I realized that the energy transition is one of the biggest challenges facing humanity today," recalls Ruotolo. "I knew I wanted to be part of the solution, so after my master's I went on to study smart grid development, and completed my PhD in energy and environmental policy, focused on microgrids."

After working as a Senior Program Manager for the New York State Smart Grid Consortium, and starting her own smart grid consulting company, Ruotolo now serves as Worley's Global Lead in Distributed Energy Systems. Her role is focused on spearheading strategy, developing teams, proving new concepts and scaling these to capture new market opportunities and accelerate the energy transition.

This role is focused on intrapreneurship, which is like entrepreneurship – building new teams, capabilities and market offerings – but in a large, established company.

"As it turns out, one of NASA's main areas of work is tracking climate change, which is one of the key drivers of the energy transition," smiles Ruotolo. "So, in a way I've ended up where I wanted to be at the start; working alongside NASA on critical planetary and climate issues." ▸

What drives Ruotolo is her fundamental belief that there's nothing more essential to our modern way of life than building a sustainable energy future for all.

"Without energy we couldn't maintain our growing urban population or global economy," says Ruotolo. "But the fossil energy we've used to get us here won't get us to where we need to go next. We have a one-time opportunity to carry out the energy transition and get it right. We need to work quickly to reduce dependence on fossil energy and adapt to new climate conditions.

"WE MUST STAY OPEN TO TRYING NEW THINGS, PRIORITIZE LEARNING, AND **NEVER FEAR FAILURE**."

"This is a complex effort that includes an array of renewable energy technologies and advanced systems, including artificial intelligence, to accelerate better decision making and improve resource efficiency."

Ruotolo acknowledges that this is a huge job, and that we'll need to approach engineering and project planning in entirely new ways. That's why, for Ruotolo, it has never been more important to stay open to new possibilities, and stay agile when it comes to technologies, processes and business models.

"The not-too-distant future will look more different than we can imagine," says Ruotolo. "We must stay open to trying new things, prioritize learning, and never fear failure."

Ruotolo shares her favorite quote.

"The best way to predict the future is to create it," says Ruotolo. "But I would add 'together' to that."

The e-waste warrior

Kirstin Neira, Director IT Digital, Requis

According to the World Economic Forum, 50 million tons of electronic waste (e-waste) are produced each year. If left unchecked, this could more than double to 120 million tons by 2050.

The time is now to act on our increasing e-waste problem. Something that Kirstin Neira believes can only be overcome with digital technology and the clever re-use of electronic assets.

"The last four years of my career were spent managing inventory operations for an IT company where I was responsible for the disposition of excess and returned stock," recalls Neira. "This role made me realize that there's a big need for digital technologies to ease the common issues of asset disposition such as financial recoveries, data protection and environmental regulation.

"I knew I had found my calling, to educate and change the IT asset disposition industry by adopting digital technologies. Not just to streamline their supply chain processes, but to also capture the millions of dollars being left on the table by companies who aren't aware of the true value of their assets."

But there's an environmental aspect, too.

Since moving to the IT asset disposition industry, Neira developed a passion for educating others about the harmful effects of e-waste.

"E-waste is currently the fastest growing solid waste stream in the world," says Neira. "Additionally, the world is facing a dwindling supply of precious metals needed to manufacture high-tech equipment that we rely on every day. Finding buyers who can re-use and reintegrate electronic parts rather than recycle them will not only increase financial returns for a company, but also preserve scarce resources and reduce our carbon footprint."

Neira uses the example of a memory chip from a laptop to explain.

"The precious metal value in a laptop's memory chip is negligible. And while the memory chip won't be suited for another laptop, it can be reintegrated into a different commodity such as a talking stuffed toy."

It's ideas like this that Neira believes will help the world overcome its increasing e-waste problem. It's why she joined technology start-up, Requis.

"THE WORLD IS FACING A DWINDLING SUPPLY OF PRECIOUS METALS NEEDED TO MANUFACTURE HIGH-TECH EQUIPMENT THAT WE RELY ON EVERY DAY. FINDING BUYERS WHO CAN RE-USE AND REINTEGRATE ELECTRONIC PARTS RATHER THAN RECYCLE THEM WILL NOT ONLY INCREASE FINANCIAL RETURNS FOR A COMPANY, BUT ALSO **PRESERVE SCARCE RESOURCES AND REDUCE OUR CARBON FOOTPRINT**."

Requis is a supply chain and commerce platform that allows businesses to buy, manage and sell their surplus or unwanted assets with qualified IT asset disposition companies. Originally developed to overcome supply chain and asset disposition challenges in the energy, chemicals and resources industry, it's now expanding into the IT industry under Neira's lead.

"Requis is an award-winning digital platform poised to help elevate the supply chain to the next level," says Neira. "For me, the most interesting part will be seeing how impactful the transformation to digital will be for the asset disposition sector of the supply chain.

"I'm excited to share Requis with the world."

The determined data scientist

Jo-Anne Ting, Lead Data Scientist, Arundo Analytics

It's 2003. Google is fast becoming a household name. Apple has made digital music downloads legal. And Jo-Anne Ting is kick-starting her career in machine learning.

"I was convinced I was going to be a professor," laughs Ting. "But after a Bachelor's in computer engineering, a PhD in computer science and a couple of years working on machine learning algorithms in academia and corporate research, I ended up at start-ups because, for me, research was too narrow in scope and corporate was too slow."

Now at Arundo Analytics, Ting is excited to be back in the engineering game, working alongside other engineers in the energy sector.

"The energy industry and digital go hand-in-hand, particularly as the industry shifts and starts to focus on energy alternatives and sustainability," says Ting.

"Data and technology have a key role to play in determining what we can do better and how we can find an optimal path forward."

But it's not going to be easy.

"There is a big safety factor in terms of people and the environment that you need to consider in the energy industry," says Ting. "The decisions you make, the models you choose and the problems you solve all have real impact. A dire impact, if it's not right.

"A large part of machine learning and data science is understanding the context and situation."

That's why, Ting believes it's important to bridge the gap between engineers and data scientists. To make sure they're solving the right problems and not spending time on the ones that can't be solved.

"WHAT KEEPS ME GOING IS THAT **I DON'T THINK WE NEED TO SOLVE A MASTER 'HOLY GRAIL' PROBLEM** TO DIGITALLY TRANSFORM THE INDUSTRY."

"What keeps me going is that I don't think we need to solve a master 'holy grail' problem to digitally transform the industry," says Ting. "I think how the energy industry moves to digital is through smaller problems that are repeatable, relevant and, as a standalone problem, resonate with people.

"The more people you have using a solution, the easier it is to propagate adoption."

So, when technology claims to solve all of the industry's problems, Ting errs on the side of caution.

"Data science isn't magic," says Ting. "It's math and science. If it sounds too good to be true, it usually is."

The energy innovator

Sundus Cordelia Ramli,
Regional Director, New Energy, Worley

As a student of astrophysics, it was puzzling for Sundus Cordelia Ramli to see that most of our energy was still coming from beneath the ground when there was an abundance of energy on earth and in space.

"I was equally concerned about climate change and I wanted to work towards finding a solution," says Ramli. "This led me to my career in renewable energy. I went from a scientist to engineer. And moved on from studying the photon, to looking for new ways to apply it."

For Ramli, this is what makes energy an incredibly exciting industry to be involved in.

"The energy landscape is evolving," says Ramli. "The cost of production is falling, making renewable energy much more competitive. Wind and solar technology continue to improve. The decarbonization of the heat and transport sector is accelerating developments in battery storage technologies, hydrogen and high-temperature heat pumps. And technologies like smart grids, demand response and blockchain are opening up new frontiers for the energy system.

"No matter which camp you sit in, we all need to care about the energy transition. The global demand for energy is set to more than double, while at the same time, there's an increasing need to move to a low carbon future."

"NO MATTER WHICH CAMP YOU SIT IN, **WE ALL NEED TO CARE ABOUT THE ENERGY TRANSITION**."

So, when we asked, "how does the world deal with this challenge?", Ramli's advice is to keep on innovating.

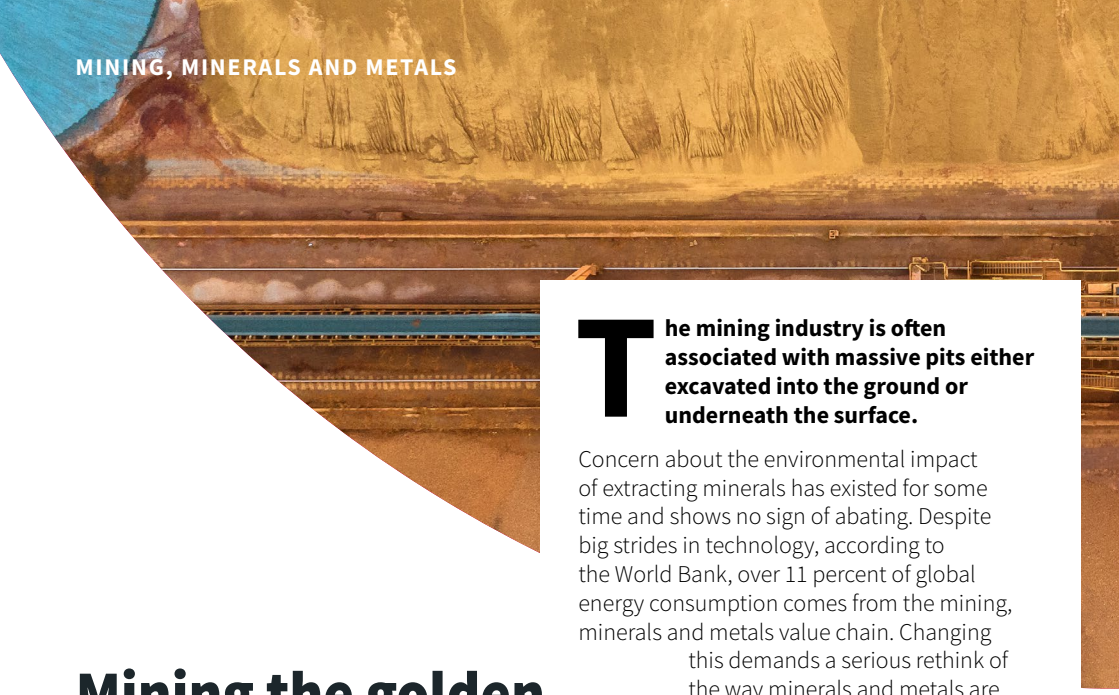
"Innovation has been the one constant companion of the energy industry," says Ramli. "The best part of my job is seeing the passion and ingenuity of my colleagues to increase the value proposition of renewable energy by combining digital technology with solutions and learnings from the oil and gas industry."

One example of this has been the adoption of Reliability Centered Maintenance (RCM) in offshore wind.

"RCM is typically used in aviation and offshore oil and gas," explains Ramli. "But when we applied it to offshore wind the results were astonishing. We identified hundreds of millions of dollars of savings across the operational lifetime of offshore wind assets. This demonstrated how, by just steering away from the normal planned maintenance regime, we can increase the value proposition of the offshore wind industry."

Ramli smiles.

"It's solutions and thinking like this that get me excited for the future." ●



Mining the golden opportunities of the energy transition and digital transformation

Have one last look at the mining of old. An entire industry is digging toward an unrecognizable future

WORDS BY TRISTAN CLARK

The mining industry is often associated with massive pits either excavated into the ground or underneath the surface.

Concern about the environmental impact of extracting minerals has existed for some time and shows no sign of abating. Despite big strides in technology, according to the World Bank, over 11 percent of global energy consumption comes from the mining, minerals and metals value chain. Changing this demands a serious rethink of the way minerals and metals are processed and mined.

But the challenges don't end there.

The scrutiny on mining companies is as broad as it is concentrated, picking apart everything from corporate stewardship to the commodity mix. Shareholders are demanding better returns on less capital with a smaller environmental footprint. The winds of change have hit mining, but blustery conditions aren't always a bad thing.

Let's start with the energy transition

The temptation is to jump straight to the conclusion that the energy transition is an existential threat to an emissions-intensive industry. After all, meeting the goals of the Paris Agreement depends on retiring carbon-intensive activities.

The movement towards low emissions technologies, such as battery storage, electrification, microgrids, wind and solar power, depends on the mining industry to provide the materials needed for this shift.

Simon Yacoub, Vice-President Strategy & Transformation Americas, Mining, Minerals and Metals at Worley, explains why.

“As we head down the electrification and energy storage path, we will require a different mineral mix. We’re witnessing considerable shifts in demand for new energy minerals and these will be used for applications in the energy transition that we can’t even foresee yet.

“The minerals of the low emissions future include lithium, cobalt, iron ore, manganese, aluminum, nickel, lead and graphite. But the single most important mineral that will enable electrification and electron mobility is copper.

“Copper is critical in low emission and electric vehicles, energy transmission and storage, and renewable energy technologies that harness the sun and the wind.

“Essentially, our sustainable development scenario cannot be achieved without these minerals. The mining industry is unique in that great responsibility rests on us to supply them responsibly, and this is shaping our direction going forward.”

So, we know which minerals we need. How do we access and process them responsibly?

“Understanding that mining underpins the fate of the planet, we need to consider less energy intensive ways of extracting and processing these minerals. We also need to power the process with energy that comes from renewable sources. This is where expectations around social license come into play. These are very powerful levers that are vitally important to our customers and hence, to us.

“Our customers have a growing demand for our new energy expertise to establish affordable, reliable power to these mine sites with technology at the forefront of the power sector. Technology is the biggest enabler to make the energy transition a commercially viable pathway. It's also a key ingredient in developing remote regional areas that are adjacent to mining provinces.

“It's exciting to shape a future where decentralized energy supply enables the growth of new economic regions.” ▸

“THE WINDS OF CHANGE HAVE HIT MINING, BUT **BLUSTERY CONDITIONS AREN’T ALWAYS A BAD THING**.”

Throw in the digital transformation

It's offering opportunities for the progressive thinkers and grey hairs for the hesitant.

The goalposts are always shifting in digital, but like the energy transition, digital transformation will enable some companies to evolve into mining majors and others to inadvertently plot their own downfall through inaction.

Evan Boyle, Senior Director Technology Solutions for Mining, Minerals & Metals APAC at Worley, details the current state of the digital transformation in mining.

"In spite of positive statements about digital, investment hasn't always backed up the excitement. It's the adage of you don't know what you don't know. Plus, while it pays off in the long-term, innovation is time-consuming and requires change, so quantifying investment cost is hard and returns are slow.

"That has created some hesitation to make big decisions in case the wrong path or tool is selected. This encourages delays and endless testing of the market, which limits collaboration or investment in digital and data-centric approaches as miners wait for a magic pill or silver bullet."

However, there is little choice but to go for it. Boyle offers a glimpse of where the opportunities lie.

"IT'S A SHIFT IN MINDSET THAT'S REQUIRED. **YOU NEED TO SEE TECHNOLOGY AS THE GLUE THAT JOINS ALL ELEMENTS OF THE PHYSICAL ENTITY, THE DATA, KNOWLEDGE COMPONENTS AND THE PEOPLE** WHO ENVISION, CREATE, BUILD, TEST AND OPERATE THE FACILITY."

"It's a shift in mindset that's required. You need to see technology as the glue that joins all elements of the physical entity, the data, knowledge components and the people who envision, create, build, test and operate the facility. There is no other glue that can stick these things together, and being integrated and working together are both essential for success.

"Technology is already at the stage where we can tap into a virtual world and use digital twinning to build and view an end result. New parts or facilities can be incorporated into the existing world to view, test and optimize the blend of components, as well as the processes and systems used to create and operate the facility. All this can be envisaged before even committing to the development of a project.

"This technology can help make better investment and operating decisions and improve process controls prior to Final Investment Decision (FID). But we must be accustomed to investing in the technology up front.

"This means the probable outcomes of embracing technology, and predicting a balanced, safe, net zero future, can be debated as part of the FID.

"Once a facility is up and running, technology also enables you to monitor its operation, make informed decisions with real-time data and allow many tasks to be performed directly by the control system, improving its own performance over time with machine learning. The assessment speed and response time helps you to keep on track, adjust performance outputs and avoid failures, all of which can contribute to a safer, cleaner and greener outcome. But it needs to be incorporated in the design phase, requiring substantial collaboration with the end user.

"These technologies also offer rational, algorithmic responses, based on many data points. This means responses are better informed, faster and ultimately safer than traditional human or manual intervention."

When the two biggest forces collide

Where there is uncertainty, there is opportunity. Then multiply that by as many times as you like, because when the energy transition and digital transformation are considered in the same breath, they will turn mining on its head.

Greg Miller, Senior Vice President for Mining, Minerals and Metals in APAC at Worley, explains the link between the two.

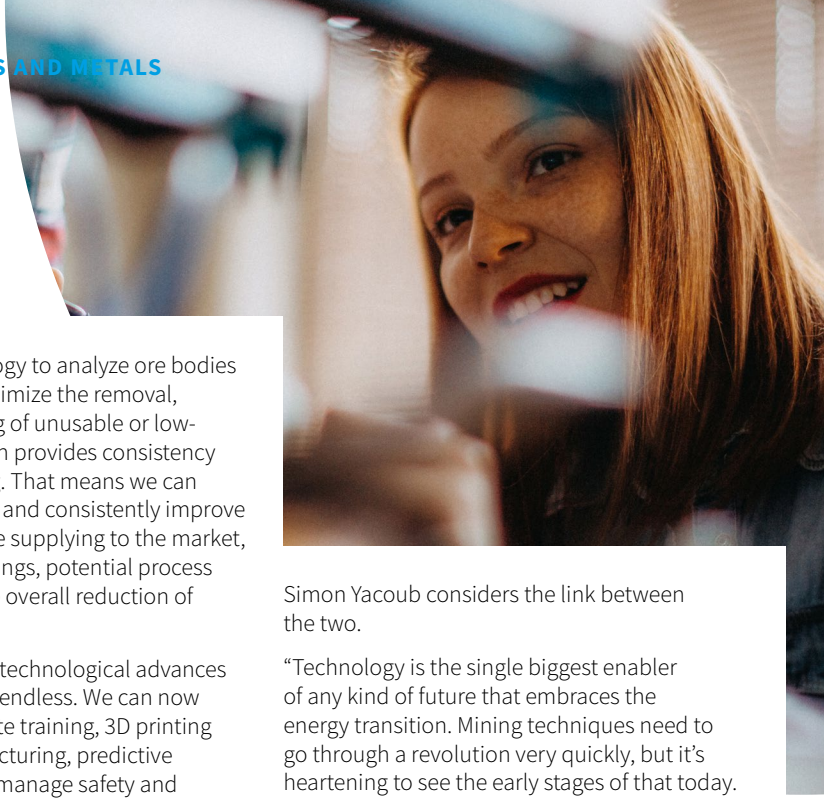
"The energy transition can't happen at the speed we need it to unless we embrace better technologies to design and run mines.

"At the same time, the need to improve overall sustainability and the social license to operate remains paramount.

"These technologies can assist mining companies to assess, track, collate and present the complex mix of elements that contribute to any sort of environmental or energy goal. Knowing what you've achieved is almost as powerful as achieving it. In a world where knowledge is king, a data-centric solution is key to making the right decisions towards achieving a net zero impact."

As Miller explains, technologies that aid productivity can have a similarly large impact on the energy transition.

"We're already seeing the successful implementation of digital tools such as our NextOre mineral sensing technology that can help pinpoint the highest-grade material from a conveyor belt or truck and provide real time grade readings in seconds. And these developments are only going to get better.



"If we can use technology to analyze ore bodies better, it's going to minimize the removal, transport or processing of unusable or low-grade ore, which in turn provides consistency of grade for processing. That means we can run fewer diesel trucks and consistently improve the grade of what we're supplying to the market, resulting in energy savings, potential process improvements and the overall reduction of the carbon footprint.

"The opportunities for technological advances in a mining setting are endless. We can now use virtual reality for site training, 3D printing for spare parts manufacturing, predictive analytics platforms to manage safety and conduct aerial inspections of mine sites using drones. These are just some examples of digital mining processes which are enabling us to optimize mine operations.

"This equates to increased safety, productivity and less carbon emissions, and helps the sector to do its bit to reach the targets of the Paris Agreement and decarbonize the mining process."

Simon Yacoub considers the link between the two.

"Technology is the single biggest enabler of any kind of future that embraces the energy transition. Mining techniques need to go through a revolution very quickly, but it's heartening to see the early stages of that today.

"I'm sure we'll look back at what we're doing now as baby steps, but right now, they are quantum leaps." ●

"TECHNOLOGY IS THE SINGLE BIGGEST ENABLER OF ANY KIND OF FUTURE THAT EMBRACES THE ENERGY TRANSITION. MINING TECHNIQUES THEMSELVES NEED TO GO THROUGH A REVOLUTION VERY QUICKLY, BUT IT'S HEARTENING TO SEE THE EARLY STAGES OF THAT TODAY."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5 minutes with... Gareth Evans

We caught up with Gareth Evans, CEO for VECKTA, on the crucial role of distributed energy systems (DES) in the energy transition.

WORDS BY MEHREEN YUSUF

What is VECKTA?

In a nutshell, VECKTA is a marketplace platform for distributed energy systems.

I bet you're wondering what that means. Let me break it down.

Consider this. Your organization has committed to reducing carbon emissions, but you're dependent on a utility company to provide conventional electrical power. You know you'll have to diversify into other sources of energy, to meet your low carbon goals. But you don't know where to begin.

Can solar power provide enough energy? Does your facility have enough land for it? Do you need battery energy storage and if so, how much? Should wind, fuel cells or combined heat and power be considered? How will the solution be configured and operated to meet your unique needs, and how much will it cost?

And that's just scratching the surface of the complexity that users face when they want to reduce carbon emissions.

And sure, there are consultants out there who might be able to answer some of those questions. But without the right toolkit, they cost a lot and can take a long time. And they probably won't consider all the variables to ensure they get to the best, bespoke solution for you.

VECKTA makes it easy. Powered by XENDEE, it's the only software platform in the world that considers all the essential parameters – technical, economic and physical – that are needed to design a distributed energy system.

Our vision is to help businesses along their energy transition by making it easy for them to design energy solutions, using power from different sources – and lead the transition to sustainable, reliable and cost-efficient energy future.

We develop these solutions using our customers' key metrics, like their energy-use profile and their business priorities, such as increasing reliability and reducing cost and emissions. With these inputs, we help our customers configure, size, and determine how their energy system should be built and operated.

What value does VECKTA provide?

Distributed energy systems have a bunch of great benefits, and VECKTA makes it easy to tap into them.

One of the key benefits is increased energy reliability. Across the world, we're seeing firsthand how catastrophic storms and wildfires can result in power outages. Using VECKTA, we can provide businesses with systems that have greater reliability, which helps them maintain continuity of power supply during extreme weather events and preserve the life of their equipment.

Distributed energy systems can also improve efficiency by optimizing loads. This lowers energy costs, and the reduced carbon footprint makes these projects more socially acceptable.

What's more, VECKTA provides a space for the energy industry to collaborate more confidently through a single interface, and be connected to a wider marketplace. Our platform does everything from empowering customer and project onboarding, design and engineering, through to project financing and construction.

How does VECKTA help tackle the energy transition?

All around us, we're hearing about the energy transition, and the need to shift from centralized, fossil-driven power infrastructure, to a more distributed, multi-directional, and renewable power setting.

But it's not always easy. There are lots of competing needs between communities, businesses, energy providers and regulators.

Distributed energy systems can provide the solution to these competing needs, but only if they're executed well. In the past, these systems have been complex to design, finance and operate.

This is because when you add in more than one energy source, it results in a myriad of options and decisions. You might have hundreds of pieces of equipment to choose from, and different ways of configuring and operating these systems.

VECKTA streamlines the design process with optimization algorithms that can handle the complexities. So, the user can gain the benefits without the headache of comparing all the options manually.

What makes you most excited about VECKTA?

For me, it's about bringing together passionate and talented individuals to deliver on a shared vision for a distributed energy future and enable us all to successfully navigate the energy transition.

We have an industry leading and diverse board. Tristan Jackson leads our strategy and aligns market needs with product development and we recently hired our CTO, Phillip Shoemaker (who was one of the key architects in developing the Apple App Store), and several awesome developers. And we are growing. Their experiences will form an integral part of VECKTA's development.

Describe VECKTA in three words

Can I have six? Our core values are to challenge limits, adapt purposefully, and empower co-creation. ●

Empowering a distributed energy future

VECKTA is the marketplace platform for distributed energy systems. Our goal is to empower you to take control of your energy future and deploy customized and sustainable solutions to meet your specific needs. We help you along your energy transition. We make it easy to design efficient energy solutions.

VECKTA

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