



INDUSTRIAL DECARBONISATION:

This is the secret of
successful projects

KHEngineering

INTRODUCTION: THE JOURNEY TO CIRCULAR CHEMISTRY

The Climate Agreement is clear: in 2030 we must have 49% less CO₂ emissions compared to the base year of 1990, and 95% less CO₂ emissions in 2050. In order to achieve this, parallel paths are being followed: development of renewable raw materials, energy saving, energy transition and circular solutions. To achieve the set goals, we still need to take a big step forward, because the energy-intensive production processes result in a considerable CO₂ footprint for the industry.

THE ROLE OF PROJECT MANAGEMENT IS CHANGING

If the chemical process industry embraces a different way of producing, it can have an enormous positive impact on the world. That is why various players in the sector have enthusiastically embarked on innovative decarbonisation projects such as: electrification of processes that were previously fired with natural gas or electrolysis for the production of hydrogen and methanol.

The circularity in the chain also plays a major role in the development of a cleaner industry. Raw materials are replaced or adapted so that they are more easily degradable or can be upcycled later in the chain. In addition, scientific research is underway to develop and test completely new production and manufacturing methodologies, such as new reactors, different scales and different chemical routes.

These kinds of projects can only succeed if the best people in their respective fields work together. From the earliest design stage through to commissioning, the role of project management is crucial. In this white paper, we describe the success factors of an innovative decarbonisation project. Join us on the journey from the linear to the circular industry.

ENERGY CONSULTANT DONALD ROELS SPEAKING

Our Process Engineering Consultant Donald Roels notices that not only existing clients approach us, but also start-ups and scale-ups. “For existing companies, it is a matter of drawing up their roadmap towards significant CO₂ emission reductions, which often requires the deployment of new technologies. On the other hand, we see many new initiatives emerging for circular solutions.”

Donald sees all these innovative technological solutions as small but necessary pieces in the overall puzzle of becoming more sustainable. “Customers turn to us to ask how they can combine the pieces of the puzzle in a project-based way. With our knowledge and experience of engineering and the process industry, we help make that happen.”

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THESE ARE THE STUMBLING BLOCKS DURING A DECARBONISATION PROJECT

In order to meet the climate targets, various players in the chemical industry have enthusiastically embarked on innovative projects to switch to energy from sustainable sources. These initiatives consist, for example, of a change from fossil-driven to electrical-driven processes or a complete restructuring of the chain.

The standard steps for project management also apply to these types of innovative projects. We do see specific challenges that arise during New Energy & Infrastructure projects. These are a good illustration of the uniqueness of this type of project. This is the reason for naming a possible stumbling block for each project phase.

FEASIBILITY PHASE

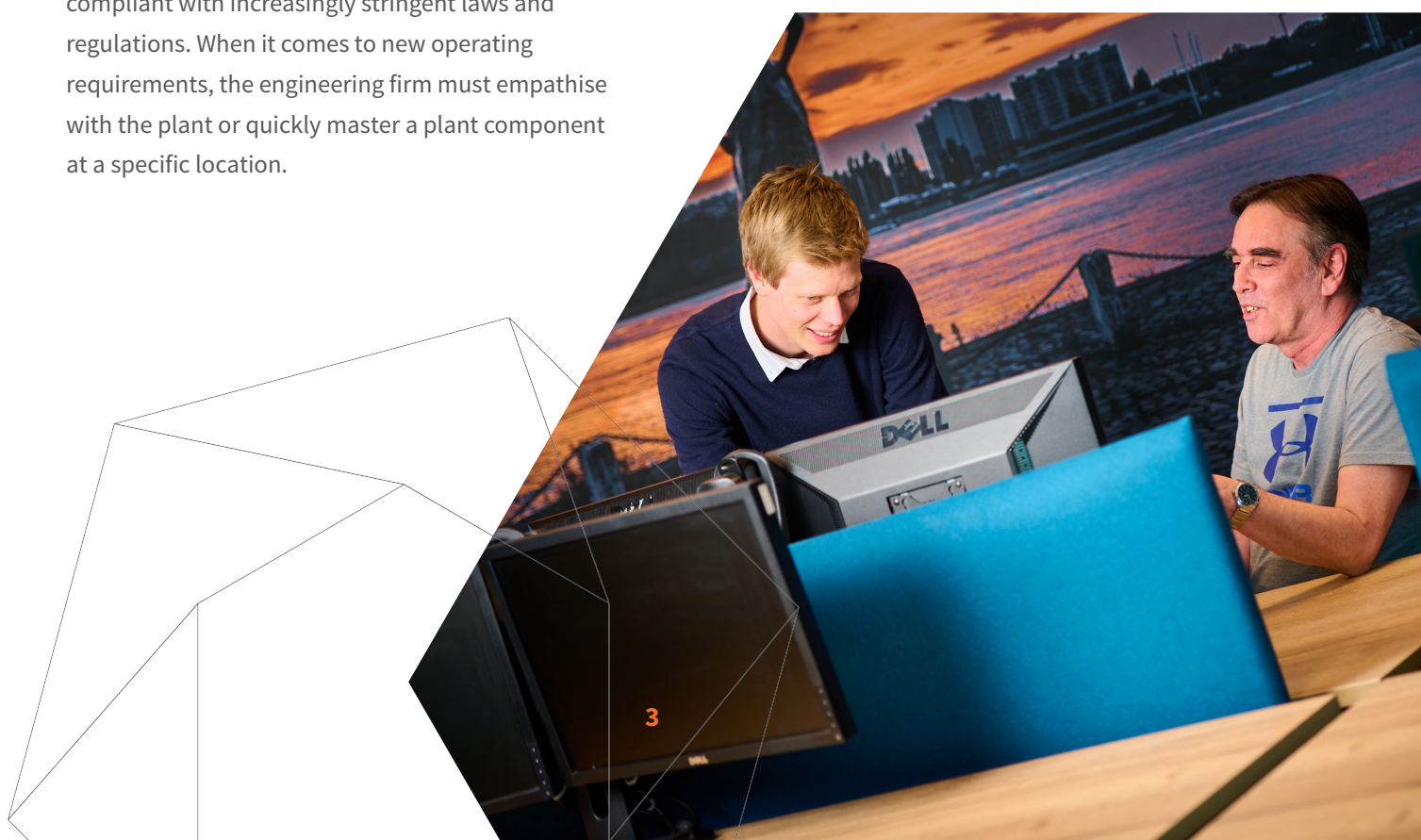
In this phase, the technical, economic and legal feasibility of the project is determined. A preliminary study or feasibility phase will show which techniques exist, what they qualify for and which technical innovation step needs to be taken to achieve the intended goals.

Stumbling block: New Energy & Infrastructure innovations have different business drivers than traditional projects and, for example, provide a new way of doing business. It is important that new installations fit into existing facilities. Often, plant installations have already undergone numerous modifications to extend their lifespan or to remain compliant with increasingly stringent laws and regulations. When it comes to new operating requirements, the engineering firm must empathise with the plant or quickly master a plant component at a specific location.

BASIC ENGINEERING

If the project maturity is sufficient, the next step can be taken. A basic design is made; it gives an overview of the technical requirements, system specifications and investment.

Stumbling block: Decarbonisation projects are often collaborations between very different players - large and small, corporate and start-up, and so on. This can lead to a clash of cultures - with different response times, communication styles or quality standards. At this stage it is desirable to get clear what the parties can expect from each other.





APPROVAL OF THE PROJECT

Sometimes a demonstration or test phase is still taking place to convince potential relations and investors of the technology. Once the project has been approved, the budget becomes available to actually start building.

Stumbling block: If there is collaboration with external knowledge carriers who fall under 'intellectual property' rules, it is sometimes more difficult for them to participate fully in the technology. It is also important to protect new intellectual property if it arises during the project, which also raises the question to whom it belongs.

WORKING OUT THE DETAILS AND BUILDING

Let's get to work! The engineering consultancy determines the tendering strategy together with the client. The contractors and suppliers are then selected. Much attention is paid to ensuring the performance guarantees that the engineering office checks together with the client during the start-up of the installation. The project development thus enters a new phase, namely long-term commissioning.

Stumbling block: Due to disinvestment programmes, many chemical companies were taken over by larger concerns in the 1990s. Shareholders managing the companies from various countries and cultures have made the chain complex. This has also brought the role of stakeholder management during a project more to the fore.

KH ENGINEERING AND THE ENERGY TRANSITION

All our clients are affected by the energy transition. Within KH Engineering, a special working group has therefore been created in 2019 to respond to these developments.

This New Energy & Infrastructure (NE&I) working group establishes cross-links between the market sectors and is aware of the trends and developments in the chemical market, among others. All developments and knowledge about the use of non-fossil fuels, heat pumps, electrification and hydrogen, among other things, are collected and shared, so that every market team within KH Engineering can benefit from them and apply them in projects for clients.

Our project account managers in this sector are in close contact with our clients and know which questions arise, such as: how do we reduce CO₂ emissions and how do we work towards green chemistry? The NE&I team is ready with its knowledge and expertise for all these questions!

THE CONNECTING FACTOR OF PROJECT MANAGEMENT

Projects are transforming from linear to circular, not only in terms of sustainability, but also in terms of project approach. Driven by technical innovations and the call for more responsibility, engineering firms are changing with them. What requirements must project management fulfil to make innovative projects successful?

Firstly, the bridging function of project management is crucial. Today's engineering consultancy is familiar with the various cultures within the chemical industry and is the linking factor between companies that are working (or will be working) together. In this respect, the engineering bureau can make use of multidisciplinary thinking and operating. New opportunities can often be created by carrying out optimisations and making use of existing utilities or production processes.

Secondly, stakeholder management is key. To keep the project team focused, organisational differences are discussed openly and transparently in the steering committee. The steering committee, which is formed by all stakeholders involved in the New Energy & Infrastructure innovation, checks whether the progress of the project is in line with the business case expectations. Thirdly, the project manager must have knowledge of the relevant technology. Topics that are currently relevant to New Energy & Infrastructure are:

- electrification
- heat transport
- heat pump applications
- heat integration in processes
- up- and recycling
- geothermal
- power to X
- hydrogen

Finally, organisational sensitivity is an important characteristic of today's project manager. Nowadays, project teams at the client company often consist of project participants from various business units who are available for the project part-time. Soft skills are needed to shape and direct the communication between team members, teams and companies. Important in this context is knowledge of:

- communication skills
- value improvement processes
- the scrum/agile method.

The success of innovative projects stands or falls with a project manager who not only has knowledge of the various disciplines, but who is also the connecting link between all those involved. To this end, companies call in external experts who are fully available to take on this task.

POWER TO METHANOL ANTWERP: SUSTAINABLE RAW MATERIAL

Methanol is a widely used raw material in the chemical industry, but until now it has been made from fossil raw materials. The new method is way different.

The first plant for sustainable methanol is currently under development in Antwerp. The Power to Methanol Antwerp consortium is working on the realisation of this plant. When the plant is built, sustainably generated electricity will be used to split water into hydrogen and oxygen via electrolysis, after which captured CO₂ will be added. The plant will then produce sustainable methanol, which can be used in various production processes in the Antwerp region.

Source: khengine.eu

ABOUT KH ENGINEERING

As a multidisciplinary full-service engineering firm, KH Engineering supports clients worldwide in the development of projects. We distinguish ourselves by our pragmatic approach, the broad technological knowledge of our colleagues and the realisation of complete projects. These range from front-end to engineering, procurement and construction management (EPCm) services for national and international clients.

KH Engineering aims to deliver innovative technological solutions by combining knowledge, capacity and experience. By doing so, we create continuous developments and valuable solutions for the market. Safety and sustainability are our preconditions for a successful project. With a dynamic approach, our professionals provide added value in every project. We provide our clients with a transparent and predictable project, in which ‘thinking and doing’ form the success of our services.

NEW ENERGY & INFRASTRUCTURE

In order to contribute to the Climate Objectives, our New Energy & Infrastructure group is specifically involved in projects related to decarbonisation, energy transition and up- and recycling. In recent years, KH Engineering has already built an impressive portfolio in energy transition projects. Think of CO₂ capture or heat transfer from industry to district heating.

In addition, our design has enabled various asset owners to recover raw materials and energy from existing processes. We have in-depth knowledge of the ideal design of the process, and all the necessary multidisciplinary disciplines to carry out the project to perfection.



Enthusiastic about the energy transition?

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