MATERIALIZING LEADERSHIP:
FROM OIL AND GAS TO RENEWABLE ENERGIES

Tanguy COSMAO, Project Director of Equinor's blue hydrogen project – **EQUINOR**
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"WE NEED AN UNDERSTANDING OF LOCAL PERMITS, LOCAL COMMUNITIES, COUNCILS AND CENTRAL GOVERNMENTS"

Where does hydrogen energy fit into the energy transition? We speak to the Norway-based project director of Equinor's blue hydrogen project located in Humber region to find out.

EQUINOR IS A PROMINENT RENEWABLE ENERGY PLAYER. HOW DID IT GET TO THIS POSITION – THROUGH HIRING, ORGANIC FOSTERING OF TALENT, OR A COMBINATION OF THE TWO? AND WHEN DID ITS RENEWABLES JOURNEY BEGIN?

Tanguy Cosmao. It was purely organic; None of our leaders in our renewable or hydrogen business unit have been externally hired. About 10 years ago we were piloting a floating wind mill offshore of Stavanger, but our focus picked up five or six years ago, when renewable energy became a business opportunity at scale. Around this time, we began to see the carbon dioxide emissions reduction as a key global and societal issue. We looked into our core oil and gas activities and how we could be more CO_2-efficient though optimization of our facilities design and our operations. Currently, our offshore operations are about 2 times more CO_2-efficient compare to the worldwide average. Around then we began to sketch out our strategy, soon entering into selected wind projects, especially in the UK.

WHAT SKILLS CAN OIL AND GAS BRING TO RENEWABLE ENERGY AND HYDROGEN EXPLOITATION, AND WHAT WILL BE THE KEY CHALLENGES OF THE TRANSITION?

Wind and hydrogen projects are both capital intensive, and the core skills of an oil and gas company – and Equinor in particular – are their rigorous decision-making process and the ability to mature a large

complex project, from feasibility, concept selection, execution all the way to operation. Companies like us have developed and mastered a robust decision-making process to develop on time and on budget complex energy projects. There are tools and skillsets for risk management, concept selection and project definition including safety that are also key to both renewable energy and hydrogen production at scale.

For offshore wind activities, we are also very familiar with marine operations and the offshore environment thanks to our offshore oil and gas activities over the last 40 years: construction and operation, materials selection and maintenance programs to name a few. A Blue Hydrogen project is in fact an extension of projects in downstream/gas-processing/petrochemical/refineries projects. Oil and gas companies have gained key operational insights in operating such facilities and continuously develop and retain key multi-disciplinary competences needed to develop a hydrogen project.

AS A PROJECT DIRECTOR, WHAT SKILLS IN PARTICULAR ARE YOU LOOKING FOR?

We are looking for an understanding of permitting issue and how to engage local communities, councils and central governments to seek their support. Most renewable and large hydrogen projects are developed under public-private partnerships (PPPs), and understanding the public concern and government drivers is key. We need technical and commercial teams that deeply understand the project's external environment and the stakeholder concerns and be able to interact in an open and transparent way.

We also want to see teams that understand safety in design issues through thorough knowledge of industrial standards, but also local regulations. Many hydrogen projects are being planned in Western Europe or in the UK, with very stringent specifications and regulations that need to be fully complied to.

We also need understanding of the potential hydrogen market. Currently this market does not exist at scale, so we are asking for teams with the flexibility and ability to mature a project at the same time that the market is establishing and developing itself, this by striking the right balance between firming up key parameters of the plant design and keeping necessary options to cater for the uncertainties in the hydrogen market.

Blue hydrogen production is part of a value chain and there are two key inter-dependencies in this value chain; First, the counterpart that will transport and store both the Hydrogen and the CO_2. Second, our Hydrogen customers that need to make their plants ready to welcome hydrogen as a new source of energy. Since we are part of a larger value chain, we need to have a robust interface management and focus on understanding of the drivers and constrains of the players in this new value chain.

WHICH HYDROGEN IS THE MOST TECHNICALLY DIFFICULT TO EXPLOIT FOR ENERGY – BLUE OR GREEN?

Hydrogen has been being produced for over 60 years; Blue hydrogen means that CO_2 emitted during the process is captured and sent to a permanent geological storage. Both hydrogen production and CO_2 capture are well-known processes, so it is mainly the upscaling and the combination of these two technologies that we need to focus on.

Large Green hydrogen, meanwhile, is a fairly new with very few plants in operation today. Cost of green hydrogen is currently significantly higher that blue hydrogen, but the industry sees the potential to reduce the cost of green hydrogen by 2035 to be at par with Blue hydrogen.

But ultimately, the final product – hydrogen – is the same and regardless of blue or green, the same attention and level of safety is needed to handle such product.

WHAT SKILLS ARE REQUIRED TO BECOME AN EXPERT IN OFFSHORE WIND?

They must understand that there is not yet a market for hydrogen production at scale. An oil and gas company knows there is been an established market for its oil and gas products. This new hydrogen market is also very contingent on government policies and structural support, given the PPP nature of these projects initially, which is not common in upstream oil and gas development.

WHAT ARE THE BIGGEST DIFFICULTIES FOR NON-ENERGY COMPANIES AIMING TO AVAIL OF HYDROGEN ENERGY?

I would say it is uncertainty. This is where Equinor, as project developer, steps in: we provide certainty in delivering a product. When a non-energy company make the decision to switch energy source, they need to know they will get that energy in a reliable manner (cost, quality and timely). These companies also will have to adapt their plants – their equipment, turbines, processes, and operational model as use of hydrogen introduce new operational boundaries.

We are working very closely with our potential customers to accompany them in this transition, understanding their constrains and their bottlenecks.

WHAT WOULD BE THE LIMITS OF HYDROGEN'S CONTRIBUTION TO THE ENERGY TRANSITION?

First of all hydrogen is seen as one of the answers among other options to tackle the climate change challenge. IAE estimate that blue/green hydrogen could represent 15% of the energy mixed by 2050. The limit I guess would be set by the competing alternative sources of low carbon energy. Both blue and green hydrogen are capital intensive. The speed of deployment of hydrogen and its scale will be key to determine the place hydrogen will have in the energy mix of tomorrow.

The storage capacity for CO_2 is also key component for blue hydrogen and extensive work around the world is being done to identify the full potential. For green hydrogen, development of large windfarms, in particular offshore, in the vicinity of green hydrogen production location will be key to see its speed of development.

How affordable is hydrogen energy compared to other forms of renewable energy?

Blue hydrogen today is significantly cheaper than green hydrogen, but green hydrogen, as relatively new production method could see economies of scale/deployment to cut its costs in the foreseeable future.

Compared to natural gas, blue hydrogen is a premium product, so naturally it is more expensive.