

EXCLUSIVE INSIGHTS /// ACTIONABLE INTELLIGENCE /// EXCLUSIVE SURVEY ANALYSIS

ENERGY TRANSITION DIALOGUES

INTELLIGENCE BRIEFING

ISSUE 3, WEDNESDAY, MARCH 31st

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SCROLL DOWN!

RETHINK LEGALITIES!

EFFICIENCY PRESSURE POINTS?

A DARK REMINDER

HYDROGEN

Big competitive boost for electrolysis by 2030

Dr. Axel Wietfeld, CEO, Uniper Hydrogen

Am I confident that the remaining \$220bn of the total \$300bn that is expected to be invested globally over the next decade to help the hydrogen market meet 20% of total energy demand by 2050 will be realised?¹

Yes, I am. But some more steps must be taken to attract public and private investments. For one, we need a proper political and regulatory framework and incentive schemes. On the customer side, for example, we need incentives to purchase green hydrogen. Now, grey hydrogen is economically more feasible. Increasing CO₂ prices would also make decarbonized hydrogen more attractive and we must decrease green hydrogen's production cost. A big part of this is the price of electricity – which is where the need for a maturing renewable energy market comes in. This is what makes the Middle East and North Africa (MENA) particularly attractive, with huge opportunities waiting to be leveraged. Importantly, we must also decrease the cost of electrolysis through economies of scale. That will automatically come as we start more and more projects and original equipment manufacturers (OEMs) start producing stacks of electrolysis on a larger scale. Once we speed up the economy, investments will start rising – of that I am sure.

*Source: Allied Market Research

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HYDROGEN

CONTINUED FROM PAGE 1

Dr. Axel Wietfeld, CEO, Uniper Hydrogen

Dr. Axel: Investors have a lot of appetite. We are also happy to invest in those technologies and those assets with a high focus on sustainability, and we have good discussions with banks and investment companies. Amid the strong interest, I am not sure whether it is relevant that we hit the \$300bn target exactly, but being in that ballpark is important.

ETD: Do you agree that green hydrogen could be cost-competitive by as early as 2030?

Dr. Axel: Yes, but that is a function of the costs of renewables, the price of electrolysis, and CO₂ prices. In a decade, we should be cost-competitive with our technologies and the cost of electrolysis will be half what it is today. But we must be careful; the cost implications are complex and the Balance of Plant (BoP) must be considered, i.e., supporting components and auxiliary systems. Having said that, this is also the case for other types of hydrogen. Plus, we cannot forget that we need customers to be prepared to pay for these green products. On the political side, we also need additional momentum. Strategies must be translated into law and regulations, so companies and customers can grab it and design commercial deals and technical projects that are based on a reliable framework for the next decade. This is crucial for their business models. For a successful market ramp-up, it is necessary that the sectors with the currently highest CO₂ avoidance costs, i.e., transport and industry, have access to all forms of climate-friendly hydrogen, recognizing the greenhouse gas (GHG) reduction. Cost effectiveness is also a big criteria for building a hydrogen

“THE COST OF ELECTROLYSIS WILL DROP BY 50% IN A DECADE. BUT WE MUST BE MINDFUL OF OTHER COSTS ASSOCIATED WITH PRODUCING GREEN HYDROGEN.”



\$2/KG

is the benchmark cost of green hydrogen that a scaled-up industry could deliver in 2030, with \$1/kg in many parts of the world by 2050.¹

“BY 2035, WE’LL TALK ABOUT HYDROGEN LIKE WE TALK ABOUT THE SIZE AND INFLUENCE OF THE NATURAL GAS AND LNG MARKET TODAY.”

economy and achieving competitiveness. Therefore, let us start with the sectors where the least support is required in order to achieve technological leadership, such as industry and refineries.

ETD: Does hitting these competitive price points by 2030 require an active import-export market?

Dr. Axel: That depends on the region and the jurisdiction. We will have an import-export market and in 10-15 years, we will talk about hydrogen in a similar way to how we talk about natural gas and LNG today. My confidence stems from two points. Firstly, there are eager customers. For example, Germany has a huge demand for hydrogen. We will produce green hydrogen ourselves, but it will be far too insufficient to meet the demand of approximately 100 TWh in 2030. So, we must import green hydrogen as a commodity as well, probably up to 80%. And secondly, from the supply side, there are huge opportunities for countries with high renewable energy resources, such as the MENA, South America, and arguably Australia. To maximize the market potential, they will have to invest in the entire supply chain and produce clean hydrogen so they can export to countries, like those in Europe. However, that can and should happen in partnership with the companies who are on the importing side.

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1. BNEF

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TWO MINUTE WARNING

Oil & gas majors must shift fiduciary focus!

Susan Mac Cormac, Corporate Partner, Morrison & Foerster

Climate change is impacting the legal sector in four different ways.

Firstly, there are several initiatives in cooperation with academia, namely Columbia Law School and Stanford Law school, where law firms are coming together to develop solutions to help both the new economy and traditional economy as it transitions. Secondly, clients are increasingly asking about our sustainability performance in their request for proposals (RFP). Thirdly, law students are rating law firms primarily, if not exclusively, based on their work for traditional energy companies. And lastly, a lot of tools have been developed that are out of the ordinary for how clients, investors, and companies can focus on climate while generating returns.

Leveraging philanthropy?

Philanthropy, or government funding, is most effective when it is used as a catalyst. One example is in a stacked deck fund, where you take philanthropy or government money as a guarantee or a first loss. This allows mainstream capital to come in. Instead of giving the philanthropic money away for things on the side, it must be tied to the overall climate strategy, both on a corporate, national, and global level.

New legal viewfinder?

What tools can ensure a good return on investments while mitigating climate change? There are different buckets. One is when you are aggregating capital within a fund structure, sometimes otherwise, to make sure that you are focused on climate emission reduction and that there is a fair financial agreement for impact returns. And then there is the underlying corporate form where in the US there has been huge advancement and this, in my opinion, is the best solution for traditional oil and gas companies. If you shift your fiduciary duties to focus on climate, it provides you with insulation from liability. If you make significant investments in clean energy and your stock price drops, you have protection.



FULL INTERVIEW HERE!

TOP 5 NEWS STORIES

- [Net Zero Targets Too Vague?](#)
- [New Shade for Green Bonds is Blue?](#)
- [Clean Tech Investment Bubble?](#)
- [Climate Effect on Countries' Credit Ratings](#)
- [Rush to Buy Carbon Permits?](#)

\$1.4TRN per year is the clean energy investment needed globally in 2020-2024 to put the world on a pathway compatible to the Paris Agreement.

\$300BN per year is the current gap in the annual \$1.4trn funding that is required for clean energy investments to hit the world's 2050 climate goals.

Source: UN

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PODCAST

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THIS WEEK EMERGING TECH FOR ENERGY EFFICIENCY – AND SOON?

Energy efficiency delivers more than 40% of the reduction in energy-related GHG emissions over the next 20 years in the International Energy Agency's (IEA) Sustainable Development Scenario. That is the theory anyway – we are far behind where we need to be. For one, global improvements in energy efficiency since 2015, as measured by primary energy intensity, have been declining. The Covid-19 crisis adds an extra load of pressure. As a result of the crisis and continuing low energy prices, energy intensity is expected to improve by only 0.8% in 2020 – roughly half the rates for 2019. Most importantly, this means we are still on the wrong longer-term trajectory when it comes to hitting the global climate goals. What will it take to quickly get back on track?



**Ridah Sabouni, Managing Director,
Middle East and North Africa, Energetics**

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If you look at where we are today versus where we were 15 years ago, the price of clean energy technology has dropped significantly.

We saw large investments about a decade ago in clean technologies and it took some time to see the fruits of those investments. Looking forward, Covid-19 has taught us that if the global community is motivated to do something, they will get it done. We will see an acceleration in adaption and a quicker rollout of new solutions.

Electrify everything!

There is an acknowledgment from the market that we are living in a carbon-constrained world. We must see more investments going into energy efficiency. On the transportation side, from the system-wide perspective, we need to electrify everything.

We see developments taking place around the world, especially with utility-scale solar and wind projects. We also see small-scale rooftop solar systems. What we now need is an electrified transportation fleet.

Low hanging fruits?

Using digital tools like artificial intelligence (AI), which falls under the umbrella of the 4th Industrial Revolution (4IR), is absolutely critical. But we are still not there across the board. We need to leverage the low-hanging fruits, like the ISO 50001 energy management system. This provides a proper approach to energy management and saves a lot of energy and of course, a lot of CO₂ emissions. The next step is to automate the process and have it be a part of a smarter and data-driven system.

FULL INTERVIEW HERE!

**Guloren Toran, General Manager - Advocacy & Communications,
Global CCS Institute**



To date, we have stored around 260mn tons of carbon through carbon capture and storage (CCS) technology globally.

But the technology has so much more to offer when it comes to reducing CO₂ emissions. Momentum is picking up as recent data shows large investments in recent months. Arguably, it is a bit later than it should have been at the scale that is needed, but it is certainly picking up. We currently have 26 facilities operating in different industries, including power generation. But the world needs to reach some 2,000 facilities by 2050. That means scaling up more than 100 times on what we currently have. The US leads the scoreboard in terms of both the existing facilities and those under development.

Spreading its wings?

BP is planning to build and develop a 1GW blue hydrogen facility – the largest clean hydrogen facility to be built, using CCS for the hydrogen production. Apart from its use in blue hydrogen production, there are many ways to leverage CCS. For example, we can use the technology to decarbonize the hard-to-abate industries, like cement and steel, which account for 20-25% of global CO₂ emissions. The CO₂ emissions issue in these industries is not the source of the emissions, but the chemical processes in place. For example, in the process for cement limestone, the input and the chemical reaction produce CO₂ emissions, which can be captured by CCS. The CCS technology can also add more reliability to renewable power plants when the sun does not shine and the wind does not blow, as CCS-equipped gas plants help ensure continuity.

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PODCAST



**Sahin Caglayan, CEO,
Faradai**

What is the return on investments for energy efficiency technologies?

They are some of the most feasible and fastest. And who are one of the pioneers in this space? The European Union (EU). It has research and development (R&D) incentives for next-generation energy efficiency and technologies for commercial and industrial facilities. Of course, different technologies are pushing this growth, like CCS, electric vehicles (EVs), microgrids, and so on.

The formula: 4D+E

To solve the energy efficiency problem, we need to look at the 4D+E trends: decarbonization, deregulation, digitalization, decentralization, and electrification. While the outlook is optimistic on paper, there is a huge gap in this transformation. For starters, there is a lack of flexible and data-driven AI-powered platforms in commercial industrial facilities. In other words, the intersection between technology

and the smart grid is empty. We must overcome the problem of legacy systems' vertical hardware dependence – and we need to do it immediately. Only then can we reduce the energy cost and the operational expenditure at the facilities.

Follow the piper

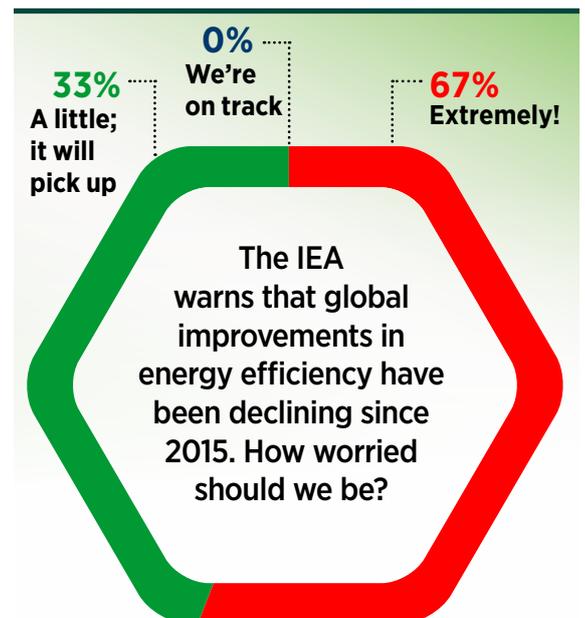
Governments must lead the energy efficiency transformation, starting with their own facilities. Surprisingly, in many regions around the world, from the Middle East to Europe, government buildings have at least 25% energy saving potential. Yet many have taken minimal action. Governments' action incentivizes investors as well supports energy service companies, energy performance contract models, and technology companies. This level of action means we start to see the whole landscape evolve.

FULL INTERVIEW HERE!

SURVEY ANALYSIS FROWN LINES JUSTIFIABLY DEEPEN!

Surely this result is back to front?

In 2021, two thirds should be saying that we are on track, not extremely worried. While some areas of the greener energy agenda over the last few years are 'newer' – green hydrogen, for example – the value of energy efficiency has been bandied around boardrooms for decades. And still, the rate of progress is far, far too slow. The concept of energy efficiency is very straightforward; perhaps that is part of the problem. Energy efficiency simply means using less energy to perform the same task, with the benefits extending to lower GHGs, reduced demand for imports, and lower economics costs, summarized the Environmental and Energy Study Institute. A potential weak spot, however, is that the phrase 'low hanging fruits' is often associated with energy efficiency in a bid to bolster efforts: what can be achieved 'here and now'? The good news is that quite a bit can be done. The bad news appears to be that this makes some firms complacent; *it is one of the easier points to achieve on our climate agenda, we will get to it soon*. It does not help that the IEA warns of declining investments in new energy-efficient buildings, equipment, and vehicles in 2020, as economic growth falls by an estimated 4.6%. But do not doubt this simple equation: without effective and widespread energy efficiency, global climate goals will not be met.



Survey source – ETD

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Earth Hour

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These facts are in recognition of Earth Hour on the 27th March. For one hour, those able around the world were asked to switch off their lights – a small act that sends a crucial message about energy security. The brief spell of darkness from Moscow's Red Square, Rome's Colosseum, Sydney's Opera House, Hong Kong's skyline, to London's Parliament Buildings and many others, should be a concerning reminder that this is the norm for a staggering 15% of the global population.

1 BILLION+
people worldwide still lack
reliable access to a power supply.

2021

could see the fastest rate of growth in renewable
power generation since 2015, as the IEA expects a 10%
climb in capacity additions this year.

+7%

rise in renewable power generation worldwide
in 2020 thanks to growth in the solar, wind,
and hydropower markets, according to the IEA.



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