



**“We need to reduce emissions to zero as soon as possible”**

HANS-JOSEF FELL,  
PRESIDENT OF THE ENERGY WATCH GROUP

**“Ideological prescriptions won’t help us make progress”**

JORGO CHATZIMARKAKIS,  
SECRETARY GENERAL OF HYDROGEN EUROPE

The President of the Energy Watch Group, Hans-Josef Fell, is calling for the almost exclusive utilization of green hydrogen from renewable sources. Jorgo Chatzimarkakis, Secretary General of the industrial association Hydrogen Europe, believes this is not enough. A debate

INTERVIEW  
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**Mr. Chatzimarkakis, Mr. Fell, not too long ago the International Energy Agency predicted a breakthrough in the utilization of hydrogen. Today practically the only things we’re talking about are the effects of the coronavirus pandemic on the economy and our society. Are you worried about the fact that the vision of a hydrogen economy is slipping off the political agenda?**

**HANS-JOSEF FELL** I’ve been hearing bulletins about the imminent breakthrough of hydrogen for the past 25 years. The last big hype occurred in 2000 or thereabouts. Unfortunately, not much has been happening. And I feel skeptical, especially right now, about whether a breakthrough will happen as fast as we would need it to happen. Since the oil prices are relatively low at the moment, there’s even less motivation to switch to other forms of energy—especially now that the coronavirus has pushed the prices of emissions certificates into the cellar.

**JORGO CHATZIMARKAKIS** I believe that this crisis is offering us the opportunity to speed up the system change to hydrogen. We’ve just had an online conference with the Executive Vice President of the European Commission, Frans Timmermans. What came out of that conference is a very concrete plan for 80 giga-

watts of capacity for the production of green hydrogen from renewable power sources: 40 gigawatts in Europe and 40 gigawatts in Africa. This plan would probably not have materialized so quickly without the big post-corona Marshall Plan that is being put together in Brussels right now. It’s true that we’ve tumbled down very drastically from some of our previous hyped-up high points. But the technology has now reached maturity. I drive a hydrogen-powered car in my everyday life.

**What role will hydrogen play in future energy consumption?**

**FELL** Green hydrogen will play an important role in the transition to a 100 percent supply from renewable energy sources, especially for the cross-sector linkage—in other words, the connection between environmentally friendly energy generation and heating systems, transportation, and industry. We need green hydrogen as a long-term storage option for green electricity and the decarbonization of industries. The core strategy for climate protection and for a zero-emissions economy is a quick and complete transition to renewable energy sources. That ultimately means a 90 percent share of green energy. Unfortunately, this expansion is being massively obstructed in Germany, especially by the national administrations led by Angela Merkel.

**CHATZIMARKAKIS** Mr. Fell, I agree with you that we have to hurry up and reduce emissions to zero. However, I have a problem with the ideological demand for a 90 percent share of green power. Renewables are not being neglected, and certainly not in Brussels. However, today 20 percent of our energy needs in Europe are covered by electrons and 80 →

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percent by molecules—in other words, by fossil fuels. Simply switching these percentages around means that we would have to make massive investments in cables and batteries. These are things we simply don’t have yet, and I’m not even talking about the political authorization structure. So let’s open up new channels for renewable energies by transforming them into molecules—that is, hydrogen—and transporting them via existing gas pipelines.

**FELL** Energy that is completely generated from renewable sources has nothing to do with ideology, Mr. Chatzimarkakis—this is natural science. The USA’s National Aeronautics and Space Administration (NASA) announced in January that the Earth’s climate had already heated up by 1.2°C. In other words, we will already have passed the 1.5°C mark in 2032. At that point we can no longer afford to release any more emissions into the atmosphere. I’m a big supporter of using existing infrastructures for renewable energies, including the natural gas infrastructure. However, we cannot afford to continue running the fossil-fuel economy—via blue hydrogen, for example—because then we will not be protecting the climate. On the contrary.

**Blue hydrogen is derived from natural gas. The CO<sub>2</sub> that is released in the process is captured and sequestered underground, for example in old natural-gas storage reservoirs. Mr. Fell, why do you feel that the hydrogen decarbonized in this manner is not a climate-friendly solution?**

**FELL** Because the hydrogen generated from natural gas brings immense methane emissions in the upstream chain—for example, as a result of leaks during its extraction and transportation. And methane’s effect

on the atmosphere is 80 times more intense than that of carbon dioxide. At the Energy Watch Group we recently compared the emissions of a new natural-gas power station with those of a coal-powered one. If we calculate in the methane emissions, the natural-gas power station is not one bit cleaner than the coal-powered one. And if the natural gas comes from fracking, the greenhouse gas emissions increase by as much as 40 percent. If we use natural gas as the source of blue hydrogen, we don’t need to talk about climate protection any more.

**CHATZIMARKAKIS** We can get to grips with the methane leaks. Unfortunately, they mainly occur in regions where EU law does not apply: in Russia and the USA. But we can use an import duty on products with a high CO<sub>2</sub> load to put the necessary pressure on the sourcing countries. Mr. Fell, you’ve just warned that we have to act quickly in view of the looming climate crisis. Blue hydrogen will help us to do exactly that. Steel companies could decarbonize their production processes by up to 95 percent, or even completely, by using hydrogen instead of coking coal. However, this hydrogen is not yet available in a form that is produced from renewable energy sources. If we prohibit blue hydrogen, we’re closing off the path to decarbonization for industry—including the chemical industry, by the way.

**Mr. Fell, doesn’t blue hydrogen at least have a justification as a stopgap technology?**

**FELL** No investment in greenhouse gas-emitting technologies helps to protect the climate. Blue hydrogen does not decarbonize, due to the methane emissions in the upstream chain. Besides, you also have to invest in the CO<sub>2</sub> sequestration. All of this means throwing away insane amounts of money and thus ultimately prolonging the survival of greenhouse gas-emitting sectors such as the natural gas industry. It’s far better to focus all our efforts on investing in zero-emissions technologies! That will trigger a tremendous surge of innovation. And then we won’t need this outrageously expensive stopgap solution at all.

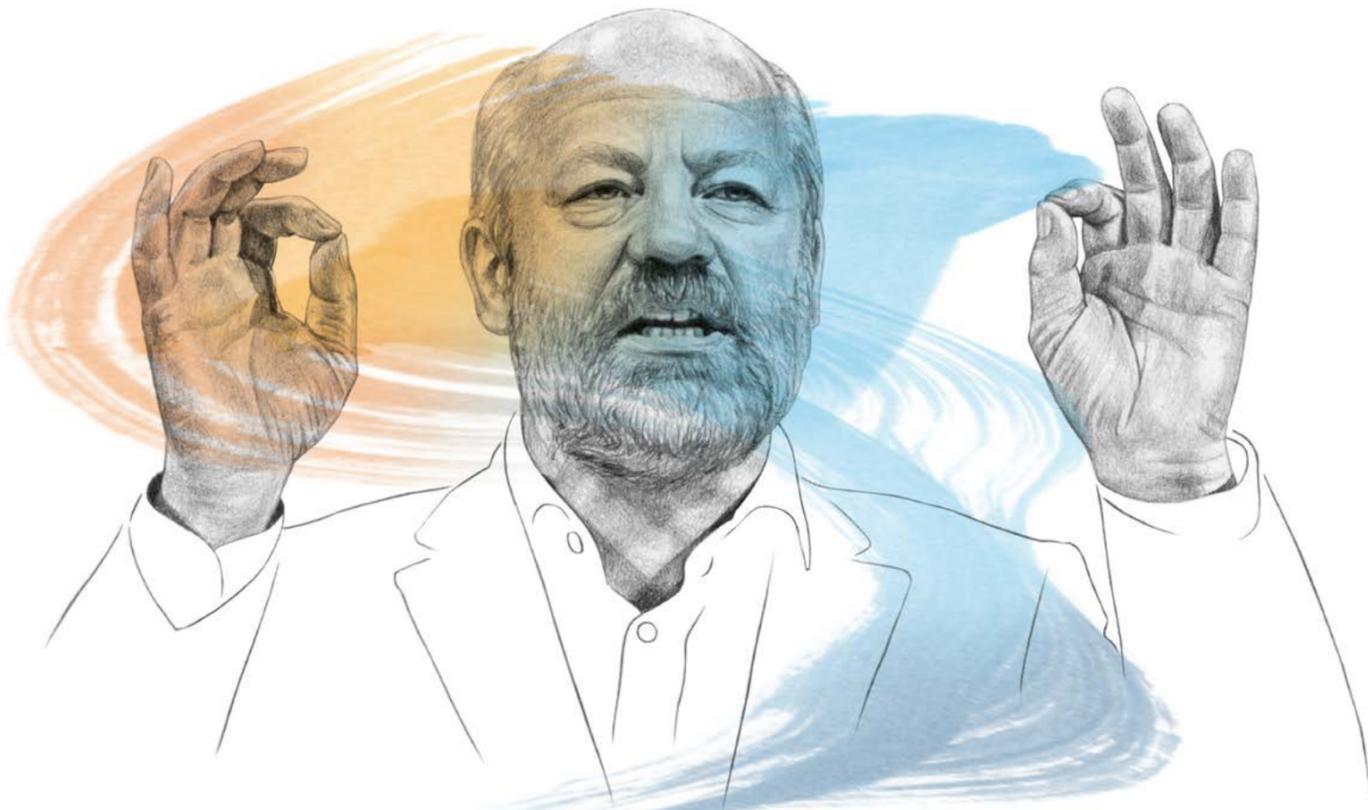


**Georgios “Jorgo” Chatzimarkakis** was born in Duisburg in 1966. He has degrees in agronomy and political science and a German as well as a Greek passport. Among his other accomplishments, Chatzimarkakis was an FDP-aligned member of the European Parliament for ten years. During the Greek financial crisis of 2014, he served briefly as the Special Ambassador of the Athens government. By his own admission, the Chernobyl catastrophe spurred his entry into politics in 1986. Since 2016, Chatzimarkakis has been the Secretary General of Hydrogen Europe, an association of approximately 160 members from numerous sectors, including automakers, technology companies, and energy providers. Chatzimarkakis is married with four daughters and drives a hydrogen-powered car.

**CHATZIMARKAKIS** Even the Intergovernmental Panel on Climate Change (IPCC) says in its latest report that we don’t have the time to wait for renewable energies. We have to use all of our available technologies right now—and the IPCC expressly mentions CO<sub>2</sub> sequestration. If we use this technology now, and if major companies enter the hydrogen economy, significant volumes of hydrogen will quickly enter the system.

**Norway is planning to sequester carbon dioxide on a large scale in old natural-gas storage reservoirs, and Japan plans to import blue hydrogen made from Australian coal. Are other countries overtaking Germany because they have fewer reservations regarding blue hydrogen?**

**FELL** Japan is moving in the wrong direction, and not only because of climate change. You’re heading into a system that requires gigantic streams of capital and huge volumes of energy for extraction, transportation, and processing operations. Today only a few countries are pursuing a zero-emissions agenda that includes green hydrogen. So I don’t see anyone overtaking us. **CHATZIMARKAKIS** I have a different opinion. I, for one, see the threat of other countries passing us by. For example, the Chinese are making grander announcements every day, about their switch to automobiles powered by fuel cells, for example. Asian countries are now implementing their system change—with blue or gray hydrogen, if necessary. We Europeans are standing by like a bunch of losers. The same thing could happen with power-to-gas... →



**Hans-Josef Fell** was born in Hammelburg in Lower Franconia in 1952 and was a physics and sports teacher at a college preparatory high school for 20 years. From 1998 until 2013, he was a member of the German Bundestag representing Alliance 90/The Greens. He acted as the parliamentary group's speaker for research and energy policy for many years. He is regarded as one of the fathers of the Renewable Energy Sources Act (EEG). In 2006 Fell founded the Energy Watch Group (EWG), an independent worldwide network of scientists and parliamentarians that commissions studies on energy-related topics. He has been the President of the EWG since 2014. Fell is married and has two sons and a daughter. He lives in a wooden house that is completely powered by renewable energy. The family's cars run on solar power and sunflower oil.

**...in other words, energy storage by means of hydrogen.**

**CHATZIMARKAKIS** Exactly. Today we're still leading the global market. But we have to make sure we don't delay and obstruct with well-meaning policy due to the fact that we're demonizing a technology that can help us get the market up and running.

**Mr. Chatzimarkakis, if blue hydrogen is only useful as a stopgap technology, what does your strategy for exiting from it look like?**

**CHATZIMARKAKIS** Mr. Fell is absolutely right when he says that the decarbonization of blue hydrogen costs a lot of money. In the future it may become even more expensive. We can even establish policies that define

this increase, as well as the decrease in the costs of green hydrogen. At some point, industries would make the switch, purely because of their own economic interest.

**FELL** My experience tells me something different—namely, that the greenhouse gas-emitting technologies will gain the upper hand and thwart the expansion of alternatives.

**What would a smart policy for promoting the right kind of hydrogen look like, Mr. Fell?**

**FELL** The most important element would be framework conditions that encourage private companies to profitably invest their capital in zero-emission technologies. The model for that is the German Renewable Energy Sources Act and the fixed rate of feed-in remuneration. These things have strongly stimulated investments. First came private individuals with their solar panels, followed by cooperatives with wind turbines, and then industry caught up.

**Why are you against a tax on carbon dioxide emissions such as the one that was passed in Germany? It would certainly help to price in the external costs of protecting the climate.**

**FELL** If the price of oil drops precipitously, as it is doing this spring, a CO<sub>2</sub> tax is worthless, and if it

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doesn't include methane, it's less than worthless. Setting a price on carbon dioxide can make sense in individual cases, but the effect of that always depends on other market developments. That's why it shouldn't be our most important tool.

**CHATZIMARKAKIS** The German price for CO<sub>2</sub> is really a joke. Switzerland is doing things better. Both of the major Swiss retail chains are now investing in 1,600 hydrogen-powered trucks, and they are doing this voluntarily because this is cheaper for them than paying the CO<sub>2</sub> tax would be.

**FELL** Yes, the Swiss have had their CO<sub>2</sub> tax for a long time now, and everyone is praising it. Nonetheless, they won't reach the emissions reduction target they've set for themselves—which is only 20 percent.

**Mr. Chatzimarkakis, your association also represents conventional energy companies. Are these companies really interested in expanding the hydrogen economy?**

**CHATZIMARKAKIS** Shell was one of the first strong players in the area of hydrogen. Shell needs hydrogen itself, for its refineries and for other processes. So does BP. Shell is currently implementing its NorthH2 project

for the ten-gigawatt offshore production of hydrogen from wind energy. Its total investment in this project is €15 billion. That refutes the argument that the fossil-fuel industries are relying on blue hydrogen to safeguard their future, Mr. Fell.

**FELL** I'm happy about Shell's green hydrogen project, but in the past I've seen oil companies simply greenwashing themselves over and over again. Even though it costs €15 billion, it's still a green fig leaf. That's because the companies are basically holding on tight to their business model, which is based on fossil carbon. If a crisis occurs, like the coronavirus pandemic we are experiencing today, it will be accompanied by the demand that everything else should be put on hold. The Economic Council to the CDU political party in Germany has just called for a reduction of the climate protection goals.

**CHATZIMARKAKIS** I absolutely agree with you on that. I think that the calls for rolling back climate protection goals are disruptive. Those who make such demands are guilty of an offense against future generations. But the major project of the European Commission, the Green Deal, is controlled in Brussels. Mr. Fell, I cordially invite you to visit us and take a look at what we're starting up here. But before that can happen, we have to be able to travel again. —

### Distanced debate

How can you have a debate via a videoconference? Quite well, as it turns out. The *Elements* talk between Jorgo Chatzimarkakis and Hans-Josef Fell took place in mid-April, at the preliminary peak of the coronavirus pandemic in Europe. That's why it was moved to a virtual conference room at short notice, although the original plans called for a lively discussion with a small group of participants in Essen. This experience is being shared by millions of people who can see their colleagues, family members, and friends only on the monitors of their laptops during these weeks. Jerky video images, cut-off audio, views of strangers' studies and bookshelves, children screaming in the background—these may be our memories of the working world of 2020. This ultimately became an exciting discussion between two experts who are striving to reach a shared goal via very different routes. And the circumstances of this talk made it clear to everyone involved that in spite of our differences of opinion all of us are sitting in the same boat.

