Clean Energy Transition in the Time of Covid

Energy Trends and Leadership Themes



Bloomberg NEF



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In this special report, executives from The Hawthorn Club, an international network for executive women in the energy industry, explore the impacts of the Covid-19 pandemic on business operations and the energy transition. Their initial concern that the pandemic would jeopardize development in clean energy was replaced with a recognition of the opportunities presented by a green recovery. In this article, we hear from many notable executives who highlight the key leadership themes to emerge from the pandemic, including innovation, collaboration and resilience.

It was Sunday morning in Perth on February 23, 2020 and Sherry Duhe was in her laundry room waiting for her dryer to finish its cycle so that she could pack her suitcase. For months, Sherry, the CFO of large LNG producer, Woodside Energy, had been planning for an upcoming investor roadshow culminating at Cambridge Energy Research Associates (CERA) Week, a premier energy conference in Houston.

The first call came in from an investment bank in London – to cancel the planned in-person meetings due to Covid-19 risk. Then another. Her dryer buzzed in the middle of an uncertain call from a member of her lead team; she reassured him workarounds were possible. However, in the midst of rescheduling flights, an email announced the cancelation of CERAWeek. The world was shutting down. Two Sundays later, the three-year pact between the Organization of the Petroleum Exporting Countries (OPEC) fell apart and Sherry prepared to lead Woodside through the unprecedented double 'black swan' of a global pandemic and oil price collapse.

On the other side of the world, Meade Harris landed in Los Angeles early on February 29, 2020. As CEO of The Hawthorn Club, a network of executive women in energy that she founded in London before moving back to her native U.S., Meade was used to international travel. That morning, however, standing in the immigration line unsettled her. During her business trip to Australia and New Zealand, China's borders had already closed, and each new flight carried more mask-wearing passengers than the last. Yet, when it was her turn at the U.S. immigration booth, she was not asked a single question about which countries she had visited or whether she might have been exposed to the novel coronavirus.

Around the same time, Mallika Ishwaran was also returning home. She and her family arrived in London from a holiday in Namibia. When the U.K. went into its first lockdown a week later on March 16, 2020, Mallika had no idea how impactful the virus would become. As then senior economist (now chief economist) for Shell, the question was whether the economy would have a V-shaped or U-shaped recovery. Like many others, she expected a trajectory similar to SARS – three to four difficult months of coordinated response followed by a return to normal. After all, there were no underlying economic problems like those that caused the global financial crisis.

Once Mallika realized that the world was in for a much longer disruption than the few months she initially anticipated, she started focusing on how the downturn would impact the energy transition. For example, electrification was essential to any deep decarbonization scenario. If industrialized economies underfunded electricity grid expansion and upgrade as



a result of the pandemic, it would stymie meaningful action to mitigate climate change. She began looking into the idea of a green recovery. If companies and governments invested in low-carbon technologies in order to create new jobs and fuel economic growth, the Covid-19 crisis could catalyze the paradigm shift that had been eluding climate-aware leaders for decades. Mallika knew that this was an opportunity for governments and businesses to work together, leading the way to a climate-sustainable economic recovery and growth.

For her part, Cynthia Dubin, who sits on several boards including the UK Competition and Markets Authority as well as ICE Futures Europe, was also thinking about how recent advancements in the environmental, social and governance (ESG) space would fare at the beginning of the Covid-19 crisis. She remembers entire months blending together, one day into the next. Nevertheless, she attributes the renewed commitment to ESG and the change in our thinking about energy, to the excess time and space created during the pandemic. Busy people everywhere were forced to put all their plans on hold and re-evaluate what was important. They finally had the bandwidth they needed to make changes toward a more sustainable future.



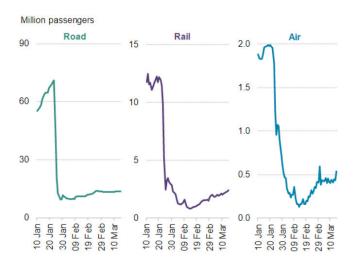
Lisa Kreuger, President, AES Corporation:

"It's important to recognize and align on the future we are working toward, a future that is 100% carbon-free."

At the Bloomberg offices in central London, members of BloombergNEF started seeing the impact of Covid-19 on their colleagues in China as early as January 2020. Meredith Annex, head of heating and hydrogen at BloombergNEF, still remembers the first research pieces written by the group on supply chain disruption as a result of the virus. In hindsight, those early disruptions were like the canary in the coal mine.

BloombergNEF was an early mover in producing research and analysis to document Covid-19's impact on the energy sector. As country after country went into lockdown, power took a hit. According to BloombergNEF data, electricity demand dropped 10-15% compared to business-as-usual (BAU), and in some cases (such as Italy and India) falling by as much as 25%. Supply-chain disruptions plagued the solar, wind and battery industries, with engineering procurement and construction (EPC) providers giving notice of 'force majeure' at an unprecedented rate.

China transport passenger data, January-March 2020

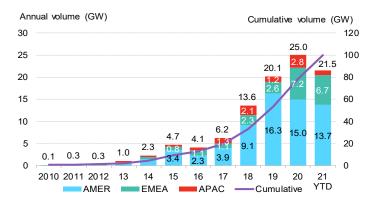


Source: BloombergNEF

Like Mallika and Cynthia, Meredith initially worried that Covid-19 would negatively impact advances in renewable energy procurement, hydrogen, and other critical energy transition technologies. She was as surprised as anyone to see trends go in the opposite direction. First, renewable power grew as a percentage of generation. In Italy, clean energy reached 50% of the generation mix; Germany reached 80% and France reached 100% (including nuclear), according to BloombergNEF data. In the U.S., 2020 marked the first year that wind generation surpassed coal. Second, corporate power purchase agreements (PPAs) for renewable power increased rather than decreased during the pandemic – a trend that has continued into 2021.



Corporate renewable PPA activity by region



Source: BloombergNEF. Note: 2021 to September.

Contrary to expectation, 2020 became the year that countless companies and states committed to net-zero emissions and roughly a trillion dollars in green stimulus was allocated by governments, according to BloombergNEF data.



(Above, left-right) Sherry, Meade, Mallika, Cynthia and Meredith

Nancy Pfund, Founder and Managing Partner, DBL Partners:

"While Covid has had so many negative effects on so many

levels, in some ways it will have a positive effect for sustainability by showing us yet another example of how extremely fragile we are on this planet. The need for action, not complacency, has never been more clear. The good news is that we have the technologies, the political and social will and, increasingly, the policies to match. And yes, we have the expertise, the entrepreneurs and the contributions from companies old and new to transform our world."

Despite positive trends toward net zero and a green recovery that emerged from the pandemic, the challenges and uncertainty related to the Covid-19 crisis cannot be overemphasized. That is particularly the case for professionals with young children. Overnight, parents found themselves responsible for childcare and remote learning in addition to their day jobs. In many cases, female professionals bore the brunt of this unexpected responsibility.

Mary Nichols, Former Chair, California Air Resources Board:

"Climate change can no longer be treated as a separate issue to be managed win its own department.

We need to understand how greenhouse gases are woven through the whole economy and add that we need to be considering climate change as part of the planning paradigm in every area. In government that means that we are using the "whole of government" model that President Biden has described to make sure that every agency is addressing its own vulnerability and its own opportunities to support the nation's greenhouse gas reduction goals.

We in California and many other states and cities are forging ahead with actions to reduce emissions. We are certainly not indifferent to the state of the economy, but recognize that it isn't going to be as it is right now forever, and that as we come back out [of coronavirus isolation] and as we look at ways to rebuild and apply stimulus policies, we have to be prepared to move more efficiently and more smartly in the direction of the zero net carbon goal that. . . is barrelling towards us..."

In response to the unprecedented interruptions to work, travel, and family life, and the staggering impacts on energy demand, supply-chain disruption, and the clean energy transition, Meade launched the virtual Thought Leadership Series for Hawthorn Club women. She first had the idea for the leadership series in mid-March 2020 when a business meeting in Midtown Manhattan ended in a Covid evacuation and a strange flight home with only one other passenger. In the eerie silence she realized that women were uniquely

positioned to lead in a crisis like Covid. Being an effective leader during the crisis would require listening and supporting colleagues through difficult times at work and home.

The virtual *Thought Leadership Series* moved the usual in-person presentations and discussions online, with the advantage of sharing the wisdom of Hawthorn Club women across all four continents. In 2020, the Club held *50 Thought Leadership* presentations, panel discussions, and interviews between Hawthorn Club women and other energy experts, leaders, and journalists. In addition, the Club published six interviews with senior executive women from Australia, the U.S. and the U.K., on the topic of ethical leadership through the pandemic, in its In Conversation Series.

Leadership themes

The 2020 Thought Leadership Series and the In Conversation Series revealed five key leadership themes that Hawthorn Club women view as important for managing during the pandemic, while also helping to realize the clean energy transition. The five themes are:

- · Long-term vision
- · Ongoing innovation
- · Partnering and collaboration
- · Human-driven
- · Perseverance and resilience

The following sections explore each of these themes in greater detail. The insights from Hawthorn Club women during the online programs in 2020, summarized here, provide a roadmap for leadership best-practices not only during crisis, but also during everyday business operations. Female leadership is at the forefront of the green recovery and the energy transition. Without it, the world does not stand a chance of mitigating the worst impacts of climate change.

Siobhan Clarke, Operating Partner, LaunchPad BP:

"If we are really going to achieve these climate change goals by 2050, what goals do we set

ourselves in the short term in order to be able to do things differently, and craft things differently? We need to be able to bring the power of the community together, in order to be able to scale these innovations."

> Kathryn Arbeit, Senior Vice President, Solar Development, Leeward Renewable Energy:

"We really need to stay the course in terms of our climate goals and

deploying solar, as well as other technologies that can help offset carbon emissions right now more than ever, because we can't keep, pardon the expression, our foot off the gas in terms of that trajectory toward our

2045 goals."

Britta Gross, Managing Director, Mobility:

"The real takeaway is that for every year we don't take action, the

harder it is to achieve those 2050 targets. Every year lost now, makes the job harder in three years, five years, eight years. Action today is critical."

Long-term vision

The first clear theme that emerged as important for women in executive roles, was the need for long-term vision and to prioritize that vision in the short term. For Hawthorn Club women, 'long-term vision' means a modern energy system that is clean, affordable and reliable. This requires a significant cultural shift for much of the western world.



Dame Fiona Woolf, Former Partner at CMS Cameron McKenna and Lord Mayor of London:

"One of the big problems the 2008 financial crisis revealed, was we discovered that the world was

absolutely full of short-termism, and everybody was being judged on their last three months' results. In the context of the energy sector, ESG [environmental, social and governance) factors in the long term are extremely important. We're doing this for our children and grandchildren. If we don't get the ESG factors right, after Coronavirus, they will be the poorer for it—more than we will, who are nearing retirement or are retired. It's their future, not ours."

The long-term version is therefore multi-dimensional. It should not be approached, as it has in the past, as a trade-off between a clean, affordable energy system and a reliable one. Nevertheless, achieving the right balance requires innovation and creativity (another key leadership theme). Hawthorn Club women are under no illusions about the difficulty of achieving the audacious goal of a clean, affordable and reliable energy system. One of the greatest challenges to achieving this goal is reaching consensus (or at least cooperation) between countless internal and external stakeholders. Nowhere is this more evident than in efforts by oil and gas majors to shift away from fossil fuels and toward renewables.

Starlee Sykes, Regional President for the Gulf of Mexico and Canada, Exploration and Production, BP:

"I am really excited about the ambition and the changes that are put

forward by bp. I think for us as a company and for Bernard [CEO of bp as a leader, this is recognition that in order for us to be part of the future, we've got to acknowledge our place in the climate debate. We welcome this debate and have spent time listening to what stakeholders say about bp and its future. Our goforward approach says to the market 'we're going to

step up to the plate and think through the entire value chain of our product from creation, when we produce oil and gas, through to end-consumer use, and make sure that we're doing it in the most responsible way'. We are also focused on the long term, so it's about how we get through the current demand destruction and oversupply environment while preserving the future at the same time."

Vicki Hollub, Chief Executive
Officer, Occidental Petroleum:

"Ironically, crises like the Covid-19 pandemic highlight the importance of having a long-term

vision at the same time they challenge leaders' ability to sustain it. In the context of Covid's urgent and critical challenges like shifting to remote working practically overnight and the need to implement policy around employees dealing with the virus first-hand it can be difficult to integrate long-term vision into decision-making. That said, without long-term vision during crises, leaders and staff can sink into a sense of hopelessness and become unproductive, which makes it even more difficult to prevail.

"While my biggest worry is our shareholders and getting them through this [pandemic], my fear is our world is too short-termist. Our investment position on carbon capture technologies was not done to create significant value in 2020, nor 2021, nor 2022. This deal, over time, supports our position to be the company that really changes the U.S. industry around carbon capture."

Ongoing innovation

Hawthorn Club women saw ongoing innovation as another cornerstone to achieving the long-term vision of a clean, affordable and reliable energy system. Achieving this ambitious goal requires creativity and problem-solving, coupled with diversity and flexibility. A number of tech companies are leading the way on sustainable innovation.



Kate Brandt, Sustainability Officer, Google:

"First, we have servers that we're upgrading and repairing with components from old machines.

Then we have a re-manufacturing

program; so when a server needs an upgrade or a more significant repair, we can pull it off the data center floor, and we do our own re-manufacturing to extend its life. We also have a very robust program of selling components on secondary markets; the technology may be outdated for us, but it often would still have great utility for others. We can wipe clean hard drives and other components and sell them into secondary markets. We did this with 9.9 million components in 2019. And lastly, whatever we can't remarket, we have it properly recycled. This is not only a great example of the opportunity to design out ways to keep our products and materials in use, but we're also avoiding hundreds of millions of dollars of cost every year by implementing these practices."

Creativity and problem-solving underpin ongoing innovation and are at the core of developing and implementing a long-term vision. In order to achieve on-going innovation, Hawthorn Club women advocated for a broad perspective – the need to ask questions and listen to the answers. Taking a broader perspective and asking the right questions goes hand-in-hand with seeking a diversity of opinions, which in turn spurs innovation.

Caroline Winn, Chief Executive, San Diego Gas & Electric:

"Fostering a culture of innovation, entrepreneurialism and continuous improvement, together with

providing a safe environment in which to experiment and recover quickly, is extremely important. We've benefited from partnering with private, public, nonprofit and academic sectors because we all come at problems from different perspectives." The most inspiring stories of flexible, innovative solutions during the pandemic, were those that were mobilized to address societal need. Elisabeth Brinton, executive vice president, New Energies, Shell, shared one such story from an Australian context:

Elisabeth Brinton, Executive Vice President, Shell Renewables & Energy Solutions:

"There were so many fantastic examples across Shell of us being

able to use our capabilities to help solve pressing local challenges quickly. When Covid-19 hit Australia, there was an immediate shortage of core medical equipment across the continent. At that early point, a lot of the Asian supply chains were having real problems. Sonnen, which is a Shell subsidiary, has highly skilled electronics manufacturing and finished goods assembly experts in Australia. So, we saw a great opportunity to lend this technical capability in support of an immediate social need. The team from Sonnen joined a medical equipment supplier and helped them to produce emergency medical equipment like ventilators for Australia's hospitals. We were able to mobilize very quickly and it was a really rewarding experience for the team as well."

Addressing the complexities and disruption associated with the Covid-19 pandemic has required innovation as well as flexibility. There were many examples of 'work-arounds' to get work done safely during Covid, and many of the women noted the rapid shift to flexible working arrangements, which suddenly placed an unprecedented level of trust in employees.

Kathryn Arbeit, Senior Vice
President, Solar Development,
Leeward Renewable Energy:

"The pandemic has been difficult for everyone. We've been finding

constant work-arounds. Those folks who are working parents, those folks who are frontline healthcare workers, folks who are facing medical conditions – all face a unique and compounded set of challenges. In



my experience, people are finding different ways to support each other and collaborate and get things done in spite of all the stress and anxiety and not being able to sit down together."

As part of the shift to flexible working arrangements, the pandemic has fast-tracked many organizations' digital innovation strategies, particularly around the use of technology, such as video and web conferencing, to enable remote working. The flexible working arrangement may become increasingly common, potentially enabling more opportunity for parents, and others, to find better balance around family and other lifestyle commitments.

Urvi Parekh, Renewable Energy, Infrastructure Data Centers, Facebook:

"In 2020, Facebook achieved 100% renewable energy and net

zero emissions across all of our operations, and a 94% reduction in our greenhouse gas emissions versus 2017. Finding new ways to work with our utilities has been a really exciting part of our work. It's very much about creating durable solutions that others can use."



"We haven't resolved all the questions around managing flexibly, but the pandemic has

changed the conversation. It has opened up our diversity capability in a way that we've not seen before, and that has been enabled by technology."

Sara Neff, head of ESG,

Lendlease: "The energy transition
is already well underway,
impacting every aspect of our
economy. For example, in real
estate, the shift towards all-electric

buildings and all-electric transportation is increasing exponentially. We have to be careful to design, build, and operate our buildings not just to meet today's needs, but to anticipate the energy needs of the future,

which include 100% renewable power, gridinteractivity, and energy resilience."

Partnering and collaboration

Another key theme that emerged was the importance of partnering and collaboration. There were many examples of partnering and collaboration during the Covid-19 crisis across stakeholders: collaboration between governments and industry and between communities and utilities. Despite these high-level examples, partnering and collaboration starts at a micro-organizational level, with teamwork.

Merryn York, Commissioner, Australian Energy Market Commission:

"One of the things that we're experiencing as we work together

with the other market bodies regarding the reform program, is we are finding that people are thinking much more holistically. In the past, people played their cards pretty close to their chest, and they have been focused on what's in their best interest, and the best interest of their business. I can understand why that is; it's their business and they're meant to look after it. However, during Covid, there seems to be a lot more perspective about, "Well, if this is the common purpose and it's not necessarily completely optimized for my business, I can see that that's actually okay for my business and it's going to deliver a better overall outcome.

"We're finding that people are a little bit more willing to compromise; to reconcile to a way forward much more quickly. They are actually bringing forward ideas that we wouldn't have seen in the past. They're willing to try new things, or even suggest things, that they might not have done in the past."

The importance of teamwork and successful collaboration has been amplified during the Covid pandemic. In both cases, genuine openness and recognition of other people's perspectives is required. This openness to broader perspectives has been particularly evident during Covid-collaboration. There



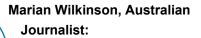
was also a recognition that effective partnerships and collaboration, whether at the team level or between organizations, is underpinned by trust.

Carla Tully, CEO & Co-founder, Earthrise Energy:

"Let's have a candid conversation about the circumstance of the company, where there's enough

trust that you know that I'm going to tell you exactly what's going on, so that you can make informed decisions."

A number of Hawthorn Club women noted how much could be achieved if the level of collaboration seen in the response to the pandemic could be maintained. It would allow many of the clean energy reforms and innovations to progress more quickly. While maintaining such a high level of collaboration and non-partisan approach may be difficult over time, the past year and a half serves as a roadmap.



"We're going to need to bottle the kind of cooperation we've seen through this Covid crisis if we are

going to be able to succeed in transitioning to the new energy system."

Jennifer Purdie, Asset President, BHP:

"There is always a need for the team's ideas to help understand what is at the root cause of

problems, and how we are to fix them. It is really important to engage the team, and be transparent about what the problems are and ask, 'What have we missed? What do you see as the critical issues?"

Vicki Hollub, Chief Executive Officer, Occidental Petroleum:

"There's nobody that inspires me more than our employees because they stepped up during Covid. We've worked hard on engaging

and empowering them and making sure that they knew that they can drive our business. We trust them to do that. Our employees just did a phenomenal job."

Nancy Sutley, Chief Sustainability
Officer, LA Department of Water
& Power:

"We've had a lot of discussions with other utilities across the U.S.,

and shared best practices. That might be around dealing with Covid, with technical operations, or how we are we're dealing with our customers. We've been able to do all that, and it's literally a few clicks of a mouse and typing in a few things, and we can talk to 40 different utilities. In some sense, that's so much easier and less disruptive. Although, you start to miss seeing people in three dimensions as opposed to a flat screen."

Human-driven

The human-driven theme is intended to address the underlying humanity among us all and that there is a need to recognize and manage the whole self through self-care and understanding. This applies to each of us individually and to others within our teams and network.

Dame Fiona Woolf, Former
Partner at CMS Cameron
McKenna and Lord Mayor of
London:

"It's about thinking not just about the profit motive or your immediate own best interests, but also considering others in society, including your own workforce."

An important aspect of the human-driven theme was a recognition that there are many facets to one's whole



self. One of the unexpected benefits of Covid was the increase of virtual meetings, which created a window into people's personal lives. In many cases, the window also humanized high-ranking officials whose personal lives were previously inaccessible. This has helped break down some of the artificial barriers between work and home life and amplified appreciation of the whole self, incorporating a key element of humanity into the business environment.

Leia Guccione, Managing Director
- Electricity Program, Rocky
Mountain Institute:

"We have this expression when we're trying to support people that

collaborate to address complex problems: what we say is to 'Bring your whole self to the work.' I think that's one of the things that I've really seen with my team during Covid, I'm seeing more of people's 'whole self'. It's the Star Wars-themed virtual backgrounds, it's the kids sitting on the laps. It's a lot of the things that I know my staff would probably have been shy about sharing previously. Now, it's coming through so generously. I'm definitely seeing positive impacts for my team in terms of this more personal dynamic."

An additional realization has been the importance of engaging with colleagues and staff from a place of concern. Rather than diminish accountability, as some previously feared, genuine empathy facilitated difficult conversations around priorities and capacity for work in the face of hardship. Approaching difficult conversations with care and empathy, as well as a better understanding of the other person's perspective, increases the probability of a positive outcome.

Elisabeth Brinton, Executive Vice President, Shell Renewables & Energy Solutions:

"Something that's struck me about this whole experience is how it's really equalized everyone in a way; and

how much more authentically we're connecting as a result of that. We're human beings, we're in our homes

with our pets and our families juggling the day-to-day, and yet we're trying to solve some of the most important problems and challenges facing society today. I think that's profound, and if we can just keep that authenticity and transparency, and foster more of that humanity, it's really going to enable us to overcome the economic, energy and climate challenges we have."

The broader context of a positive outcome as a professional team is the ability to catalyze the energy transition. Many of the Hawthorn Club women work in the energy sector because they are driven by purpose to deliver a clean, affordable and reliable energy system that has society's best interests at heart.

Carla Peterman, executive vice president, corporate affairs, PG&E:

"Climate change is having an impact on the affordability of many

essential services such as electricity, water, and housing. As we make investments to improve our energy supply and grid, it is important to be mindful of the impact of rising costs across the economy, and that our work is not in isolation."

Merryn York, Commissioner, Australian Energy Market Commission:

"I want to add value to the community, I know that's part of what has attracted me to the energy

sector and kept me in it for 30 years. I think many people who work in the energy sector have those kinds of values – that sense of value and community purpose."

Perseverance and resilience

The final themes to have emerged as critical to leading the energy transition during Covid are possibly the most important – perseverance and resilience. The ability to preserve in the face of difficulties and the ability to recover from setbacks are often inter-linked.



At a personal level, perseverance and resilience are underpinned by a commitment to the long-term vision, which often requires optimism in the short term as well as the ability to manage through ambiguity.

> Samantha Stuart, Vice President Strategy and Corporate Development, TC Energy:

"That means the ability to quantitatively and qualitatively look

at where things are going supports one's ability to lay out different potential pathways pertaining to energy transition – and where, and more importantly, how to position in order to meet the evolving needs of customers. Different pathways are really important. And that, to me, ensures that we continue to maintain our base infrastructure in order to be resilient as energy needs shift - and we also remain open to the significant opportunities that unfold as emerging technologies evolve."

Hawthorn Cub women shared personal stories of their own resiliency, and the inspiration they found in the resiliency and perseverance of those around them. At an individual level, this can be both mental and physical. There was a recognition from some women that an important part of resilience is accepting and creating space for people's vulnerabilities, which also links to the human-driven theme. Here, Hawthorn Club women also noted the importance of optimism associated with acting on behalf of a greater purpose.

Sherry Duhe, Chief Financial
Officer and Executive Vice
President, Woodside:

"One of the main leadership qualities I see as important during Covid is resilience – physical and

mental resilience. It's something that I have been personally focusing on for a number of years now, with more or less success depending on what part of the year it is! Being pummelled, having your belief systems imploded from every possible angle, and having your workload tripled every day, feels like a marathon. It's

not just me, it's my whole team. I've been inspired by many of my folks in terms of watching them show that resilience, and also watching them be able to show their vulnerabilities when they're struggling, so that we can help each other. I think that's equally important — we're all human here."

The Covid-19 pandemic caused extreme levels of global disruption, but extreme events are likely to become more frequent with the onset of climate change. The presence of women leaders will be essential to effective management through future crises in the energy sector and more broadly.

Kate Brandt, Sustainability Officer, Google:

"We started from a really optimistic place. In so much of the work that we do, it's been so

important to capitalize on the innovation and the ingenuity of our workforce and to tap into all the knowledge that they already have, and to really supercharge that."

The Hawthorn Club

The Hawthorn Club an international network for executive women in the energy industry. The mission of the Club is to promote the appointment of women to senior corporate positions and boards, and to facilitate gender diversity within the global energy sector.

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