TRACTO

WHY DIG TRENCHES WHEN THERE ARE BETTER SOLUTIONS?

ADVANCED TRENCHLESS TECHNOLOGY

TRACTO.COM/APPLICATIONS

TRENCHLESS TECHNOLOGY
FOR YOUR APPLICATIONS

APPLICATIONS AT A GLANCE

All information on trenchless applications
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The economic and ecological benefits of trenchless pipeline construction compared with open construction are obvious:

- Valuable surfaces and resources are conserved because there is no need for costly excavation and restoration work
- Traffic is hardly impaired, the economy is not obstructed and there is no inconvenience for residents
- Emissions and the consumption of natural capital are greatly reduced
- The direct as well as indirect costs are significantly lower
- Construction times bcome considerably shorter

Our NODIG product range offers efficient solutions for all applications. Whether you want to expand your pipeline network, make connections to consumers or renew pipelines – all this can also be done underground without digging trenches.

With trenchless technology, pipeline construction is environmentally friendly, sustainable and economical – regardless of the application. On the following pages you discover the benefits of TRACTO's intelligent and flexible NODIG solutions for your applications and learn how we can support you in your projects.

RELIABLE
WATER PIPELINE CONSTRUCTION

RESOURCE-SAVING AND COST-EFFICIENT – WATER PIPELINE CONSTRUCTION WITH OUR NODIG SYSTEMS:

- Water pipes installation with precision, using proven and powerful trenchless technology.
- Installing water mains along roads, under traffic routes and under waterways - with short or long pipes in all common materials.
- Installing water mains for service connections to or into the building, or directly from the service connection to the main - underground and in the opposite direction.
- Eliminate water loss and replace irreparable drinking water pipes and service connections without trenching - simply and efficiently by installing a new pipe in the existing route.
- Eliminate leaks in water pipes and at the same time increase the capacity of the pipes by 1 - 2 nominal diameters.
- Proven technique, safe application

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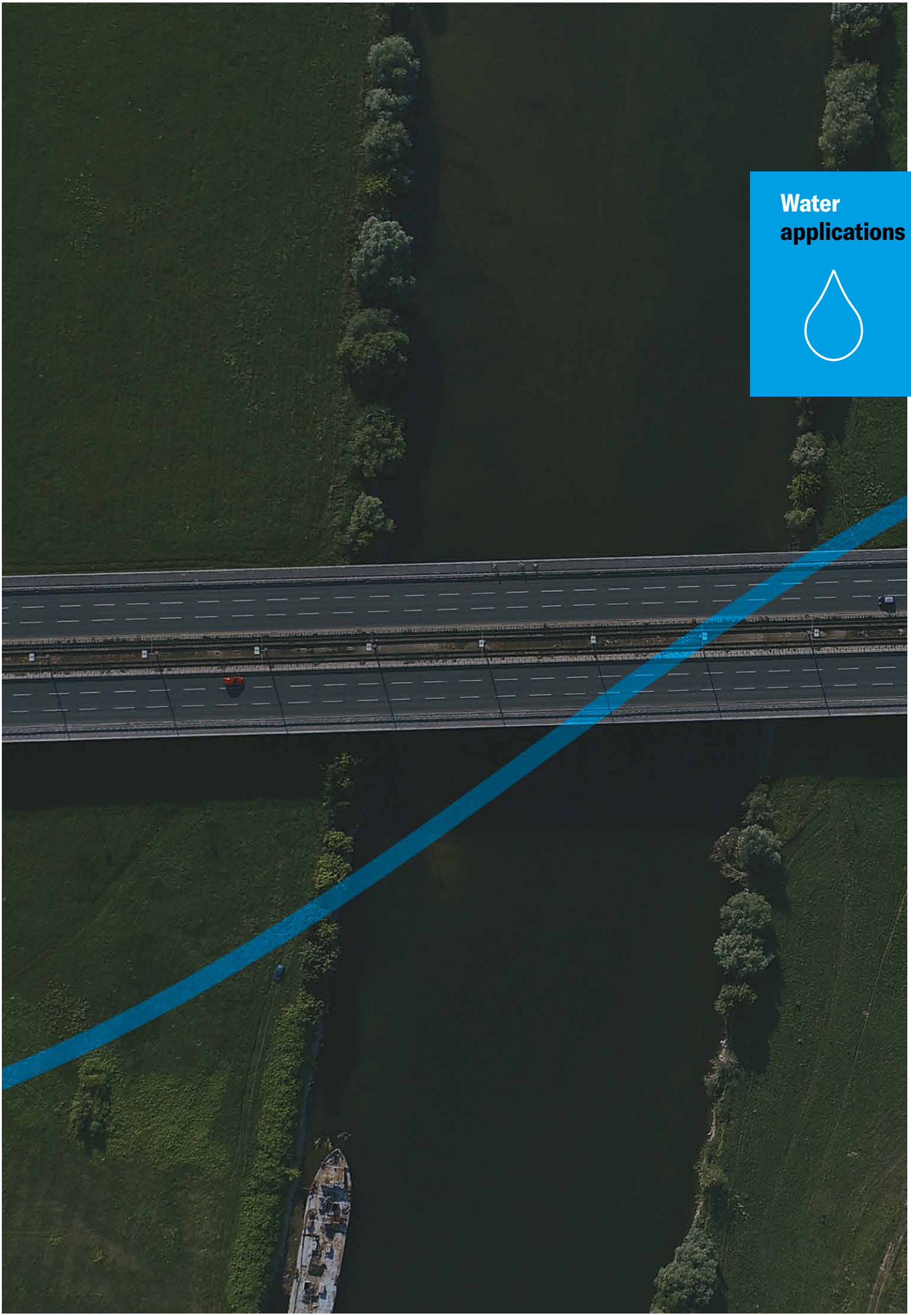
The most important resource of life – optimally managed

Water pipes are the arteries of life and our most important infrastructure. Trenchless technology can be used not only to expand the pipeline network in a gentle way, but also to renew and repair old pipelines. TRACTO's NODIG technology makes it possible to build and maintain modern water supplies without interrupting them during the construction phase. This is made possible by upgrading and renewing old pipelines in parallel, with minimal environmental impact and disruption to daily life.

Safe, sustainable and profitable water supply

For modern water supply, the capacity of the pipeline network must be adapted to the ever-increasing demand, while the supply of high-quality drinking water must remain secure. Trenchless technology makes it possible to meet all the requirements of water pipeline construction - from the installation of pressure pipes to the construction of service connections to the consumer. The underground construction method guarantees ecologically and economically sound development, even in complex ground conditions.



Water applications

FAST
FIBRE OPTIC NETWORK CONSTRUCTION

THE PERFECT PARTNER FOR YOUR FIBRE OPTIC PROJECT –
ALL THE ADVANTAGES

- Fast and minimally invasive installation of underground ducts and fibre optic cables along roads (FTTC) and under traffic ways.
- It is also possible to install the fibre through existing sewers, significantly reducing disruption to residents or transport infrastructure.
- Whether urban or rural, trenchless technology offers flexible deployment from fibre roll-out in the countryside to distribution and service connections in urban areas.
- All types of fibre optic connections (FTTX) are possible - the installation of single or serial fibre optic home connections from the distributor to the building (FTTH) or directly into the basement (FTTB), also in the opposite direction.
- The proven techniques are safe to use and offer maximum speed and economy with perfectly matched accessories.

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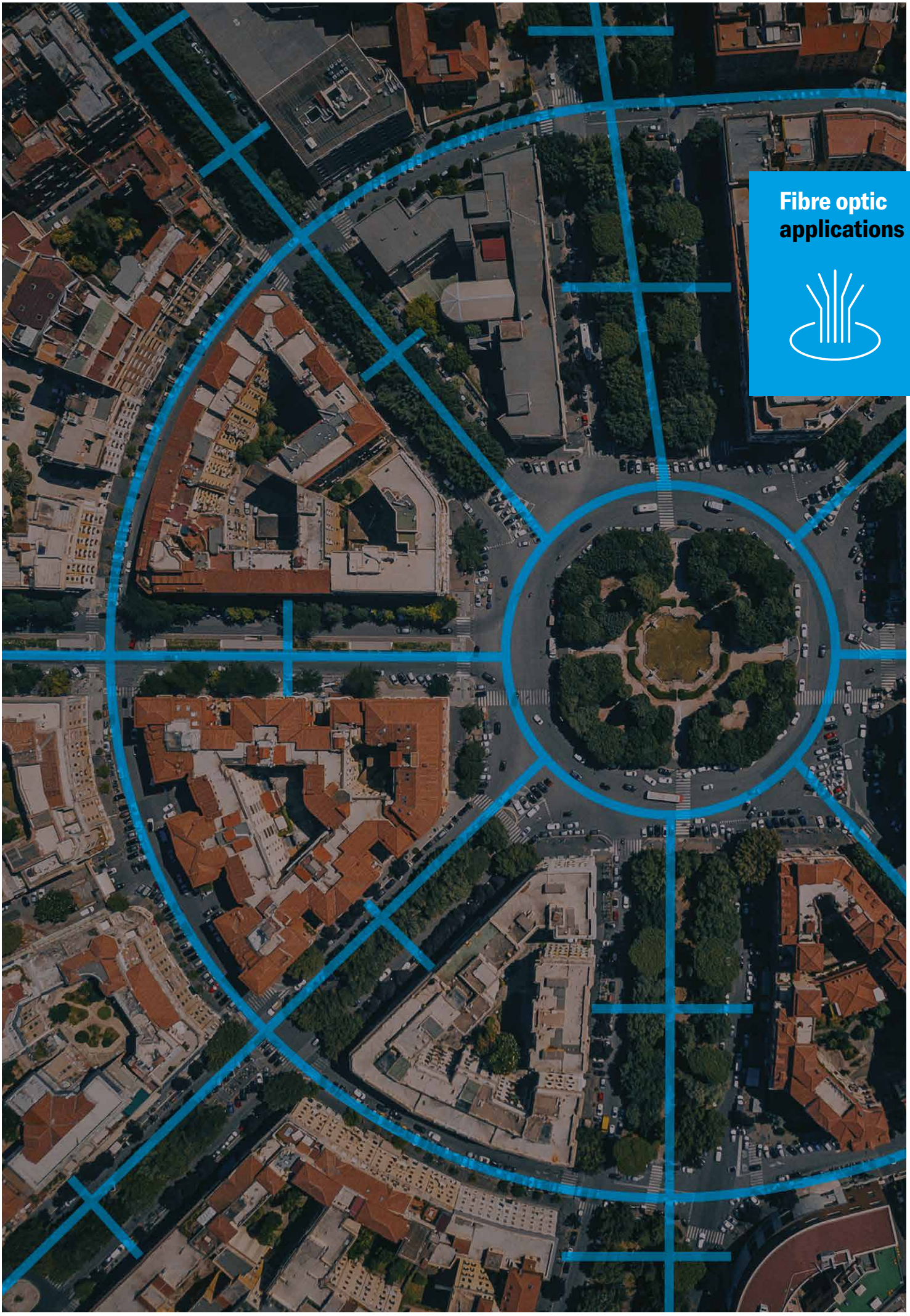
Fast connections without trenches – cost-effective and environmentally friendly

A powerful and widespread fibre-optic network is the backbone of digitalisation. However, high costs and long construction times often act as a brake on investment in network expansion, which in many places is not progressing fast enough. Trenchless technology shows that this does not have to be the case. Whether for the backbone or the last mile, it can be used to lay fibre optic cables and establish fibre connections without high costs and lengthy civil engineering works.

Fibre optic expansion (FTTX) without time-consuming restoration work

Minimally invasive trenchless methods protect surfaces and avoid time-consuming and costly civil engineering works. There is no need to cut deep slits in the asphalt, which minimises the loss of value of the affected areas and the cost of restoration. Fibre optic cables can be installed quickly and safely under and along roads (FTTC), to the home (FTTH) or directly into the basement. Sufficient installation depth guarantees security of supply.



Fibre optic applications

PROFESSIONAL
NATURAL GAS DISTRIBUTION NETWORKS

THE ADVANTAGES OF OUR NODIG SYSTEMS FOR GAS PIPELINE CONSTRUCTION

- Protective and product gas pipes can be laid professionally – along roads, under traffic routes and waterways, with short and long pipes made of all common materials.
- The trenchless installation of a gas house connection from a pit/keyhole to the building or directly into the supply room is possible without any complications, even in the opposite direction.
- Our NODIG technology replaces defective gas pipes and house connections with a new pipe in the existing route (bursting method) and prevents leaks in the long term.
- At the same time, trenchless pipe renewal allows pipeline capacities to be adjusted by 1 - 2 nominal widths.
- With specific accessories, the partial repair and renovation of gas pipes is also possible
- NODIG technology comlpies with the latest regulations and offers maximum planning and technical safety in the gas distribution network.
- Trenchless installation and renewal guarantee precise verifiability of the position, function and tightness of new gas pipes.

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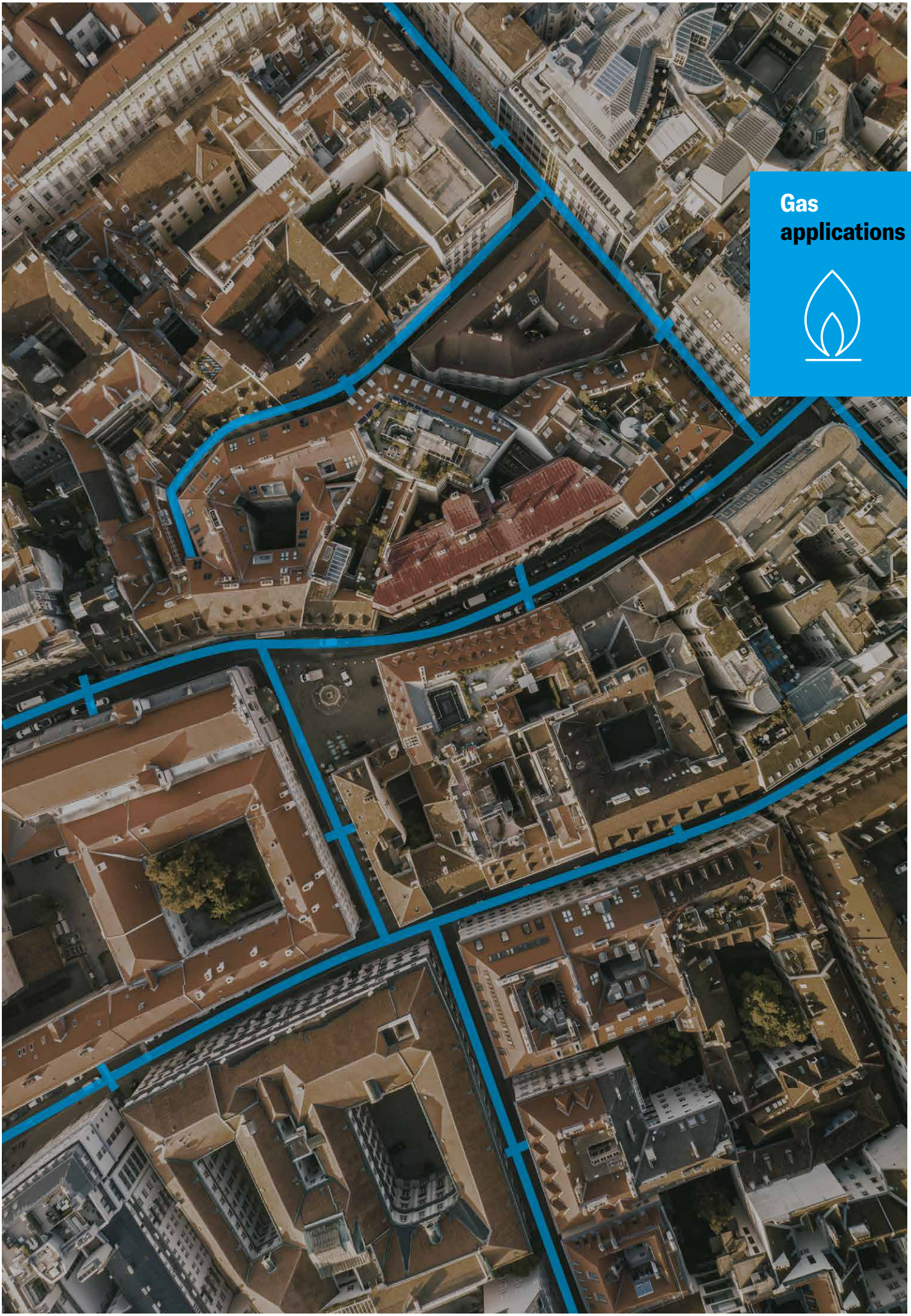
Preserving infrastructure with trenchless technology

Gas distribution networks play an important role in a successful energy transition. In order to transport and store sufficient quantities of fossil and, increasingly, renewable natural gas, large investments are needed to maintain and expand these networks. With trenchless technology for gas pipeline construction, not only can these investments be reduced, but maintenance and expansion can also be carried out in an environmentally friendly and accelerated manner.

Installing or renewing gas pipes without trenches

With our NODIG technology, all types of gas pipelines can be installed and even renewed in a safe and professional manner, making them quickly ready for use again in accordance with the regulations. Be it pipelines for feeding natural gas produced abroad into national networks, pressure pipelines for transport and distribution, pipelines for storing synthetic gas from the overproduction of green electricity, or the connection of service lines to the end user.



Gas applications

CLEVER
UNDERGROUND CABLING

UNDERGROUND CABLE INSTALLATION WITH NODIG TECHNOLOGY
ALL ADVANTAGES AT A GLANCE

- Our innovative NODIG systems allow underground cables to be installed along roads and under traffic routes and waterways – with short or long pipes made of all common materials.
- The trenchless installation of a power connection is easily possible from a pit/keyhole to the building and also in the opposite direction.
- The depths required for safe underground cable installation can be easily achieved.
- NODIG technology complies with the latest regulations and offers maximum planning and technical security.
- Trenchless installation guarantees precise verifiability of the position, function and tightness of the underground cables.
- Our innovative process is recognised by environmental organisations as sustainable because of its proven low consumption of valuable natural capital.

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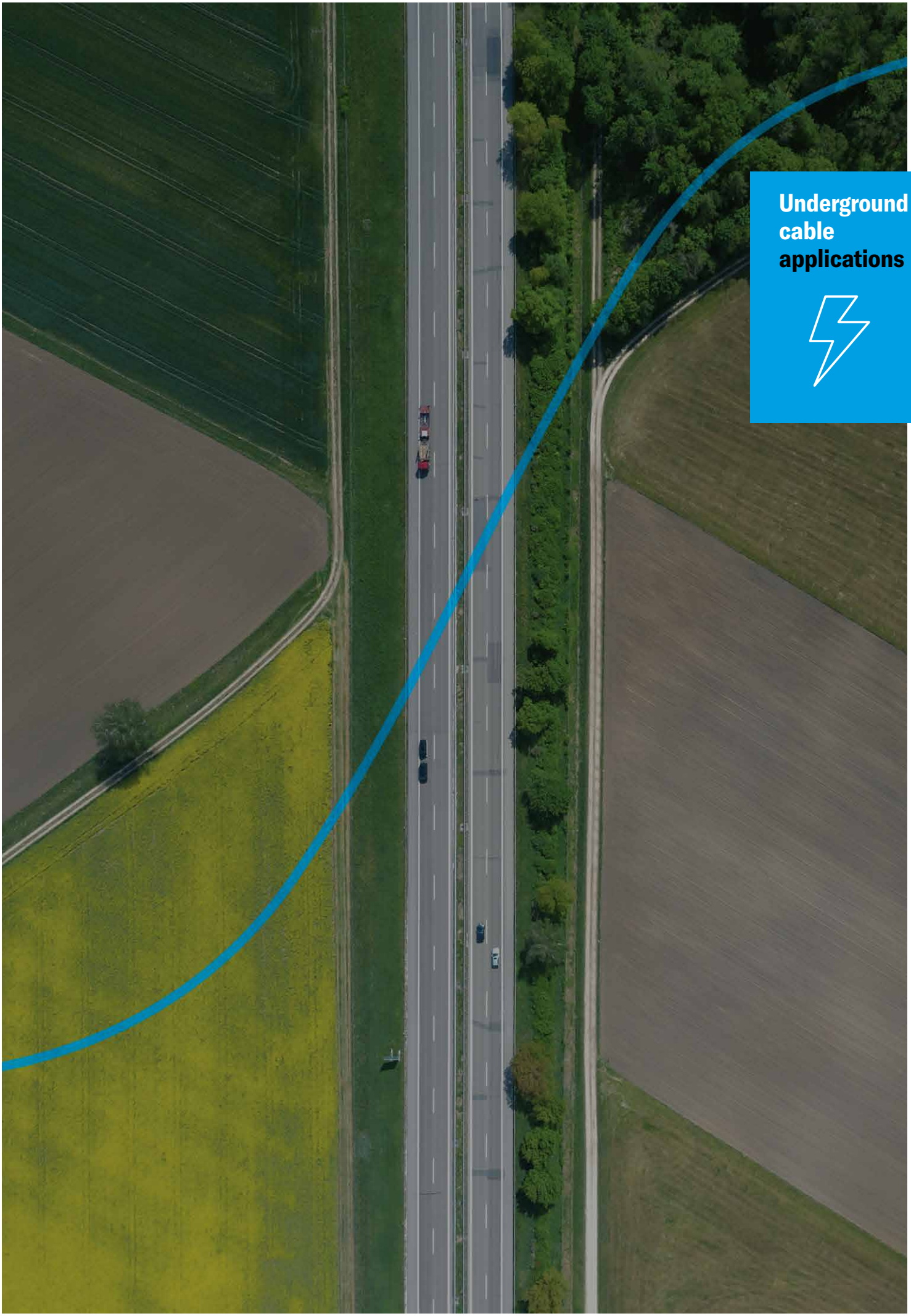
A clever solution - trenchless and virtually everywhere
The basic supply of electricity requires a dense and flexible electricity network. However, the high material and financial cost of installing power cables often prevents the electricity from getting to where it is needed. The solution is environmentally and economically friendly trenchless construction. Underground cabling is possible practically everywhere - in urban centres, in protected areas or under water.

Uncomplicated, environmentally friendly and efficient
Safe and easy installation of conduits for medium and high-voltage power cables to ensure transport and distribution over long distances, or installation of the underground cable house connection at the end user's premises right up to the supply room. Innovative technology allows for versatility - proven standards make underground power cabling easier than you think.

Underground cable applications



PRECISE
SEWER CONSTRUCTION

ALL THE ADVANTAGES OF OUR NODIG SYSTEMS FOR SEWER CONSTRUCTION AT A GLANCE

- Trenchless technology is used to precisely install pressure and gravity sewers along and under traffic routes and waterways - with minimum effort and maximum impact.
- Trenchless sewer construction is gentle and sustainable with short or long pipes in all common materials, even from manhole to manhole.
- Gravity pipes for house connections can easily be installed from manholes or pits.
- Trenchless pipe replacement means the permanent elimination of leaks due to a new pipe being laid in the existing route. It works perfectly on old pipes with a round or oval profile and on house connections.
- By renewing sewer pipes with TRACTO technology, you can increase the pipe capacity by 1-2 nominal diameters in the same operation.
- Many options for trenchless pipe rehabilitation with one system: safe and reliable with calibre bursting, relining, pipe reduction or tight-in-pipe.
- With the right accessories, you can quickly and easily clean pipes and even replace round or square and round manhole covers.
- Our NODIG technology is compliant, accurate, safe and proven. The position, function and tightness of new sewer pipes can be accurately verified.

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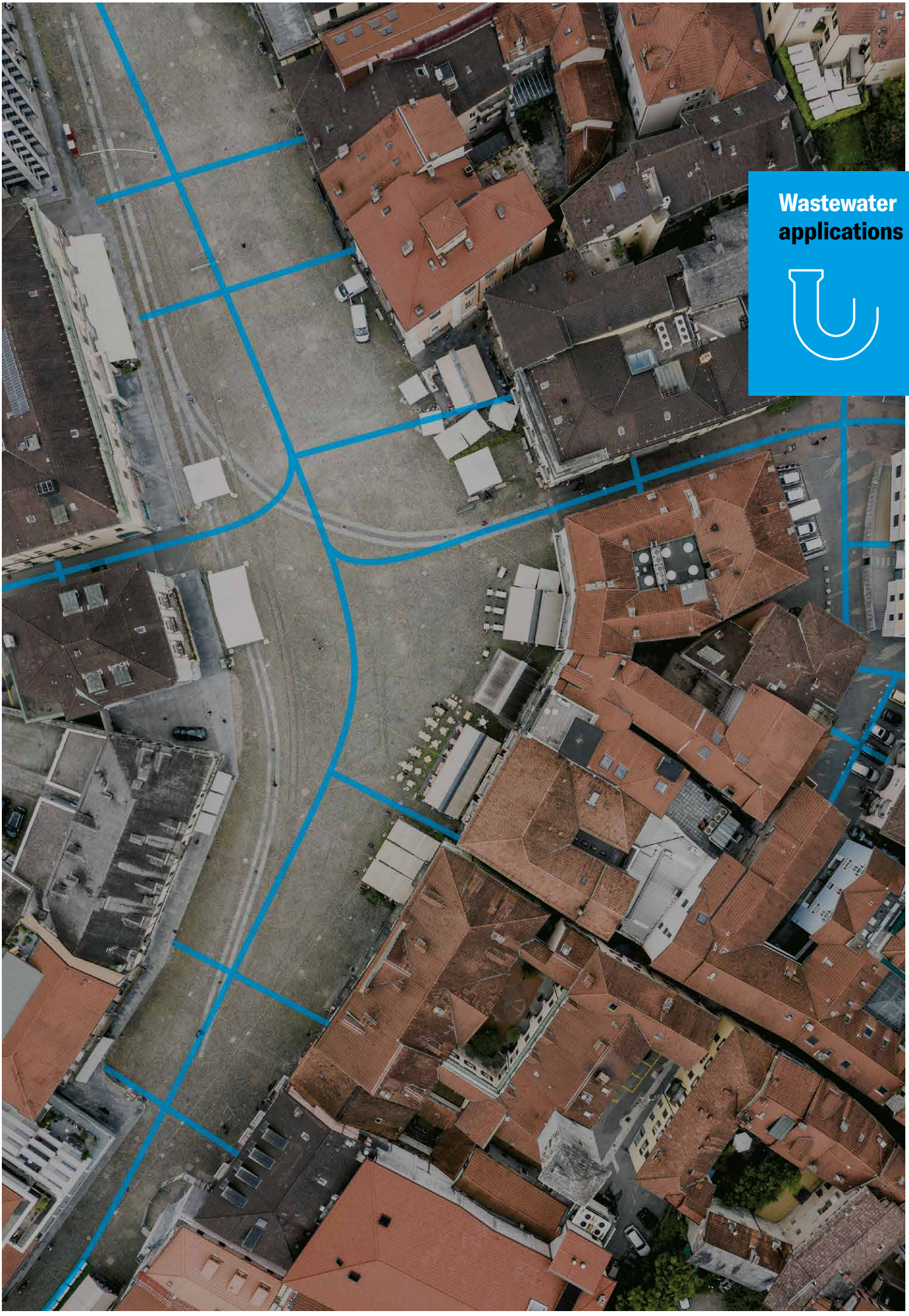
Accurate sewer construction guaranteed with NODIG technology

Sewer construction is subject to strict regulations to prevent polluted wastewater from seeping into the groundwater. To ensure that the pipes are absolutely watertight and in the correct position, the highest precision is required when laying sewer pipes. This precision is guaranteed with trenchless pipe installation using TRACTO technology, whether you are installing, renovating or replacing.

Trenchless to an intact sewer network - Replacement and renovation

In case of massive damage to sewer pipes, such as cracks or root ingrowth, repair is not the answer. The only lasting remedy is renewal. With our NODIG pipe bursting systems, this can be done without the disadvantages of conventional open construction. You can replace defective sewer pipes for transport or house connections without trenching, with minimal construction and financial outlay, and thus avoid ex- and infiltration in a gentle way. And if the damage is still repairable, you can use our versatile bursting systems to renovate or repair the sewer pipes using a variety of methods.



Wastewater applications

INTELLIGENT E-MOBILITY

EXPANDING E-MOBILITY WITH NODIG TECHNOLOGY –
ALL ADVANTAGES AT A GLANCE

- Our NODIG systems can be used wherever electric charging points for electric cars, e-scooters, etc. need to be installed or connected to the grid.
- Using the keyhole method, the pit can be used as the foundation for the charging station.
- With its minimally invasive approach, trenchless technology protects paved surfaces and infrastructure.
- Our NODIG systems for installing charging station cables are flexible and can be installed in any direction.
- Our trenchless technology is suitable for serial installation of EV charging stations on public and private property, as well as for connection to the sub-distribution of charging stations.
- Our tried and tested system technology offers intelligent and proven solutions, with perfectly matched accessories that guar antee maximum speed and economy in the expansion of electric mobility.

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**Efficient and low-emissions –
NODIG technology for electric mobility**

Electromobility plays an important key role in the energy transition to reduce greenhouse gas emissions. However, the acceptance of e-mobility, which is indispensable for achieving the upcoming climate targets, depends on a sufficient number of charging stations throughout the country. Trenchless technology offers an intelligent solution for efficiently installing the cables that supply power to electric vehicle charging stations in a low-emission way.

Trenchless expansion of the electromobility infrastructure

The intelligent NODIG systems are suitable for installing the protective conduits for power and control cables from the connection point (sub-distribution) to the EV charging station, as well as between the charging points. Trenchless technology is perfect for the installation of single and serial charging stations on public and private land. Also possible are: House connections, the wall box at home, e-charging stations in hotels, shopping centres or on the street, and lines for large triple chargers (e.g. at motorway service stations).

E-mobility applications

HIGH-PERFORMANCE PIPELINE CONSTRUCTION

PRODUCTIVE IN PIPELINE CONSTRUCTION –
THE ADVANTAGES OF OUR NODIG SYSTEMS AT A GLANCE

- Maximum productivity and high efficiency in pipeline construction with NODIG technology.
- Plastic or steel pipes can be installed professionallyalong roads, under traffic routes and waterways and surfaces of all kinds.
- Our technologyincludes non-steerable NODIG processes with spiral welded or seamless pipes as well as pipes with insulation protection such as long-distance gas pipelines.
- Using HDD Assist & Rescue techniques, pipelines can be in stalled in the most challenging conditions.
- Our environmentally friendly process guarantees short approval times and offers a high level of planning and technical safety.
- Trenchless installation allows precise verification of the position, function and position, function and tightness of the new pipeline.
- And: unlimited possibilities for underground pipeline construction.

  NODIG systems in use:
  - For pipelines of all dimensions, pressure levels and and materials.
  - For pipelines for transporting and distributing natural gas, crude oil, chemical products.
  - For installing district heating pipelines.
  - For urban pipeline construction.
  - For building culverts under rivers.
  - Installing pipelines for gasification systems and low pressure gas distribution systems.
  - Pipeline storage systems.
  - Supply and disposal pipelines for underground storage facilities (natural gas).
  - For the installation of water supply systems.

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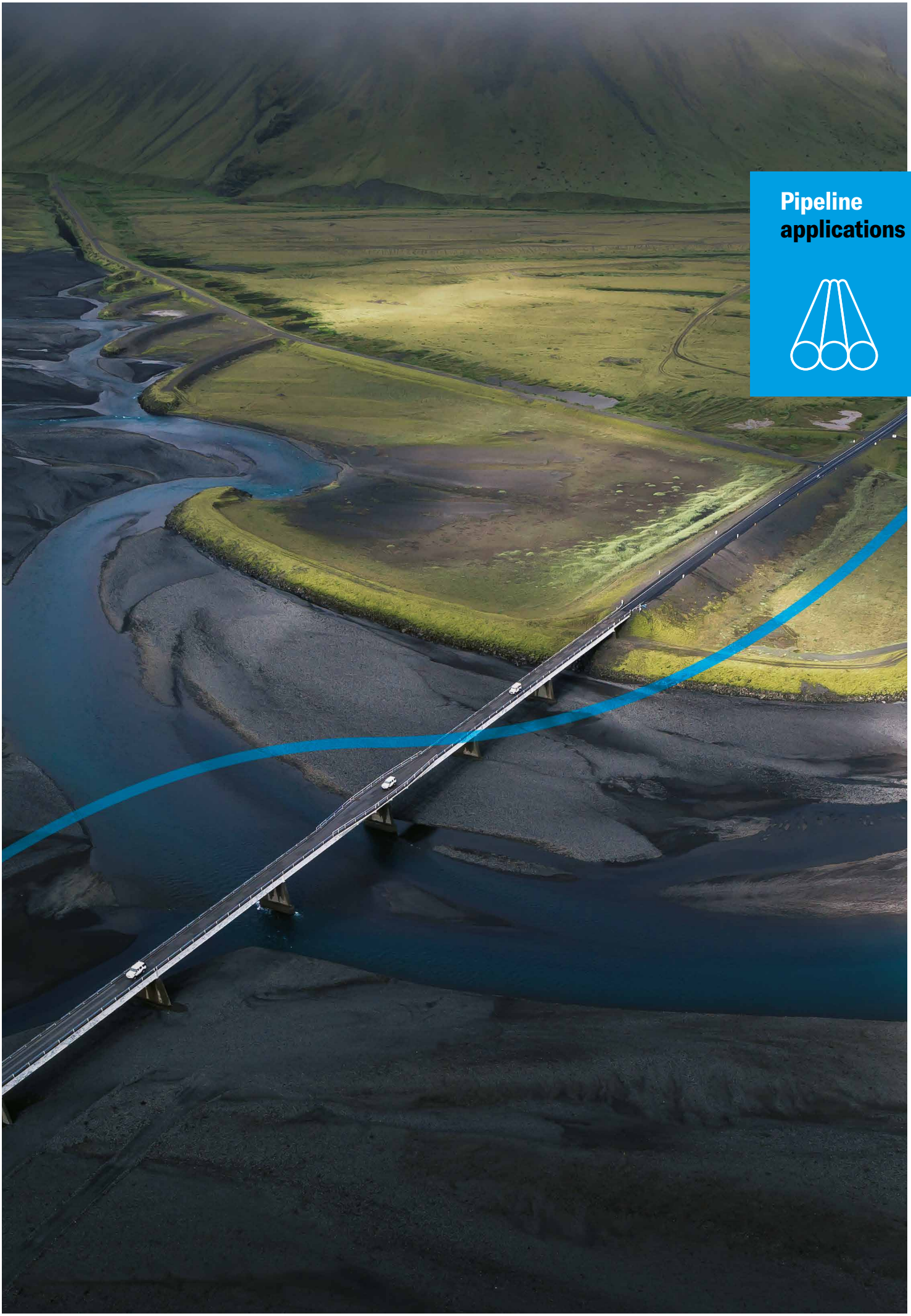
Trenchless technology for pipeline construction
Growing demand for energy requires reliable cross-border pipeline networks. In the case of oil and natural gas, the pipelines needed to transport it from the producer to the distributor are often thousands of kilometres long. The necessary routes often cannot be built as planned because environmental regulations or construction obstacles make implementation difficult. This is now a thing of the past thanks to powerful trenchless technology, which guarantees fast, gentle and efficient installation.

Efficient and successful – even when the going gets tough
No matter where, trenchless technology makes it possible to construct pipelines in built-up areas, under rivers and other bodies of water. Our GRUNDORAM horizontal rammers are even used successfully for complicated HDD bores in pipeline construction and under particularly difficult conditions - also known as “HDD Assist & Rescue”: NODIG systems can be relied upon to drill through protective casings and loosen stuck pipes, as well as to pull out drill rods or recover stuck product and protective pipes of any diameter.

Pipeline applications



PRODUCTIVE WIND FARMS

ECOLOGICALLY FRIENDLY, ECONOMICALLY SOUND - CONNECTING WIND POWER PLANTS WITH OUR NODIG SYSTEMS:

- A sustainable method with high economic efficiency and proven low consumption of natural capital.
- Underground installation is suitable for media pipes to transport electricity from onshore and offshore wind farms - under traffic routes and waterways and with short or long pipes made of all common materials.
- Also possible without trenches: Installing the pipelines that connect wind farms and wind turbines to each other and to the distributor that feeds the wind energy into the grid.
  into the grid.
- The space required to build the necessary pipelines for wind turbines is significantly reduced.
- The cost of building and extending the power grid to accommodate wind are easy to calculate.

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APPLICATIONS

Driving the energy transition - with wind farms and trenchless technology

Wind power plants are a mainstay of the energy transition and make a significant contribution to electricity supply. This potential needs to be tapped worldwide, not least because it is one of the most economical forms of renewable energy. The trenchless installation of media pipes, which enable the transport, distribution and connection of wind power plants to the grid, can develop this potential in an economically sensible and at the same time environmentally friendly way.

Minimum effort, more energy

Maximising the potential of efficient wind turbines: Our NODIG technology provides flexible methods to create a powerful grid with minimal effort and increase the availability of wind energy in the long term. This low-emission technology is an important part of the irreversible energy transition that is driving the expansion of wind farms, which are becoming increasingly popular with the public.

Wind farm applications

EFFICIENT
DISTRICT HEATING GRID EXPANSION

EFFICIENT AND FLEXIBLE – THE ADVANTAGES OF OUR NODIG SYSTEMS FOR DISTRICT HEATING PIPES

- The underground installation of flexible and rigid district heating pipes made of common materials can be carried out along roads, under traffic routes and waterways and along linear or flexible routes.
- The proven and flexible procedures ensure safe installation of different types of pipes in district heating construction.
- Parallel installation of supply and return pipes in district heating networks is possible.
- The NODIG technology takes into account the latest regulations and offers maximum planning and technical safety.
- Trenchless installation guarantees precise verification of the position, function and tightness of the new district heating pipes.

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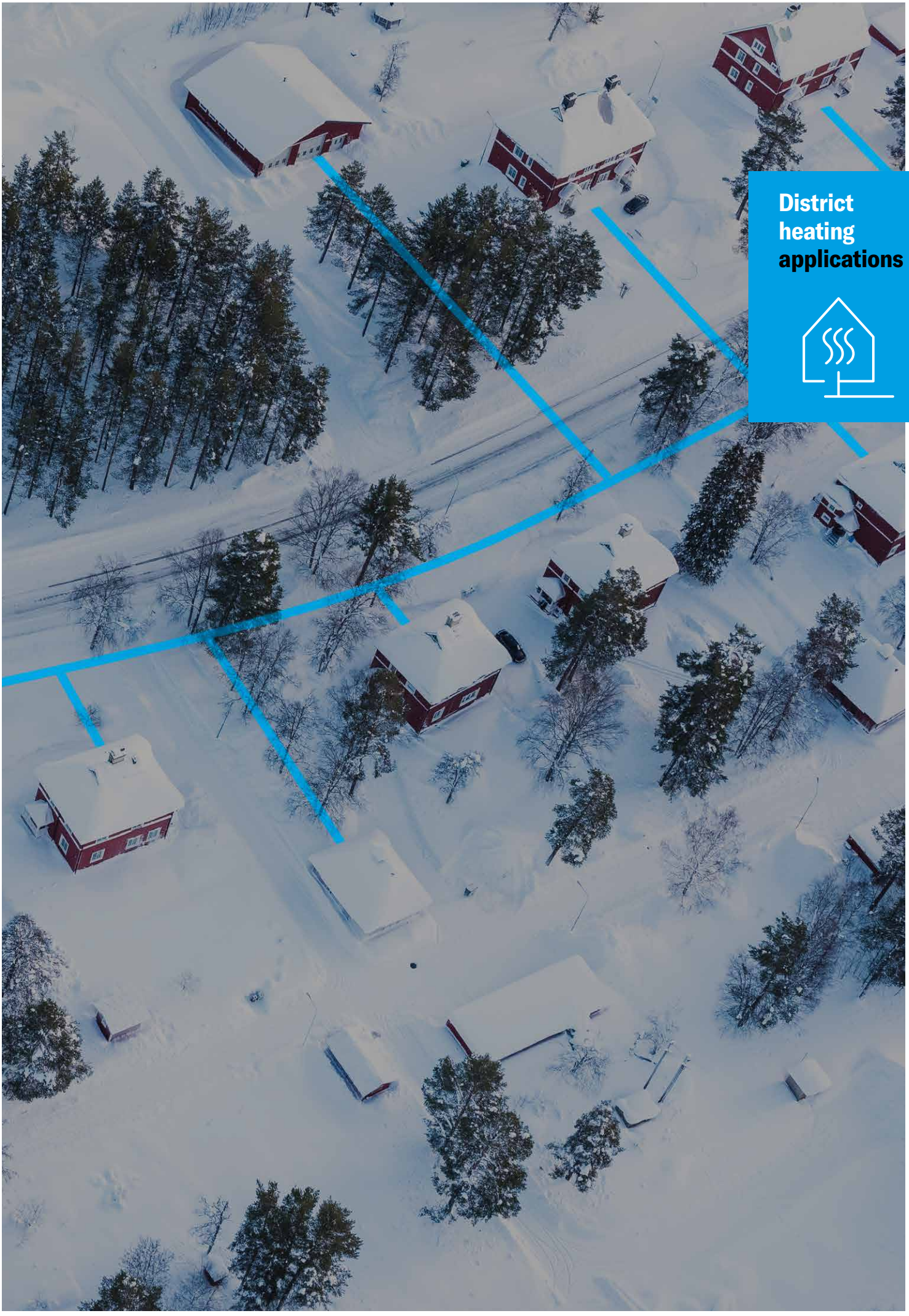
District heating pipelines: An efficient expansion that pays off

Of all energy sources, district heating still offers the greatest security of supply, but it is not available everywhere. The development of areas for district heating grids depends on both technical and economic aspects. Installing the important transport and supply pipelines without trenches makes it possible to construct district heating pipelines in an economically and ecologically efficient way - profitably and without heat loss.

District heating applications



FURTHER INNOVATIVE APPLICATIONS

OUR INNOVATIVE TRENCHLESS SOLUTIONS AT A GLANCE

- Tunnel construction: Trenchless technology efficiently supports tunnel construction when retrofitting inlets and outlets, optimising ridge protection or constructing pipe shields for new tunnels.
- Drainage construction: Drainage pipes to secure slopes, embankments or buildings can be installed gently and effectively underground.
- Mining: In mining, vertical drawdown wells or horizontal butt drains can be constructed efficiently without trenching.
- Well construction: Well construction benefits from NODIG technology in the construction of horizontal wells or wells for seawater extraction points or remediation of contaminated sites without the need for a shaft.
- Geotechnical engineering: In geotechnical engineering, trenchless technology makes it possible to efficiently drill anchor holes for the stabilisation of dams, dykes or rock walls, or to drill holes for subsidence, ground sealing or soil improvement.
- Service connection technology: Our specially developed telescopic tools can be used to disconnect and reconnect service connections or repair valve caps - all through a 65 cm diameter keyhole.
- Vertical applications: When used vertically, our NODIG systems can be used to easily install foundations and piles for sign gantries or noise barriers, but also to construct wells.

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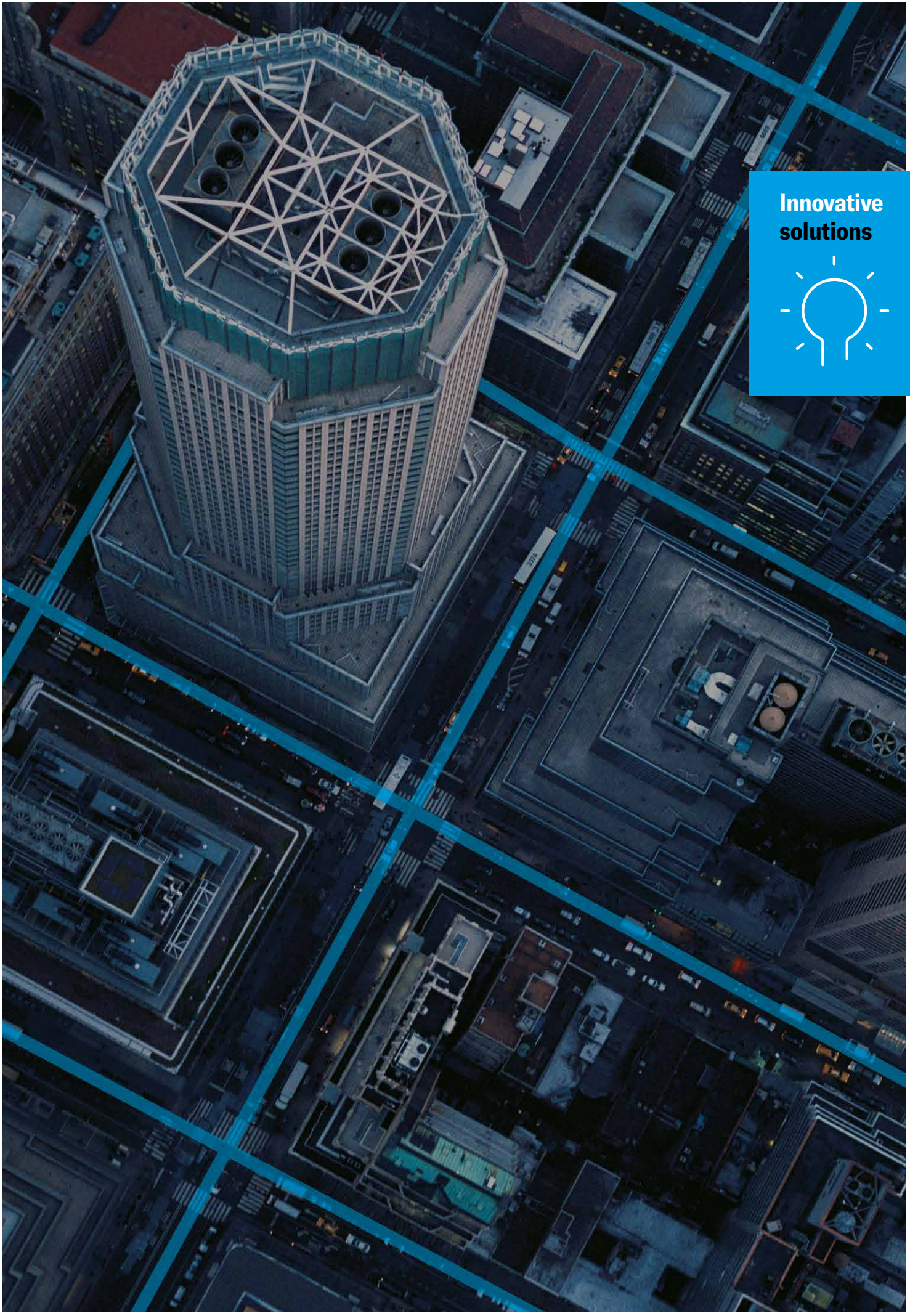
More than just pipeline construction – Innovative solutions with trenchless technology

As developers of a future technology, we are committed to developing flexible and efficient NODIG systems that deliver maximum value. That's why we always keep our ear to the market to find out what is needed in practice. With this knowledge, we have developed a broad repertoire of innovative solutions that go beyond the actual pipeline construction.

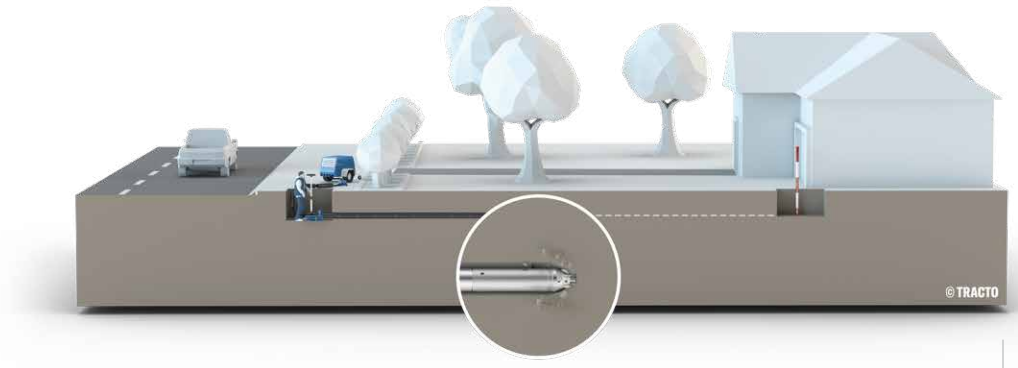
From tunnelling to site remediation – it can all be done without trenches

Whether horizontal or vertical, our trenchless technology is used in a wide range of applications outside of pipeline construction. Whether in tunnelling, drainage, mining, well drilling, service connection or vertical applications, our NODIG technology offers solutions that are not only surprisingly innovative, but also as sustainable and gentle as trenchless construction itself. All of these applications are not only technically advanced, but also practical and economical. The best proof of this are the individual, innovative solutions for project partners such as GDF Suez or SGN, which have resulted in award-winning products such as keyhole technology.


Innovative
solutions

HOUSE CONNECTION TECHNOLOGY

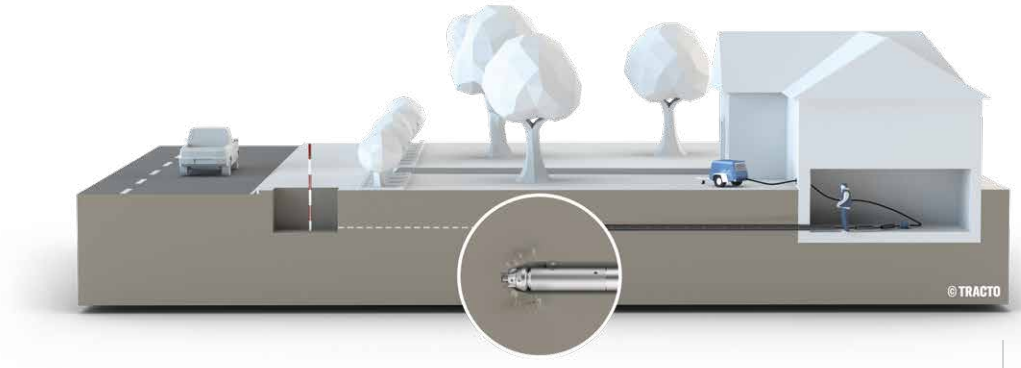
HOUSE CONNECTION: PIT – PIT



GRUNDOMAT

Method	Non-steerable soil displacement method
Lengths	Max. 25 m
Pipe diameter	Up to 160 mm
Pipe materials	PE, PP, PVC (short and long pipes)
Soil classes	1 - 5, displaceable soils

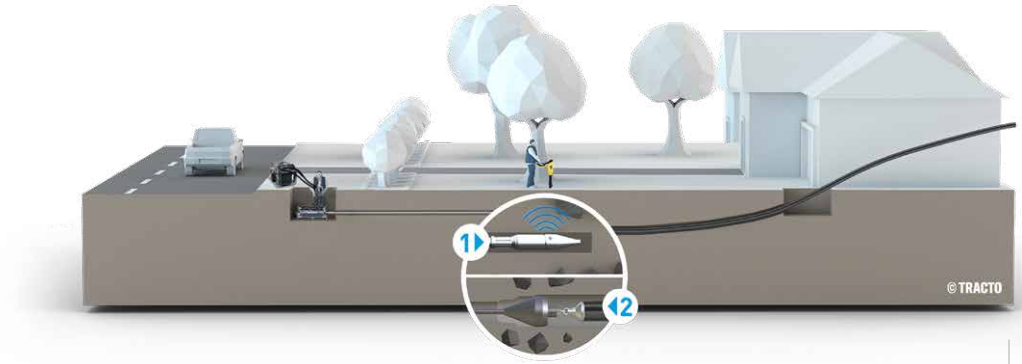
HOUSE CONNECTION: BASEMENT – PIT



GRUNDOMAT

Method	Non-steerable soil displacement method
Lengths	Max. 25 m
Pipe diameter	Up to 160 mm
Pipe materials	PE, PP, PVC (short and long pipes)
Soil classes	1 - 5, displaceable soils

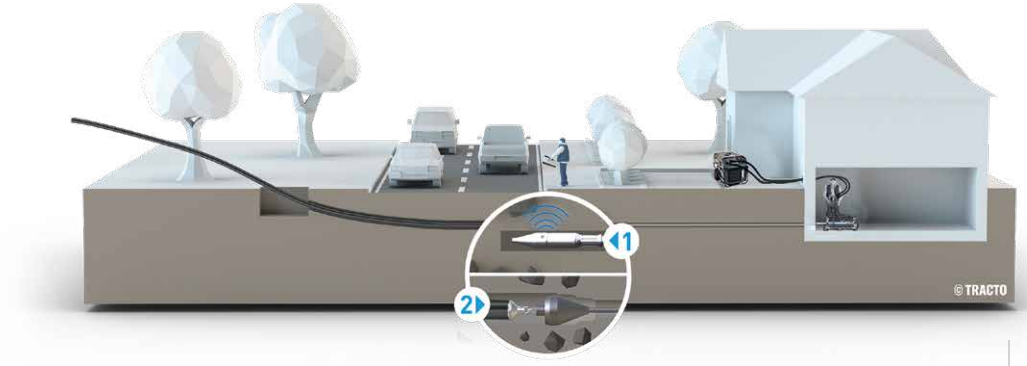
HOUSE CONNECTION: PIT – PIT



GRUNDOSTEER

Method	Guided rod pudhing method
Lengths	Max. 25 m
Pipe diameter	Max. 100 mm
Pipe materials	PE, PP, PVC (short and long pipes)
Soil classes	1 - 5, displaceable soils, up to medium density

HOUSE CONNECTION: BASEMENT – PIT

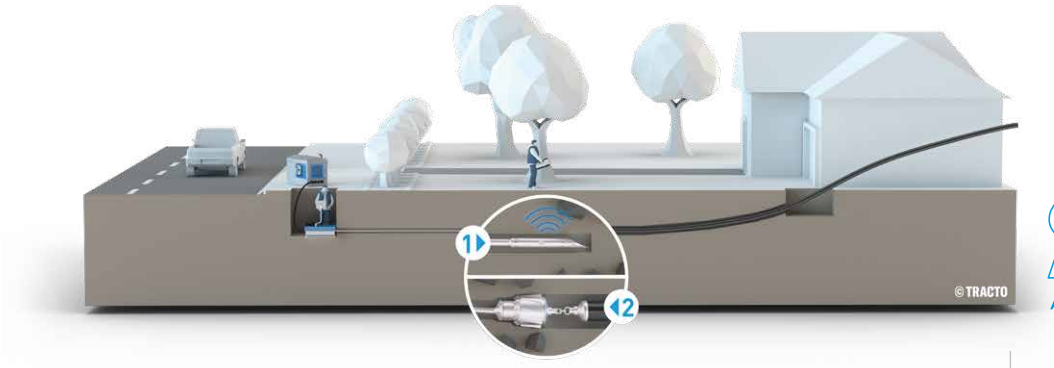


GRUNDOSTEER

Method	Guided rod pudhing method
Lengths	Max. 25 m
Pipe diameter	Max. 100 mm
Pipe materials	PE, PP, PVC (short and long pipes)
Soil classes	1 - 5, displaceable soils, up to medium density

HOUSE CONNECTION TECHNOLOGY

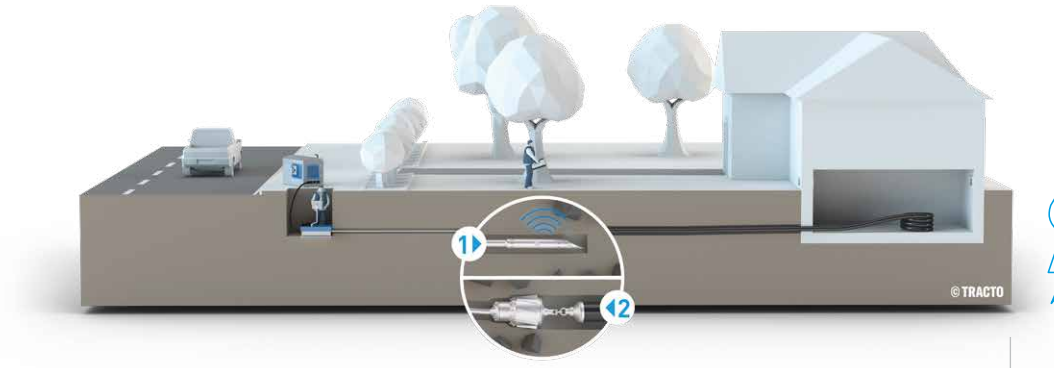
HOUSE CONNECTION: PIT – PIT



GRUNDOPIT

Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 100 m
Pipe diameter	200 mm
Pipe materials	PE, PP, steel, cast iron
Soil classes	1 - 6

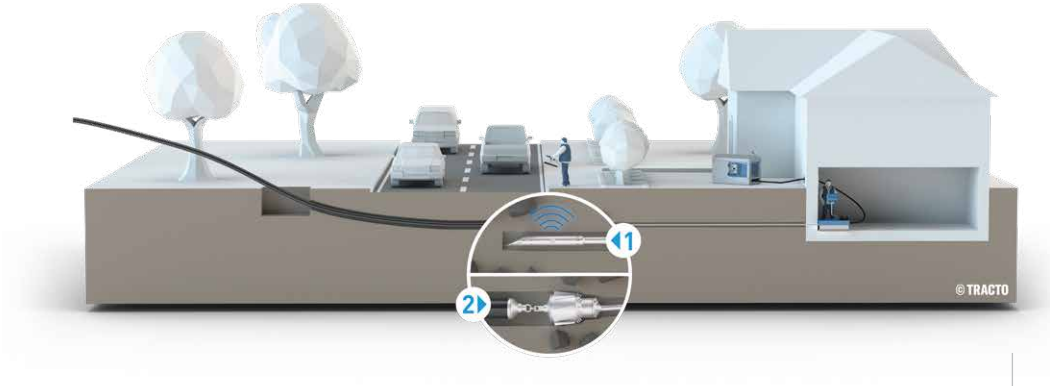
HOUSE CONNECTION: PIT – BASEMENT



GRUNDOPIT

Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 100 m
Pipe diameter	200 mm
Pipe materials	PE, PP, steel, cast iron
Soil classes	1 - 6

HOUSE CONNECTION: BASEMENT – PIT

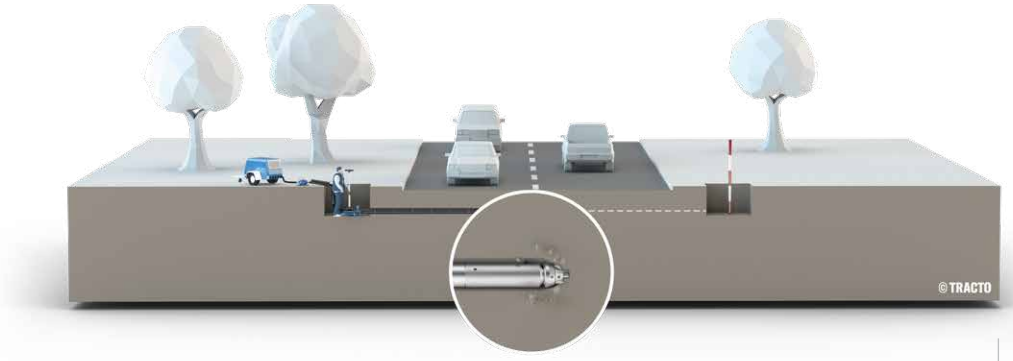


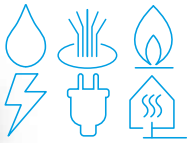
Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 100 m
Pipe diameter	200 mm
Pipe materials	PE, PP, steel, cast iron
Soil classes	1 - 6

GRUNDOPIT
PS40

NEW PIPE INSTALLATION

CROSSING TRAFFIC ROUTES





GRUNDOMAT

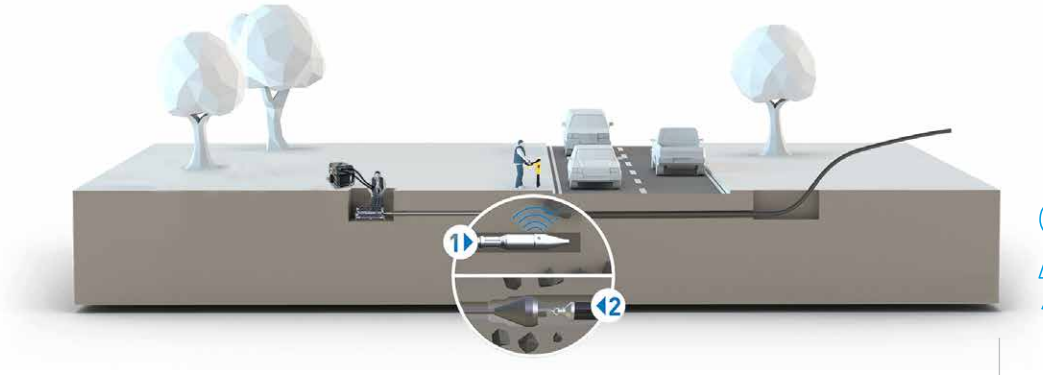
Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 25 m
Pipe diameter	Up to 160 mm
Pipe materials	PE, PP, PVC, steel, cast iron
Soil classes	1 - 5, displaceable soils

CROSSING TRAFFIC ROUTES

GRUNDORAM

Method	Non-steerable dynamic pipe ramming
Lengths	Max. 100 m
Pipe diameter	Up to 4000 mm
Pipe materials	Steel
Soil classes	1 - 5

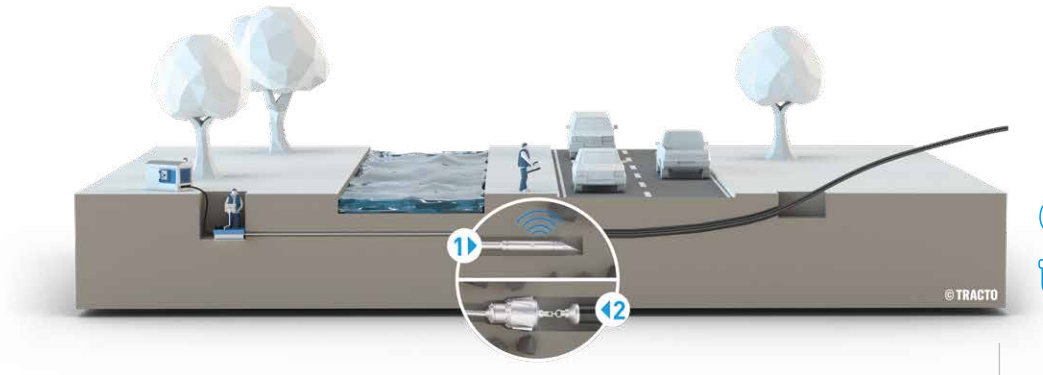
CROSSING TRAFFIC ROUTES



GRUNDOSTEER

Method	Guided rod pudhing method
Lengths	Max. 25 m
Pipe diameter	Max. 100 mm
Pipe materials	PE, PP, PVC (short and long pipes), PA12
Soil classes	1 - 5, displaceable soils, up to medium density

CROSSING TRAFFIC ROUTES AND WATERWAYS

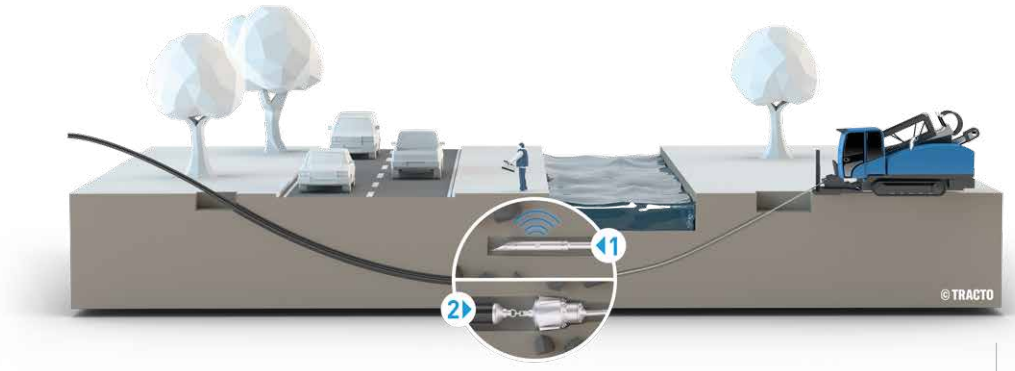


GRUNDOPIT

Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 100 m
Pipe diameter	32 - 160 mm
Pipe materials	PE, PP, steel, cast iron
Soil classes	1 - 6

NEW PIPE INSTALLATION

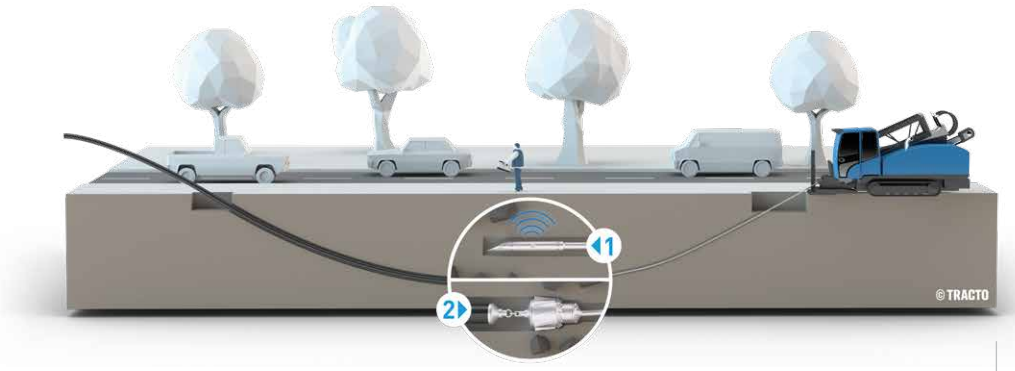
CROSSING TRAFFIC ROUTES AND WATERWAYS



Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 500 m
Pipe diameter	Up to 710 mm
Pipe materials	PE, PP, steel, cast iron
Soil classes	1 - 7

GRUNDODRILL

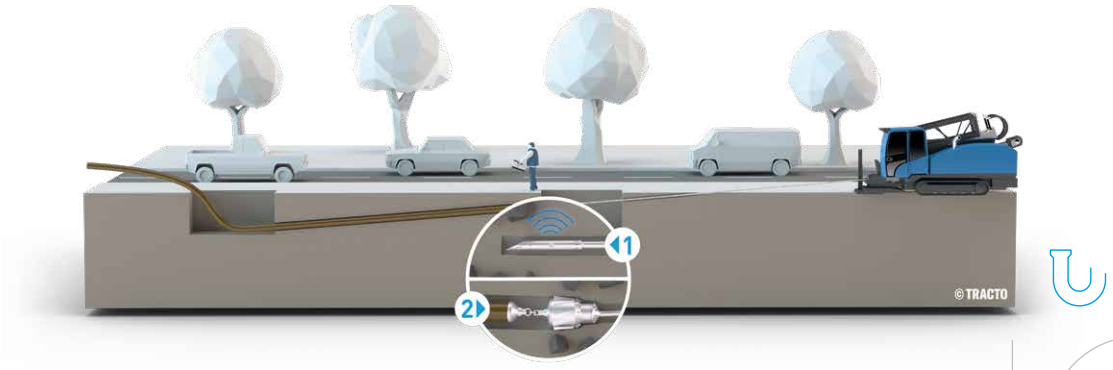
LONGITUDINAL INSTALLATION



Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 500 m
Pipe diameter	Up to 710 mm
Pipe materials	PE, PP, steel, cast iron
Soil classes	1 - 7

GRUNDODRILL

GRAVITY PIPES



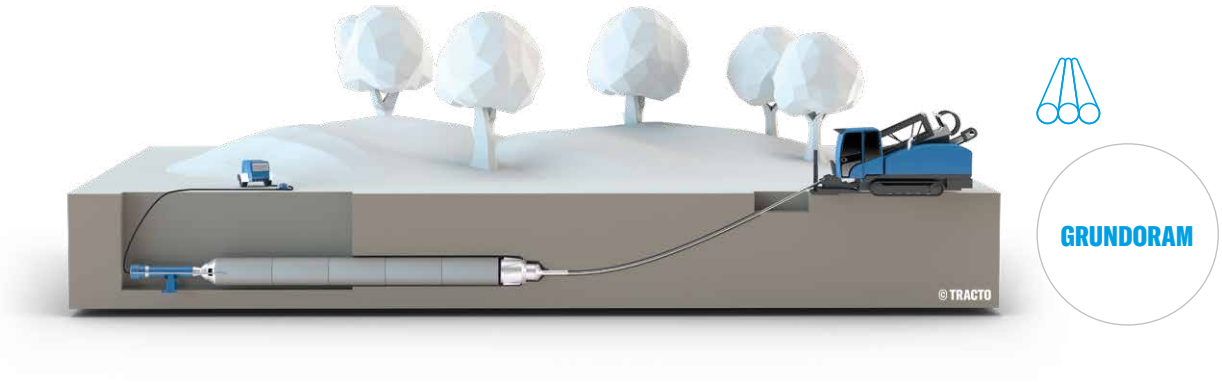
Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 500 m
Pipe diameter	Up to 710 mm
Pipe materials	PE, steel, ductile
Soil classes	1 - 7

GRUNDODRILL

SPECIAL APPLICATIONS
HDD ASSIST & RESCUE

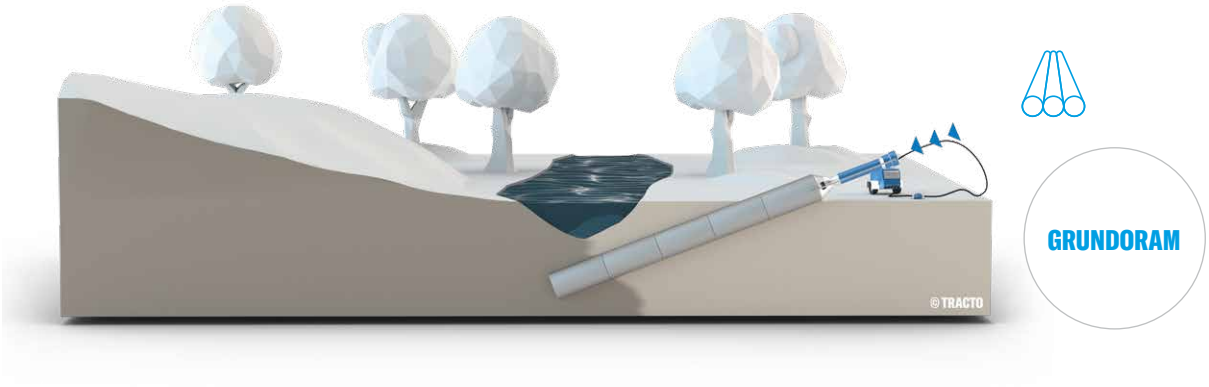
Method	Non-steerable dynamic pipe ramming
Pipe diameter	Up to 4000 mm
Pipe materials	Steel
Soil classes	1 - 5

HDD-ASSIST: PULL-BACK ASSIST



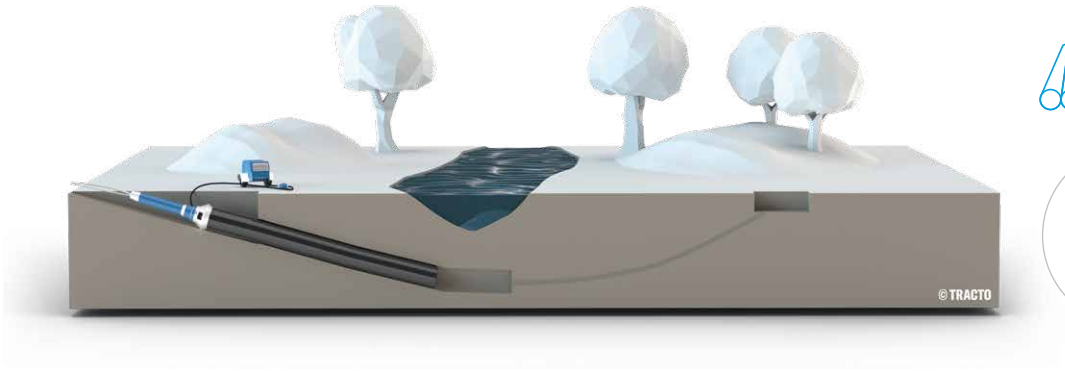
GRUNDORAM

HDD-ASSIST: CONDUCTOR BARREL



GRUNDORAM

HDD-ASSIST: BORE SALVAGE



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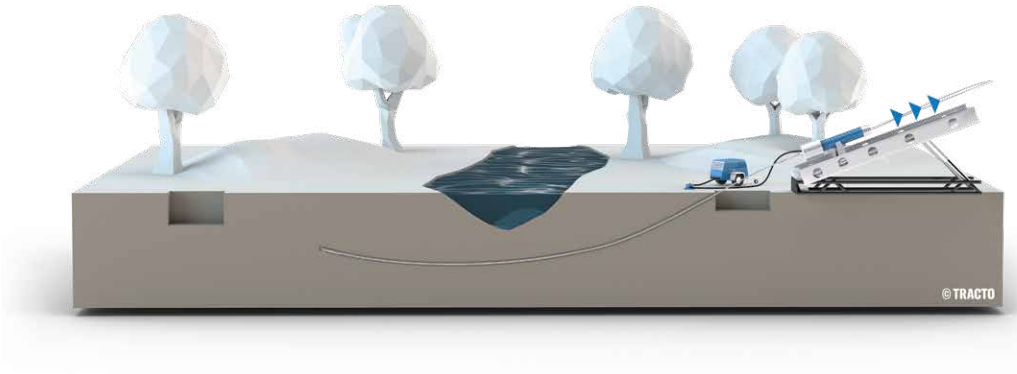
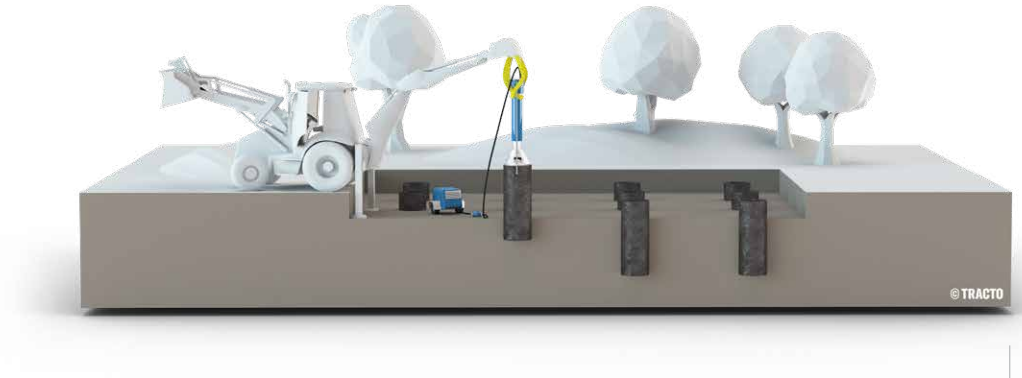
HDD-RESCUE: DRILL ROD RECOVERY



GRUNDORAM

VERTICAL APPLICATION

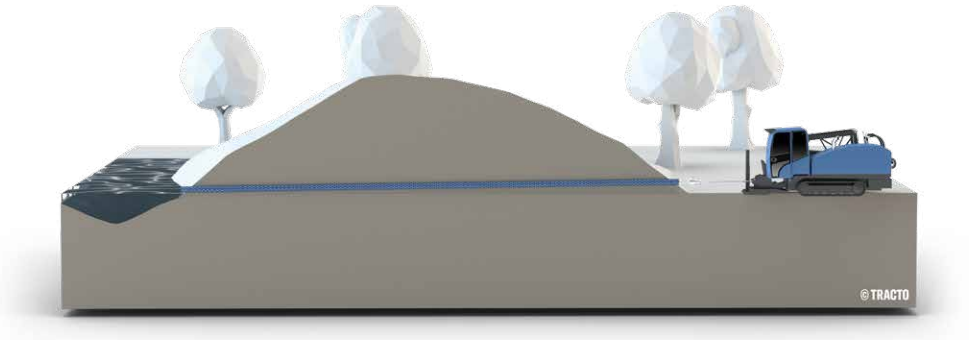


GRUNDORAM

Method	Foundations and pilings, well construction

MORE INNOVATIVE SOLUTIONS

DRAINAGE CONSTRUCTION (E.G. DYKE, SLOPE, LANDFILL)

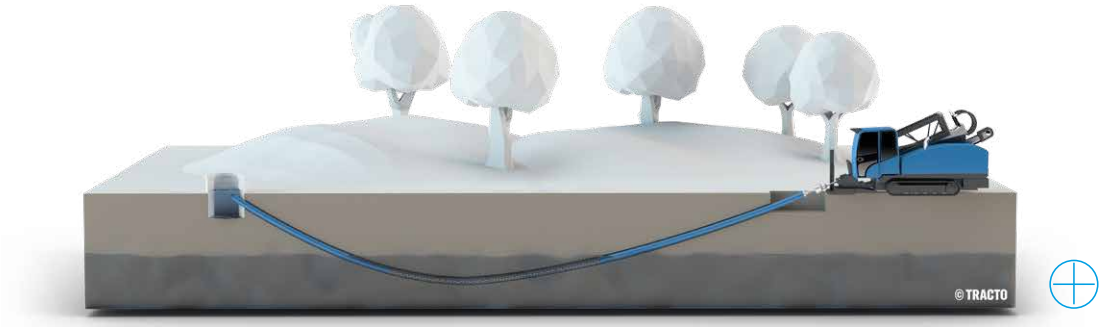


Method	Steerable Horizontal Directional Drilling
Lengths	Max. 500 m
Pipe diameter	63 - 710 mm
Pipe materials	PE, PP
Soil classes	1 - 7, homogeneous soils a cc. to DIN 18324

In drainage construction, drainage pipes for securing slopes, dykes or buildings can be laid vibration-free and gently. In geotechnical engineering, trenchless anchor holes can be selectively placed to stabilise dams, dykes or rock walls, and holes can be drilled for subsidence or base sealing as well as for soil improvement.

GRUNDODRILL

WELL CONSTRUCTION

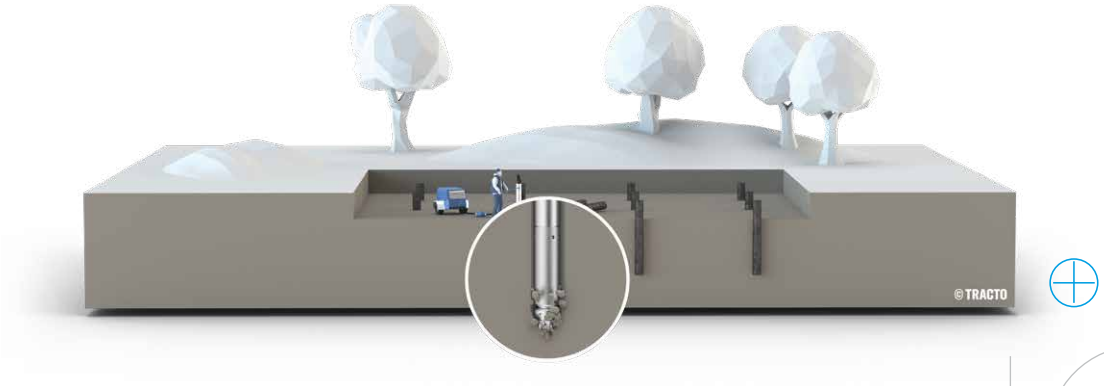


GRUNDODRILL

Method	Steerable Horizontal Directional Drilling method
Lengths	Max. 500 m
Pipe diameter	32 - 710 mm
Pipe materials	PE, PP
Soil classes	1 - 7, homogeneous soils a cc. to DIN 18324

In well construction, trenchless drilling technology allows, among other things, the construction of horizontal wells and wells for seawater extraction points, remediation of contaminated sites even in difficult geological conditions and shallow waters without the need for a manhole.

VERTICAL INSERTS



GRUNDOMAT

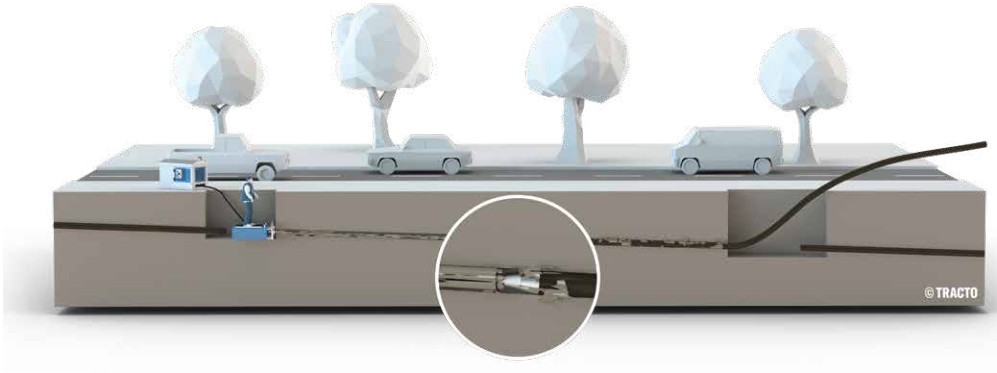
Procedure	Pile foundations

PIPE REHABILITATION

PIPE RENEWAL USING THE BURSTING METHOD WITH INSERTION OF A NEW PIPE OF THE SAME SIZE OR LARGER

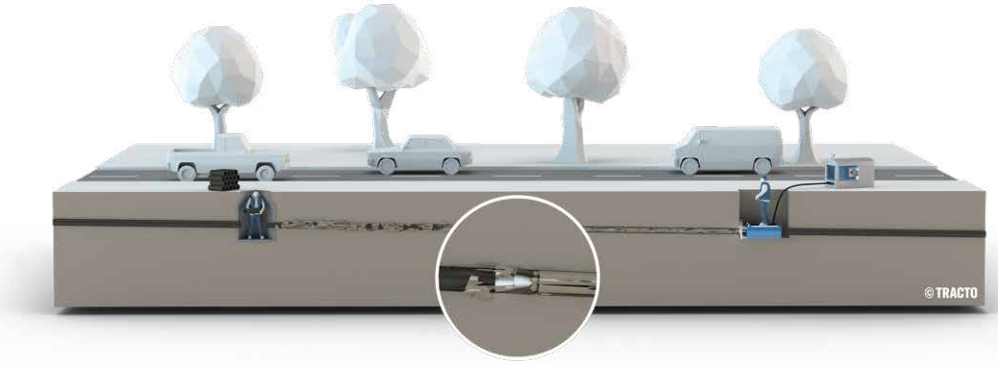
Static bursting procedure
In the static bursting procedure, pressure and gravity pipes are replaced with new pipes with the same or larger cross-section in the existing route. First, a bursting rod is pushed through the old pipeline with the hydraulically operated GRUNDOBURST. When the rod is pulled back, the old pipe is destroyed and at the same time the new pipe is pulled into the existing route. In addition to the static bursting method, the GRUNDOBURST bursting rigs can also be used for pipe rehabilitation by means of calibre bursting, relining, TIP or reduction methods.

PIT – PIT



GRUNDOBURST

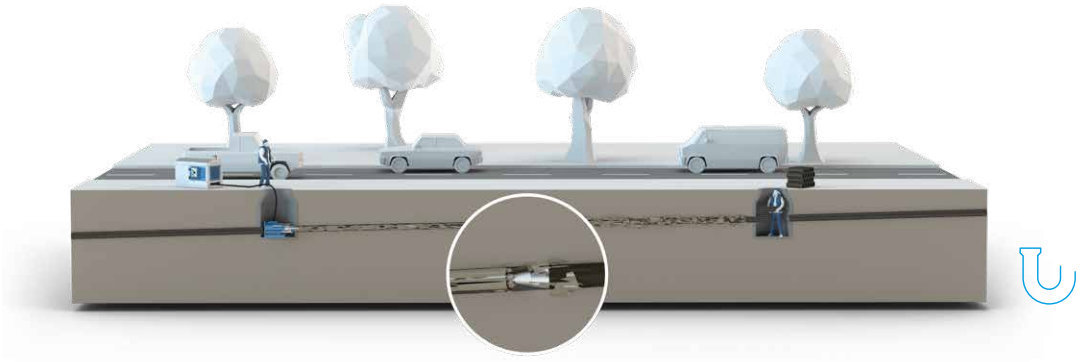
PIT – MANHOLE



GRUNDOBURST

Method	Static bursting method
Lengths	Max. 300 m
Pipe diameter	50 - 1.200 mm
Pipe materials – old pipe	Cast iron, ductile cast iron, asbestos cement, fibre cement, PE/PP, PVC, glass-fibre reinforced plastics (GRP), steel, liner
Pipe materials – new pipe	PE/PP, PVC, glass fibre reinforced plastics (GRP), ductile cast iron, steel
Soil classes	Old pipe passable for rods

MANHOLE – MANHOLE



Method	Static pipe bursting method
Lengths	Max. 50 m
Pipe diameter	50 - 400 mm
Pipe materials – old pipe	Cast iron, ductile cast iron, asbestos cement, fibre cement, PE/PP, PVC, glass-fibre reinforced plastics (GRP), steel, liner
Pipe materials – new pipe	PE/PP, PVC, glass fibre reinforced plastics (GRP), ductile cast iron, steel
Soil classes	Old pipe passable for rods

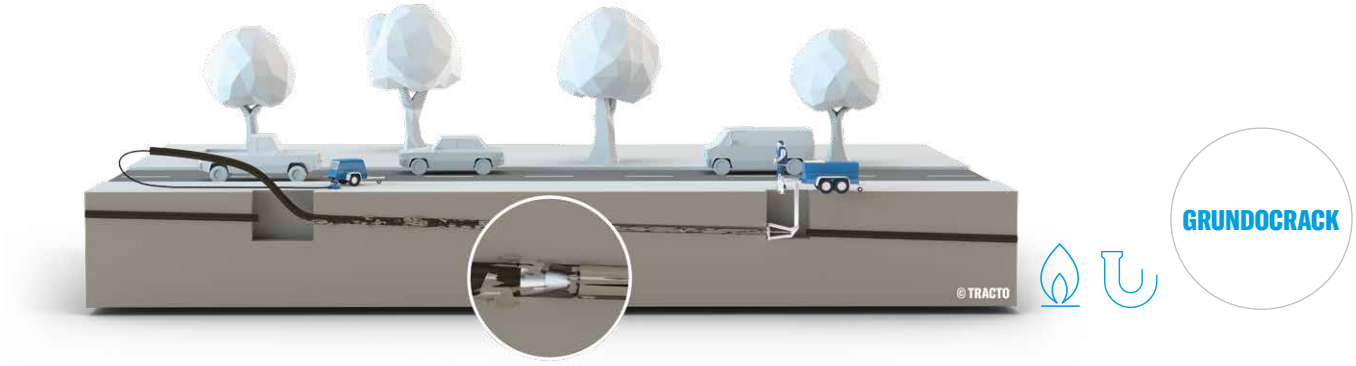
GRUNDOBURST
400S

PIPE REHABILITATION

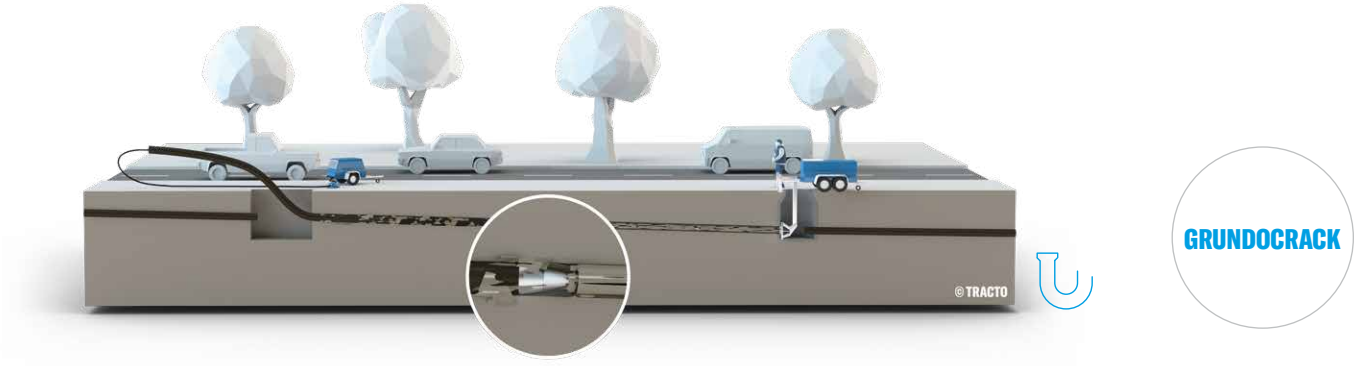
PIPE RENEWAL USING THE BURSTING METHOD WITH INSERTION OF A NEW PIPE OF THE SAME SIZE OR LARGER

Dynamic bursting method
With the dynamic bursting method, old pipes made of brittle materials are destroyed and simultaneously replaced with new pipes of the same or larger nominal size. The pneumatically driven GRUNDOCRACK destroys the old pipe during feeding and drives out the fragments into the surrounding soil in a radial direction. At the same time, the route for the new pipe is expanded. The tensile force of a winch supports the cracker and ensures safe guidance through the given pipeline route.

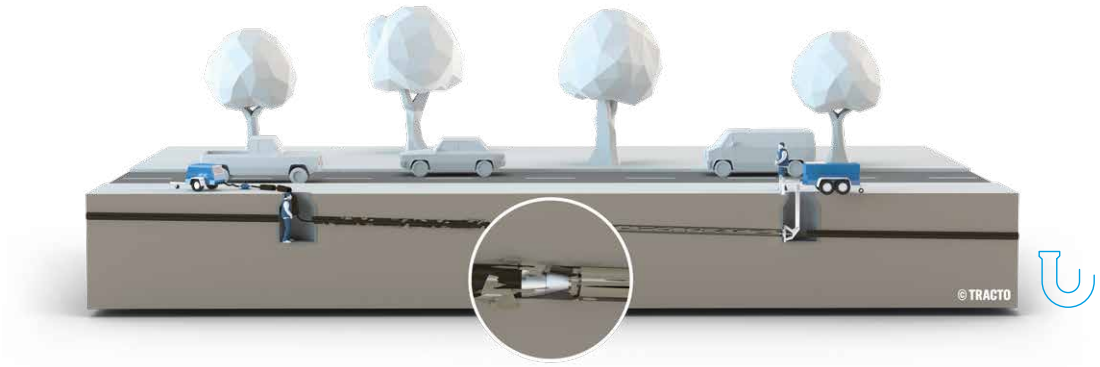
PIT – PIT



PIT – MANHOLE



MANHOLE – MANHOLE



Method	Dynamic burst lining
Lengths	Max. 300 m
Pipe diameter	Up to 508 mm
Pipe materials – old pipe	Concrete, reinforced concrete, stoneware, cast iron, PVC, asbestos cement, fibre cement
Pipe materials – new pipe	Steel, PE/PP, PVC
Soil classes	Old pipe passable for cable pull

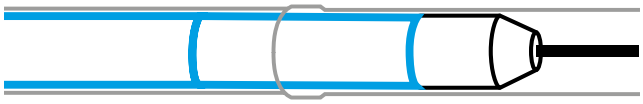
GRUNDOCRACK

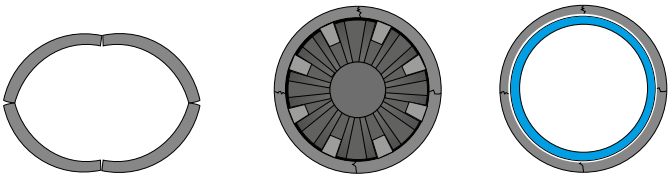
PIPE REHABILITATION

RENOVATION USING THE TIP METHOD, REDUCTION METHOD OR RELINING BY PULLING IN A SMALLER NEW PIPE.

TIP method

The TIP process (Tight-In-Pipe Lining process) with prefabricated pipes is used for the renovation of sewers and depressurised pipes made of vitrified clay, concrete and fibre cement (including asbestos fibre cement). The use of this method with other pipe materials must be checked in each individual case. In the TIP method, prefabricated single pipes or pipe strings are inserted into the old pipe. The new pipe has only a slightly reduced cross section compared to the old pipe. A small annular gap is left which does not need to be filled. Special pipes with dimensions adapted to the inside diameter of the old pipe are used. Deformations of up to approx. 25% and pipe offsets of up to 10% in the old pipe are reshaped by a leading calibration head and the pipe is renovated/renewed by the TIP method. method.

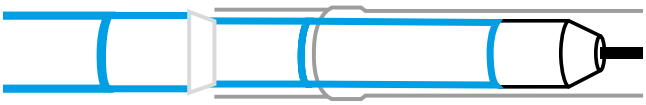


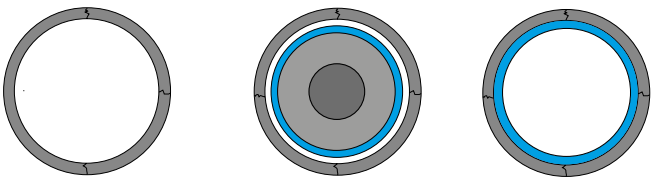


OLD PIPE CALIBRATION NEW PIPE

Reduction method

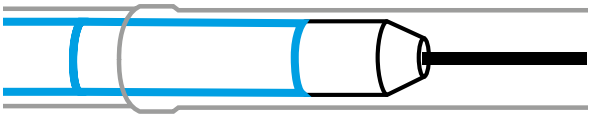
The reduction method is a lining method using prefabricated pipes without an annular gap. During the process, special pipes are evenly pulled through a conical die on site under constant tensile stress and reduced in diameter by approximately 10% to 12% so the new pipe can be pulled through the old pipe of the same nominal diameter. After pulling, the pipe returns to its original shape resp. close to the inside diameter of the old pipe. The method is used for both depressurised and pressurised pipes.

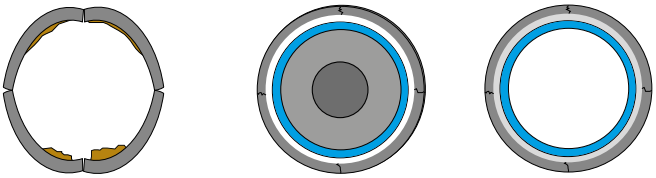




OLD PIPE PIPE INSTALLATION NEW PIPE

Pipe relining
With relining, prefabricated single pipes or long pipe strings of smaller diameter are continuously pulled into the old pipe. Longer sections of up to 1 km are possible with this method. Once the pipe has been pulled in, an annular space is left which has to be filled afterwards.





OLD PIPE PIPE INSTALLATION NEW PIPE

FUTURE TECHNOLOGY FOR THE INFRASTRUCTURE OF TOMORROW

Our mission is to establish Advanced Trenchless Technology as the new standard in pipeline construction worldwide. We see ourselves as designers and innovators of a future technology, because with TRACTO pipes are installed and renewed without trenching - resource-saving, climate-friendly and sustainable.

TRACTO laid the foundations for the trenchless future more than sixty years ago, when our founder's vision became reality with the invention of the GRUNDOMAT soil displacement hammer: Long trenches were no longer necessary to safely install pipes underground. This milestone was followed by other unique NODIG solutions under the trademark of the mole, which since then has stood for high-performance premium products "Made in Germany". With the innovative power of a technology leader, we have consistently developed the 'mole technology' and today offer intelligent trenchless solution for every task in pipeline construction, which can be used in complex infrastructures and difficult geologies in a safe and profitable way. Because we always think sustainability, profitability and efficiency together.

The vision of a sustainable technology:
Minimum intervention, maximum effect
A changing world requires new technologies, energy concepts and connections to develop infrastructure in a sustainable way, while minimising negative environmental impacts. Compared to traditional open trench construction, trenchless technology is ideal in many ways: It protects surfaces, consumes fewer resources, reduces noise, CO2 and particulate emissions, shortens construction times and saves costs. That is why TRACTO is committed to the increased use of this future technology, both nationally and internationally. At the same time, we are using our expertise to further advance NODIG technology. With the possibilities of digitalisation, we are now working on the vision of autonomous drilling.

TRACTO Application videos at

TRACTO.COM/
APPLICATIONS

WHY DIG TRENCHES WHEN THERE ARE BETTER SOLUTIONS?

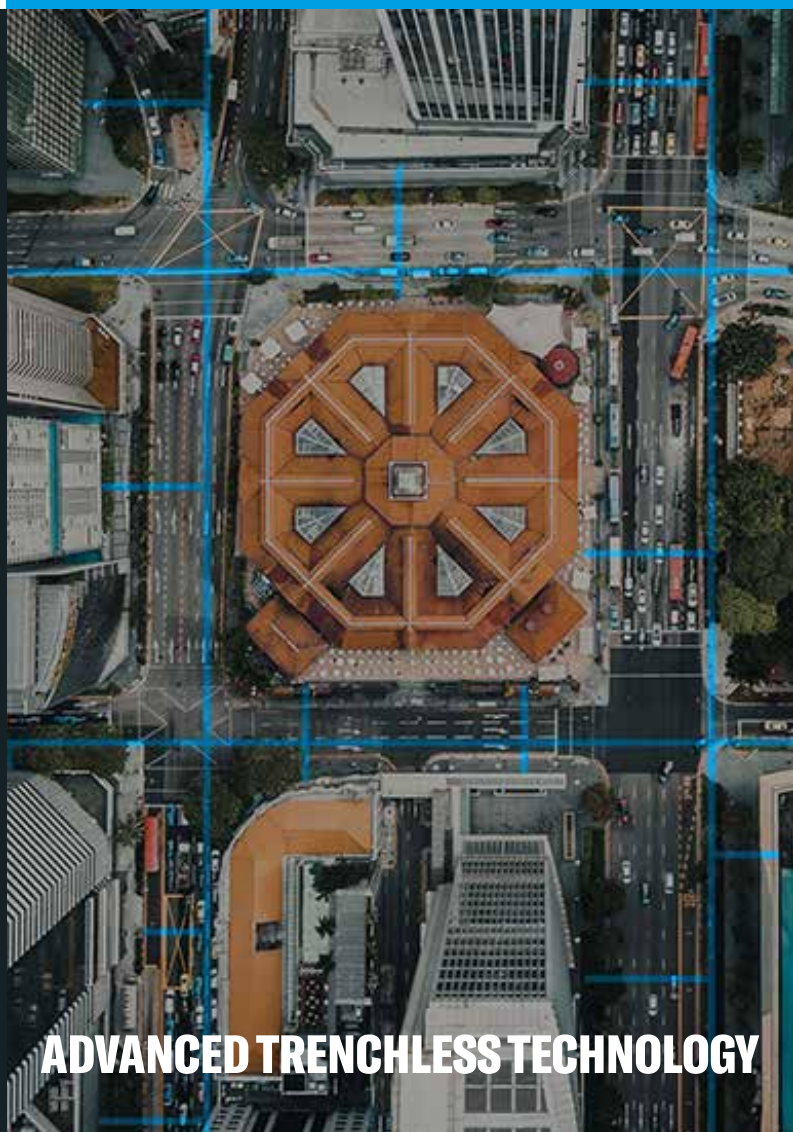
TRACTO.COM

THE WORLD IS CHANGING.

Our cities are growing faster than ever. New technologies and energy concepts require new networks. We need to expand and improve our infrastructure. At the same time, it is more important than ever to take full and consistent account of the environmental impacts of growth and renewal.

MISSION

Our mission is to significantly reduce the negative impacts and consequences resulting from infrastructure expansion. That is why we develop and build the world's best trenchless products. That is why we promote and inspire this technology of the future wherever we can. That is why we are committed to its expansion at all levels.



ADVANCED TRENCHLESS TECHNOLOGY

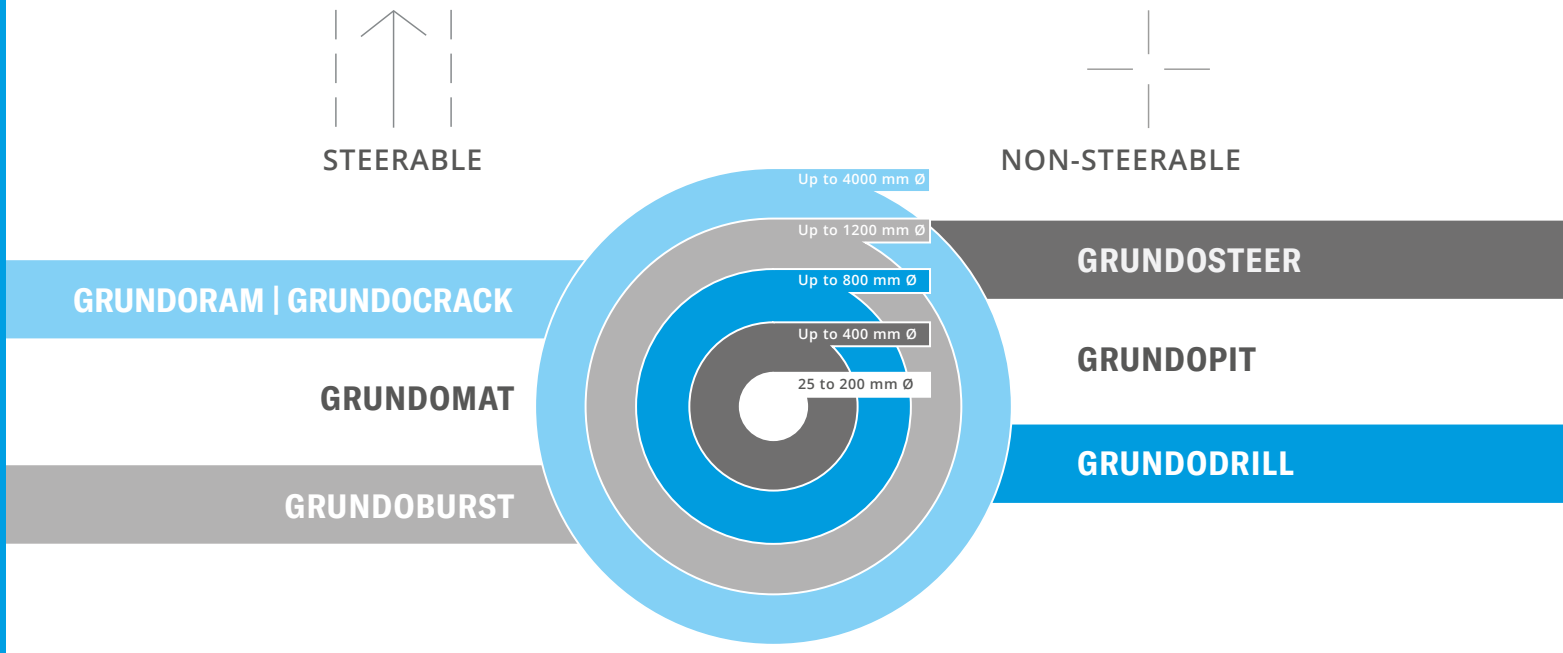
TRACTO PRODUCT DIVERSITY
FOR THE PIPELINE CONSTRUCTION OF THE FUTURE

Our resource-saving and sustainable NODIG technology is ideal for the construction and maintenance of modern pipeline infrastructures of all kinds. Trenchless technology from TRACTO means powerful NODIG systems that are flexible in use and reliable in operation. Our product portfolio includes all common methods of underground pipeline construction as well as innovative special solutions. Everything is 100% TRACTO, which means Guaranteed long life, high quality, extremely versatile, low maintenance and state of the art.

Services and consulting for clients
First-class global service with customised consulting and support is a matter of course for us. Our Trenchless Development service informs planners, municipalities and associations, network operators and utility companies about the numerous advantages and possibilities of trenchless technology and supports them by providing tender documents for specific projects. Our Special Civil Engineering Service (STS) for Application Technology demonstrates the NODIG systems live on site, provides on-site support during use and instructs on special applications.

Quality made by TRACTO
Our soil displacement hammers, HDD bore rigs, pile drivers and bursting systems are used all over the world for supply and disposal and meet the highest environmental standards.

- GRUNDOMAT Soil displacement hammers: non-steered pipe installation ND 25 to 200 mm
- GRUNDORAM Horizontal rammers non-steered steel pipe installation up to ND 4000 mm
- GRUNDOPIT Mini HDD rigs: directional drilling up to ND 200 mm
- GRUNDODRILL HDD rigs: directional drilling up to ND 710 mm
- GRUNDOBURST Bursting systems: static pipe renewal up to ND1200 mm
- GRUNDOCRACK Bursting systems: dynamic pipe renewal up to ND 500 mm



STORIES NODIG in use worldwide

TRACTO.COM/STORIES

GRUNDOMAT
Soil displacement hammers

GRUNDORAM
Horizontal rammers

GRUNDOPIT
Mini HDD rigs

GRUNDODRILL
HDD rigs

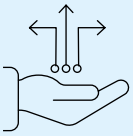
GRUNDOSTEER
Guided rod pushers

GRUNDOCRACK
Dynamic pipe bursting systems

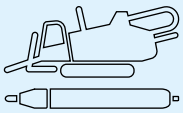
GRUNDOBURST
Static pipe bursting systems

FULL SERVICE FOR TRENCHLESS TECHNOLOGY

Whether its before, during or after the purchase, whether in person or online – we are always at your side with advice and support. Our wide-ranged service is specially tailored to the requirements of trenchless pipe installations, so you can concentrate fully on your core business.



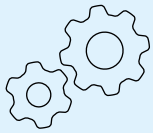
Digital Solutions
Our website offers you the whole world of trenchless technology in digital form. Find out more about our company, our products and their applications. Discover the digital tools for the HDD drilling technology and many other intelligent solutions. Always stay up to date by using the links to our social media channels. Or you can order machines, accessories and spare parts in our eSHOP – easy and conveniently via PC, smartphone or tablet.



Nodig Product Specialists
You can truly rely on our product specialists for all technical questions regarding the function and application of our steerable and non-steerable NODIG-systems. With comprehensive knowledge in each of their special fields, you can be sure they will find the best solution for your trenchless projects and advise you competently on setting up your jobsite.

Financing
We offer attractive financing solutions for new and used machines to our customers and sales partners through the TRACTO-TECHNIK Finance GmbH. Be it financing, hire purchase, various types of leasing or insurance: we provide extensive expert advice, individually and personally, in order to find the tailored solution for you. Discretion goes without saying.

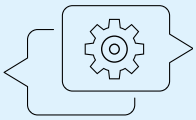
Training
Qualified training enables you to apply trenchless technology even more effectively and profitably. Our wide range of training courses for machine operators, construction professionals as well as planners and clients cover all aspects of NODIG technology, including special topics. Certified trainers also instruct you, in theory and practice according to your individual requirements, either at one of our numerous company locations, or directly on your own premises or online, independent of time and place.



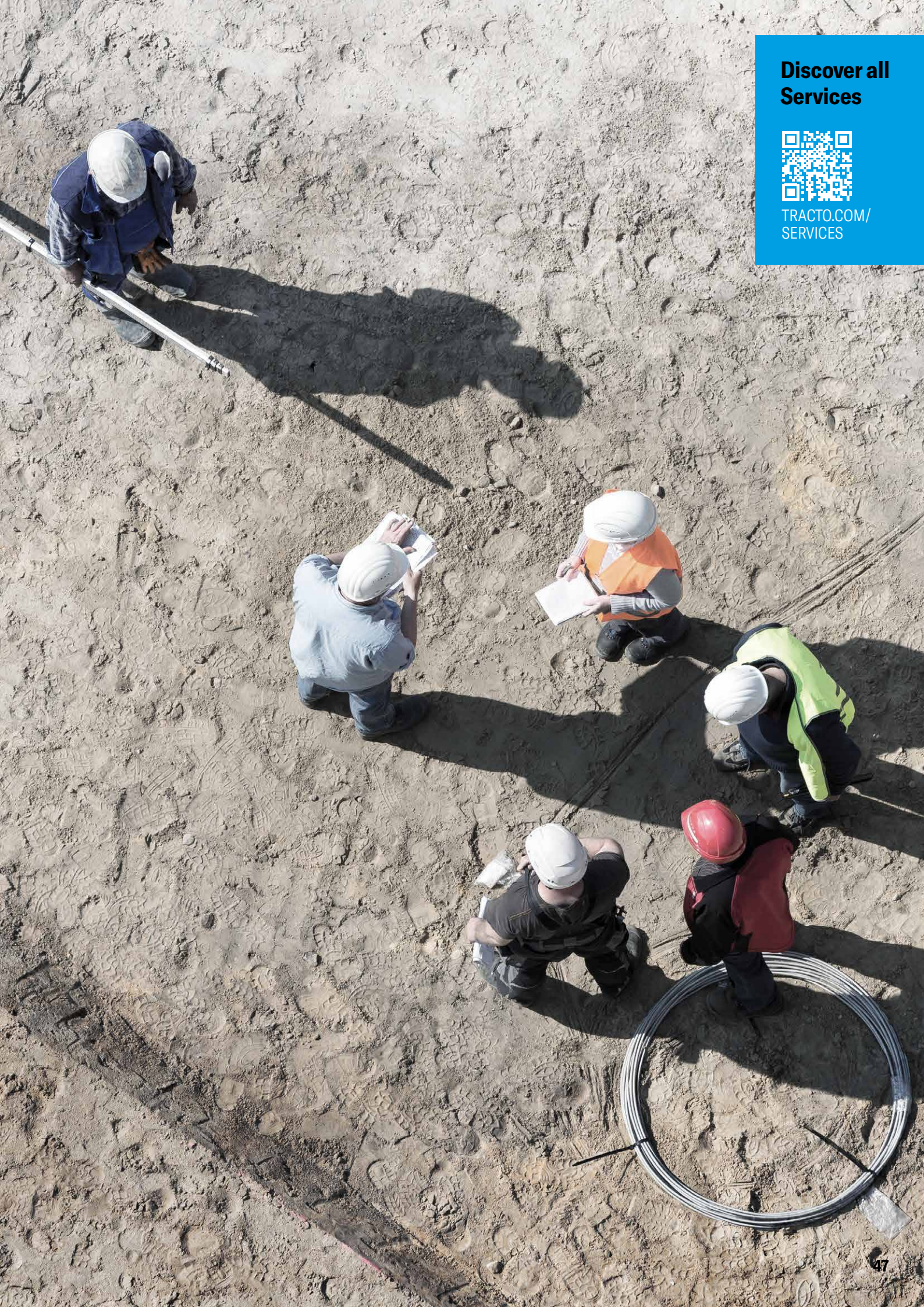
Specialised Civil Engineering Service (Application Technology)
The specialised civil engineering service for application technology provides support for all your trenchless construction sites. Our experts demonstrate the steerable and non-steerable NODIG technology live in practical use, show your drilling teams how to use it or actively assist with special projects.

Geoservice
Precise knowledge of the soil is the key to successful trenchless projects. Our Geoservice team provides you with this professional knowledge. Our expertise puts you in a position to master every type of soil. Based on geoscientific maps and existing construction files, we supply information on the soil, which will help you with calculations or supplements.

Used Equipment
If you want to sell a used machine at an attractive price or are looking for the right equipment for your tasks, our full service for used NODIG machines will take the workload off your hands – from appraisal and price determination to professional repair and certification, through to achieving the best price for you via our used machine website with access to one of the world's largest construction machinery platforms.



After Sales
Via our worldwide service network we are always there for you, even after the purchase. A total of five TRACTO plants and seven customer centres in Germany, as well as our worldwide sister companies and sales partners guarantee fast supply of spare parts and immediate availability. Our competent service staff offer fast assistance, to ensure you don't lose any time.



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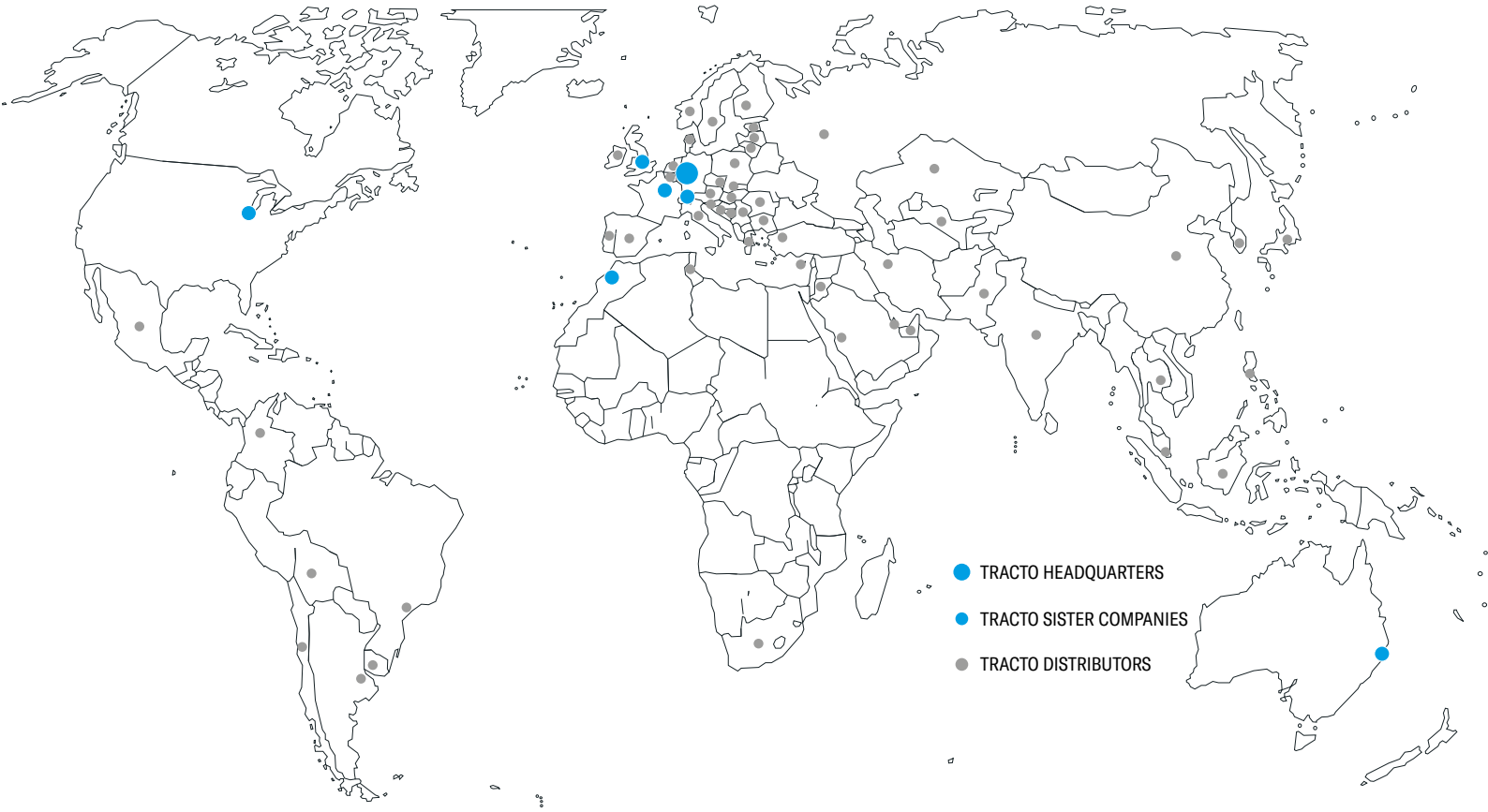

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