

Speech Annie Krist (CEO GasTerra) – Flame – 15 May 2019

Subject: Embracing the green future, adapting to the market and developing new business models

Ladies and gentlemen,

I should like to thank Flame for giving me this opportunity to speak about a subject that is close to the heart of my company, GasTerra: greening the energy supply. And of course in particular about the role of gas in that development, now and for a considerable time to come. Today I am going to talk about a type of gas that is increasingly attracting attention in that regard: hydrogen. Some of you may be somewhat sceptical and think that this is nothing but hype, but that would be failing to recognise the enormous potential of hydrogen as a sustainable energy carrier in many sectors. But potential is, as you know, not enough. To make hydrogen a fully-fledged part of the energy market, a lot needs to be done. It is not just a matter of having the right technology and enough investment. It is also essential to create a real liquid market for hydrogen and to adapt our business models to that strategic goal. Today, I will focus on that part of the hydrogen story.

Before I go on, I would like to bring to your attention the images I will show today. They are all downloaded from a 12 minutes animated video that GasTerra produced last year: *Morrowland*. **[slide 1]** The key message of that video is that the future of our energy economy will increasingly and inevitably be climate neutral. The gas industry must adapt to that reality, the reality of new energy. Green but also blue hydrogen are part of that reality.

When we talk about gas, we often refer to molecules as a complement and an alternative to electrons. In recent years, the trend with regard to making energy sources and carriers more sustainable has indeed focused on electricity from renewable sources, especially wind and sun. **[slide 2]** This has led to an unbalanced situation in which natural gas as a fossil fuel, and by extension renewable gas, has been more or less ignored by policymakers and NGOs. They all too easily forgot that the energy transition is a long-term process that goes through phases. The most polluting sources – coal but also oil – should in the first instance make way for cleaner alternatives, which in the short and medium term also include natural gas. The realisation that gas as a product could also become greener took a long time to penetrate. It also took quite a while for it to be broadly accepted that molecules offer many comparative advantages over electrons. Apart from making energy supplies much more sustainable they offer flexibility, cost efficient storage and transport and, thus, security of supply. Finally it became apparent that some processes, especially industrial ones, cannot easily be made more sustainable by means of electrons. In brief, an affordable, reliable and more sustainable energy supply must include a significant role for molecules. In that context, hydrogen is an important trump card alongside bio-methane.

Does this mean that it will be easy to increase the share of hydrogen in the energy mix? By no means. Attention to this promising alternative has got off to a good start, but much remains to be done. Let me begin by describing the resistance that gas still encounters. This is still stronger in the Netherlands than elsewhere in Europe. How is that possible in a country that for decades has been the country of gas? Over 90 per cent of households are still connected to the gas grid. Much electricity is produced from gas-fired power stations. Industry is a large user of natural gas for heating and as a feedstock. And that is

why we have a complex infrastructure of production and storage facilities and pipelines, that are also completely or partly suitable for renewable gases.

An innocent bystander would therefore probably expect government and society to do everything in their power to continue to use these valuable resources to improve the structural sustainability of the energy supply.

As you are no doubt aware, ladies and gentlemen, reality is different.

There is a real anti-gas mood here, related not only and not even mainly to the climate issue, but especially because of something that does not affect neighbouring countries: earthquakes as a result of gas extraction in our most northerly province, Groningen. The damage and the feelings of uncertainty that this has produced have caused our government to decide to eventually phase out production entirely and to leave hundreds of billions of cubic metres sitting in the ground. Further we see that this has led to a complete reversal of attitudes towards gas. From a comfortable energy carrier for almost everyone, and a more than welcome source of income for the government, within a relatively short time natural gas has in influential parts of public opinion and politics become a threat and a climate-killer, and something that we must get away from as quickly as possible. This has led to a blurring of the essential distinction between Groningen natural gas and natural gas from other sources, as well as the equally important distinction between fossil natural gas and sustainable, green, gas.

But I should like to point out straightaway that things seem to be moving in a positive direction. More and more people are coming to realise that we will never be able to achieve this sustainable energy economy in our flat country if we focus purely on electrons at the expense of molecules. And, as I have

already said, hydrogen certainly has good prospects in theory in this regard in any case.

A few barriers do need to be overcome for hydrogen. I should like to put them into three categories. The first relates to the technological challenges. Offshore these are significant but certainly not insurmountable. The second has to do with time pressure. After a number of adjustments, gas grids can be made suitable for the transport of hydrogen. This is one reason why we should not wait too long to develop a hydrogen economy, because the future of the gas infrastructure depends on whether policymakers commit themselves to hydrogen. If there is no certainty on this, investors will sit on their hands and facilities that are no longer in use will be dismantled. **[slide 3]** And finally there are the economic conditions. We hear little about this, but if they are not favourable investors will also hold back. In short, we need to timely develop a really fluid market for hydrogen in which the price of hydrogen is based on supply and demand, and traders can buy and sell freely.

Ladies and gentlemen.

As the increasing attention to hydrogen is due mainly to its potential as a sustainable alternative, the debates and analyses are currently focused mainly on *green* hydrogen, i.e. hydrogen from sustainable electricity that is produced by electrolysis. **[Slide 4]** *Blue* hydrogen, i.e. grey hydrogen obtained in the traditional way from natural gas, with the CO₂ released being captured and stored, is regarded as less desirable, partly because CCS does not yet enjoy universal support and partly because of the fear that blue hydrogen will become locked in and block the prospects of 'real' green hydrogen. But if we are to make significant progress towards developing a hydrogen market in the foreseeable future, it will be vital to create economies of scale as a basis for

developing demand and infrastructure. It is much cheaper and simpler to create volume with blue hydrogen than with green hydrogen.

Where will this end up?

Blue hydrogen is cheaper than green hydrogen. Research carried out by Groningen University on behalf of GasTerra shows that green hydrogen only becomes more economical than blue hydrogen when electricity prices are structurally lower than gas prices. Let's look at the situation in the Netherlands as an example, as the researchers did. When gas costs 20 euros per megawatt hour and CO₂ costs 10 euros per tonne, electricity will have to cost less than 17 euros per megawatt hour. This level is unlikely to be reached in the Netherlands in the foreseeable future, because the price of electricity is almost always determined by the marginal costs of a gas-fired power station. This is something that will not change quickly. A rise in the price of CO₂ has hardly any impact. When gas costs 20 euros per megawatt hour and CO₂ 40 euros per tonne, electricity will have to cost less than 20 euros per megawatt hour. In addition, the task of making electricity production more sustainable presents an enormous challenge for the Netherlands. Will the additional capacity for sustainable electricity production that will probably come on stream in the decades to come, be used to produce green hydrogen?

The development of blue hydrogen is therefore vital to give hydrogen the opportunity that it deserves. The government could do away with concerns about the possible lock-in of blue hydrogen by introducing statutory measures to encourage green hydrogen, similar to existing national arrangements. Examples are the small fields policy for the extraction of natural gas from resources that are smaller than the Groningen field, and congestion

management for electricity networks that give priority to electricity from sustainable sources over other forms of electricity.

Ladies and gentlemen

Thanks to liberalisation, in the past few decades the European energy markets have evolved into mature trading markets. We can use our knowledge of the development of energy markets to help a hydrogen market become established more quickly. But we must make sure that we do not blindly impose the current gas market model on the hydrogen market. This is because a market in the early stages of development needs different impulses than a mature trading market. When the gas and electricity markets were first created in Europe, they looked very different from the current energy market. In those days, there were vertically integrated companies and considerable government participation. This made possible the substantial investments in production and infrastructure that were needed to develop the markets that were wanted. This worked well. The gas and electricity markets are now mature; transport and trading are unbundled, third-party access exists and there are liquid trading hubs.

The hydrogen market has not got nearly as far as this; in fact, it has yet to begin. So it does not seem logical to transfer the market model of our mature energy markets unaltered to create a hydrogen market. We need to look carefully at what market model and how much government participation are needed at this stage to get the hydrogen market growing. We also need to look at the differences and similarities between hydrogen and gas and electricity. Just to mention one important difference: hydrogen is *transported* in a similar way to gas: there is one network and a natural monopoly of the operator of the transport network. But *production* is closer to the way in which electricity is

produced: with power stations, locally, several production units that are not bound to a particular location.

This is one reason why good consultation with the government is needed to ensure that new regulation is a good fit for the specific properties of a hydrogen market and the development stage of that market.

It is also important for us to avoid being too inward-looking; we need to keep sight of the international picture. **[Slide 5]** There are initiatives in the field of sustainable hydrogen all over the world. In the United Kingdom, the city of Leeds is examining how the gas distribution network can be made suitable for hydrogen, combined with storage in salt caverns. Australia is experimenting with the production and storage of green hydrogen as a back-up for the gas and electricity supply, and the extraction of liquid hydrogen from coal.

In brief, by moving out of our local bubble we can learn a lot from each other. Sharing knowledge will help speed up the development of hydrogen. This requires not just technological knowledge but clearly also the right economic circumstances and market arrangements to allow sustainable hydrogen to take its rightful place in the energy mix. Climate change and security of supply are not local issues but global challenges. In the end there is a clear goal: CO₂ reduction. This is why energy transition requires a more open approach to innovation than we are used to. I hope you agree with me that this is even more true for a development of which we expect so much but which is really still in its infancy: the production, marketing and distribution of sustainable hydrogen.

Thank you for your attention.