NICOLAUS AUGUST OTTO AWARD

2020

Contents

Creating space for asking the questions that are relevant today.
Providing impetus for the discussions that are needed tomorrow.

Dear reader,
dear friend of DEUTZ AG,

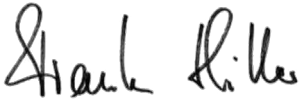
Our Nicolaus August Otto Award recognizes the innovative achievements and pioneering spirit of inventors and visionaries. This year, we very much regret that we are unable to hold an award ceremony together with you and other guests. The award will instead be presented in a pared-back but no less prestigious format. This is due to the coronavirus pandemic, of course, which continues to restrict what all of us can do.

Every cloud has a silver lining, however. In Germany and around the world, the response to the COVID-19 pandemic has provided a genuine boost to digitalization, creating lots of scope for innovation and fresh thinking even in established companies. Instead of sitting in meeting rooms, we attend video conferences; instead of traveling, we are focusing on tasks that have been on the back-burner for far too long. In other words, we are not just sticking with what has worked in the past, but seizing the moment and making things better, both now and in the future. We are driven by our flexibility, and powered by our willingness to capitalize on opportunities and shape the future.

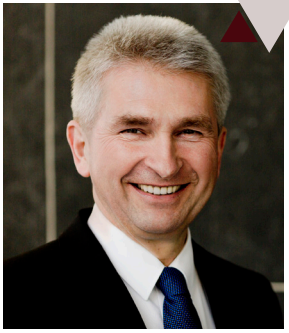
Nicolaus August Otto, the founder of our Company, was a pioneer himself. He had the courage to innovate and develop new technologies. Even in this strangest of years, DEUTZ AG wishes to honor this tradition by presenting the Nicolaus August Otto Award in recognition of visionary thinking and to foster a wider culture of innovation. We want to create space for asking the questions that are relevant today and provide impetus for the discussions that are needed tomorrow.

In 2020, more than perhaps ever before, we need passion, dynamism, and bold ideas so that we can move forward and make the world a better place.

Warm regards,



Dr. Frank Hiller
Chairman of the Board of Management of DEUTZ AG



Dear reader,

The coronavirus pandemic, which seemed to come from nowhere, has hit all of us hard and brought the need for modernization in our region into sharp focus. Indeed, innovation actually becomes more relevant in times of crisis, not less so.

Given the huge transformation-related challenges presented to us by digitalization and climate change, businesses need to reposition themselves and open up new markets with innovative products and smart, technology-based solutions.

The first step in overcoming these challenges is to recognize that they also represent opportunities, and this calls for courage, creativity, and ingenuity. What better time then to present the Nicolaus August Otto Award, an accolade that honors the work of pioneers whose visions and decisiveness can provide inspiration to others. We need this enthusiasm for innovation more than ever before.

Best wishes,

Professor Dr. Andreas Pinkwart

Minister for Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia

Dear reader,

Cologne and the surrounding Rhineland region are part of Germany's industrial heartland. Today our city is renowned for its major players doing business around the globe and its hidden champions serving niche markets.

When it comes to engineering, we can look back with pride on a long and distinguished history in Cologne. We owe this in no small part to the ingenuity and pioneering spirit shown many years ago by Nicolaus August Otto, who founded the company that would later become DEUTZ. The award that now bears his name honors the continuing tradition of innovation and of developing ideas that will shape the future.

As Mayor of Cologne, I have a keen interest in new, forward-thinking concepts, particularly in the area of transport – whether it's new drive technologies or increased connectedness. Of course, innovation today is also about making a better world tomorrow. Which is why the Nicolaus August Otto Award has a cachet that reaches far beyond the confines of our city.

Sincerely,

Henriette Reker

Henriette Reker
Mayor of Cologne

The Nicolaus August Otto Award

This year, for the second time, DEUTZ AG is presenting the award named after its founder Nicolaus August Otto in recognition of innovative achievements and pioneering spirit. The purpose of the award is to raise public awareness of the relevance of innovation and technological progress for the economy and society as a whole, and to establish a culture of debate that will help us to shape a brighter future.

For more than 150 years, DEUTZ has been synonymous with advanced engine technologies and is now one of the world's leading manufacturers of innovative drive systems – not least because it has kept up the tradition of its founder by continuously reinventing itself.

The Nicolaus August Otto Award honors outstanding lifetime achievements, innovations that will define the future, new technologies, and pioneering research. The award, intended to recognize the visionaries of today, is endowed with prize money of €30,000 for the promotion of innovative ideas.

The patron of this year's Nicolaus August Otto Award is Professor Dr. Andreas Pinkwart, Minister for Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia. The former rector of Leipzig's HHL Graduate School of Management and holder of its chair for innovation management and entrepreneurship is an expert in innovation.

Professor Dr. Wolfgang Reitzle

Winner of the Nicolaus August Otto Award for 2020

This year, DEUTZ AG is presenting the Nicolaus August Otto Award to Professor Dr. Wolfgang Reitzle – research engineer, business leader, and visionary in the world of drive technologies. Reitzle was an early advocate of hydrogen drives and fuel cell technology. In the latter half of the 1980s, while at BMW, he developed one of the first hydrogen cars and to this day is regarded as a pioneer of sustainable, low-emission transport and of the hydrogen society. Reitzle sees hydrogen-powered vehicles as a realistic alternative to combustion and battery-powered engines. He takes bold steps to drive forward his visions and in 2009 was already planning an industrial alliance aimed at helping the fuel cell to make its breakthrough. Under Reitzle's stewardship, Linde AG supplied fuel cell passenger cars for a carsharing project in Munich in 2016, and in 2018 it supplied ultra-efficient technology that doubled the hydrogen refueling capacity in California.

Reitzle studied engineering and economics at the Technical University of Munich, where he received his doctorate in engineering with the highest possible distinction. In 1976, at just 27 years of age, he began working as a production specialist for BMW, rising to become Head of Research and then Chief Development Officer. Known as the 'car guy', he presided over the development of a series of successful models and rising sales figures at the carmaker. In 1999, he moved to Ford, where he was in charge of the brands Jaguar, Aston Martin, Volvo, Land Rover, and Lincoln as CEO of the Premier Automotive Group. In 2002, Reitzle was appointed CEO of the industrial gas and technology firm Linde. By 2014 he had turned it into one of the most valuable publicly listed companies in Germany. In 2018, as head of Linde's Supervisory Board, he played a major part in driving forward the merger with Praxair. Reitzle is Chairman of the Supervisory Board of Continental AG and a member of the supervisory board in several high-profile companies in Germany and abroad, and he also sits on the Board of Trustees of the Technical University of Munich.

Hydrogen – fuel of the future?

Q&A with Professor Dr. Wolfgang Reitzle

Professor Reitzle, you are calling for a 'hydrogen society'. What will this entail in terms of sustainable forms of transport?

Let me put it this way. We say we live in a 'fossil-fuel society' today because the bulk of our energy is obtained from fossil fuels. However, we can – and we should – become a 'hydrogen society' that draws most of its energy from a different resource. Why? Quite simply because fossil fuels are finite. The question as to when they will run out is not what's important here, just the fact that they will. Hydrogen, on the other hand, is an infinitely abundant energy source both on our planet and in the universe. We can obtain it from water, but also from many other base materials. The technologies for this are already available, and they've been proven to work. But there is obviously still a lot to do – both in terms of building the necessary infrastructure and bringing the process costs down to an acceptable level. Hydrogen produces zero emissions. Transport is just one of many areas of society that would benefit from this. In the long term, only by using hydrogen can we reconcile our growing personal transport needs with the growing requirements of climate protection and other sustainability and societal objectives.

What advantages do you believe that hydrogen drives, with or without fuel cell technology, have over other alternative drives – such as electric motors? And what applications are they best suited to?

Electric drives are the future of transport. In urban centers, the preferred drive system would be a battery-powered electric vehicle that is lightweight and sufficient for covering short journeys. For heavy vehicles such as trucks, buses, vans, or larger sedans, i.e. for vehicles that need to carry heavy loads or cover long distances, hydrogen fuel-cell drives will be the answer. Both are in essence electric vehicles. The difference lies in the fact that in one the power is stored in the battery, and in the other it is generated on board from the hydrogen stored in a fuel cell. The very short refueling time and long range are the major advantages of the hydrogen drive.

The German government wants to reduce greenhouse gas emissions in Germany by 55 percent by 2030, a target enshrined in its Climate Protection Program 2030 and Climate Change Act. Do you think the current initiatives in the area of alternative drives are the right ones to achieve this?

Generally speaking, we should welcome the fact that policymakers want to promote electric-powered transport. Nevertheless, the way this is happening is highly questionable. Policies are being put in place that intentionally set emissions limits for manufacturers' fleet consumption that are no longer possible to achieve even with the most sophisticated combustion engine. The current limits correspond to a diesel equivalent of 2.2 l/100 km, and a further tightening of this limit to 1.8 l/100 km is now being discussed. This calculation is based on the assumption that an electric car is a zero-emission vehicle. In a country such as Germany, however, carbon emissions produced by electricity generation are actually quite high and so certainly not zero. This means that running an electric vehicle does not actually reduce the environmental impact of driving. Yet policymakers still categorize the e-vehicle as zero-emission. If this continues, it won't be long before the combustion engine is driven out of the market entirely. No one would be able to make conventional cars any more. Factories would close and jobs would be lost.

Moving on to Germany's national hydrogen strategy. How important is it that incentives are provided to encourage companies to invest more in research and development?

Such incentives are extremely important. And not because the companies themselves are doing too little, but because the challenge is monumental and our time budget is tiny. In other words, huge efforts are needed. And focus is critical in such a situation. Policymakers have to prioritize urgent tasks more stringently and then promote relevant research and development that embraces new technologies. For hydrogen, the Fraunhofer Institute tells us that this would specifically entail the following: We need green electricity at affordable prices, we need a pipeline of infrastructure, and we need internationally harmonized regulation.

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