



PROF. DR. WERNER BEBA

Prof. Dr. Werner Beba is the head of the Competence Center for Renewable Energy and Energy Efficiency (CC4E) at the Hamburg University of Applied Sciences (HAW Hamburg). In addition, he is the spokesperson for the Hamburg energy grid council (Energienetzbeirat), director of the Renewable Energy Hamburg Cluster and chairperson of the supervisory board of UMaAG. At the same time, he is project coordinator of the collaborative project "NEW 4.0: Energy Transition in Northern Germany" and of the "North German Real-world Laboratory", which is currently being set up.

COURAGE AND INNOVATIVE STRENGTH FOR THE THIRD PHASE OF THE ENERGY TRANSITION

The transition of the energy system is progressing at a rapid pace. This entails some challenges, but also great opportunities for the regional economy. What developments are foreseeable and where do we still have to set the course?

Over the past 30 years, the construction and efficiency of wind power turbines as well as photovoltaic and biomass plants have made major progress and they have become the main pillar of electricity supply. It is thanks to

the Renewable Energy Act (EEG), but also to the innovative strength of enterprises, that the cost of energy has been significantly reduced and the prerequisites for a sustainable energy supply have been created. Today, electricity from renewable energies is cheaper than that generated from conventional power plants. The development of the necessary basic technologies for achieving the energy transition has largely been completed, and we have reached the second phase of system integration: How do we integrate the existing technologies into a

stable overall system? How do we combine security of supply and effective climate protection in a functioning market, in other words, how do we create the energy system of the future that supplies us safely without nuclear and fossil energy sources? With showcase projects such as “NEW 4.0: Energy Transition in Northern Germany”, the northern federal states are at the forefront here, because thanks to windy coastal regions, the north is a good ten years ahead of the challenges of the energy transition in Germany.

We are at the beginning of the third and decisive phase of the energy transition and climate change. The aim is to develop sector coupling technologies and implement them on a large scale. From the electricity change to the energy transition affecting all areas of life. In concrete terms, this means either using electricity directly across all consumption sectors or converting it into other forms of energy for areas of application in which merely electrical solutions are not foreseeable – road, sea and air transport, industrial processes and heat supply. This requires a massive increase in renewable energy generation, namely by a factor of 3 by 2030 if a CO₂ reduction target of 55 percent is to be achieved.

Hydrogen as the technology of the future

In addition to electricity-based sector coupling, green hydrogen will play a decisive role in this third phase of the energy transition due to the diversity of its uses: On the one hand, the conversion of electricity from renewable energies into hydrogen has the advantage of using this electricity if it would otherwise be limited due to grid bottlenecks. This creates system security

and avoids the use of balancing energy from fossil power plants. On the other hand, large quantities of hydrogen can be stored in the gas infrastructure or in caverns. This storage of large amounts of energy for deferred use has a high-performance potential. This is because the expansion of generation capacities will lead to large, volatile volumes of electricity from renewable energies, which can no longer be absorbed by direct consumption, short-term storage and load management alone.

The great power of hydrogen is its ability to make the German industry a pioneer of technological innovations for climate-neutral products and production processes. The conversion into synthetic fuels, but also direct use in industrial processes, makes an important contribution to decarbonising our energy consumption. This requires the production of green hydrogen to be tested on an industrial scale and developed for market ramp-up. This is the goal of the major project “North German Real-world Laboratory”, which is expected to start at the end of 2020 and in which PNE will also participate.

There are still many challenges to be met before hydrogen can be widely used – from the most efficient generation and safe transport and storage options to economic use in industry, transport and households. These questions help to initiate innovation processes that lead to entrepreneurial growth, a strengthened regional economy and the creation of new jobs.

Climate protection and economic growth: the energy transition offers great opportunities

PNE is an example of how sustainable solutions for climate protection and positive business development can go hand in hand. Against the backdrop of climate change, the transformation from a successful wind energy project planning and operating company to a listed company that has expanded its business area to include the development of hybrid solutions for storage, system integration and sector coupling is both consistent and visionary: If the energy transition is also to be a success from an economic point of view, companies must develop new business perspectives, implement technical solutions and leverage new value creation potential. It requires a broader view of the energy system chain in order to develop an overall systemic understanding.

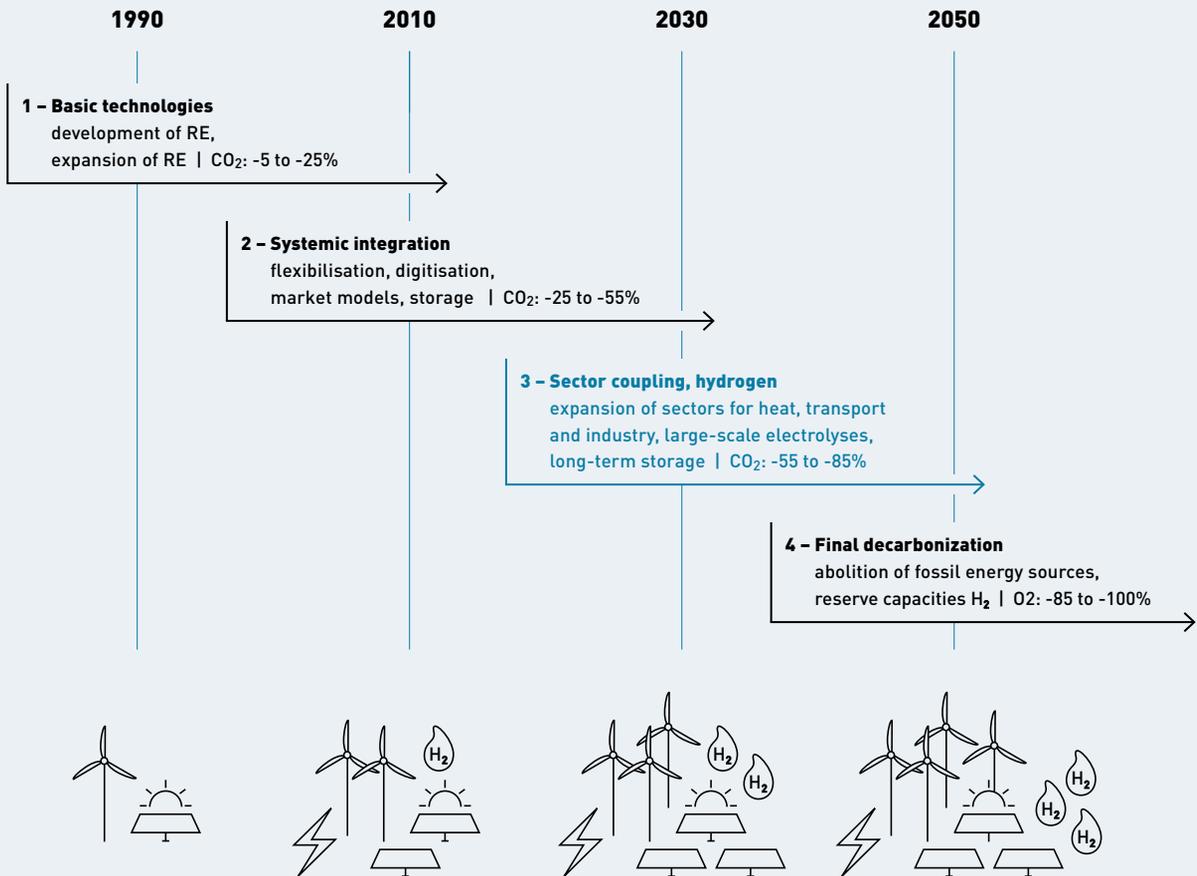
The energy transition is therefore also a turning point in thinking, with enormous potential for Germany as a location for industry and innovation. The expansion of renewable energies – in the north, above all wind energy – continues to form the basis for this. But it is only through the parallel development of storage and flexibility solutions, their integration into a stable overall system and not least through the coupling of different consumption sectors that the decarbonisation of our living environment can be decisively advanced. This requires companies that not only want to participate in this innovative development, but also want to drive it forward significantly, to think in terms of a holistic system. And courage.

Technological innovations are no longer an end in themselves, but become an important impetus for the economic orientation of an enterprise: With the future-oriented expansion of its business segments, PNE was able to increase its enterprise value sustainably. The energy transition will thus also result in a strengthening of the regional economy – rather than a challenge of the century, it is an opportunity of the century.

Necessary setting of courses for the energy transition

It takes companies like PNE to drive forward the energy transition here in the North of Germany with courage and innovation. But it also needs the support of politicians: In fact, most technologies for storing and refining electricity from renewable energies for sector coupling could already be operated economically today. However, the regulatory framework from the “old” energy world poses obstacles. Electricity from renewable sources is subject to taxes and levies, which artificially increase the price of electricity compared to coal, oil and gas. And hydrogen, the hope of the future, is also burdened by these charges and levies on the electricity price. The still existing restrictions must be lifted and removed in order to avoid impeding the progress of the energy transition in Germany even more. In order to make innovative power-to-X technologies competitive with fossil fuels and attractive for investment, a dual strategy must be implemented: on the one hand, regulating the CO₂ prices and, on the other, reducing taxes and charges on green electricity. The level of

PHASES OF THE ENERGY TRANSITION



Increasing coupling of energy sectors, growing demand for electricity from RE

Integrated energy system

CO₂ emissions must become the benchmark for taxes and charges on electricity. This creates the investment security required by companies.

is successful, the German energy transition could become an export hit – with the North of Germany and PNE as pioneers.

Business, science, politics and society must now together set the course for the energy transition. Everyone must play their part and pull together with determination. If this tour de force

Contribution by Prof. Dr. Werner Beba relating to the 2019 Annual Report of PNE AG