Consultancy for energy infrastructure

gasunie infrastruktur

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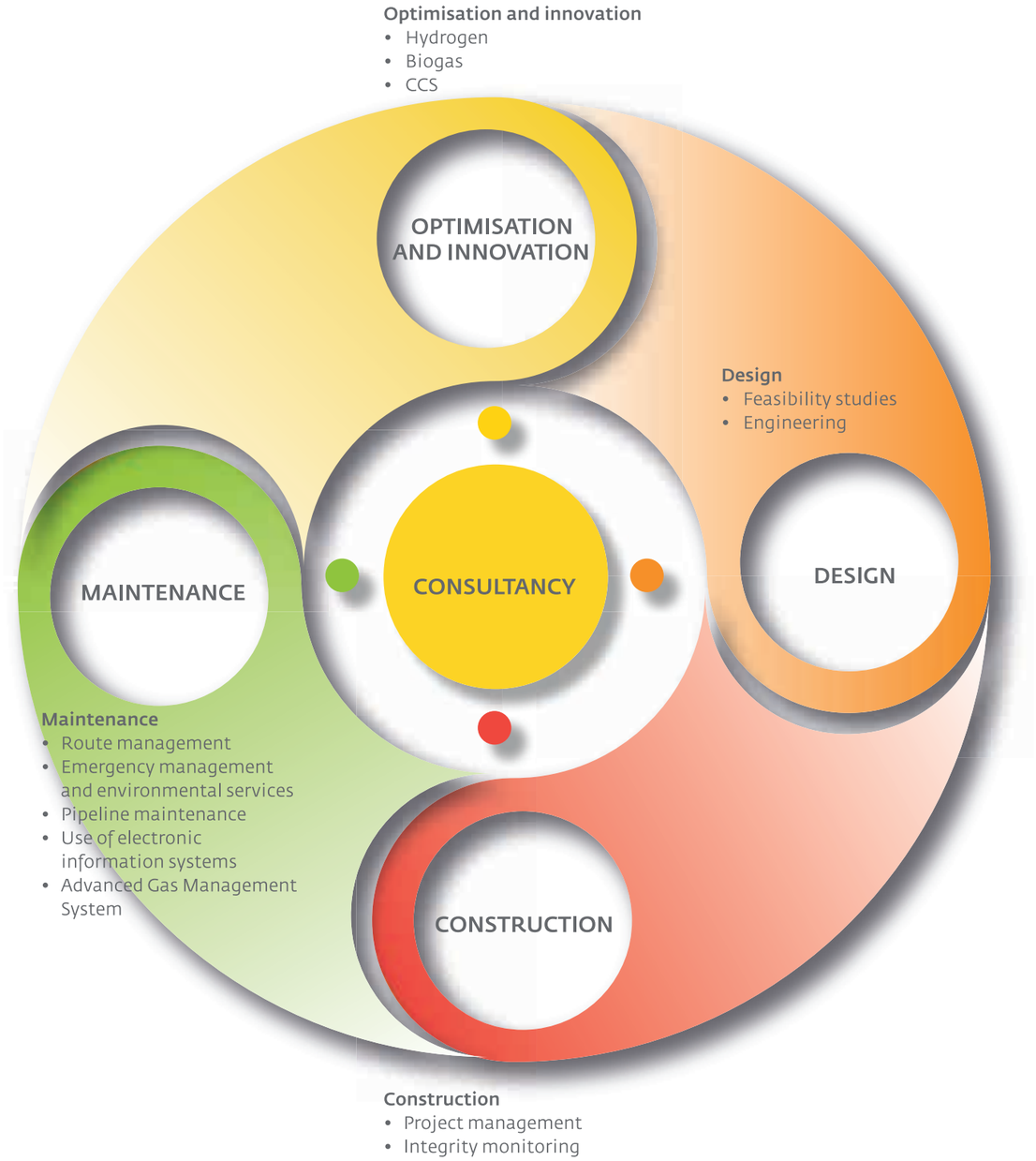


Engineering & Services

Gasunie Infrastruktur provides consultancy services in the field of pipeline and energy infrastructure. As a subsidiary of Gasunie, Gasunie Infrastruktur has in-house expertise that can be used to the optimisation, extension, and refurbishment of existing gas and other pipeline infrastructure. The company applies its valuable knowledge and expertise to the development of future-proof, flexible, and efficient international pipeline networks.

Gasunie Infrastruktur has expertise in all aspects of gas and energy infrastructure, ranging from management and maintenance of existing pipelines to the development of innovative energy projects, and from the design of new pipelines, stations, and facilities, to their final construction. On top of this, the company has 'thirty-five years' experience in implementing projects all over the world. This wealth of expertise means that Gasunie Infrastruktur is the partner when it comes to advice and support in relation to pipeline infrastructure projects, whether it involves maintenance, transition in gas infrastructure, or the development of new transport and storage systems.

This brochure illustrates Gasunie Infrastruktur's expertise and resources, and explains how we can help you. We use four fields of expertise to demonstrate the wide range of our experience:

- Maintenance
- Optimisation and innovation
- Design
- Construction

Gasunie Infrastruktur's parent company – Gasunie – has been a market leader in European gas infrastructure for more than 50 years. Gasunie's network is one of the largest high-pressure pipeline networks in Europe, comprising 15,500 kilometres of pipelines in the Netherlands and northern Germany, along with dozens of gas installations and some 1,300 gas receiving stations. Every year, more than 1106 TWh of gas flows through Gasunie's pipelines. Apart from pipeline maintenance, the company also provides gas transport services and facilitates gas trade on the Title Transfer Facility (TTF) – Europe's largest gas trading hub. Gasunie also works to accelerate climate-neutral energy supply by developing transitional energy supply chains and sustainable energy supply chains by striking up new partnerships and creating new business models. Gasunie invests in projects in the areas of green gas, hydrogen, heating, CCUS and LNG.

Maintenance

Our network is one of the largest high-pressure gas transport networks in Europe. When the ground has a high density of cables and pipelines, network safety is crucial. Pipeline infrastructure maintenance involves not only the maintenance of the pipelines themselves, but the management of the surrounding area too. Laws and regulations, land use, and zoning plans (i.e. town and country planning) all need to be taken into account. Besides managing and maintaining its own pipeline network, Gasunie can also manage and maintain your network.

Route management

Route management involves monitoring potentially hazardous excavation activities using a reporting and assessment system. After all, the greatest threat to pipeline systems comes from third party intervention. It is essential, for preventing damages to the pipelines, that proposed excavation works are analysed in combination with geographical and pipeline data. The exchange of information with all stakeholders plays a key role in avoiding damage through excavation, both in terms of damage to your pipeline network and harm to the environment caused by the release of hazardous substances. Gasunie Infrastruktur has experienced environment managers who can help manage your excavation project. In addition to monitoring developments in relation to town and country planning, our environment managers also take into consideration future bottlenecks in your underground infrastructure. Land use and zoning plans are used to determine the best way of avoiding such obstacles.

Emergency control

Gasunie Infrastruktur is an expert when it comes to modifying and repairing pipelines that are in service (i.e. with the gas still flowing under pressure), by maintaining the gas flow. Apart from the required expertise, Gasunie Infrastruktur also has its own equipment for hot-tapping and stoppling, and for manual and automatic welding.

Gasunie Infrastruktur has 24/7 access to mobile installations for use during emergencies: natural gas trailers(CNG trailers) including reduction units (PRS), mobile re-compressors (CNG mobile reduction units), mobile gas receiving stations (GRS), mobile heating units, emergency pipelines and much more besides.

When it comes to preventing emergencies, Gasunie Infrastruktur has a range of expertise in the field of emergency prevention and policy-making. We are experienced in taking into consideration all environmental factors when assessing risks and we know what action to take in order to avoid damage and/or maintenance on the pipelines.

Pipeline maintenance

Our maintenance engineers focus on the condition of steel pipelines in the ground. Gasunie Infrastruktur maintenance experts strive continuously to improve and optimise the gas transport network in order to ensure its integrity. This requires a thorough knowledge of tools, equipment and maintenance techniques. Maintenance engineering therefore also plays a key role in determining maintenance schedules and adequately preparing maintenance projects.

Gasunie Infrastruktur has its own standards for these preparatory and construction phases: the Gasunie Technical Standard. While the standard is based on international norms, it goes beyond these with extremely high levels of quality and safety. It is one of the most stringent and most respected guidelines in the field of the construction and management of gas infrastructure.

Gasunie Infrastruktur routinely runs projects in conjunction with other pipeline or cable owners. In cases where, all of the pipelines/cables need to be diverted in a particular zone due to planning considerations, it is obvious that the work should be done at the same time. One of the parties should act as project coordinator. Gasunie Infrastruktur is the obvious choice for this role since, from a safety and planning perspective. Moreover, by preparing and executing the work for all pipeline owners, costs can be saved.

Even if you manage your own projects, you may want all parts of your project to be assessed by an expert partner. In such cases, Gasunie Infrastruktur's specialists can be called upon to give advice or a second opinion. We can also provide specialised staff training.

Electronic information systems

Gasunie Infrastruktur uses geographical, pipeline and town and country planning data for environmental management. In order to ensure the continued integrity of the gas network, large amounts of data from various systems need to be correlated and filtered. Gasunie Infrastruktur uses innovative IT applications to do this. The more efficiently and specifically the available data can be combined and analysed, the better the management of safety, damage prevention, and the integrity of the gas infrastructure will be, thereby reducing cost.

The environment and safety are monitored, using data from Sentinel-1 and Sentinel-2 satellites, i.e. pipeline inspection from space. In-company (pipeline) data, GIS data, and external data are used in combination so as to instigate risk-mitigating action on the ground where necessary.

The smart and efficient combination and filtering of information using in-house software reduces the risk of excavation damage and false reports. This provides Gasunie Infrastruktur with a valuable information tool: a data system that provides information on pipeline route inspection, soil pollution, gas leak inspection, water junctions, visual assistance, inspection of dike crossings, earthquakes, waterlogging/flooding, detection of change, ground level measurements, ground deformation, imagery, and help and assistance in the event of crop damage.

Gasunie Infrastruktur can support you with environmental management and pipeline inspection by improving existing reporting and analysis systems or by developing an entirely new analysis system tailored to your pipeline network.
Using our specialist IT systems for gas infrastructure (AGMS), Gasunie Infrastruktur can contribute to the safety and supply security of your gas transport network.

Advanced Gas Management System

Gasunie Infrastruktur uses specialist software to manage its network. Gasunie's AGMS (Advanced Gas Management System) is a bespoke network management software package which was developed by Gasunie and Schneider Electric and which is based on the Distribution Management System. Its main application involves the provision of functional support to dispatchers. Gasunie can also manage your network using its Central Command Post and, using our AGMS, we can help optimise and/or modernise your dispatching system.

Environmental services

Gasunie Infrastruktur has the equipment to minimize your CO_2 and Gas Emissions. With stoppling and plugging you can create a temporary by-pass. Recompression minimizes the loss of product. Flaring will stop you from you CH-emmission and our burners are flameless and soundproof. Our CNG-trailers can provide you with a constant flow of Groninger quality gas to prevent your plant or delivery of gas to stop.
Our wide range of different possibilities will suite every need. Contact us for your solution.

Optimisation and innovation

Gasunie Infrastruktur's parent company is Gasunie, an energy infrastructure company that is fully committed to the long-term sustainable energy supply. The Paris Climate Agreement states that we aim to reach a carbon-neutral society by 2050. Gasunie and its partners are looking at the feasibility of sustainable technologies suitable for large-scale application. Together, they are developing business models for innovative and sustainable energy concepts that are reliable, affordable and socially responsible. Gasunie Infrastruktur's parent company provides it with access to all the new developments in the future, sustainable energy supply.

Our main goals are to produce and use hydrogen gas sustainably, to support green gas production and to contribute towards CO_2 capture, reuse and storage. Concrete projects in these areas in which Gasunie is currently involved include the Hydrogen Backbone, HyStock and NortH 2 (hydrogen), Torrgas and SCW or supercritical water gasification (green gas) and Porthos (Carbon Capture and Storage).

Hydrogen

Hydrogen (H_2) is a sustainable energy carrier, but the production of hydrogen itself is a far from sustainable process. The hydrogen project's mission is to develop 'green hydrogen gas' and to design hydrogen storage and transport systems. Renewable, i.e. wind- and solar-generated, energy, is currently difficult to store. Green energy can be stored in gaseous energy carriers via power-to-gas technology.
Gas can be stored more easily. Gasunie subsidiary EnergyStock operates the first Dutch power-to-gas installation. Pilot project Hystock provides stored sustainable energy intended for mobility and industry.

Another ambitious hydrogen project is NortH2, a wind-to-hydrogen project that was launched in early 2020. NortH2 is a consortium comprising Gasunie, Shell Nederland, Groningen Seaports, RWE and Norwegian company Equinor. The joint objective is to use offshore wind energy to power large-scale production of green hydrogen. Capacity will be no less than 4 Gigawatts by 2030 and more than 10 GW by 2040. By then, green hydrogen production will total around 1,000,000 tonnes per year, cutting CO_2 emissions by more than eight to ten megatonnes per year.

Biogas

Green gas is made from biomass. Expectations are that green gas will play a major role in the energy transition. Green gas can be used exactly like natural gas and the infrastructure is already in place. However, green gas production methods could be improved. Gasunie wants to facilitate the transition from natural gas to green gas and is supplying its expertise, knowledge and gas transport experience. It is participating in demonstration and upsizing projects and making its infrastructure available.

One of the technologies used is supercritical water gasification, in which wet biomass waste streams such as manure, green waste and sewage sludge are converted into sustainable energy and reusable raw materials.
A demonstration plant has been built in Alkmaar together with partner SCW Systems. Five hundred thousand cubic metres of green gas could be fed into the system by 2023 as a result of this technology.

The aim of the Torrgas project is the completion of a commercial gasification plant based on woody residual flows in Delfzijl. This technology uses torrefied wood pellets as input for the gasification. This is based on certified Grade B wood, or waste wood. Torrefaction is a process of steam pretreatment which gives the wood pellets a higher
energy density.

CCS

CO_2 emissions cause climate change. One of the ways to reduce these CO_2 emissions is to capture, store and reuse them. This whole process is also called CCUS, Carbon Capture, Utilisation and Storage.

Porthos is the name of a CO_2 storage and transport project in the Port of Rotterdam. From 2023, Gasunie and its partners plan to store CO_2 emitted by industry in the Port of Rotterdam in depleted gas fields deep below the North Sea. Technically this is feasible and it is, moreover, a cost-effective solution for reducing emissions in the short term. The project focuses on the construction of a pipeline to which various industries and companies can connect. The CO_2 will largely be transported to depleted natural gas or oil fields beneath the North Sea via Gasunie's existing, but decommissioned, natural gas pipelines.
Some of the CO_2 will be used in horticulture and, in future, possibly also in industrial processes, such as the chemistry and energy sector or in the production of new building materials. Gasunie and its subsidiaries support projects for the development of storage facilities and the modification of European energy infrastructure for a CO_2-neutral world.

Sustainable innovation and energy transition are rapidly evolving knowledge domains.
Are you a developer of innovations or are you working on a transition project? If so, Gasunie Infrastruktur would like to work with you. By joining forces and pooling our resources we can achieve a sustainable energy supply in Europe far sooner.

Design

Gasunie Infrastruktur has a wealth of experience in the preparation of projects for the construction of new installations, pipeline routes, and storage facilities. Our experts can provide a realistic estimate of the costs, benefits, and risks associated with your new gas and/or energy infrastructure project. Our in-depth knowledge of the gas and energy market comes in handy when drawing up feasibility studies; we are aware of the context of projects and take into consideration future developments in the field of energy infrastructure. We are aware of the conditions in the energy market and its players: government bodies, businesses, stakeholders, the existing infrastructure, supply and demand, and development opportunities for gas. Our business cases are realistic because we combine our experience and expertise with data analysis. We handle our knowledge efficiently, by combining various data communication networks and analysing the results accordingly. Network modelling results in realistic estimates for project prerequisites and associated decisions.

Gasunie Infrastruktur can provide advice on preparatory works for the construction phase of pipeline projects. Our experts can also optimise existing pipeline projects by upgrading them to international standards, thereby ensuring safety and integrity. Gasunie Infrastruktur is also an experienced consultancy partner for the management of international joint ventures and the monitoring of project efficiency. Gasunie Infrastruktur can train your maintenance personnel and engineers if required, but can also carry out routine maintenance.

Feasibility studies

Construction

Engineering

Gasunie Infrastruktur has an extensive technical knowledge and expert personnel in relation to pipeline infrastructure, i.e. the pipelines and installations themselves. A range of engineering specialists work together in a multidisciplinary project team throughout the process, from final design to the preparations for construction. Our areas of expertise include:

- the external safety of gas pipelines, including the consideration of design regulations for pipelines;
- the management of environmental integrity, including the control of noise and emissions;
- the technical integrity of gas pipelines, including the required coating and cathodic protection.
  Biogas

Following an assessment, a functional specification is made outlining the functionality of the installation.
The project team then draws up a project specification specifying in detail the type of installation to be used, including all its parameters (among other things: diameter, operating pressure etc.). Next, construction of the project starts: we engage contractors and resolve any unexpected issues on-site and in conjunction with our engineers.
Gasunie Infrastruktur is experienced in drawing up a FEED (Front-End Engineering Design), which helps ensure that projects are more efficient and cost-effective.
Gasunie Infrastruktur has around 150 engineers represented in all of the essential disciplines for the maintenance and construction of an installation or pipeline.

A team of engineers assembled from Gasunie Infrastruktur works on the commissioning of the project, ensuring that the project is delivered according to plan, complete with manuals, and is safe to put into service. Upon completion, the installation is "ready for gas".
Maintenance engineers document the maintenance required for equipment and/or installation in manuals, for the maintenance staff to execute.
The operation of installations that use an explosive medium such as gas, requires a strict safety policy. Process safety is key and includes both occupational and technical safety. Firstly, this relates to the human influence on safety: stop systems, precautions, safety requirements, the existence of manuals, and the ability to operate equipment safely. Secondly, it relates to technical integrity: assurance of adequate construction and everything else relating
to the safe operation and monitoring of the installation or pipeline.

During the construction of your new installation and pipeline routes, Gasunie Infrastruktur will manage the process through to the final commissioning. A detailed process is involved in the run up to the safe commissioning of a pipeline or installation. Our experts diligently test the safety and quality of the installations and oversee the construction phase. Gasunie Infrastruktur has the wide-ranging professional expertise needed to undertake the role of contract manager for your project and our experts help unite all involved parties. For instance, they manage the procurement of materials and services in order to ensure timely delivery. Our project managers look after the preparatory works for construction, planning and supervision of construction, as well as the coordination and management of the installation and construction phase itself. With a complete overview and knowledge of all of the factors involved in the construction process, from design through to commissioning, Gasunie Infrastruktur's experts will ensure that your project is a success. When it comes to efficient project management, project supervision and construction management.

Project management

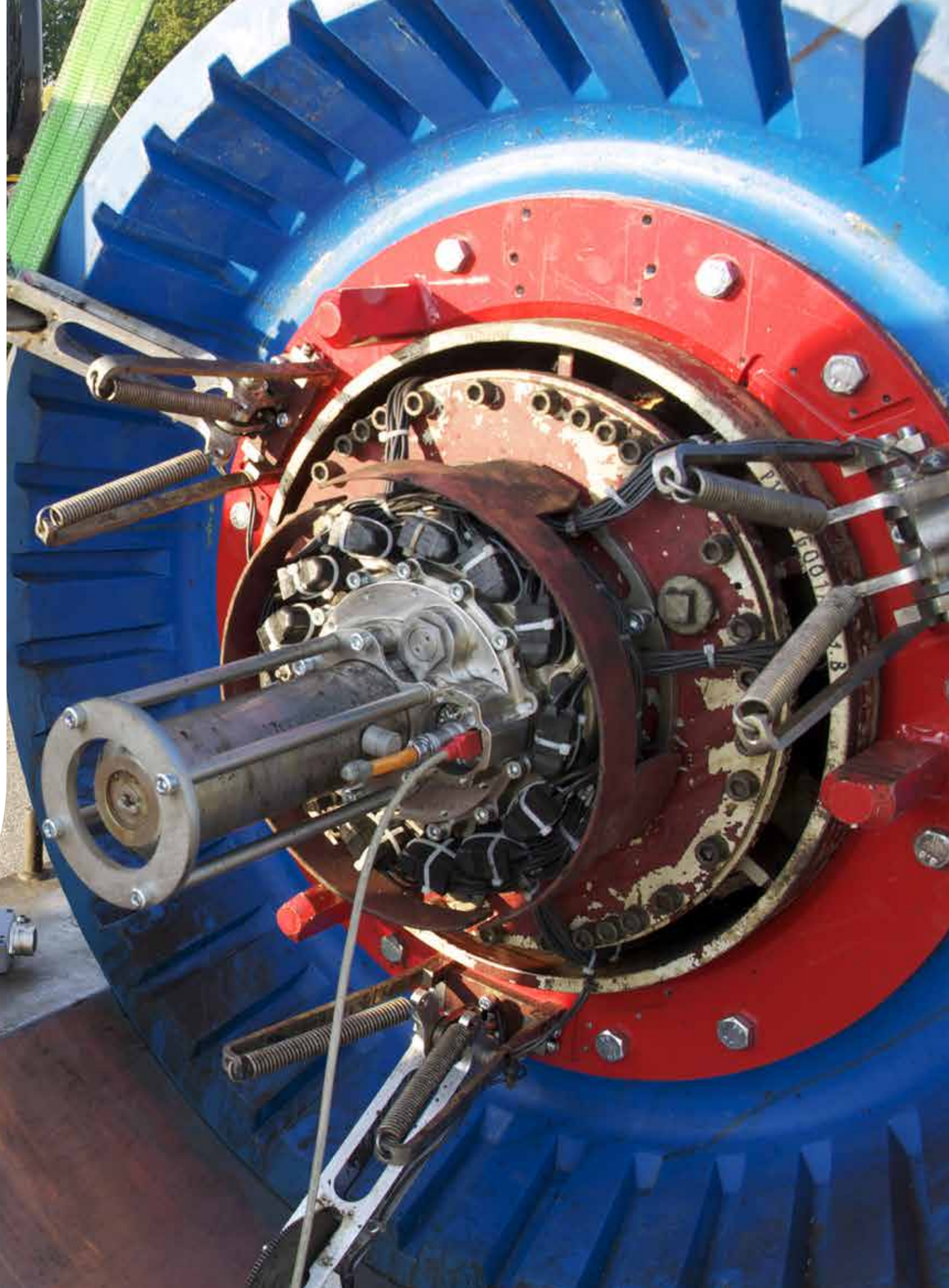
Gasunie Infrastruktur has extensive experience in project management. During the organisation, preparation, planning, implementation, and completion of energy infrastructure projects, Gasunie Infrastruktur uses an array of competent project leaders to manage the different sub-projects and associated teams and team leaders.
Gasunie Infrastruktur's project leaders are proficient in drawing up contracts with contractors, managing project finances, stakeholder management (agreements with local government bodies and water authority's), applying for licences/permits and environmental management (route surveying and signing agreements with land owners).
All stages of the infrastructure project are the responsibility of the project's management. Gasunie Infrastruktur's project managers are experienced at managing these responsibilities in international projects.

Integrity monitoring

The safe positioning of pipelines plays a crucial role in ensuring that gas can be transported safely and reliably. Consequently, Gasunie Infrastruktur Engineering & Services also pays close attention to the monitoring of integrity and safety. Pipelines are monitored both internally and externally.
In order to ensure that integrity is monitored adequately, a plan is drawn up detailing which measure safeguards to abide any applicable laws and regulations.
For internal pipeline monitoring, or In-Line-Inspections (ILIs) as they are known, we use intelligent 'pigs'. A pig uses advanced electronics to measure the condition of the pipeline wall from the inside. Our engineers also ensure that pipelines are piggable by installing temporary launchers and receivers. Information generated by the pigs is stored on a millimetre-by-millimetre basis for retrieval later on. Measurement data is analysed and, where necessary, the pipeline is excavated for further visual inspection and/or repair, thereby ensuring its continued safe installation.

You can add value to inspections performed by third parties if you have the report from your pigging firm assessed by Gasunie engineers. Unnecessary excavation or failure to identify potentially harmful features can be very expensive and/or may jeopardise pipeline integrity, so a second opinion can prove invaluable.
Pigs can get stuck accidentally during a run, but Gasunie Infrastruktur uses a smart tracking system in order to track the progress of the pig run online. We use our Pig Tracking System (PTS), developed in-house, for this purpose. Small cabinets are positioned alongside the pipeline and they detect the sound of a passing pig, which can then be used to calculate its position and speed. The PTS displays real time information about the speed and position of the pig. The system communicates with the vibration and pressure database, providing objective data immediately as a result. Another advantage of automating your pig tracking process is that it requires less manpower on-site.

Gasunie Infrastruktur's experts can help and advise you in selecting a suitable inspection company or pigging tool. Gasunie's PTS can also be used for pipeline inspection. We provide support services for data analysis and assessment, in addition to the equipment needed to install launching and receiving stations on a gas pipeline.



Consultancy

Gasunie Infrastruktur has a wide range of expertise and specialist skills and almost half a century's worth of experience in international gas infrastructure. This brochure has demonstrated that Gasunie Infrastruktur stands apart from the competition on account of its know-how in just about every aspect associated with the construction and maintenance of energy infrastructures: the management and maintenance of networks, special projects, the design of new installations and the construction of installations. Its understanding of the relationships between these areas of expertise and its extensive knowledge of the energy market have resulted in Gasunie Infrastruktur becoming a company that represents quality and efficiency. Gasunie Infrastruktur engages highly-qualified project managers engineers, and skilled professionals for international projects in the field of energy infrastructure.

If you would like to find out more about how Gasunie Infrastruktur can assist you, please contact our account managers at info@gasunieinfrastruktur.com

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