



**WPC**  
ENERGY

The World Forum  
for Energy  
Transformation

# ENERGY TRANSITION: The path to net zero



young professionals



24TH WORLD  
**PETROLEUM  
CONGRESS**  
**2023**  
CALGARY | CANADA

**17 - 21 SEPTEMBER**



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# Editor in Chief Introduction



*Shamus Hardie, Editor-in-Chief and WPC YP Representative,  
Senior Market Analyst, Inter Pipeline*

Welcome to the 2023 edition of WPC Energy's Young Professionals (YP) Magazine. On behalf of our editors, I am proud to share this magazine to coincide with the 24th World Petroleum Congress hosted in my hometown of Calgary, Canada.

This year's magazine is separated into four sections: Young Professionals Committee (YPC) Highlights, Developing the Energy Transition, Delivering Sustainable Solutions, and Bridging Generations.

The first segment offers readers insights into the projects and efforts of the YPC from the current cycle, including a recap of the 7th Youth Forum held last year in Almaty, Kazakhstan, a summary of the benefits of the Mentorship Programme, interviews with the Serbian National Committee, and finally the results of the latest Youth Survey.

Developing the Energy Transition provides well-rounded international perspectives of challenges and opportunities for the energy industry, including addressing issues of climate change, gender and youth diversity,

and alternative energy sources, among other topics.

Delivering Sustainable Solutions focuses on technical innovations that speak to advancing carbon neutrality within the petroleum industry. Articles in this section cover novel solutions such as green hydrogen, desalination, carbon capture, and flare gas recovery to reduce emissions.

Finally, Bridging Generations connects current young professionals with experienced industry leaders, including a trio of articles from YPC Alumni, a thought-provoking interview with the 2023 Dewhurst Award winner, Amin Nasser, and lastly a feature on the 'YP Link' that brings together multiple Canadian young professional groups.

This year's edition offers a wide range of ideas that align with the Congress' theme of "Energy Transition: The Path to Net Zero". We hope you enjoy the articles we have compiled, gain a greater awareness of the changing world around us, and find a way to contribute towards a transformative energy system.





## **Dear readers of the WPC Energy Young Professionals Committee magazine**



**A**nother cycle has passed and we are uniting again for the 24th World Petroleum Congress in Calgary, Canada, under the topic of 'The Path to Net Zero'.

I will not write about the challenges our industry is facing nowadays, you will find a lot of fascinating and inspiring articles around that in this magazine. I would like, though, to take this opportunity and to cherish and appreciate all the hard work done by young professionals of the WPC Energy over the years.

The Young Professionals Committee of the WPC Energy is a team of extremely talented, committed, and passionate young individuals. Guided by our core values and commitment to sustainable energy, we provide a platform for inclusive dialogue about current energy challenges, seeking to build an energy future that will benefit our generation and those to come.

Through this cycle our Committee has successfully run the mentoring program, uniting and matching mentors and mentees from all over the world. We have conducted a global survey in cooperation with Accenture, questioning 1,800 young people from different countries and with various backgrounds about their perception of the industry. I invite you all to not only read a report that you can find later in this magazine, but also share it with your colleagues and fellows! This is a great opportunity to ensure that the voice of young generation is heard.

WPC Energy YPC continued building our global network YP Connect through media channels: LinkedIn and Instagram. We also organised in October 2022 the 7th WPC

Energy Youth Forum in Almaty, Kazakhstan, which attracted 700 delegates and 112 speakers from 29 countries. The YP Program of the 24th WPC Congress has been fully developed and organized by the Canadian Future Leaders Committee with support of WPC Energy YPC. I hope you will enjoy the interesting sessions, tour visits, workshops and, of course, the Youth Night that are prepared for you!

You are now reading the YP Magazine, which is already the 8th edition published by Young Professionals Committee. The magazine is a great platform where young professionals, students and industry leaders share their views on key topics shaping the energy industry. I am sure you will find a lot of interesting and useful articles here.

I have listed only some of our projects that have been running on a daily basis. The real impact that we have globally and locally is truly inspiring!

Dear, WPC Energy Young Professionals Committee, dear future leaders, you have done an amazing job! I feel extremely honored that I had a chance to be a part of this team. Your talent, commitment and passion that is so needed for the energy transition will definitely be the key! For me it was an unforgettable ride. Thank you for sharing it with me!

I wish all industry young professionals, students, and readers an amazing experience at the 24th World Petroleum Congress in Calgary!

Lesana Kurbonshoeva,  
WPC Energy YPC Chair



## Welcome Message from WPC Energy President

# The 24th World Petroleum Congress is here!

After almost two years of dedicated work, undertaken in unique circumstances, we look forward to welcoming the entire energy community to Calgary from September 17 to 21, 2023. And personally, I would like to extend a personal warm welcome to all participants and especially to the Young Professionals.

The preparation for this Congress has been particularly intense and not only due to the work involved in organising the largest global meeting of the energy community. The backdrop of this project has been that of an organisation in transition; not simply refreshing its name and brand but also undergoing a complete evaluation of its future role and purpose within the energy sector. And let's not forget that all this follows on from the 23rd Congress which was heavily impacted by the COVID pandemic, which not only affected the level of attendance but also the very way in which international events, such as those organised by WPC ENERGY, will be managed in the future.

The WPC Energy Strategic Plan 2021/2026, whose framework was approved at the 7th WPC Youth Forum held in Almaty in October 2022, was prompted by feedback from our sixty National Committees and created in close consultation with our membership. Our priority has been to acknowledge the rich heritage and DNA of our organisation whilst recognising our responsibility to facilitate dialogue and connection across all spheres of the rapidly evolving energy landscape. We must stretch our focus beyond new and

traditional energies and highlight emerging industry trends such as increasing energy efficiency, circular economy, synthetic and bio fuels, digitalisation and electrification. Finally, we will advocate that all energies and technologies must be embraced to face the challenge to energise the planet in a responsible way.

And during this process, you our Young Professionals will play a crucial role by actively participating in all discussions and contributing your ideas, opinions and views. We want and need to keep it this way. Your presence during the energy transition, as the least conforming and innovative layer of society, will help our industry understand and meet the demands of today which will become the trends of tomorrow.

Therefore, I encourage you to participate as actively as you can in the Congress, attending all the events and contributing your thoughts and ideas in an open and clear way. And to continue to do this after the Congress in your day-to-day professional lives. You have an important role as Ambassadors of this industry and yours will be the single most important contribution to the future of our sector.

So, once again, welcome to the 24th World Petroleum Congress in which you play a unique and central role.

I look forward to meeting as many of you as possible during my time in Calgary.

Warmest Wishes  
Pedro Miras  
President, WPC ENERGY

CANADA



## Welcome Message from WPC Canada Chair Richard Masson

Society faces many daunting challenges today. Developing an energy system that enables us to meet our climate objectives, while providing affordable and secure energy to a growing global population is among the most pressing and most complex. The actions we take to change our energy systems will have both intended and unintended consequences, which are not readily predictable.

While many view hydrocarbons as a "sunset" industry, it is very likely that coming decades will prove it to be crucial to the energy system transition, with the resources, skills and creativity of its people being at the forefront of the change. As Young

Professionals involved in this industry, you have an opportunity and a challenge to help lead this change. It will take technical skills, business acumen, and strong interpersonal networks to be able to maximize your impact.

WPC Canada is proud to welcome you to Calgary to be part of the 24th World Petroleum Congress as we address the theme "Energy Transition – the Path to Net Zero" with experts from around the globe. We hope that you will have a great experience at the Congress and in our beautiful city of Calgary, and will continue to develop the skill set and networks that you will need to have an impactful future as part of the global energy industry.

# WPC YP Highlights

## Introduction

*Daulet Kibatov, Engineer, KazTransOil JSC, Kazakhstan*

Welcome to the Highlights section of the 2023 edition of the WPC Young Professionals Magazine. This particular portion of our publication is committed to showcasing the diverse achievements, perspectives, and innovations from our global network of young professionals.

Our Highlights section encapsulates the essence of our theme, "Energy Transition: Dialogue of Generations", bringing together a compelling mix of reflections, insights, and forward-thinking ideas. These are not just narratives but powerful dialogues - ones that challenge conventions, inspire change, and stimulate thought about the nuances of innovative leadership, the role of sustainable technologies, and the

impact of energy on society.

As we navigate through a period of significant transition, we remain focused on our vision of a net-zero future. The stories you will discover in this section echo this commitment, questioning the present and envisioning the future of the energy industry.

This section is an ode to the brilliance of young professionals worldwide, the ones poised to shape a sustainable, inclusive, and technologically advanced future for the industry. Their voices, ideas, and actions are the lifeblood of the energy transition - let's amplify them together.

We invite you to delve into these Highlights and join us on this journey of discovery and transformation.

## Almaty Highlights

*Below right: Daulet Kibatov, KazTransOil JSC, engineer*

*Below left: Diana Omarova, KBTU University, MSc in Petroleum Engineering Kazakhstan*

The VII WPC Youth Forum in Almaty, Kazakhstan, emerged as a vibrant platform that brilliantly encapsulated the essence of the theme, "Energy Transition: Dialogue of Generations". Over 700 delegates from around the globe, from aspiring young professionals to revered industry stalwarts, added depth to over 20 events, stimulating discussions about the energy industry's evolution. The Forum highlighted the synergy between generational wisdom and youthful innovation in adapting to new energy realities.

It also shone a spotlight on Kazakhstan's strategic initiatives for a successful energy transition, showcasing its commitment to environmental responsibility and decarbonization. The culmination of these profound dialogues led to the WPC Almaty Declaration, a testament to our shared vision for a sustainable energy future.

This piece invites you to delve deeper into the highlights of this enlightening gathering. As we forge ahead, let these insights serve as a catalyst to spark fresh conversations and fuel innovative solutions.



Kazakhstan



Oman



Serbia





# Oman Highlights

## Mentoring for the Young Professionals

*Maram Al Belushi, WPC YP Representative Mentoring Program Vice Chair, Oman  
Oman WPC YP Representative Mentoring Program Vice Chair*

The ongoing global energy transition with emerging AI technologies has caused an increased and continued challenges to the industry. However, emerging technologies have also created a considerable number of opportunities. In such prolific times, the role of Mentoring becomes an essential need. Nowadays we witness a massive flow and exposure of information compiled with accelerated technological growth – causing confusion for the young professional. Having a Mentor effectively increases the focus and helps keep the young professional in check - especially in the first years of their career.

The Mentor provides a proper guide for the young professional on areas such as knowledge sharing, skills development, experienced advice and support, networking and connections, and personal growth. Notwithstanding, the young professionals themselves must have the desire to learn and grow which will insure extracting the

utmost value with the Mentor.

WPC YP provides an outstanding Mentoring Program for the industry's young professionals in which they are directly connected with the industry's finest leaders. Young professionals from around the globe can apply for the program that extends for two years with engagement sessions conducted with their assigned Mentor.

Throughout the program, the young professionals are exposed to different topics that serves their career and personal growth. Being in the program Committee for two years, I advise the young professional to apply and benefit from the learnings and connections provided with young professionals and Mentor from different countries and with different backgrounds that provides direct cross-learning and experience sharing. Stay tuned for the opening of the 6th Mentoring to apply and encourage your colleagues to join you.



# Serbia Highlights

## Catching up with local YPs

*Jelena Zivic, Expert for Relations with Foreign Organizations, NIS j.s.c. Novi Sad (meaning Petroleum Industry of Serbia JSC)*

*Stanislava Radojcic, Expert coordinator for projects of cooperation with state authorities and business associations*

The Young Professionals of National Petroleum Committee of Serbia, since the establishment, have been dedicated to fostering collaboration between young experts and seasoned professionals.

Teamwork of young professionals and experienced mentors is the optimal way for the business to keep pace with the unstoppable advancement of technology and stay ahead. Not only do innovative problem-solving approaches of juniors address present challenges, but they also seek to refine them, thus enabling its application in future transformations.

However, in order for the oil industry's reframing processes to operate smoothly new generations are required to immerse themselves in an already accumulated

experience. Herein lies the importance of synergy between senior and fresh professionals, i.e. the knowledge transfer. Indeed, the most fruitful outcomes arise when they complement each other.

In addition, it is inspiring to witness the rise of women in petroleum engineering, as young female professionals make remarkable strides in this traditionally male-dominated field.

Looking ahead, the Young Professionals Committee should strive to hold workshops of committee members and industry representatives with young professionals in order to the exchange views and innovative ideas. From our standpoint, this will strengthen the said synergy; hence, it will enable a proper transformation of our industry.



# Are you listening? Charting the pivotal role of young professionals in the energy transition

Olga Fedorova, YPC Member (Cepsa), Spain, Lesana Rousselet, Chair of YPC (Technip Energies), Adi Akheramka, YPC Member (IPA Global), Alaa al Zarafi, YPC Member (Baker Hughes), Iñigo Iulibarri, YPC Member (Tubacex)

The 2023 edition of the WPC Youth Survey ‘Youth Perception of the Energy Industry: The Future Landscape’ provides insights of how young professionals perceive the energy transition. Here’s the headline: Young professionals and students have a positive view of the energy industry—and strong opinions about what’s needed to take it to the next level. It’s time to tap into their passion and empower them as leaders and advocates who can

help accelerate the global energy transition. This year’s online survey reached over 1,800 respondents from over 30 countries. The young respondents’ profiles were evenly distributed by age groups. Broken down by discipline and gender, STEM background educated was prevalent – 78% of respondents – and despite strong participation from young women, men still represented 58% of respondents. (Graph 1)

Traditionally, the energy transition has been seen as the responsibility of governments and international bodies. But this expectation is changing. As governments shift their focus back to more traditional politics (think energy security, economic recovery post-pandemic, war), we are entering into a new era. Moving forward, the energy transition will be characterized by individuals and corporations taking the reigns – driving action through grassroots movements and leveraging the scale of corporate resources to enact tangible change. In this changing environment this survey investigates the importance of the role that young professionals can and will play in the energy transition and makes a call-to-action for industry leaders to leverage young professionals’ voice to reinvent the energy industry.

### Energizing the Future

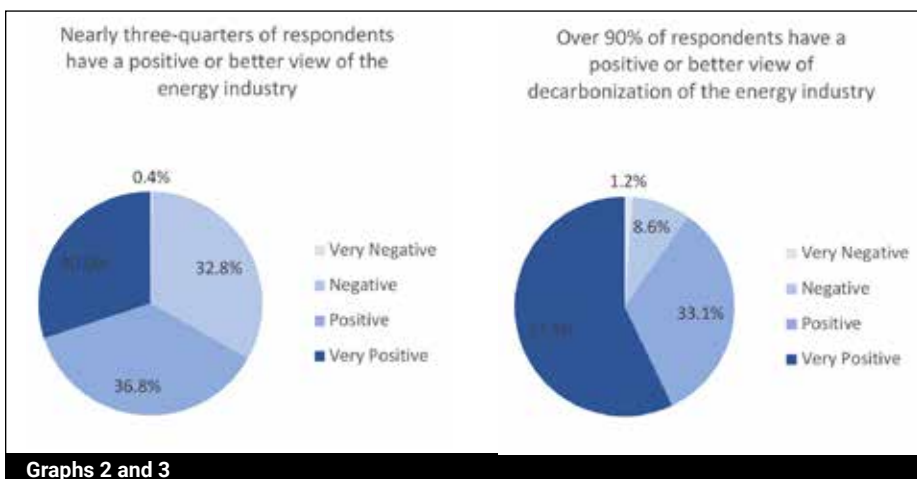
What we found is that young professionals have an overwhelmingly positive perception of the energy industry and are optimistic about the industry’s progress towards decarbonization. (Graphs 2 3) Regionally, respondents from India and the Middle East were the most optimistic about the state of the industry overall, while European respondents had the most negative view, with a similar regional response regarding the perception of decarbonization globally. And although young professionals have this positive perception of the energy industry (and its commitment to climate action), the challenge lies in converting this hopeful sentiment into tangible actions. This is where industry leaders and corporations have an opportunity to make significant impact.

### The Details Matter

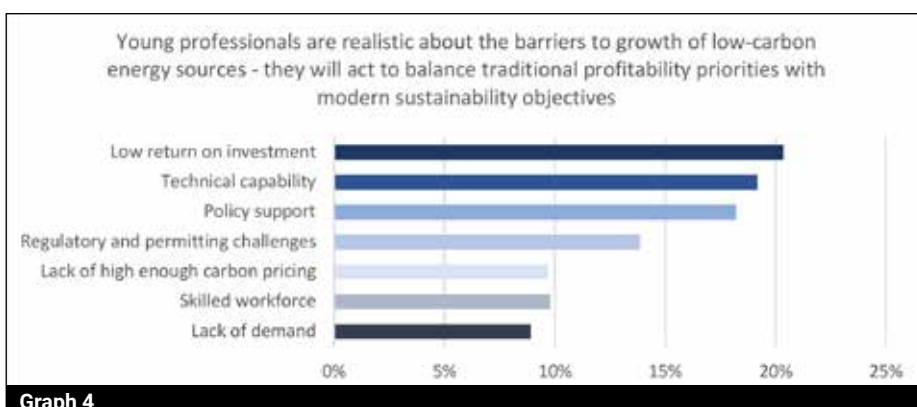
Despite the positive perception, only 26% of respondents felt that net zero strategies were communicated clearly and a staggering 67% believe that energy companies will not achieve their net zero emissions targets by 2050. Furthermore only 17% think that the 2015 Paris Agreement and subsequent Conference of Party (COP) agreements have had a high impact on limiting temperature increases. (Almost 30% believe the impact has been low or none). Highlighting the



Graph 1

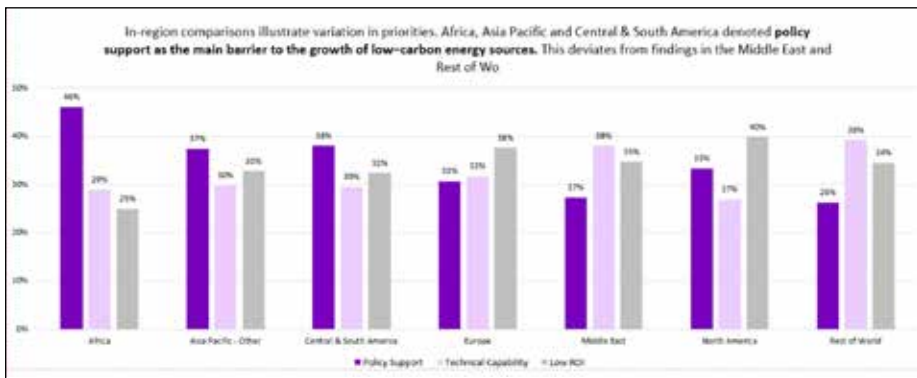


Graphs 2 and 3

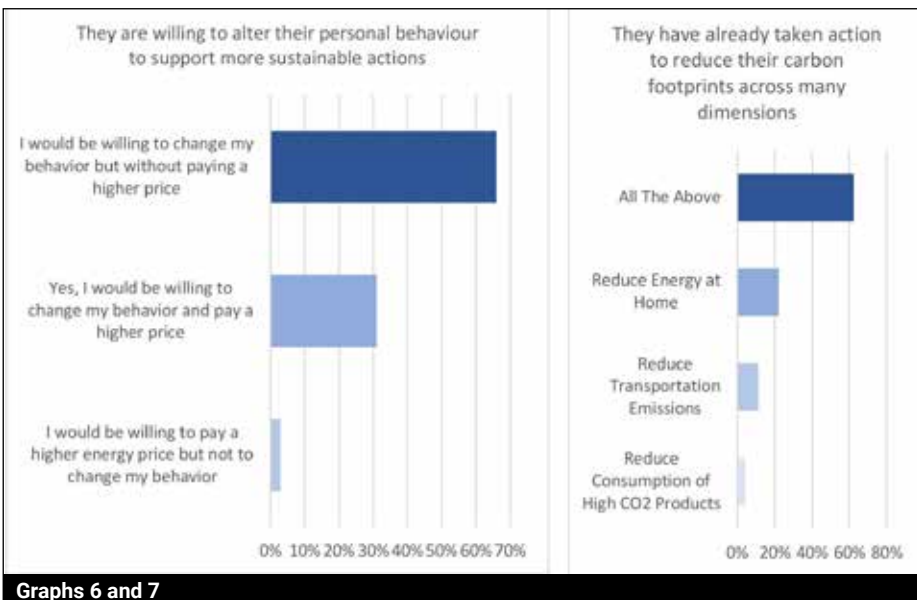


Graph 4

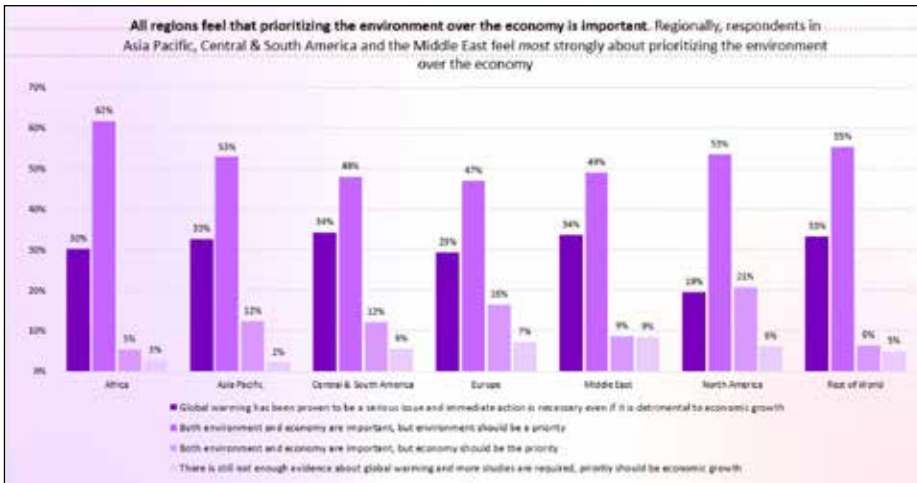




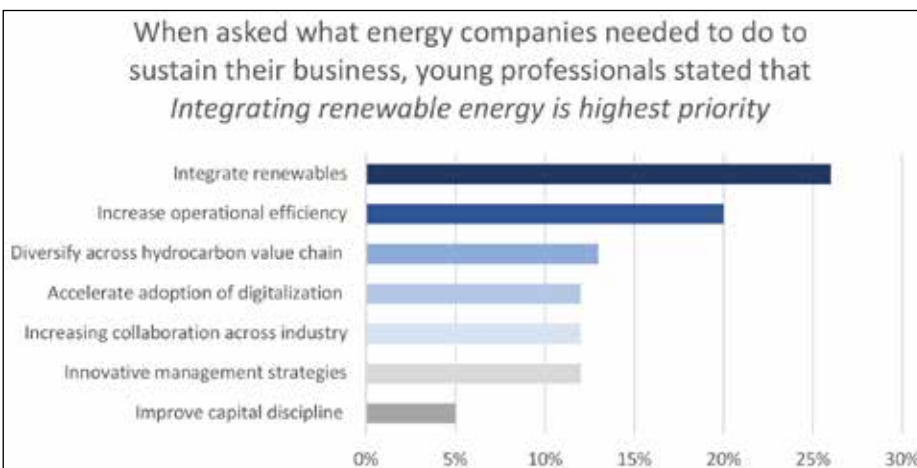
Graph 5



Graphs 6 and 7



Graph 8



Graph 9

disheartenment of the young professionals with the lack of progress in the energy transition.

Young professionals aren't looking for castles in the sky. They are pragmatic about the challenges that accompany the energy transition, and the time it will take for companies' strategies and actions to have the desired effect. When asked what the major barriers to faster growth of low-carbon energy sources are, over 20% responded Low ROI, followed closely by the need for better technical capabilities and an appropriately skilled workforce. (Graph 4)

They also understand that progress isn't always going to be linear. Young professionals know that there is a maturity curve mirroring regional development that plays a significant role in shaping the energy transition. First, policy support is required to establish boundaries within which the energy industry must operate. Once policy is in place, technical feasibility is the next priority. And finally, return on investment can be scrutinized once regulation and technology support the switch to low-carbon energy sources. (Graph 5)

Young professionals understand that different parts of the world are at different stages along the energy transition journey and finding a sustainable solution means finding a unique balance where the energy trilemma is addressed on a regional basis.

**Progress with Purpose**

Respondents are realistic about the pathways to limit global warming and they are also committed to addressing climate change in their personal lives. Young professionals are the future consumer and their viewpoints depict as much – including the choices the next generations will make around multi-energy fuel/product choices and willingness to pay. (Graph 6&7)

Geographically, the Asia Pacific and Central and South America are most committed to environment-first priorities, despite potential economic harm. Conversely, North American respondents lean towards economy-first priorities more than other global regions. Industry leaders and policy makers trying to minimize the impact of global warming should leverage the voices of young professionals who know both the economy and the environment are important to bring a balanced perspective to the debate on climate change. (Graph 8)

**Getting to Net Zero**

Students and young professional have a strong and generally uniform response as to the best strategies to getting to net zero. Integrating renewable energy is highest priority (>25% of respondents) and increasing operational efficiency was the second most important priority (20% of respondents) indicating that companies need to look to innovation for both core and new businesses. (Graph 9)

A more granular picture emerged by region and age: globally, solar power was the top choice for future technology investment, followed by batteries, storage and hydrogen. However, respondents in North America prioritized investments in Solar Power

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## Editor's Introduction - Let the young generations take the lead for a sustainable energy transition: YP speak up on several technologies that will be key to reach carbon neutrality



*Raquel Cantón Jara, Lead Account Manager, Honeywell*

In a world where the effects of the global warming are very visible, including floodings and droughts, and with their environmental and social devastating consequences being faced by millions of people, almost no one doubts that urgent actions to combat climate change by reducing greenhouse gases (GHG) emissions should be urgently taken. However, this indispensable transformation can be a challenge from a technological perspective because it is required not only to find feasible solutions but also to make those economically viable. But the energy industry, with numerous examples of innovation and collaboration behind it, is decided to attract the brightest talents to overcome this challenge and make the energy transition happen.

This 2023-year magazine was fortunate

to hear from many fascinating angles and diverse countries and backgrounds, about solutions that can be taken to rocket the energy transition and achieve carbon neutrality. Articles in this section feature perspective from YP on hot topics like green hydrogen, humidification-dehumidification systems for desalination, CO<sub>2</sub> capture and storage and flare gas recovery systems through LNG production. These solutions tackle among others, problems such as the difficulties to decarbonize some energy-intensive sectors, water scarcity or GHGs reduction.

On behalf of the World Petroleum Council's Young Professional Magazine editing team, we hope you enjoy this compilation of articles, and we look forward to seeing you in Calgary this year.

## Flare gas recovery through liquid natural gas production

*Delara Heidari, Lawyer, Oil and Gas Law Expert, Iranian Offshore Engineering and Construction*



According to a World Bank report, one of the measures that can be focused on to reduce climate change is to control or reduce the emission of pollutants caused by flare gas. Flaring of gas contributes to climate change and impacts the environment through emission of carbon dioxide, black carbon and other pollutants. It also wastes a valuable energy resource that could be used to advance the sustainable development of producing countries other pollutants. For instance, the large amount of Associated Petroleum Gas (APG) in the upstream part of Persian Gulf is burned which requires investment.

The plan suggests; using facilities like Floating Liquid Natural Gas (FLNG) for bunkering is a most suitable choice for investments in recovering APG for the following arguments:

- I. Considerable volume of burning APG;
- II. Short distance to consuming markets;
- III. Economic savings to avoid pipeline construction. Considering dazzling expenses to transport APGs over long distances from the rigs to nearest shore, for any other implementation;

IV. Increasing demands for LNG in domestic and regional markets since 2020 after the IMO regulations which required ships to reduce their sulfur consumption.

Investment in small-scale FLNG along with innovative financial and commercial structures will create economic values and earn profits. Compared to a traditional LNG plant, it requires less capital and the return-on-investment period is considerably shorter. Moving LNG production to an offshore setting presents a demanding set of challenges that these issues are solved by bunkering and the supplying of fuel for use by ships in the form of consignment sales.

The research results show that companies in this area can reduce billions cubic feet of greenhouse gas emissions per year by implementing an LNG production process that is aligned with the global goals of reaching the Zero Routine Flaring. With the cooperation of the private sector, these companies can earn a significant profit. Providing clean fuel for bunkering can lead the state oil companies to enter the sustainable fuel production chain for the international transport fleet.

# Storing captured CO<sub>2</sub> : Your questions answered



Prasanna Joshi, Vice President, ExxonMobil Low Carbon Solutions Technologies

**C**arbon capture and storage (CCS) is considered a key solution to the challenge of decarbonization. CCS reroutes CO<sub>2</sub> away from the atmosphere and safely stores it below the earth's surface.

CCS on its own, or in combination with hydrogen production, is among the few proven technologies that could enable significant CO<sub>2</sub> emission reductions from high emitting and hard-to-decarbonize sectors, such as power generation and heavy industries, including manufacturing, refining, steel, cement, and petrochemicals.

In my work and even among my friends and family, I get a lot of questions about CCS – particularly the “storage” part.

People naturally recognize the benefits of capturing CO<sub>2</sub> emissions instead of releasing them into the atmosphere where they contribute to climate change, but they often have questions about the logistics of storing the captured CO<sub>2</sub> underground.

I'd like to address some of the most common questions I hear – and clear up some misperceptions I think are out there.

What happens to the captured CO<sub>2</sub> ? After CO<sub>2</sub> has been captured from a power plant or industrial source, it's compressed, transported (usually via pipeline), and injected deep underground.

Where is the CO<sub>2</sub> stored? One option is where we found oil and natural gas in the first place – the microscopic holes in rock formations thousands of feet underground. The holes that were emptied to get the oil and gas can be refilled with CO<sub>2</sub>. But the biggest opportunity is in saline formations deep underground, which are porous rocks that hold undrinkable water. They're found all over the world, and in fact, hold the biggest potential storage capacity. And if they're located close to an emissions source, they can reduce the cost of transporting the captured CO<sub>2</sub>.

Is there enough capacity? More than enough. The International Energy Agency (IEA) and other renowned experts estimate there's enough storage capacity worldwide to hold upwards of 55,000 gigatons. To put that number into perspective, one gigaton is roughly equivalent to 200 million elephants. Now multiply that number by 55,000.

Is it safe? Yes, and we've been doing it for

decades. Storage sites are carefully selected only after rigorous analysis to ensure they're geologically suitable. Once injected, the CO<sub>2</sub> is capped by an impermeable seal of rock that originally held the oil and natural gas underground in the first place. The storage sites are thousands of feet underground, far below any drinking water supplies, and they're constantly monitored for any potential changes.

What else can be done with CO<sub>2</sub>? Once captured, some CO<sub>2</sub> can be utilized instead of stored – which is why you sometimes hear the term “carbon capture, utilization, and storage,” or CCUS for short. One common use today is enhanced oil recovery. Some more innovative options are being developed – such as using CO<sub>2</sub> to make e-fuels or turning CO<sub>2</sub> into a mineral for use in building materials or industrial processes. But for now, these options are still at a very small scale – and a very high cost.

ExxonMobil is a global leader in CCS: We have more than 30 years' experience and have captured more man-made CO<sub>2</sub> than any other company.

And we're scaling up even further. We've announced several CCS projects, including one at our Baytown complex and ones for CF Industries, Linde and Nucor. In fact, the total CO<sub>2</sub> we've agreed to transport and store for our customers has reached 5 million metric tons per year. That's equivalent to replacing about 2 million gasoline-powered cars with electric vehicles, which is roughly equal to the total number of EVs on U.S. roads today.

But we'll need to scale up carbon capture and storage much more if we're going to meet the world's climate goals, because it's one of the few options for significantly reducing emissions from the heaviest-emitting sectors: power generation, commercial transportation, and heavy industries like steel and cement.

As the IEA says, carbon capture and storage “will need to be a key pillar in successful clean energy transitions.”

Have more questions? Check out these FAQs from the U.S. National Energy Technology Laboratory or this IEA report, which contains more details about capacity and safety, and has some great charts.





Jinsok Sung, Ph.D, Research Fellow, Energy Studies Institute, National University of Singapore

Over 190 countries have joined the Paris Climate Agreement and since have been facing the task of decreasing greenhouse gas (GHG) emissions to meet a global climate goal. The UN's Intergovernmental Panel on Climate Change (IPCC) indicates that temperature rise over 1.5°C above pre-industrial levels risks severely worsening climate change impacts. According to reports of IPCC, the Earth is already roughly 1.1°C warmer compared to pre-industrial levels, this means that to achieve the climate target, global GHG emissions will need to peak before 2025 and achieve levels close to zero by 2050.

Achieving the climate target with currently available means is quite challenging taking into account a tight timeframe. New ways of reducing GHG emissions are constantly being developed, and a wider application of hydrogen is one for them.

The key advantage of hydrogen resides in its versatility. It can be used as a fuel, an energy carrier or even a feedstock. It can also play

a complimentary role in hard-to-decarbonize sectors such as steel-manufacturing, power sector and transport. Besides, hydrogen has the potential to facilitate the development of renewables: it can store large quantities of energy for a longer period of time and help alleviate the problem of intermittency. From a climate point of view, hydrogen is also an attractive source of energy, and could reduce emissions in hard-to-abate sectors. In transport, for example, it can replace fossil fuels for various types of vehicles, such as long-haul transport and heavy vehicles. In power generation, it can significantly reduce the carbon emissions if mixed with natural gas or in the form of ammonia with coal.

Hydrogen has an enormous potential in advancing the energy transition. But its wider application will largely depend on the availability of innovative technologies in all segments of the supply chain, from production, transportation and storage, as well as on its ability to remain price competitive compared to traditional fuels.

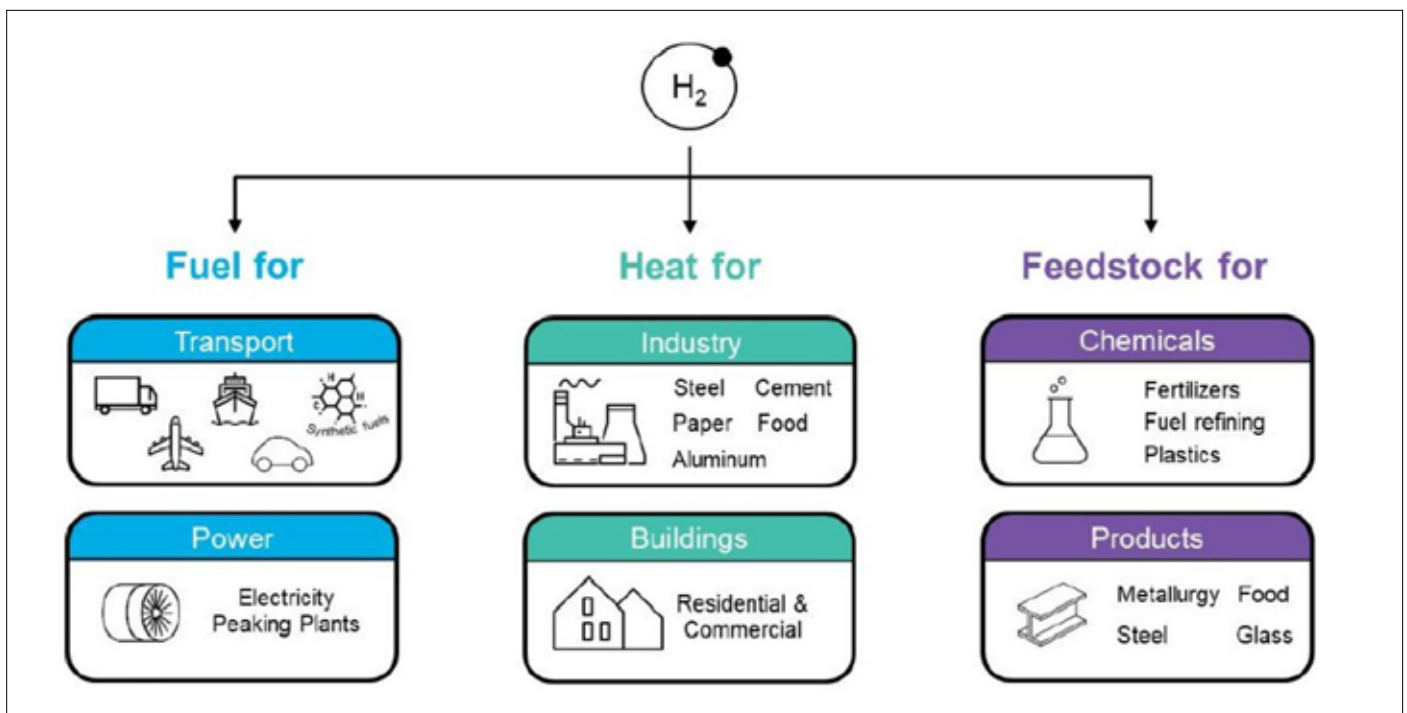


Figure : The many uses of hydrogen

Source : BloombergNEF

# Prospect of HDH (Humidification and Dehumidification) system in oil and gas industries

Parnab Saha, Ph.D, Mechanical Engineering, Michigan State University



Around 70% of the earth's surface is covered by water and 96% of it is available as ocean water. Only 3% of water is available for drinking. Therefore, water scarcity is becoming a major issue around the world. The conventional desalination technologies require a large amount of energy which makes them inconvenient for many countries. Therefore, it has attracted researchers globally, prompting them to explore creative remedies for desalination methods, including employing renewable energy and utilizing low grade heat sources to produce freshwater.

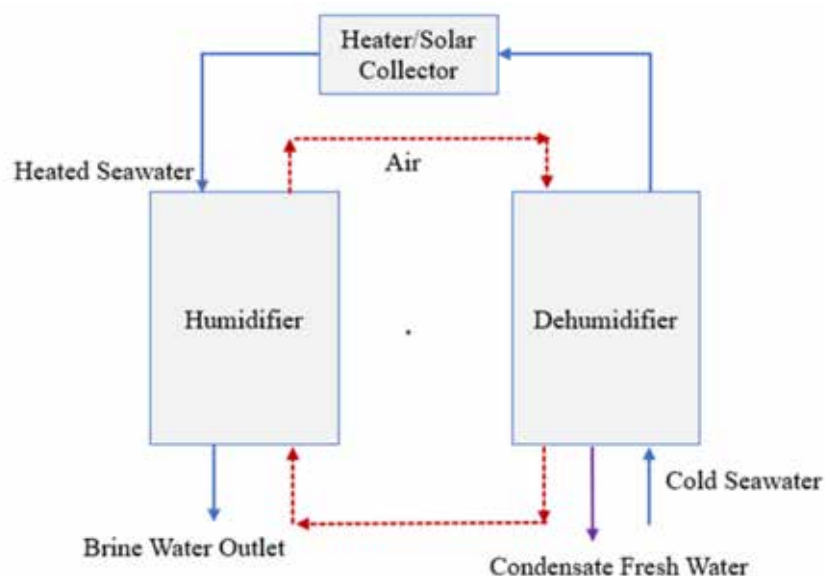
A thermal-based HDH system has the capacity to harness renewable energy like solar and geothermal sources, as well as tap into low-grade energy sources such as waste energy from power plants, heat pumps, and refrigerants. A typical HDH system consists of a humidifier where heated water is used to increase the moisture of air and then it is taken into a dehumidifier where cold pure water is condensed out of hot moisture air.

One of the significant advantages of the HDH system is that it can treat brine water (30,000-40,000 ppm) which has higher salinity than brackish water (1,000-10,000 ppm). Moreover, this method operates without membrane or extensive reliance on metal components. Therefore, it can treat highly saline water efficiently containing some oil content without requiring expensive corrosion resistant material. HDH has recently been commercialized and has succeeded in treating produced water from hydraulically fractured oil and gas wells. HDH systems can be both a water heated system and air heated system. Various methods like solar chimney, AC waste heat, solar stills and different packing systems can enhance HDH system effectiveness.

The optimized HDH system can be integrated in the oil and gas industry to address the challenges associated with water management and disposal. It can provide an attractive solution to water scarcity around the world as well.

**Figure : A typical HDH system consisting of humidifier and dehumidifier and solar collector**

Source: Parnab Saha, Raghav Bihani, Mahyar Abedi, Xu Tan, James Klausner, Andre Benard. "Condenser Performance in a cylindrical humidification and dehumidification (HDH) system", Heat Transfer, Wiley, 2023



# Developing the energy transition

Olga Gerasimchuk, Ph.D, Energy & Climate Policy Analyst



Everyone will agree that energy has become something quite common for the most of the world's population, just like water flowing from the tap. We need energy for almost everything, whether we want to charge our mobile phone, fill up our car or simply cook a tasty dinner for our family. We are especially aware of its importance when we receive and pay our bills.

Since the Industrial Revolution, global energy consumption has been growing relentlessly. It has translated into a great deal of economic growth that allowed not only increasing our standard of living, but also raising millions of people out of poverty. At first glance, these results seem impressive and make us proud. But when we hear in the news about the drying up of the rivers in Europe, the floods in Asia, the ongoing fires in the United States and Australia, we unvoluntarily ask ourselves : at what cost has economic progress been achieved ? And what will happen to us and to our Planet in 20, 30 or 50 years if we pursue the business as usual patterns?

Today, the energy we use comes mainly from fossil, non-renewable and polluting resources. The harmful emissions that are constantly released in the atmosphere upset the delicate ecological balance. According to scientists, the only way to avoid catastrophic consequences of climate change is to significantly transform energy production, distribution and consumption systems and to develop instead a more sustainable energy model.

The energy transition has become imperative to halt the climate emergency. The changes should be widely introduced at all levels and affect not only the main actors, e.g. key areas responsible for GHG emissions including industry, transport or

agriculture, but also end consumers, who will have to reconsider their usual way of life by implementing more rational use of energy.

Any industry, making part of the global energy system, be it O&G, nuclear energy or hydrogen, can and should contribute to advancing the energy transition. It's like teamwork : the success depends on the participation and the involvement of each member. In order to demonstrate that each industry can successfully play its part in the energy transition I invited for this section experts with different academic and professional background, representing different countries and working at different structures, from traditional O&G companies, think tanks and global networks dealing with renewables, to independent energy efficiency consultants, working on the implementation of new innovative solutions.

Shifting the energy sector towards a more sustainable state requires a significant change, all societal, state and private stakeholders should unite their efforts and act together in a more visible and synergic way.

This section would not be complete without addressing the role of women and youth in advancing the climate agenda. Many barriers still remain to ensure their full and effective participation in the energy transition. But if we aspire that the energy system transformation is implemented in a just and inclusive manner, we must ensure women and youth's right to participate. It means having a say, to be heard and take part in decision-making process. As a woman and a mother, I would be happy to see their voices, knowledge and energy to be harnessed in the most effective way to built a better working world.

I wish you interesting reading!

## Are you listening? Charting the pivotal role of young professionals in the energy transition continued from p7

significantly less than those in all other regions (e.g. 23% in North America vs. 55% in Rest of World). Africa, Asia Pacific, Middle East and Central & South America are more confident that new technologies will enable renewables to play a larger role in the future energy mix than respondents in North America and Europe.

From a generational perspective, older respondents prioritize own core competencies as opposed to younger respondents who were more likely to invest in renewable and/or emerging technologies.

Technology is not a major concern; rather,

it's seen as a crucial enabler for change. A significant majority – 81% – believe that emerging technology will contribute significantly to meeting the clean energy demand by 2050.

As a conclusion from the results of this survey we can say that while young professionals are solidly optimistic about the state of the energy industry and their positive view prevails alongside pragmatism about what's needed to address the industry's challenges, they feel not enough is being done neither by governments nor companies. Personal motivations, needs,

desires and frustrations shape how young professionals will respond to challenges ahead. They are asking for credible low-carbon roadmaps and for industry leaders to bring them into the fold. Getting to net zero means listening and empowering today's youth to become the energy warriors of tomorrow.

We look forward to further discussing these and many more insights with you during 24th WPC Congress in Calgary, Canada and you can read the full report prepared in collaboration with Accenture on the WPC webpage.

# Shifting gears in the global oil and gas industry: The role of national oil companies to hasten climate action



*Left: Leonardo Beltrán-Rodríguez - Fellow, Extractive Resource Governance Program, University of Calgary.*

*Right: Juan Roberto Lozano-Maya - Expert, Extractive Resource Governance Program, University of Calgary.*

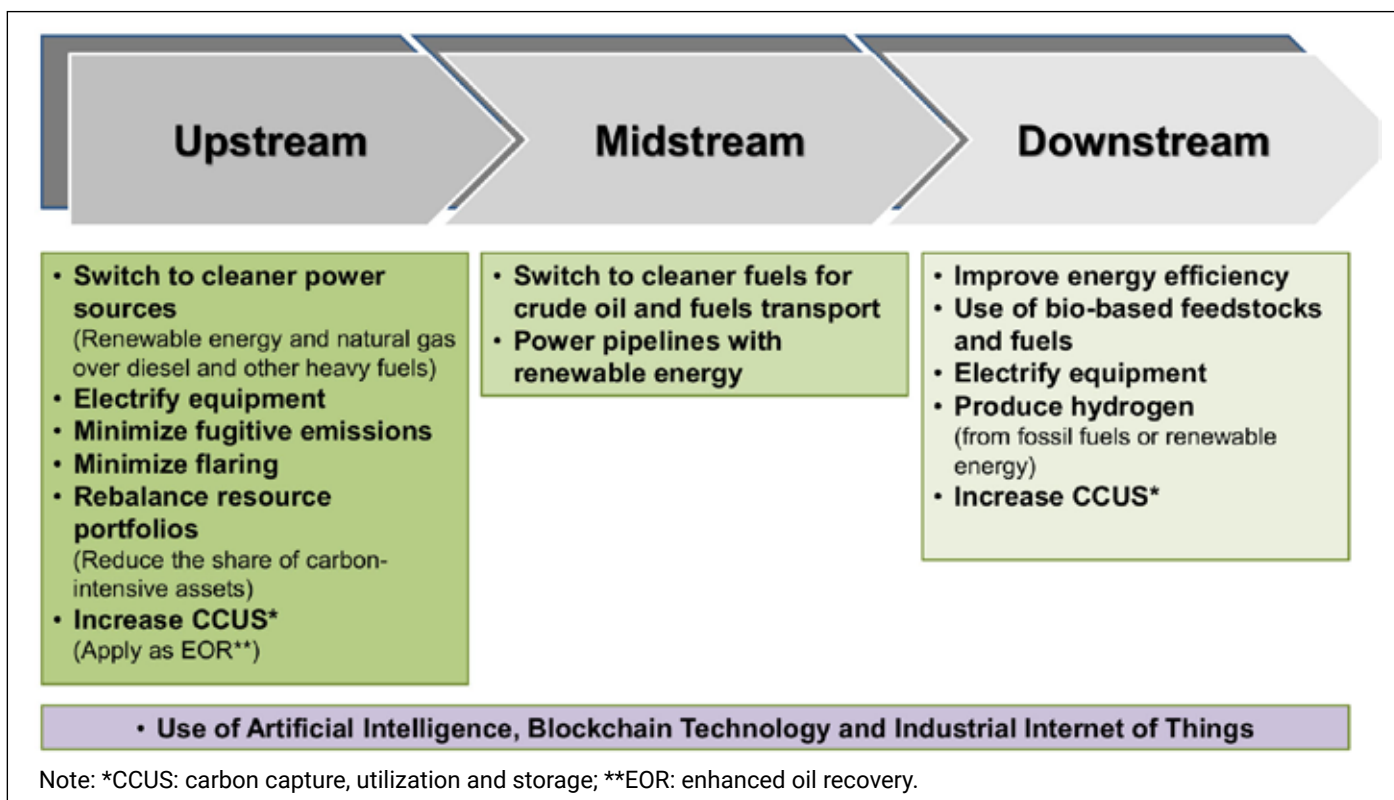
The energy sector is the largest single emitter of CO<sub>2</sub>, with Oil & Gas activities accounting for the largest share of those emissions. To tackle climate change more meaningfully, bolder actions need to be carried out that target National Oil Companies (NOCs), as these represent the dominant players in the Oil & Gas industry.

In 2010, NOCs concentrated 90% of global oil & gas proven reserves and 75% of production, in addition to holding most undiscovered resources to be developed. Within this context, national governments, which typically hold total or partial ownership of their NOCs, are expected to embrace more eagerly a decarbonization of their NOCs assets and operations for two main reasons. First, to fulfil more effectively their emission reduction pledges in the Paris Agreement; second, to create enduring value not only for regular NOC shareholders but for a growing number of stakeholders under a genuine sustainable development pathway.

In an international environment that

increasingly values the development of energy assets and systems with a lower or zero carbon intensity in the fight against climate change, facilitating a transition from the conventional operations performed by NOCs in favor of renewable and low-carbon energy development like the activities noted in the figure below would greatly support the efforts of national governments to increase prosperity and sustainability for all their citizens.

Moreover, for NOCs to embrace truly ground-breaking outcomes, we suggest that their mission and business models should encompass their full life-cycle emissions, going beyond those under their direct control (coming from the power and heat used in their regular operations and their venting, flaring and leaking practices) to their more elusive but substantially larger indirect emissions. In essence, this means changing the business models and products that NOCs deliver to the market, from fossil-based fuels to low- or zero-carbon products and services.



Source: (2021) Beltrán Rodríguez, Leonardo and Lozano-Maya, Juan Roberto. The key role of No-Carbon National Oil Companies in Global Climate Action: Leveraging the G20 Forum to accelerate Energy Transition. University of Calgary School of Public Policy Research Paper/ The School of Public Policy Publications. Vol. 14:21. Available at: <https://doi.org/10.11575/sppp.v14i1.71801>

# Energy Efficiency above all

Božidar Pavlović, Energy Efficiency Consultant



The world is increasingly determined to cut greenhouse gas emissions, in order to avoid, or at least reduce, the negative impact they have on climate change. This requires a significant change in the energy system as we know it today. The main focus is on fossil fuels technologies, and their producers are being encouraged to introduce new innovative solutions that will further reduce carbon emissions.

That means that efficient use of energy has to be recognized as priority when it comes to energy policy development and investment flows. The aim is to make our energy supply and demand more efficient by improving transmission and distribution practices, as well as by implementing measures to achieve cost-effective energy savings by end-users. It should be noted that opportunities for transformation of all sectors on the demand side, and mainly those which depend on fossil fuels (transport, industry, buildings, etc.) are enormous. The possibilities for new projects that will help achieve energy savings, reduce emissions and facilitate the use of clean

energy sources are almost limitless.

In the European Union, energy efficiency measures are recognized not only as an effective tool of cutting GHG emissions, but also as a part of energy strategy aimed at improving security of supply and reducing import bills, promoting thus European competitiveness. Many EU members States provide strong support for the implementation of energy efficiency projects. The priority is given to demand-side solutions, even if generally they turn out to be more expensive than investments in new energy infrastructure.

Further implementation of energy efficiency projects will create new job opportunities. This would require energy professionals to go beyond their usual competencies and constantly improve their skills. The introduction of new innovative solutions is always a challenge, as it requires the application of new ideas and different approaches. But this is also a chance for young engineers to demonstrate their creativity by making innovative designs to solve real-world problems.

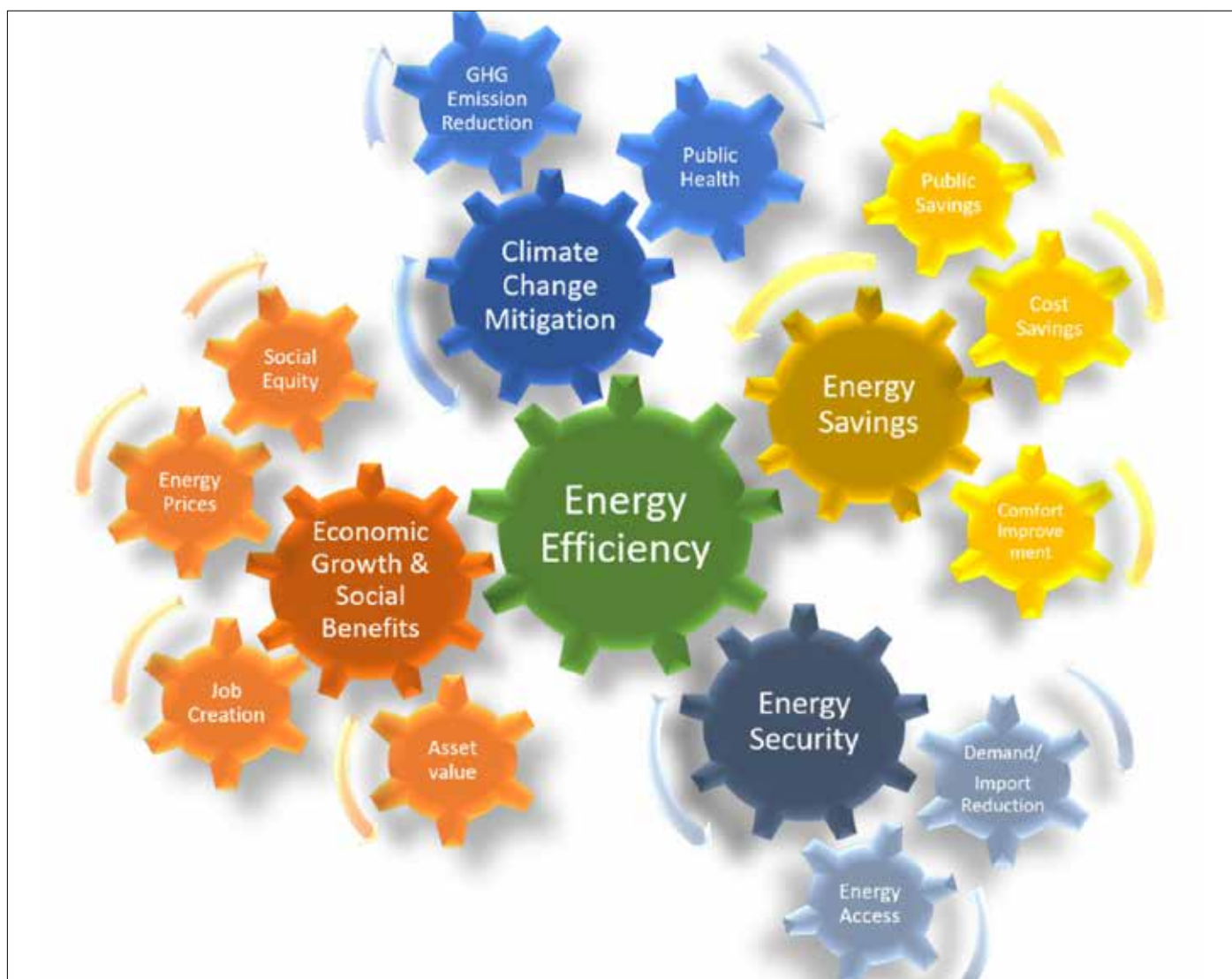


Figure: The benefits of energy efficiency

Source: Author



# The role of fossil fuels in the energy transition under international law

*Dr Ernesto Bonafé, Senior Research Fellow, Centre for Energy, Petroleum and Mineral Law and Policy, University of Dundee*



The Paris Agreement on climate change put the use of oil and gas on the wrong side of history. However, less than seven years later the war in Ukraine has forced many countries to reconsider energy policies. Net zero carbon emissions remains a long-term target to be reached in the United Kingdom (UK) and the European Union (EU) by 2050 (with some shorter deadlines, for instance in Scotland and in Germany by the year 2045), but the pace and the way to achieve it is under discussion. Prior to ending energy dependence on fossil fuels, the UK and the EU aim to end dependence on Russian fossil fuels by producing them domestically where possible and, if imports are necessary, by diversifying external suppliers.

The UK government is planning to award new licenses in oil and gas exploration in the North Sea in an attempt to achieve greater energy independence, although the plan is being criticized by the opposition party. The EU is also experiencing its own tensions in trying to meet security concerns by using some fossil fuels while pursuing its goal of an energy transition, as illustrated by the U-turn over the sole international treaty to address the energy sector, the Energy Charter Treaty (ECT). A lengthy negotiations process has led to a modernized ECT text, but it lacks sufficient support among EU member states, even if it is more aligned with the Paris Agreement than the old version, dating from the early 1990s: as a result, the European Commission is now proposing to end the EU's membership to the ECT.

The ECT is a multilateral agreement protecting foreign investors against misconduct from host countries, including illegal expropriation and the breach of the fair

and equitable treatment standard. Conflicts typically involve important amounts of money and are ultimately resolved by ad-hoc arbitration tribunals through the so-called investor-state dispute settlement (ISDS) mechanism. The modernized ECT would bring an end to intra-EU investment disputes, increase transparency in dispute settlement proceedings and provide protection against frivolous investment claims. Moreover, it would preserve the right of governments to regulate in the pursuit of public policy objectives, including climate change mitigation and adaptation.

A recent example of the ECT in action comes from Italy. In August 2022 an arbitration tribunal under the ECT ordered the Italian government to pay 190 million euros to the UK oil company Rockhopper over an offshore oil and gas drilling ban. The case concerned a law of 2015 prohibiting research, prospection and exploitation in waters within a 12-mile limit of the Italian Peninsula, namely within the geographical limit of Rockhopper's proposed production wells in Ombria Mare. As a result, the oil developer was deprived from its right to be granted a production concession, amounting to an illegal expropriation under the ECT, according to the tribunal.

The precautionary principle was also at stake in view of the potential environmental effects of the exploitation of the area concerned. However, a thorough impact assessment was carried out by Rockhopper at a ministerial request, and then fully approved by the competent authorities. Therefore, Italy could not apply the precautionary principle to overrule what its own administration had validated in terms of environmental protection.



# The role of youth in advancing sustainable development goals in the context of energy transition

*Hassan M. Alzain, Environmental Scientist, Saudi Aramco*

As climate change remains one of the major challenges of this century, the international energy business landscape is channeling collective efforts to be more resilient and operationally sustainable. The youth has its own part to play in advancing sustainable energy development, notably through the promotion of the UN Sustainable Development Goals (SDGs).

Provided with fundamental knowledge, essential skills and refined capabilities, young inspired leaders can support the

transition to an all-inclusive energy system through:

- **Critical Thinking:** Evaluating existing issues and challenging the status-quo; providing realistic bottom-up solutions, in particular for hard-to-abate energy sectors and decarbonization plans.
- **Advanced Innovation:** Unlocking new and innovative SDG-oriented insights to help jump-start and operationalize climate mitigation, adaptation and resiliency solutions at global scale.

*continued on next page*

# Women advancing the global energy transition



*Christine Lins, Co-Founder and Executive Director of GWNET (Global Women's Network for the Energy Transition)*

The energy sector workforce is characterised by a gender gap greater than most other sectors. As stated in the report "Renewable Energy: A Gender Perspective" by the International Renewable Energy Agency (IRENA), the energy industry is far from being gender-balanced with only 22% of women in the O&G sector workforce and 32% in the renewable energy workforce. According to Ernst & Young's Women in Power and Utilities Index, only 5% of board executives and 16% of board members of the top 200 utilities are women.

Women have a lot to offer for the sustainable energy sector. Scientific research has found that a diversified workforce delivers better results, not only in terms of increased creativity and innovation potential, but also related to better decision-making and greater profits. Initial research findings have also led to conclude that companies with more women on their board of directors are inter alia more likely to invest in renewable power generation, mitigate climate change and proactively address environmental concerns.

Still, this potential has not yet translated into a substantially narrower gender gap in the energy sector. Considering that the workforce in the renewable energy sector is predicted to rise from 12,7 million jobs today to about 42 million jobs in 2050, the attraction of female talent will be crucial to ensure a thriving sector.

With this in mind, a group of senior energy professionals got together in 2017 to create GWNET, the Global Women's Network for the Energy Transition, a global network aimed at empowering women working in sustainable energy in both developed and emerging/developing countries at different career levels from both the public and private sector through interdisciplinary networking, advocacy, training and mentoring. The network which currently consists of over 3.500 members from 150+ countries is open to individuals and corporations who are committed to gender balance in the energy sector and who wish to connect with their peers to advance the energy transition more rapidly.

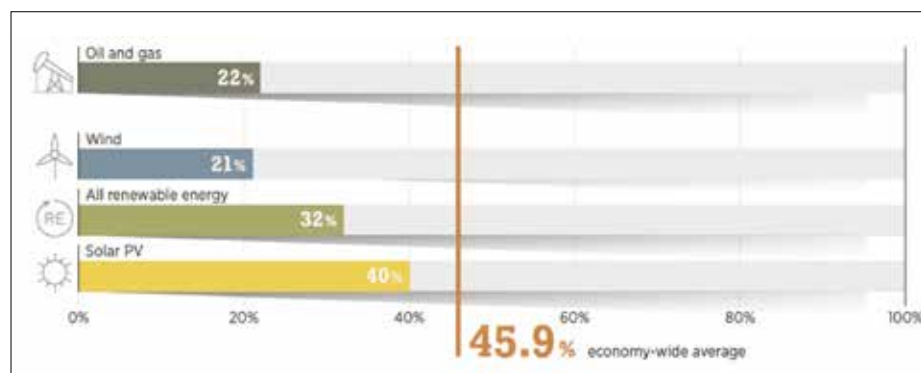


Figure : Women's share in the energy sector

Source : IRENA

## The role of youth in advancing sustainable development goals in the context of energy transition continued from page 15

- Tailored Approach: Translating complex and emerging international developments to far-reaching communities; driving positive change at local, national and international levels.
- Decision-Making: Impacting processes and frameworks on matters related to an inclusive and just energy transition, influencing policy-makers and industry leaders to make a change.
- Influencing Advocacy: Communicating the positive impacts of taking climate actions across different sectors along with raising awareness among consumers to help contribute to the SDGs.
- Shadow Boards: Working with executive leaders and senior subject matter experts on key sectoral issues and strategic

initiatives to ensure comprehensive, cross-generational outcomes.

The youth has the power to shape a sustainable energy future by introducing new innovative solutions which contribute to global socio-economic development. This will be easier to do if young professionals are supported at national and international levels, in particular through a strong financial and technical support of various youth organizations involved in energy and climate activities. No one should be left behind when it comes to energy transition frameworks in the context of sustainable socio-economic diversification. The youth has the necessary knowledge and competencies, as well as huge energy to turn strategic goals into concrete results and built a better working future.



# Standing on the shoulders of giants: role of nuclear power in energy transition



Michał Klasa, IEEE Poland Section Member, Power Engineering Society

It's interesting to read old, illustrated articles, imagining "the future", and compare it with today. They usually extrapolated most innovative trends of the time and assumed them to dominate the future. And yet we, people of twenty first century do not have Nikola Tesla's visionary towers for remote power transmission, neither we beam solar energy from orbit as envisioned at peak Space Race era. It turns out that certain hard realities of technology, operation, maintenance and daily business remain constant regardless of current trends and popularity and in the future... We may have to stick with modernized iteration of something we used to have before.

Therefore, most important image of energy transformation is notion of green energy and zero emissions for each particular application. But the real picture will not be that homogenous. On the contrary, laws of thermodynamics will most likely necessitate diverse mix of different energy technologies for various purposes. From grand scale

power generation, through combined heating and power cycles, to fuels in transportation - we may observe multitude of approaches. Approaches which result in net decrease emissions considered for entire system. Nuclear is set to make a comeback. For maintaining stability in the grid and secure fulfillment base load demand with zero greenhouse gases emitted. Nuclear power is already developed technology which guarantees gigawatts of installed capacity with affordable pricing and foreseeable operation in the future.

Moreover, as popular metaphor says: "Standing on the shoulders of giants", many promising technologies: hydrogen fuel production, carbon capture and storage from fossil fuels, or perhaps negative emissions technologies powered by peaks of renewable energy - can operate in synergy if considerable part of mix with NPPs. One can dream big and be creative if he has a solid backbone. And such a backbone is nuclear.

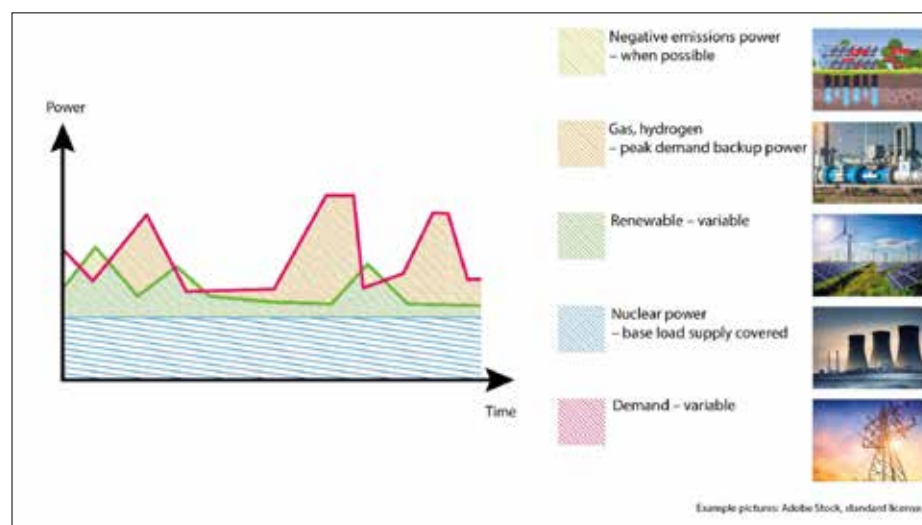


Figure : Diverse energy mix with nuclear for base load demand





## Carbon-neutral hydrocarbons: the future of the energy transition?



Zlata Sergeeva, Research Associate, King Abdullah Petroleum Studies and Research Center (KAPSARC)

The European energy crisis highlighted the importance of ensuring energy security during the energy transition. As a result, consumers turned to imports of “carbon-neutral LNG” which reached a record 34 deliveries in 2021. Carbon-neutral LNG (or “GHG-offset LNG”) is the same as conventional LNG, albeit its emissions are offset by carbon credits. The nascent market, which counted only 3 cargoes in 2019, suddenly attracted the attention of various customers, struggling with targets of achieving net zero emissions by mid-century. Even in 2022 with soaring natural prices, demand for carbon-neutral LNG remained strong, with 17 cargoes delivered. Is it hype or a sustainable trend?

We came to the following conclusions after analyzing 64 cases between June 2019 and June 2023.

- In the early stages of the market development, such cargoes were used to demonstrate companies’ commitment to a climate agenda. However, after controversies related to the quality of offsets (the CEO of

the biggest carbon credit certifier stepped down), carbon-neutral products are received with caution. Companies continue procuring GHG-offset cargoes and counting it as sustainability efforts without covering it in press releases.

- Due to the interest from the final consumers, the market started expanding to carbon-neutral kerosene, diesel, LPG, etc. The ease of procuring and low price of offsets set a low entry threshold for sellers of all scales.

This demand is likely to continue, especially in Asia. For instance, the Japanese gas industry included carbon-neutral LNG in its net zero plan. Some companies concluded mid- and long-term contracts to deliver carbon-neutral LNG or city gas (Shell, PetroChina, Shenergy, Inpex).

However, the growing criticism of achieving carbon neutrality through offsets will likely push energy producers to undertake other measures to achieve carbon neutrality. The need to keep hydrocarbons in the energy mix can become key for developing CCS technologies.

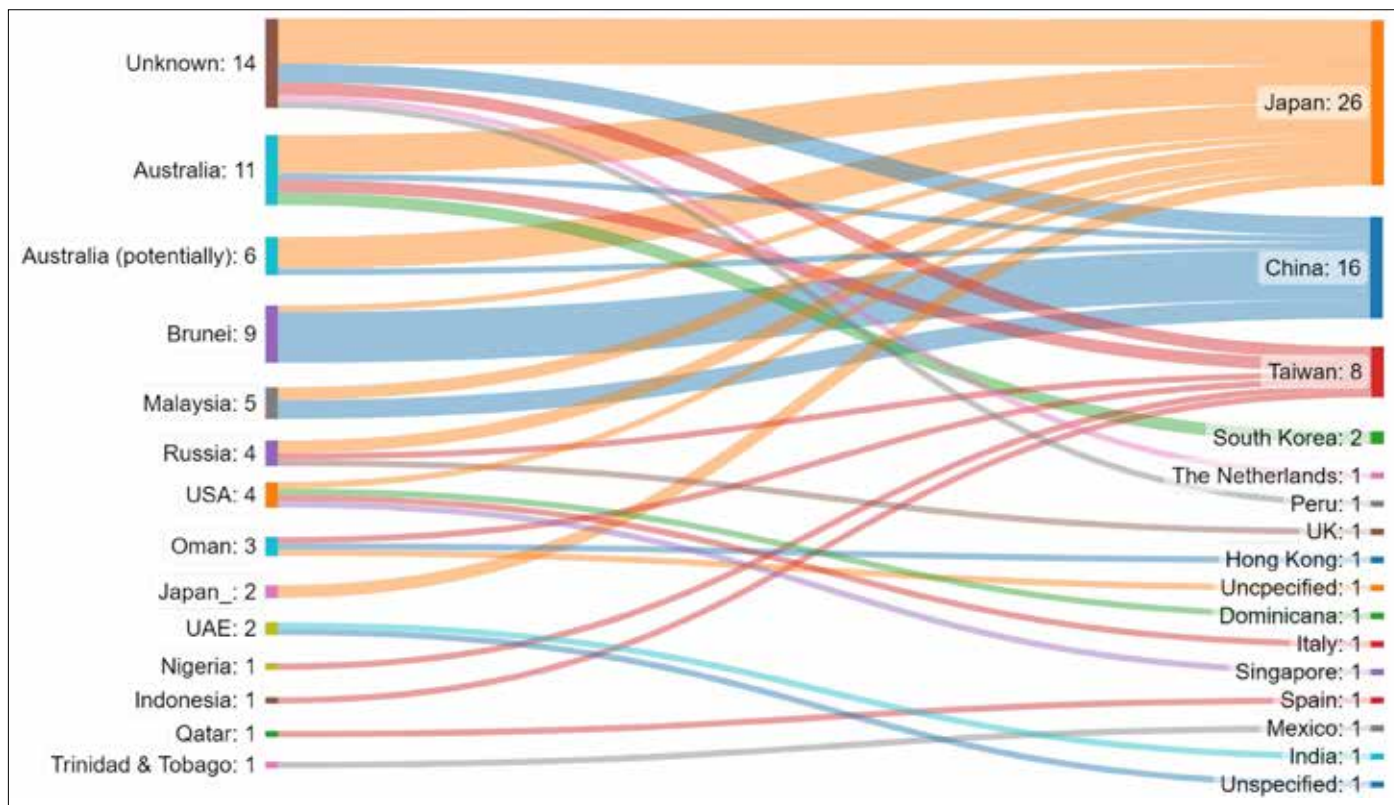


Figure: Flows of carbon-neutral LNG deliveries between exporters (left side) and importers (right side), June 2019 – June 2023

Source: Author

# Bridging Generations Introduction



*Shamus Hardie*, Editor-in-Chief and WPC YP Representative,  
Senior Market Analyst, Inter Pipeline

In the concluding section of this year's Magazine, *Bridging Generations* carries on the tradition to connect current readers with YPC Alumni, learn from executive leadership in the global industry, and discover collaborative initiatives to bring together young professionals at a local level.

The trio of Alumni Stories shares a common theme of perspectives and experiences gained as former members of the YPC. These engaged individuals describe their time with WPC, personal developments as members of an international community, and unique achievements through their volunteering efforts.

In An Interview with the 2023 Dewhurst Award Recipient, we have the privileged opportunity to hear from Amin Nasser,

President and Chief Executive Officer with Aramco. The discussion focuses on the transition to a low-carbon economy, inquiring about investments needed, how companies can credibly reduce emissions, and commercializing clean fuels, among other questions.

Finally, we feature a highlight on the Canadian YP Link group, which is a coalition of five young professional groups in energy, including the WPC Canada Future Leaders. YP Link explains how it is a collaborative initiative, offering education and networking opportunities to those in the early to mid-stages of their careers, and serves as a benchmark for other international young professional associations.

Enjoy these final insightful articles from the 2023 YP Magazine.

## WPC Alumni Stories - Iran

*Ali Rahneshin*, Young Professional Representative, Iran National Committee Member & WPC YPC Alumni, Commercial Department, Nouri Petrochemical Complex



It was 2011, and I can still recall my first year with WPC in Doha, Qatar. There were many amongst the petroleum industry, academics, corporate and governing leaders. It has the potential to bring industry decision-makers together.

The WPC Youth Forum provides a perspective on international industry best practices, technological advancements, Corporate Social Responsibility (CSR), financing, supply and demand, future energy mix, health, safety and environment (HSE), career opportunities, sustainable production as well as the opportunity to develop solutions to current key issues and foreseeable challenges. It offers a unique forum to engage young energy professionals in a cross-generational dialogue with current leaders, academics and experts to debate today's and tomorrow's energy challenges. The forum provides current industry leaders the opportunity to engage with the next generation of energy professionals on industry issues.

Looking back to Doha and the 12 years since then, I spent 10 years in the Young Professionals Committee as a volunteer activity with team working, and I gained such international exposure and knowledge base that I would not have experienced without the WPC.

I participated on numerous WPC events

and meetings in Qatar, Russia, Turkey, Kazakhstan, UK, Azerbaijan, India, Poland, Austria, Norway, Hungary, Serbia, Brazil and Iran where I had the opportunity to be an organizer, speaker, Call for Papers and Excellence Awards Judging committee, Moderator, keynote speaker, Congress Program Committee coordinator, Expert Workshop Program Committee, Youth Forum Program Committee, National Committee Network Development of WPC YPCs Coordinator, National Committee focal point, WPC YP Connect coordinator, CSR Committees International Advisory Board, Mentoring Program and Iran Representative at WPC CPC, YPC, Council meetings to share my opinion, experience and knowledge.

I even made our team's dream come true by organizing a WPC event in my home country, Iran, where the "Sustainable Strategies for HSE in the Oil, Gas, and Petrochemical Industry" took place in 2019 and the WPC Virtual Expert Workshop in 2021.

I consider myself privileged to count some of my most inspiring and insightful role models as my WPC friends, and I hope that every one of you finds this community through your own experiences.

Great to see that now we are at the 8th WPC YOUTH FORUM!

"Welcome Dear new YPs & Students joiners, enjoy with WPC FAMILY".

## WPC Alumni Stories - Russia

*Vlada Streletskaya*, Director, Russian National Committee of the World Petroleum Council; Executive assistant to rector, Gubkin Russian State University of Oil and Gas, YPC Alumni



When you get a chance to attend the World Petroleum Congress for the first time, you cannot understand how lucky you are because you don't know what will be happening there! I still remember flags all around the city welcoming Congress participants, huge conventional center with hundreds of companies' booths, dozens of ministerial and CEO sessions, leading experts from all over the World. I do remember the 20th WPC in Doha, the very moment when I joined YPC and WPC family.

The next Congress was to be organised in Moscow, so I also became a member of the Congress organising committee. It was an unforgettable experience: I had an opportunity to take part in meetings of various levels, I could even represent my country as an alternate in YPC, show my expertise as vice-chair of one of the WPC technical sessions, I could also show my leadership skills as a Director of the Youth and Volunteer programmes of the 21st WPC.

At that time the highest acknowledgment for me were the words from the WPC President Renato Bertani when during the Congress closing remarks he said that it was "the best volunteers programme". These words inspired us to organise another WPC event – Youth WPC Forum (Future Leaders Forum).

Soon after that our National committee decided to bid for hosting the WPC Youth Forum. Winning the bid 2 years after the Congress seemed to be impossible, however we've done it. I was appointed for a managing position and the preparation process for another unforgettable event started again. Those were the most exciting days of my life!

Seven years in YPC WPC and 5 years as a Director of the WPC Russian National Committee are behind, however I believe it's just the beginning! Looking back I can say with confidence that when joining YPC WPC you become not just the WPC family member but you get the opportunity to make dreams come true!

# WPC Alumni Stories - Spain

## Empowering purpose and connecting leaders shaping tomorrow

*Laura Garcia Chiquero, Country Manager México - CEPESA*



**A**s a former Vice Chair of the World Petroleum Council (WPC) Young Professionals Committee, I am honored to share my reflections on the unforgettable experiences and invaluable takeaways that this esteemed institution has offered me. The journey was not only an enriching professional endeavor but has also highlighted the significance of global connection and collaborative vision in our ever-changing world.

I joined the WPC back in 2014 during the 21st Moscow Congress as the Spanish representative. Later, I was elected as the Vice Chair of the Young Professionals Committee in 2017 in Istanbul, and I continued in this role until concluding my commitment in Houston in 2021, ready to reach a more senior role.

Imagine a space where young minds from all corners of the planet gather to exchange ideas, insights, and stories. That's what the WPC Energy Young Professionals Committee is all about. Passionate individuals like you, hailing from diverse backgrounds, cultures, and areas of expertise, come together to create something bigger than ourselves.

Being part of this dynamic community isn't just about building connections—it's about creating a global family. In today's world,

challenges and opportunities transcend borders. Having a network that spans the planet is pure gold. The opportunity to exchange experiences with peers from Asia to Africa, Europe to the Americas, and hearing firsthand about their perspectives on the industry, the environment, and everything in between, provides invaluable knowledge to inform future decisions and negotiations. This gives you a definite competitive advantage compared to other professionals.

WPC is also about creating a vision for a better, more sustainable future. Young leaders are meant to be game-changers. We came together to craft an innovative roadmap that lead to a world where petroleum and sustainability aren't opposites, but allies.

WPC YP hasn't just been an asset; it's a family that empowers me to drive change. These experiences have led me to achieve higher responsibilities and tackle challenges where my global vision, industry network, and leadership skills, enhanced through my participation in the WPC, played a key role in pursuing the next big thing. Empowering purpose and connecting leaders shaping tomorrow to transform our industry from our roles and thus, our world. Are you ready to approach the energy world from a different perspective?



# An Interview with the 2023 Dewhurst Award Recipient

Amin Nasser, President & CEO, Aramco, Saudi Arabia



*How do you see the Ukraine crisis and the current energy crisis in Europe affecting the pace of the global transition to a low-carbon economy?*

Nasser: The situation in Ukraine has exposed the limitations of current energy policies and underscored the critical role energy companies play in providing reliable, affordable and increasingly sustainable energy. Specifically, it has highlighted how geopolitics can impact fragile energy transition plans. However, it is important to recognise that the conflict is not the root cause of the crisis. The oil market was already stretched following years of underinvestment. To ensure an orderly transition, the world needs conventional and new energy to run in parallel for as long as needed. Prematurely discontinuing investments in conventional energy will likely lead to serious supply shortfalls and slow the pace of the global transition towards lower emissions.

*How is the transition to a low-carbon economy affecting oil and gas firms' investment strategies in conventional energy assets?*

Nasser: Discouraging investment in oil and gas has hindered—rather than helped—the global energy transition. Indeed, this has left economies and consumers more vulnerable to the sort of shocks we have seen during the past year. We believe that continued investment in conventional energy alongside ongoing efforts to advance renewable technologies is the most effective way to deliver an orderly transition that does not come at the expense of economic prosperity or energy security. Ensuring this security is why we aim to increase our capacity through multiple increments. At the same time, we also intend to increase our natural gas production by more than half by 2030 to help the Kingdom achieve a lower carbon energy mix.

*How well is Aramco placed to address the global transition to a low-carbon firm compared to other competitors?*

Nasser: As the lowest-cost producer globally, we are uniquely positioned to leverage the emerging technologies needed to support a stable and orderly transition. Additionally, with our track record in technology leadership and upstream low carbon intensity, we have potential for large-scale, sustainable fuel production, including hydrogen.

We are focused on further improving our performance, and we have announced interim targets for 2035 as part of our ambition to achieve net-zero scope one and scope two greenhouse gas emissions across our wholly owned operated assets by 2050.

We are also expanding our portfolio to include solutions such as lower-carbon ammonia, which we believe may have an important role to play in a lower-emission future.

*How is Aramco progressing on its plans to reach net-zero scope one and two emissions by 2050?*

*"Discouraging investment in oil and gas has hindered—rather than helped—the global energy transition"*

Nasser: We are making good progress. Last year we presented our roadmap to reach 2050 targets with specific interim targets for 2035, which provide a good indication of our approach and progress. We aim to further reduce our, already low, upstream carbon intensity by at least 15% by 2035 against our 2018 baseline. We also aim to reduce, or mitigate, more than 50m t of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) annually from 2035 onwards, compared to our business-as-usual forecast. Additionally, we aim to capture, utilise or store 11m metric t/yr of CO<sub>2</sub>e by 2035, out of which we intend to capture up to 9m t/yr CO<sub>2</sub> by 2027 through our recently announced CCS Hub. Through our investment in renewables, we also hope to achieve a 14m t/yr CO<sub>2</sub>e reduction from 2035 onwards.

Other plans include: Methane and flaring reduction (to achieve 1m t/yr CO<sub>2</sub>e reduction) Offsets purchased through voluntary markets and planting of mangroves (to achieve 16m t/yr CO<sub>2</sub>e reduction) Our \$1.5 billion Sustainability Fund, one of the world's largest sustainability-focused venture capital funds, which aims to invest in technologies with potential to address climate challenges.

*What action is Aramco taking on methane emissions?*

Nasser: We are proud that we already have one of the lowest upstream carbon footprints in the world, and our methane emissions are also among the lowest in our industry. As you know, methane contains more greenhouse gas warming potential than carbon dioxide, which is why this is such an important focus for us. In fact, methane emissions are responsible for about 30% of global warming to date, so reducing them must be a priority for all stakeholders.

Aramco and other members of the Oil and Gas Climate Initiative (OGCI) have launched the Aiming for Zero Methane Emissions Initiative, which calls for the energy industry to strive to reach near-zero methane emissions from operated oil and gas assets by 2030.

For Aramco specifically, our upstream methane intensity remained low in 2022 at 0.05% (equal to 2021) and is already well below the OGCI ambition to achieve at least 0.20% by 2025—and we are working to share best practices to maximise global impact.

*Can you talk about Aramco's plans in low-carbon hydrogen?*

Nasser: We see huge potential for large-scale, competitive hydrogen production,



which is why Aramco intends to be a leading player in the new markets for hydrogen solutions. To support that ambition, we are developing a low-carbon hydrogen programme, which will be one of the world's largest production facilities with the capacity to produce blue ammonia in the range of 11m t/yr by 2030.

As a carrier of hydrogen, low-carbon ammonia can help overcome obstacles with the transportation of hydrogen, in addition to being an important commodity in its own right.

"We intend to increase our natural gas production by more than half by 2030 to help the Kingdom achieve a lower carbon energy mix"

Hydrogen is a primary element in the oil and gas value chain, and it offers significant potential as a lower-emission and sustainable energy source that could support significant emissions reductions, especially in sectors that are hard to decarbonise such as heavy transport, heating and industry. This is why we are seeing major industrialised economies such as Korea and Japan rapidly pursuing and incentivising hydrogen

solutions to propel their economies forward, while lowering emissions.

We continue to work with potential customers and other stakeholders around the world, making real progress across the blue hydrogen value chain. This includes receiving the world's first independent certification with SABIC Agri-Nutrients for blue ammonia and blue hydrogen production, as well as delivering three shipments of blue ammonia to customers in Asia.

*Do you see any demand for low-carbon hydrogen offtake agreements yet? How will the industry develop?*

Nasser: Commercial offtake agreements will be a critical cornerstone in the development of a thriving global hydrogen economy. Given the relatively high cost of establishing this energy source and a lack of both the required infrastructure and supportive policies, offtake agreements will be needed to safeguard all stakeholders and encourage investment. We believe that such required support can help blue hydrogen and blue

ammonia play a significant role in the energy mix. Policymakers need to provide reliable signals to potential investors in this fuel of the future.

*Does the firm see a big role for CCUS technology in the oil and gas industry of the future?*

Nasser: CCUS will play a pivotal role in our shared efforts to reduce emissions. This is particularly true given the need for reliable, affordable and more sustainable supplies of energy, particularly considering that alternatives are not yet ready to replace conventional resources.

As mentioned previously, we are targeting the capture of as much as 11m metric t/yr of CO<sub>2</sub>e by 2035 and Aramco is committed to becoming a leader in this field. As part of that ambition, we are establishing one of the largest planned CCS hubs in the world. Located on the east coast of Saudi Arabia in Jubail, it will potentially be able to safely store up to 9m t/yr of CO<sub>2</sub> by 2027.

## YP Link: Engaging the Next Generation of Energy Leaders



The 'YP Link' is a collaborative effort between five differentiated organizations focused on the next generation of energy leaders in Canada: Young Professionals in Energy (YPE), World Petroleum Council (WPC) Future Leaders, Society of Petroleum Engineers (SPE) Young Professionals, Young Women in Energy (YWE) and Young Energy Infrastructure Professionals (YEIP).

Member organizations work collaboratively to cross-promote their own events and initiatives, offering educational and networking opportunities for young professionals in the energy industry to connect with others in different roles and learn about emerging topics, technologies, and transformation. On an annual basis, these groups work together to co-host learning opportunities and events to target a larger audience. YP Link events also feature a charitable component, which has included

fundraising for various initiatives such as the Calgary Food Bank, Canadian Mental Health Association, and others.

These Young Professional led organizations participate in the Clean Resource Innovation Network (CRIN)-YP Sector Engagement Plan that funds key opportunities for these groups, including sponsored spots into Avatar Innovations' Ignite Program, physical space in the Energy Transition Center at The Ampersand building in downtown Calgary, and increased access to industry conferences and events for young professionals.

These groups know they are stronger when working together to advocate for and educate about the future of energy in Canada.

Check them out and show your support by attending events, volunteering, sponsoring and following them on social media.

### Member Organizations

Young Professionals in Energy (YPE) Website: <https://ype-calgary.org/>

LinkedIn:

<https://www.linkedin.com/company/young-professionals-in-energy-ype-calgary-chapter/>

Society of Petroleum Engineers (SPE) Young Professionals

Website: <http://calgary.spe.org/calgary/home>

LinkedIn: <https://www.linkedin.com/showcase/spe-yp-calgary-section/>

World Petroleum Council (WPC) Canada Future Leaders

Website: <https://futureleaders.wpccanada.com/>

LinkedIn: <https://www.linkedin.com/company/wpc-future-leaders/about/>

Young Women in Energy (YWE)

Website: <https://www.youngwomeninenergy.com>

LinkedIn: <https://www.linkedin.com/company/ywe/>

Young Energy Infrastructure Professionals (YEIP)

Website: <https://yeip.energy/>

LinkedIn: <https://www.linkedin.com/company/yeipenergy/>



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The World Forum for  
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# ENERGY TRANSITION: The path to net zero



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