

Speaker 1 ([00:00](#)):

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Bill Garner ([00:19](#)):

Welcome back to Greenberg Traurig's E2 law podcast, where we discuss global energy and environmental issues. In this episode, we continue with part two of the discussion on the government's role in hydrogen development.

Bill Garner ([00:32](#)):

Marijn is going to talk about European Union and Dutch policy developments. The development of hydrogen as a valuable fuel source.

Marijn Bodelier ([00:46](#)):

Thanks, Bill, for the introduction. So hydrogen currently accounts for less than 2% of Europe's present energy consumption. So if we are looking at volumes, I think we are really in early stages, particularly if we are looking at the ambitions that we're going to talk about in a bit, 2% is very little.

Marijn Bodelier ([01:06](#)):

And if we look at what type of hydrogen we're talking about, most of the hydrogen is so-called "gray hydrogen," so hydrogen that's created with fossil fuels as production beats. And there's significant amounts of CO2 emissions going along with that.

Marijn Bodelier ([01:23](#)):

In Europe, 2020, we saw the hydrogen strategy come to light, a very big focus on green hydrogen. That also creates discussion in the member states, for example, in the Netherlands, with respect to cost. So we have the 2021 Green Deal, of course, huge project initiated by the European Commission to reduce CO2 emissions by 55% in 2030, compared to 1990, and to get European Union climate-neutral by 2050.

Marijn Bodelier ([01:54](#)):

So last summer, the European Commission also presented a package of legislative proposals, the Fit for 55, the legislative proposal that half of the hydrogen that's used by the industry should be generated using renewable sources.

Marijn Bodelier ([02:09](#)):

There's going to be a EU-wide certification of hydrogen, and the European Union wants 40 gigawatts of electrolyzer capacity to produce 10 million tons of hydrogen a year from renewable sources. So this is the, let's say, step by step approach that was laid down in the EU's hydrogen vision.

Marijn Bodelier ([02:34](#)):

And as we can see from today to 2024, a focus on supporting the installation of at least six gigs of renewable energy, hydrogen electrolyzers, and then see a rise of production up to one million metric tons of renewable energy.

Marijn Bodelier ([02:51](#)):

The next phase is going to be 2025 to 2030, where we're going to go from where hydrogen needs to become an intrinsic part of the energy system with at least a huge introduction, going to 40 gigawatts of renewable hydrogen electrolyzers and 10 million tons of renewable hydrogen.

Marijn Bodelier ([03:14](#)):

And then we see the developments going on after that, where renewable hydrogen will be deployed on a large scale and will be the main energy carrier in the EU.

Marijn Bodelier ([03:23](#)):

So if we look at all these policy developments and where are we now, when we look at the legal framework, so actually what's going on in legislation and availability of financial support, and then the basic conclusion is, is that there is very little regulation.

Marijn Bodelier ([03:42](#)):

We have the gas directive, which traditionally of course, was focused on the natural gas market. But if we look at the definition of what that directive looks at, we also see that it regulates other types of gas, so also hydrogen. Well, the European Commission recognized that.

Marijn Bodelier ([04:02](#)):

That directive is not suited for the regulation of an emerging hydrogen market, so they initiated a review and revision of the gas directive, and that's expected by the end of this year to come to light, or at least the proposal for the revision.

Marijn Bodelier ([04:23](#)):

But at the same time, in the context of the EU Green Deal and the Fit for 55, we're seeing other initiatives coming to light that might also impact the business case for hydrogen projects. And one of the examples, for example as mentioned here on the slide, is the EU Carbon Border Adjustment Mechanism, which basically will tax products that are imported into the EU and have been produced with carbon-intensive means. Those will be taxed with a carbon border tax.

Marijn Bodelier ([04:54](#)):

Another example, I think, which could be relevant is the EU taxonomy regulation, which basically gives a definition of what a sustainable investment is. So carbon-intensive products will likely not be ... will not qualify as a sustainable investment and may thus impact where we will see investments in the future and may impact the business case.

Marijn Bodelier ([05:19](#)):

In Europe, we also have a number of financial schemes that are available. For example, fuel cell and hydrogen joint undertaking. That actually closed already, but there's a new program being developed and that's a public-private partnership to develop hydrogen projects.

Marijn Bodelier ([05:38](#)):

We have the Horizon 2020 for fundamental research. And I think a scheme that's important is the Next Generation EU, which is basically the COVID-19 recovery package for the EU that has the aim of reducing

the cost, the price of hydrogen to one to two euros per kilogram, to see 200 billion euros in investments and increase turnover in the hydrogen sector from two billion at the moment to 140 billion in 2030.

Marijn Bodelier ([06:14](#)):

So that was the EU level. If we look at the Dutch level, we're seeing that the Dutch ministry, but also the gas regulator is very active when it comes to policy developments. We've seen a Dutch hydrogen vision come to light. We've seen letters on hydrogen infrastructure. We've seen active parliamentary questions on what's going on in the hydrogen infrastructure.

Marijn Bodelier ([06:45](#)):

And for example, one of the initiatives to create a market when it comes to demand of hydrogen is to ... It's so called to break through the "chicken or egg situation," as it's called in the letter, is to give renewable energy credits to the use of green hydrogen in refinery processes.

Marijn Bodelier ([07:09](#)):

So all of these, let's say, letters, visions, et cetera, that have been communicated to parliament, what do they basically boil down to? Basically they boil down to four pillars that support the hydrogen policy in the Netherlands.

Marijn Bodelier ([07:25](#)):

The first is legislation. In the Netherlands, there has been a choice, and also there has been a decision on a government level to use the existing natural gas grid for hydrogen.

Marijn Bodelier ([07:43](#)):

There has been the Highway 27 project, was a research that was performed that was ordered by the Dutch government. And in that, the Dutch gas grid operator was found to be most suited to create a infrastructure backbone.

Marijn Bodelier ([08:03](#)):

The other point is market regulation and temporary tasks for the grid operators. The basic assumption in the Netherlands is that grid operators can just operate the grid and not be involved in the production of green hydrogen. And there may perhaps be a bit space there for green operators in the future.

Marijn Bodelier ([08:23](#)):

That's the creation of certificates of origin. And it's a big focus on safety. Of course, many people in the hydrogen world have the, let's say, the Hindenburg drama still in the back of their minds. Like Bill asked me, "How are you going to prevent that the ball that you're going to fill with hydrogen, how are you going to prevent it from catching flame?" That's all addressed in this pillar of the policy.

Marijn Bodelier ([08:52](#)):

Another important policy is cost reduction and scaling up of green hydrogen. To that end, there are funds for research schemes. There is the initiative of connecting hydrogen to offshore wind, which is an important project of the Dutch government when it comes to renewables, and the required blending of hydrogen with other fuels.

Marijn Bodelier ([09:17](#)):

And it's also a focus on increasing the sustainability of the end use. And I think Katrina also said something about that. You want to focus on, where can you already use hydrogen? For example, the hydrogen valleys. And the Dutch government has identified harbors and other industrial clusters as locations that have a high opportunity or a high chance of being successful when it comes to the use of green hydrogen.

Marijn Bodelier ([09:47](#)):

Another driver that maybe uses the zero emission logistics. The Dutch climate agreement says that the 30 largest cities of the Netherlands should introduce zero emission zones where only logistics can take place with zero emissions, so trucks and vans can only be zero emission, and hydrogen could play a big role in that.

Marijn Bodelier ([10:12](#)):

The other part is the built environment. The Netherlands traditionally used natural gas to heat houses and to cook, but a decision has been reached not to use natural gas anymore. And for example, in the built environment, hydrogen may play a role. I should note that there's some discussion on that, whether that is the most beneficial application of hydrogen.

Marijn Bodelier ([10:39](#)):

Of course, we have the electricity sector. That's expected to grow. And that could, for example, use hydrogen when it comes to shaving the peaks of electricity production. For example, when we are talking about solar fields that could use hydrogen as a storage, as a so-called ... as a battery, in essence.

Marijn Bodelier ([11:06](#)):

And that sort of relates to what Katrina said about the grid capacity in the US. Also in the Netherlands, we are seeing grid capacity problems, or not so much outages of the system, but the grid operator saying to projects that there's no more capacity on the grid and that they have to look for other means. And hydrogen could play a role there. And the other, finally, the agricultural sector.

Marijn Bodelier ([11:32](#)):

So there are also some supporting initiatives, which is the last that's looking for international corporation. I think our webinar is a great example of how, also on a more private level, you can look at what countries are doing, and perhaps that could be expanded and investing in research and development.

Marijn Bodelier ([11:53](#)):

So if we look at the current legal framework, I think the first thing that should be said is that there is no specific legislation that has been adopted yet for hydrogen.

Marijn Bodelier ([12:05](#)):

We have the mandatory separation between gas grid operators and energy producers/suppliers, and that applies to hydrogen as well. So network operators, grid operators are allowed to build and operate transport networks for alternative energy carriers, but they cannot be involved in production.

Marijn Bodelier ([12:27](#)):

There's one exception to that. That is, if they are part of a ... they have a minority stake in a joint venture, or where the production is inextricably linked to the infrastructure.

Marijn Bodelier ([12:39](#)):

Now, the Dutch Consumers and Markets Authority, which is the regulator for the gas market, has already said, "We want to see if there's room for experiments in the scaling up process of hydrogen for pilot projects."

Marijn Bodelier ([12:58](#)):

And they also have the view, "All this legislation that we currently have for the gas market, that is not really suited for the hydrogen market because the hydrogen market is in a completely different level than the gas market when we introduced all of this legislation."

Marijn Bodelier ([13:18](#)):

So there are some subsidy and financial schemes available. The SDE, which is the Stimulation for Sustainable Energy Subsidy, is available. It's actually closed for 2021 and it had a limited amount of production hours.

Marijn Bodelier ([13:36](#)):

There's also a more, let's say, innovation subsidy, which is the DE+ subsidy for pilot projects. That's available, but also a limited amount. I think only 19 million was available, of which projects can be a maximum of three million, I believe.

Marijn Bodelier ([13:58](#)):

A new financial support scheme for hydrogen has been announced, but we have a government that has stepped down and we are in the process of getting a new government in the Netherlands, and likely this new financial support scheme will not be announced until we have that new government.

Marijn Bodelier ([14:15](#)):

But the expectation is that once that new government is announced, we are talking about significant amounts of financial support. Another topic that I think is very relevant for hydrogen projects is that the permitting part may be challenging.

Marijn Bodelier ([14:33](#)):

And we also have seen that in projects in the Netherlands, where the local competent authority has not yet had any experience with hydrogen projects and does not have any clear guidelines, or let's say, research to fall back on when it comes to, for example, which safety standards to apply when it comes to hydrogen.

Marijn Bodelier ([14:58](#)):

And there, I would like to know that for large hydrogen production plants, I think if it's more than 100,000 metric tons per year, an environmental impact assessment would be required. And then of course, the question is, how are you going to assess that environmental impact assessment, and how do

you make sure that you assess all of these projects in the same way? So how do you create a level playing field?

Marijn Bodelier ([15:28](#)):

And finally, I think it's good to note that discussion has opened up in the Netherlands because the Netherlands felt that in the early stages of scaling up hydrogen and the hydrogen infrastructure, it would be good to focus on blue or gray hydrogen, so hydrogen that's produced by fossil fuels or where you carbon capture and storage, but the EU has focus has its focus much more on green hydrogen, so produced by renewable means.

Marijn Bodelier ([16:04](#)):

And there have been some newspaper articles in which the position was taken that green hydrogen is where we should end up, but that in the scaling up phase, the costs of green hydrogen would be too high to right away create that hydrogen market. And actually a number of politicians have asked questions to the Dutch minister on her view on that point.

Marijn Bodelier ([16:35](#)):

And there haven't been any answers on that, but I believe that's being discussed also currently in parliament. So in conclusion, we don't have a tailored legal framework yet, but we are expecting to see it soon, I should say.

Marijn Bodelier ([16:50](#)):

And that creates somewhat of a legal uncertainty on, what is going to be that legal framework in the future? And I think a very important part, at least from a Dutch perspective, is that the financial support schemes, they seem essential for the business case for hydrogen and particularly for scaling up green hydrogen, and they are not available yet, or at least they're not very clear yet on what that's going to be apart from that there is a huge amount of money that will likely go into these projects also from a European level.

Bill Garner ([17:27](#)):

Thank you, Mauryan. The next section of this program will be discussion with the two presenters, and also a panel discussion with those that were introduced earlier.

Bill Garner ([17:37](#)):

At this stage, I want to talk about something I thought about during the World Hydrogen Congress that was held in Amsterdam. There was a lot of discussion about projects, manufacturing of hydrogen and transportation of hydrogen and usage and consumption, but there wasn't a lot of thought given to policy and the law.

Bill Garner ([17:58](#)):

And that's really important because you're not going to have projects unless the policy and the law is determined. And the reason for that is, is that the people lending money into these projects are not going to lend the money unless there's certainty. Certainty over prices and certainty over the law.

Bill Garner ([18:18](#)):

And there, as opposed to what I'll call the developed hydrocarbon and electricity markets where the laws are known and the rules are known and the policies are known, hydrogen is a developing area.

Bill Garner ([18:33](#)):

So I'd like to spend some time with our speakers and the panelists talking about this disconnect and how it's developing currently. There's a deficiency. There's no tailored legal framework and there's legal uncertainty.

Bill Garner ([18:49](#)):

So Katrina, you talked about the need for regional standards in the US. Well, we really don't have any federal standards either. And I'm kind of curious if you would talk about kind of where we are.

Bill Garner ([19:03](#)):

And it's not only the US, because the US is so intertwined with Canada. There needs to be a meeting of the minds between the two nations as to what those standards might be. Would you agree with that?

Katrina Fritz ([19:14](#)):

I definitely agree with that. That was on the grid modernization topic. That's something that needs to be considered. And there is one project being developed between Nevada, Utah, and California right now, where they have a bevy of lawyers involved that are working on those regulatory issues and any guiding legal framework that they can create to set that standard in order to produce the hydrogen in one state and transport it via pipeline to another state.

Katrina Fritz ([19:47](#)):

So I agree with you. To date, we have had most of this policy created at the state level when it comes to energy and distributed energy resources. So this infrastructure act kicks off, in my mind, the first significant federal attempt at that.

Katrina Fritz ([20:08](#)):

And these hydrogen hubs are the first step. So having the hydrogen hubs is a forcing function to starting to focus on that policy, similar to this other project that's in California. That was a forcing function to get the government officials at the table.

Katrina Fritz ([20:23](#)):

There are some multi-state government alliances that have formed to talk about hydrogen, but we do not have a coordinated effort yet. And there will need to be coordination between federal and state level regulatory officials to address this.

Katrina Fritz ([20:44](#)):

So I don't have an answer for you, Bill, other than to be in agreement and say that, again, to reiterate, the forcing function will be just starting to develop the projects and identifying the areas that do need to be addressed.

Bill Garner ([20:59](#)):

Yeah, this is also important from a legal perspective because the legal policy in the US Canada is, "If it's not regulated, or if there's not a law against it, I'm going to do it."

Bill Garner ([21:13](#)):

Of course, in Europe, there's different standards of law in Europe. It appears more to be, "I can't do it unless the law allows me to do it." And so it's a different standard. That's why the rules are so important here, and the people lending the money under understand all of that.

Bill Garner ([21:31](#)):

Katrina, something else I wanted to ask you about. This is really getting into the weeds. It's the question of carbon credits. In the United States, there are no federal carbon credits, and it's the same in Canada, but there are provincial and state carbon credits on a state and province by province basis. Do the hydrogen fuel cells that you talked about in your presentation, do they generate carbon credits?

Katrina Fritz ([22:01](#)):

Yeah, they do. It depends on what jurisdiction you're in. So there is a low-emission renewable energy credit. So not one-for-one carbon credit, but LREC program in Connecticut that is transitioning into what will more likely be a strictly renewable energy credit program into the future.

Katrina Fritz ([22:21](#)):

So, yeah, I would not say there's formal carbon credit programs for hydrogen or fuel cells, but similar to other items that we've encountered in the past, the first time you apply for it can set that precedent for being able to generate the carbon credits.

Katrina Fritz ([22:40](#)):

Hydrogen is included in the low carbon fuel standard in California as well. And there is some work toward a low fuel standard in New York state right now, that could move us in that direction. But I would say there's no formal programs for carbon credits for hydrogen.

Bill Garner ([23:02](#)):

Yeah. The importance of carbon credits in the United States is that you can monetize them, and so it can be an enhancement to your project finances. I don't see that a lot of other places, but in the states that do grant them, you can sell them to people that can use the tax credits.

Bill Garner ([23:21](#)):

Marijn, you mentioned something that we've had a debate about in the law firm, and I'd like you to kind of talk about this and its relationship between the Carbon Border Adjustment Mechanism that we're beginning to hear about in the European Union, and whispers about in Washington DC, and how does hydrogen relate to this whole adjustment mechanism? And if you look into the future, what's going to happen?

Marijn Bodelier ([23:45](#)):

I think it's best clarified by making it concrete. And if we look at, for example, steel mills, right? Because steel is one of the products that is covered by the proposed EU Carbon Border Adjustment Mechanism. I



think that if you look at, if for example, a steel that's produced carbon-intensively abroad, will likely be taxed when it comes into Europe, when it's imported in Europe.

Marijn Bodelier ([24:13](#)):

And at the same time, likely carbon emission rights in Europe will be reduced. So at the moment, a lot of industries get three carbon emission rights. That is likely to be reduced because otherwise the scheme of taxing imports would be contrary to WTO trade regulations.

Marijn Bodelier ([24:36](#)):

That would mean that in Europe, the business case for creating steel with hydrogen process, instead of doing it carbon-intensive, for example, by means of coal, could become more attractive because of the taxation on carbon emissions. And I think that could impact hydrogen in the sense that it becomes more attractive to use hydrogen in your production processes.

Bill Garner ([25:06](#)):

Martin, I know there's one topic that's near and dear to your heart, which was in a bullet that Mauryan had. It's the mandatory separation between gas networks and energy production suppliers. How is that going to work with hydrogen? Is it beneficial or not beneficial, or just ... Do people understand what's going to happen? Have people thought about it?

Martin Borning ([25:33](#)):

People have started to think about it, yes. And there are different views about it. I mean, these are what you're referring to, are the unbundling rules so that someone active in either energy, power or gas distribution or production cannot be at the same time, operate a transmission system for power or gas.

Martin Borning ([25:51](#)):

And with the applicable regulation that we already have for these grids, basically blending of hydrogen into the grid is also covered by them. And existing natural gas operators would be subject to these unbundling rules and probably would not be able to build, for example, an electrolyzer, if you're a power transmission system operator or gas transmission system operator.

Martin Borning ([26:21](#)):

There are small exceptions for certain technical features that you can install, or facilities for the security of the net, of the grid. But to the extent that we are talking about, for example, reserve energy, you could not operate an electrolyzer at the site.

Martin Borning ([26:39](#)):

And for hydrogen, it will be actually quite interesting to see whether the regulation that is being developed on the European level will also contain these kind of unbundling rules for pure hydrogen grids, for example.

Martin Borning ([26:52](#)):

And we have seen in the meantime, interestingly in Germany, a first effort by the German government to provide a regulatory framework for pure hydrogen grids, just a very short number of paragraphs, I think seven or eight really, on the regulation for pure hydrogen grids.

Martin Borning ([27:13](#)):

And interestingly, it is optional. So the operators of existing natural gas grids, they're only obliged to cooperate among ... well, with anyone active in this market basically, to secure the broad and wide establishment of a hydrogen transportation and storage infrastructure.

Martin Borning ([27:35](#)):

But apart from that, whether you want to be part of a specific hydrogen related regulation, the transmission system operators have the option, they can opt into the regulation.

Martin Borning ([27:46](#)):

And we have seen both. We do see operators that are planning to opt for this regulation, because it provides a certain certainty on costs and investment and access to infrastructure, for example, for the clients, which may be a selling point for the customers of the operators.

Martin Borning ([28:12](#)):

But also then, of course, some investors want to be free in there, at least in the initial state. And you can, I think it is valid to ask the question whether regulation that has been put on infrastructure that has been evolving for hundreds, or for at least a hundred years, whether that is fitting to promote a hydrogen grid, which is only being established currently.

Bill Garner ([28:34](#)):

Exactly. I should mention, Martin testified in front of a United Nations industrial development panel, and is considered to be one of the hydrogen experts in the European union these days, at least from the policy perspective. I don't think you'd want to put him in charge of manufacturing it, but certainly from a policy and legal perspective, he's one of the recognized worldwide experts on this.

Bill Garner ([28:57](#)):

Frederik, something I've been thinking about and something we talked about is in the Netherlands, and I think there was some discussion between you and Mauryan, and I think Katrina, that maybe the Netherlands is not as far along in terms of policy and legal development as people thought, and things might change with the new government. Can you expound on that?

Frederik de Vries ([29:20](#)):

Yeah, I can try. In general, we are very good in the Netherlands in making plans, and we have made a significant lot of very big plans for hydrogen, specifically for hydrogen backbone, large projects for producing hydrogen, either offshore or onshore.

Frederik de Vries ([29:44](#)):

But in general, we see that all these projects are very much dependable on additional funding coming in from the government, in terms of subsidy, either from Europe or either from European funds or either national funds.

Frederik de Vries ([30:00](#)):

And what we see is that specifically in the Netherlands, we don't have a government for almost a year now, and we really need to have some funding coming in, in these projects to be able to make the

investment decisions that are necessary to start these projects, for instance, the projects in Rotterdam, the electrolyzer projects that are over there, but also in Amsterdam at the Tata Steel company, which is a big issue in the Netherlands at the moment.

Frederik de Vries ([30:31](#)):

So, yeah, in general, I think we are really going along. I was very surprised to hear also from Katrina, that California already has more than 10,000 fuel cell cars, I think you mentioned.

Frederik de Vries ([30:43](#)):

In the Netherlands, we got about 500 at this moment. So we really are ... What we always say is that we are lagging about 10 years behind compared to battery electric and mobility.

Frederik de Vries ([30:55](#)):

And yeah, in general, we see that we've got a huge interest in hydrogen specifically, because we have to find new ways for our energy consumption, because we have to stop using natural gas in Netherlands.

Frederik de Vries ([31:16](#)):

And so the impasses are very big, but in the Netherlands, planning takes a lot of time and takes also a lot of additional funding at this moment. So we're really hoping that we see some investment decisions coming up in the first quarter of next year.

Bill Garner ([31:32](#)):

Pietro, in Italy, I suspect Italy is debating this, but I don't think I've seen an outright intent in Italy to replace natural gas with hydrogen or something else. And I suspect maybe things are developing on a policy framework in front of the Italian parliament, but you don't hear too much about what's happening. Any comment on that?

Pietro Caliceti ([31:59](#)):

Yes, actually from a technical perspective in Italy, we're very much advanced in this area of research. The main Italian gas distribution companies now has already been testing the injection of hydrogen into the natural gas pipeline setups, where 10% are blending, and tests are on their way to increase that percentage to 20%.

Pietro Caliceti ([32:31](#)):

And this is a very nice example of what the country's [inaudible 00:32:35] especially, for the unbundling issue. This, to me, as I said, is probably one of the most delicate topics that the government, our government, but I think also the other governments around the EU, should focus on.

Pietro Caliceti ([32:54](#)):

Because when you speak about hydrogen, and we had been, in the last example, in the Amsterdam Congress just a month ago, when you speak about Congress, everyone, everyone agrees that we will reach a real hydrogen economy only if all the players involved will incorporate.

Pietro Caliceti ([33:19](#)):

So this is true. I think that the regulations should facilitate and foster the [inaudible 00:33:29] and joint ventures and aggregations of enterprises and operators, rather than doing the opposite, which is essentially just copy the unbundling regulation.

Pietro Caliceti ([33:45](#)):

And this is all the more true with respect to hydrogen and gas, because from a technical perspective, the gas distribution network is the best place to distribute, the best way and the most economic way to distribute hydrogen, so as I see it, gas distribution operators are the most natural main interest in investing in hydrogen. But as long as they will be prevented to taking a majority stake in that economy, the whole process will get delayed and eventually we will fail to reach the EU goals.

Bill Garner ([34:30](#)):

Thank you, Pietro. [Heike 00:34:31], you actually are working on hydrogen storage projects currently, your firm is, and Mauryan had a bullet point in his presentation about the challenge of permitting simply because there's a lack of experience by the regulators, which I guess in your case would be mainly state-level regulators?

Heike Bernhardt ([34:55](#)):

Federal or state.

Bill Garner ([34:56](#)):

Are they federal or state? Both?

Heike Bernhardt ([34:58](#)):

State. State level, mainly.

Bill Garner ([35:00](#)):

Okay, yeah. I suspect they don't have a lot of experience with these kinds of projects. What has your experience been with permitting so far? And first explain what you're doing, what the firm is doing, and then your situation with permitting.

Heike Bernhardt ([35:14](#)):

Yeah. Actually, what we are doing, we are building underground gas storages for, I think, 50 years, more than 50 years. So many for natural gas until now. And I can explain that we have a comfortable position because there are already existing hydrogen gas storages in the world.

Heike Bernhardt ([35:34](#)):

We have some in the US, actually, and also one or two caverns in the UK. So from a technological part, we are relatively comfortable with the technology. So it works because it has been done already.

Heike Bernhardt ([35:48](#)):

And the technology itself is relatively known and proven. The problem we have until now is that we, in the EU, with the EU level and with the safety level we have, it's not yet a proven technology on this certified part of the technology.

Heike Bernhardt ([36:07](#)):

So that's what we are doing at the moment. We have to prove under certain conditions that it's safe to operate it and also that it's safe to integrate it in an existing system.

Heike Bernhardt ([36:20](#)):

And I think that's the ... what we have to combine here is the technical level and the legal level and the regulative level, which has not yet been done so far, because we are now trying to combine different producers, different consumers with an existing technology.

Heike Bernhardt ([36:40](#)):

And I think that's the difficulty we see at the moment, even if we can say that the technology itself is relatively clear for us, for the engineers, from the engineering part.

Heike Bernhardt ([36:52](#)):

So I would say the more problematic thing will be to find the right regulations to make it happen, to be able to store this amount of hydrogen, which will be needed according to the new policy demands and the climate policies we have at the moment.

Bill Garner ([37:16](#)):

And the hydrogen will need to be stored, at least in large scale, in salt caverns. Nothing else will really work. Is that your opinion?

Heike Bernhardt ([37:28](#)):

Yeah. We have seen the gas infrastructure Europe study, which has shown the need or requirement for hydrogen and also the storage need which we have. And only the large scale storages are able to do that actually. And even if you consider the storages we have at the moment and the potential we have at the moment, especially for salt caverns, it's not enough until now.

Heike Bernhardt ([37:57](#)):

And that's the only technical feasible option we have currently. There are also other storage potentials, like porous storage, but it's not proven at the moment. And that's one of the problems we have currently.

Bill Garner ([38:11](#)):

Interesting. And we don't have too much more remaining time, but let me ask Katrina and Mauryan. Do you have any questions from anything that's been discussed so far, hearing that?

Katrina Fritz ([38:23](#)):

So, well, I do have one. The US has just only this week announced support for hydrogen in a meaningful way. And the European Commission has been supporting hydrogen for many years. What do you think were the policy drivers in the EU that started this conversation so many years ago?

Bill Garner ([38:48](#)):

Frederick? Mauryan? Martin?

Marijn Bodelier ([38:51](#)):

Well, in the Netherlands, let's say from a European perspective, I think it's sustainability. You know, that's the clear, an energy transition, recognizing that large scale electrification of the energy system we have in Europe is not possible without hydrogen. I think that's the main policy driver.

Bill Garner ([39:16](#)):

Martin?

Martin Borning ([39:17](#)):

I think you could really see the discussion starting with the Paris Climate Conference in December 2015, I think it was. And then in the year following that, there were a lot of government initiatives on the German level where they had the climate protection program, climate protection plan, and they were already announcing hydrogen strategies, which then didn't come really until last year.

Martin Borning ([39:43](#)):

But this really started the discussion on the policy level, I believe. And in the same wave also then, the European Green Deal, which is also a program that is now already a few years old, but I think about five to six years ago, the discussion started and basically starting from the climate goals that the EU and the national governments want to pursue through.

Bill Garner ([40:05](#)):

Frederick?

Frederik de Vries ([40:10](#)):

Yeah, I agree with Mauryan and Martin, I think, but also when you look at, for instance, Germany was the first one going into production of large amounts of renewable energy in Europe. And then the idea that you have to do something to keep your grid stable and to store all the additional energy that you have in moments that you cannot use it, I think that also has been a very important driver for hydrogen policy.

Heike Bernhardt ([40:43](#)):

I think that was the point actually, because it's also about the technical feasibility, because you cannot store power itself, so you need something else to do it, and also to transmit it to certain parts of the countries. So the hydrogen was the only way to do it in the end.

Frederik de Vries ([41:00](#)):

We're coming up towards the end of our period of time. I want to give our speakers the right to make the last comments. If you have anything you're just dying to say, speak now or forever hold your peace.

Marijn Bodelier ([41:16](#)):

I have a question for Katrina, because I know Katrina is not only an expert on what's going on in the US, but also has a lot of expertise on what's going on in Europe. And I just wanted to ask you, because I think it's phenomenal what is happening in the US, with like you said, that there seemed to be an advantage of the EU, but if I look at the projects, the amount of fuel cell cars, et cetera, what can the EU learn from the US in your view?

Katrina Fritz ([41:48](#)):

Let me go back several years to, I think, a key point in research and development. And that is that the US was ahead of Europe, and let's say Asia and the US, as far as the actual fuel cell systems that would use the hydrogen.

Katrina Fritz ([42:05](#)):

So we have the big, large scale stationary manufacturers. The vehicle manufacturers were primarily in Asia and the US. Germany, certainly as well. And at a certain point, the EU stopped investing in that side to the extent that they were and started investing in the hydrogen side, because you have the large scale renewables, and saw that opportunity.

Katrina Fritz ([42:33](#)):

And you were ahead of the US on the electrification side, realizing that you couldn't electrify everything. So we started at the fuel cell level and primarily on fossil fuels. And we are just now getting to this point of looking at 100% renewable hydrogen that's green, and what do we need to do to take that next step?

Katrina Fritz ([42:58](#)):

So yes, our deployments and fuel cells are significant, but you are ahead of us in these large scale demonstrations. We have the salt caverns in Texas and in Utah, as Heike mentioned. And now, just now, we're trying to figure out, how do we take advantage of all of these different assets that we do have?

Katrina Fritz ([43:20](#)):

And I think Heike made a really important point. A lot of this has been demonstrated and we, industry, universities, trade associations, make strong attempts to let state level policy makers and federal policy makers know that.

Katrina Fritz ([43:40](#)):

If it's not being demonstrated in their state, it doesn't mean it's not working. It's working somewhere else and sharing that type of information, and it has been challenging, I would say, getting that level of understanding that you already have in the EU. And it sounds like it's still a bit of a challenge according to Heike, in the EU.

Bill Garner ([44:01](#)):

Thank you for listening and tune in to the next episode of E2 Law, Greenberg Traurig's energy and environmental podcast.