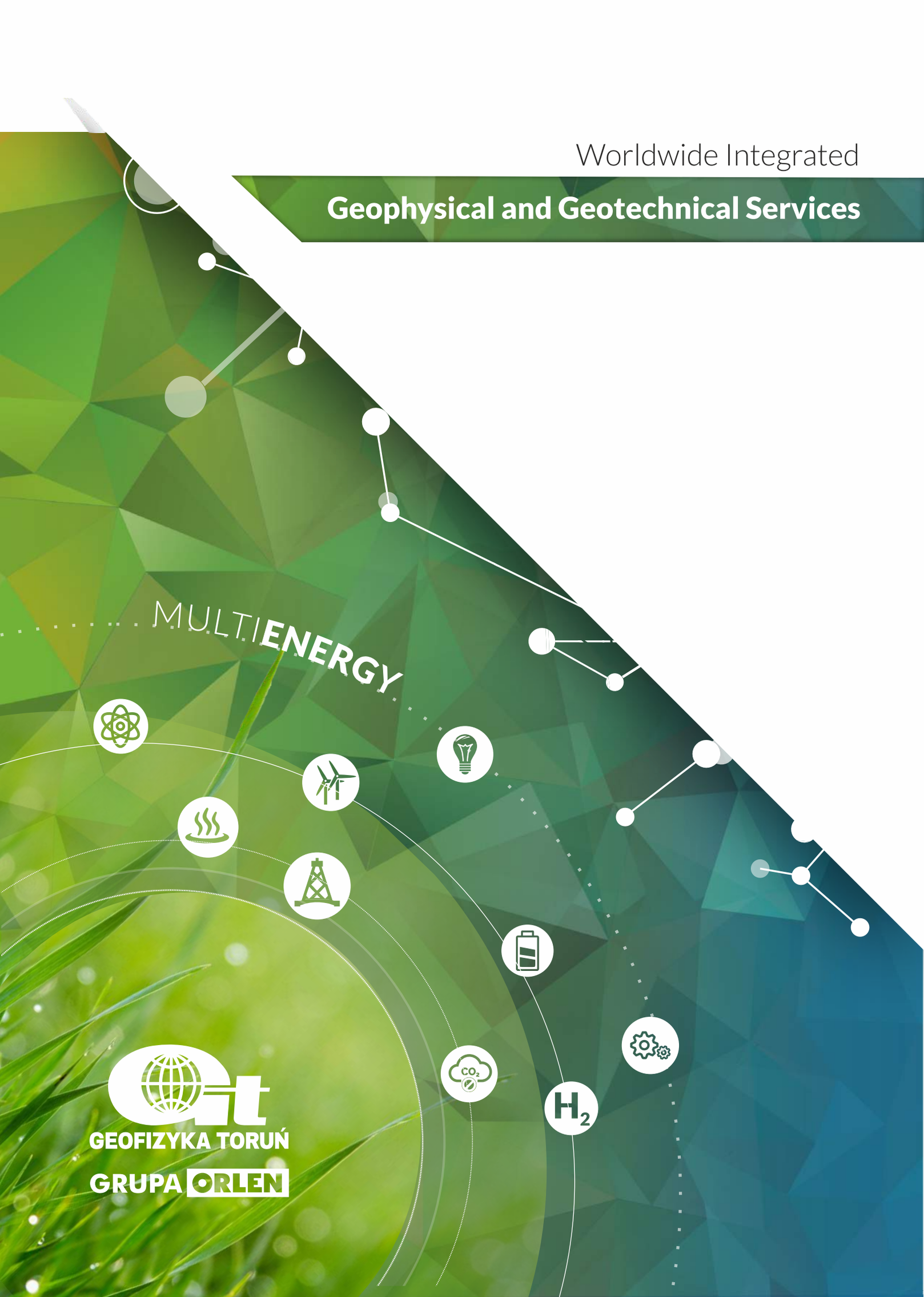
Worldwide Integrated

Geophysical and Geotechnical Services

MULTI**ENERGY**



GEOFIZYKA TORUŃ

GRUPA ORLEN

Company profile

Since 1966 Geofizyka Toruń S.A. is a leading supporter for multienergy companies in solving their most complex chalanges in the field of renewable energy resources, hydrocarbons & minerals exploration, nuclear energy, construction & mining and natural energy storages. Our experienced team of geophysicists and geologists - some of the most innovative professionals in the industry - strive to push the limits of geoscience and geoengineering every day, using leading-edge solutions to maximize understanding of the earth's subsurface to produce energy safely and efficiently.

Continuous development

We believe that to stand still is to fall behind. That's why for more than 55 years we've beed constantly implementing the newest innovations and making technological progress in our everyday work.

MORE THAN
55 YEARS
OF WORLDWIDE
EXPERIENCE

KEY FACTS AND FIGURES

Business areas

Our innovative solutions successfully address a wide range of targets. Hydrocarbons & minerals exploration, geothermal energy, wind farms and power plants, nuclear energy, underground storages, construction & mining industry are some of the sectors we excel off.

What we do?

Our story:
GT corporate movie

- seismic data **acquisition**
- seismic data **processing & imaging**
- seismic data **interpretation**
- **well services**, logging and perforating
- well **log analysis**
- **borehole** seismic
- **geological** drilling and **geotechnical** services
- **engineering** geophysics

Regular
workshops
for clients
and business
partners
since 2011

KEY FACTS AND FIGURES

Energy transition

We are focused on providing solutions for maximizing the value of assets in the upstream sector as well as **developing and increasing the efficiency of renewable and alternative energy sources**, which will help to achieve ambitious greenhouse **gas emission reduction** targets.

We are driven by the development of **breakthrough technologies** that will direct the evolution of the energy mix towards renewable sources and increase the storage infrastructure of energy carriers. These technologies are part of the broadly understood trend of sustainable development while limiting the negative impact on the environment and meeting the criteria of economic profitability.

Our strategic allocation in the energy transformation process focuses on **geothermal energy, offshore wind energy, nuclear energy as well as hydrogen and multi-energy storages.**

GLOBAL PRESENCE

OPERATIONS
ON
6 CONTINENTS
AND IN
50 COUNTRIES

KEY FACTS AND FIGURES

WE COOPERATED WITH:

eni
Chevron
ExxonMobil
ConocoPhillips
ecopetrol
ORLEN Upstream
PAREX RESOURCES
PGNiG GRUPA ORLEN
REPSOL
sasol
TOTAL
Shell
CEPSA

& more

our people

service quality

Our values

health & safety

innovative approach

social responsibility

client satisfaction

ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

KEY FACTS AND FIGURES

QHSE Management System

SHELL

„We thank GT for their responsiveness to Shell requests and suggestions made during the project."

We are committed to supporting sustainable progress, defined as the economic and social development connected with environmental protection, and recognize also the need for ensuring diverse opportunities to improve society development.

We anticipate and **adapt to changing conditions to minimize your risk.** We have international experience in managing various HSE hazards related to diverse terrain and climate conditions, operational needs and challenges, multicultural aspects. We put an emphasis on detailed HSE risk assessment and adequate work planning, and committed day-to-day cooperative HSE and operational management.

We believe that our services not only create value for owners, but also **contribute positively to the natural environment and society.**

Everyday performance under challenging conditions proves that GT's **high reputation** among the contractors is well deserved.

We listen carefully and respond to your needs and challenges. Our surveys are carried out in **full compliance with the individual objectives, expectations and QHSE requirements** of every Client and in line with industry HSE standards (IOGP / EnerGeo Alliance), ensuring safe and efficient operations.

Our people are highly skilled, supportive and considerate. Thanks to visible proactive approach and culture of continuous improvement, we set goals and comprehensive solutions to minimize incidents risks, improve work standards and engage all employees as we believe that **safety and quality of works starts with each of us** in our "Mission Zero" – striving after injury free workplace and QHSE excellence.

EXXON MOBILE

„Your professionalism and commitment to our shared goal of Nobody Gets Hurt are appreciated."

Seismic data acquisition

Geofizyka Toruń S.A. is one of the few innovative international suppliers of integrated seismic data acquisition services, where supreme geoscience expertise goes together with tremendous operational flexibility of petabyte-scale projects.

Having varied worldwide track record since 1966 and capacity to run simultaneusly multiple seismic crews, we are able to perform the most challenging surveys safely and with minimal impact to the environment. For every risk of your exploration we address powerful and scalable geophysical skills unlocking extraordinary survey precision and turnaround.

Our story:

3D seismic survey in Colombia movie

Urban seismic survey movie

KEY FACTS AND FIGURES

Over 50,000 sq. km of 3D seismic data and over 160,000 km of 2D seismic data acquired worldwide

Our scope of services:

Onshore 2D/3D/3C seismic surveys
Transistion zone seismic operations
Seismic refraction and reflection with ultra high resolution system (UHRS)
Large-scale 3D seismic campaigns

Adrian Müller for VER, © VER

MND

„Data acquired are of high quality, the sufficient fold coverage was achieved even within towns with 10000+ inhabitants. The careful scouting and source points placement has led to excellent spread geometry preservation."

We are experienced in:

- Seismic survey areascouting
- Survey design & pre-planning
- Pre-permitting & permitting
- Land surveying & GIS
- Wireless and cable seismic data acquisition
- Multisource operations: heavy & medium vibrators, minivibrators, explosives, weight drops, air-guns and UHRS Multi-tip Sparker
- High productivity operations flip flop, slip-sweep and simultaneous shooting seismic operations)
- Drilling and explosives operations by manual, portable and mechanical units
- Near surface surveys & interpretation , upholes
- Quality control & quality assurance
- Data transcription, harmonic removal & final data format conversion
- In-Field and Fast Track seismic data processing

Find out more:

on www.gtservices.pl

Next generation seismic

Next generation seismic data we acquire is characterized by greater spatial sampling and better distribution of offsets and azimuths. Acquisition requirements for complex areas can only be met by autonomous nodal systems, which are characterized by low weight, long battery endurance and large memory. Furthermore, the large amount of recorded data implies a change in the philosophy of quality evaluation in the direction of statistics rather than excessive care for the quality of a single record.

Our story:

GTs nodal solutions movie

Main benefits for clients

- Increased operational access in diverse terrain areas (urban, agricultural, offshore, deserts, lowlands, highlands, mountains, transition zones)
- Increased trace density and spatial sampling (receiver positioning flexibility)
- Increased productivity
- Reduced permitting hazard
- Reduced exposure to hazard
- Reduced environmental footprint

KEY FACTS AND FIGURES

Nodal systems:
7 years of experience
60 projects
in 13 countries

MOL HUNGARIAN OIL & GAS

„The nodal system gave us data quality comparable to the conventional array based system and ensured operational flexibility never seen before "

Cooperation with equipment suppliers on technology development

KEY FACTS AND FIGURES

TECHNOLOGY

Recording systems

Nodal systems:

- Quantum (INOVA)

Cable systems:

- 428XL (Sercel)
- 408UL (Sercel)

Wireless system:

- UNITE (Sercel)

Offshore system:

- UHRS Channel Streamers with Multi-tip Sparker System and Multi-Trace recorder

Vibroseis

Ultra-Light:

- Univib PLS-326 (INOVA)

Light:

- Hemi-50 (IVI)

Heavy:

- Nomad 65 (Sercel)
- ATS (IVI)
- Hemi-60 (IVI)
- AHV-IV PL-364 Commander (INOVA)
- AHV-IV PL-362 (INOVA)

Other equipment

- Transcriber equipment for nodal systems
- Mechanical drilling units mounted on 6x6 trucks, tractors & pick-ups
- Manual drilling tools
- Weight drop Af450 and air-guns Bolt 2800LLX LongLife
- Land surveying & GIS and in-field seismic data acquisition QC equipment with software

Find out more:

on www.gtservices.pl

Seismic data processing & imaging

GT is an acclaimed international provider of time & depth seismic data processing and imaging solutions. Progressing since 1973, we have become one of the biggest seismic data Processing Centre in the world. Having an impressive track record and capacity to process parallelly several multi-terabyte-scale projects at unprecedented turnaround, we are able to perform the most challenging tasks onshore and offshore.

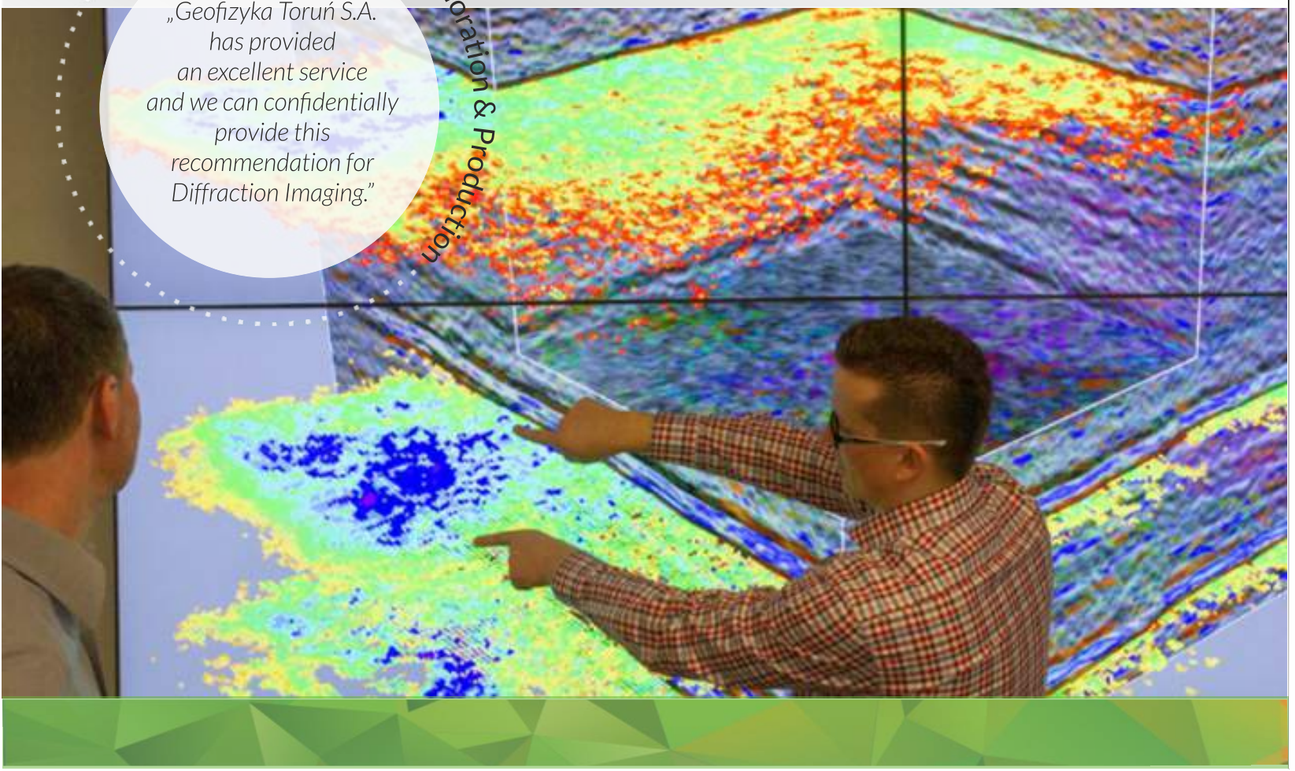
We integrate multi-physics, well log and geological information into our imaging workflows and provide reservoir products offering the best understanding of the subsurface geology available in the industry.

Our seismic imaging capabilities

- Advanced 2D & Wide Line & 3D & 4D as well as 3C/9C seismic data processing and imaging in time & depth domain
- High Density, Wide Azimuth and High-Resolution processing
- Advanced Pre-stack & Post-stack migrations, Diffraction Imaging, VVAZ, AVAZ analysis and multi-attributes reservoir characterization
- In-field QC & Fast Track processing with PreSTM during seismic data acquisition

OMV Exploration & Production

„Geofizyka Toruń S.A. has provided an excellent service and we can confidentially provide this recommendation for Diffraction Imaging."



Our solutions & innovations

We offer services using leading data processing software packages with unique advantage of dedicated tolls, algorithms and tailored workflows focused on the best imaging of land, marine, transition zone as well as borehole seismic data. This brings effectiveness in integrating modern methods of imaging for your seismic data. We are experts in advanced data processing where high-quality results are achieved through interactive solutions, instead of purely automated approach.

We implement the cutting-edge IT technology solutions available on the market and match them with innovative GT Data Tiering for maximum SSD storage usage.

KEY FACTS AND FIGURES

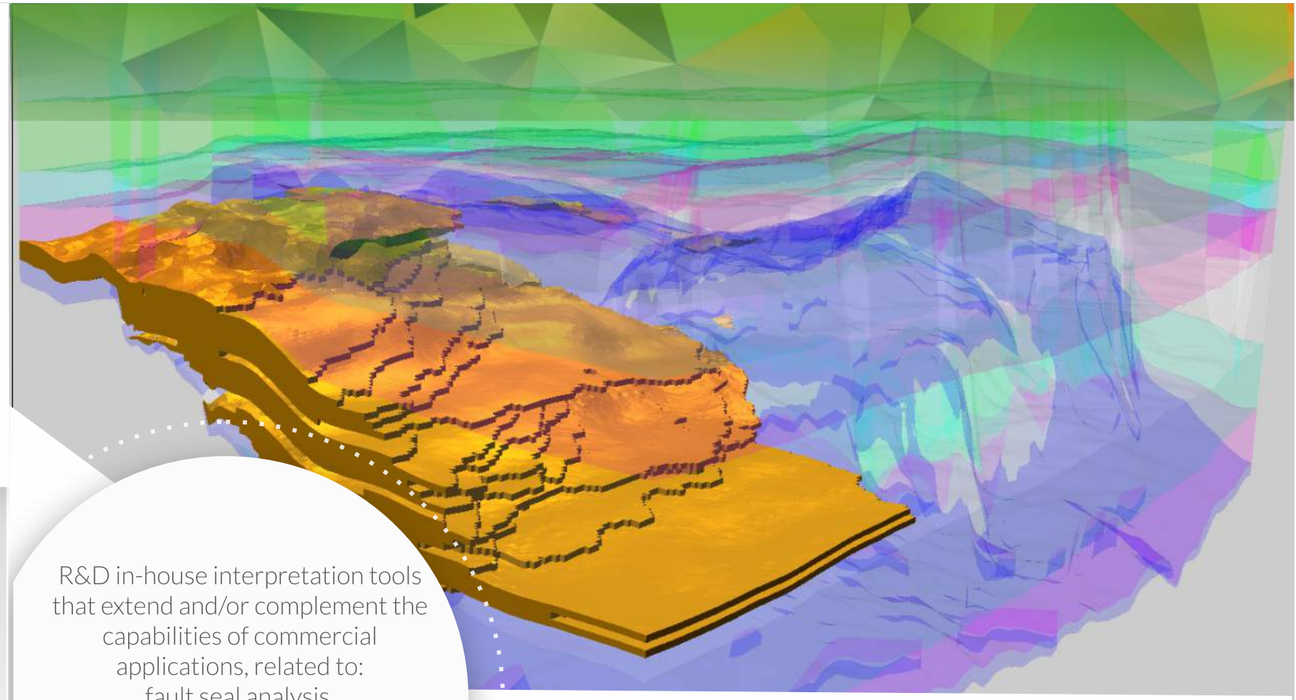
Our proven know-how covers:

- Multi-survey merging/ signal matching / wavelet standardization
- Proprietary innovative methods of non-invasive coherent and random noise attenuation
- Dedicated solutions of static corrections with advanced near-surface modeling as well as high or low near-surface velocity anomaly corrections
- GT innovative workflow for the backward reconstruction of seismic trace amplitude relations
- Advanced signal processing with Q factor estimation and GT Interactive Wavelet Shaping (IWS) methods
- Advanced S/N enhancement by proprietary GT techniques: Enhanced Coherency Processing (ECP) and Virtual Ray Imaging (VRI)
- Various methods for multiple attenuations dedicated to marine as well as land seismic surveys e.g. hybrid multiple modeling by CRS/ECP with adaptive subtraction
- 3D, 4D, 5D and hybrid interpolation / regularization algorithms with GT's innovative Structure-Oriented 5D Interpolation (SOI5D) approach
- Advanced isotropic and anisotropic (VTI, TTI, HTI) pre-stack time as well as pre-stack depth migrations
- Depth imaging with complex Velocity Model Building (VMB) as well as with FAZ tomography
- 3D Specular & Diffraction Imaging (DI)
- Full azimuth on-fly sectorization and VVAZ / AVAZ attributes from full azimuth angle domain

Find out more:
on www.gtservices.pl

Seismic data interpretation

Delivering more informed exploration decisions and exposing petroleum reservoirs' properties with advanced approach, have become the hallmark of our Seismic Data Interpretation Division. As an acclaimed international provider of integrated geological and geophysical interpretation of seismic and well data, we take full advantage of our experience and progress since 1973. Through all these years we have unlocked the hydrocarbon potential of various international petroleum basins onshore and offshore. Having impressive track record and capacity to evaluate plays at unprecedented turnaround, we are able to perform the most challenging tasks and produce a fast and clear view of difficult reservoirs.

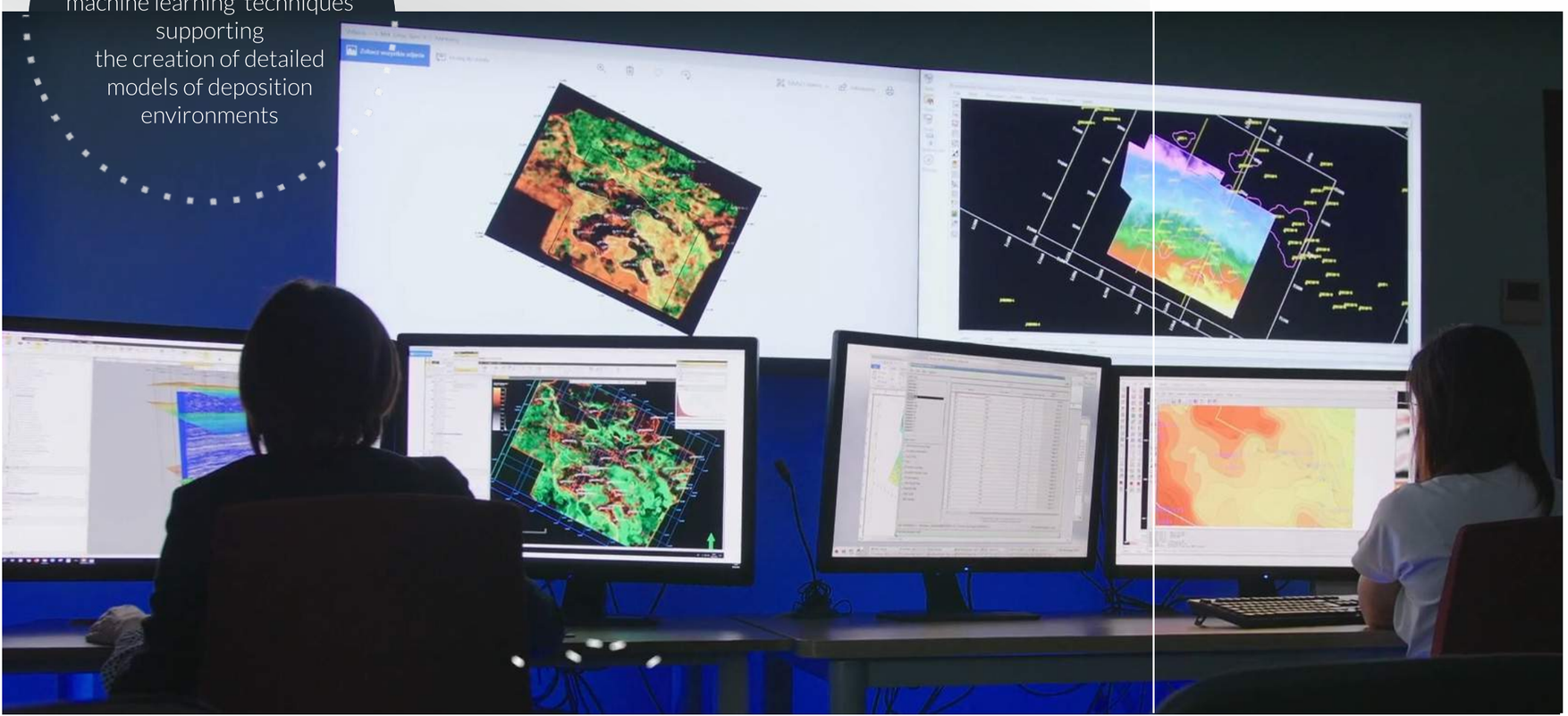


Our primary scope of interpretation solutions:

- Qualitative and quantitative evaluation of processed seismic data for feasibility of designed interpretation tasks
- Comprehensive geological interpretation of 2D and 3D seismic volumes, construction of structural models
- Identification of sub-seismic faults and fractures based on geostatistical analysis of 3D seismic volumes using geometric attributes and spectral decomposition
- Creation of velocity models and time-depth conversion of seismic data
- Map construction in the time and depth domain
- Processing and interpretation of vertical seismic profiling

KEY FACTS AND FIGURES

We provide ready-made solutions for the use of machine learning techniques supporting the creation of detailed models of deposition environments



R&D in-house interpretation tools that extend and/or complement the capabilities of commercial applications, related to: fault seal analysis, time to depth transformations, Q factor estimation from VSP data, synthetic seismograms creation that includes transmission/absorption effects etc.

KEY FACTS AND FIGURES

Our advanced scope of interpretation solutions:

- Anisotropy analysis - determination of intensity and azimuth of anisotropy using seismic and well data (AVO, AVAZ, seismic inversion)
- Assessment of variability of geomechanical parameters of a rock medium
- Geological, geophysical and petrophysical modelling of reservoir formations
- Estimation of hydrocarbon resources and geological risk assessment
- Seismic modeling (1D and 2D)
- Prestack and Poststack inversions, AVO analyses and multi-attribute characterization of geological media
- Using machine learning processes in detailed structural and facial interpretation of 3D seismic data

Find out more:

on www.gtservices.pl

Well services, logging & perforating

We are an innovative international supplier of various well services including wireline logging services and perforating, providing a full understanding of a reservoir. Our solutions deliver vital drilling information and more accurate well data to better evaluate production potential and increase their return on investment. Our scalable and innovative capacity as well as know-how have unlocked reservoirs' potential on various petroleum basins worldwide since 1966. Having impressive track record and capacity to perform challenging tasks we are able to produce deeper understanding of the complex subsurface and maximize the reservoir value throughout its full lifecycle.

KEY FACTS AND FIGURES

Cost effective rigless P&A method with following services:
Cast iron bridge plug setting,
Wireline Dumb bailer for cement plug setting,
Puncher service for cement squeeze operations,
Casing cutting service,
Cut and retrieve wellhead.

Our well services and solutions:

- Formation Evaluation
- Formation Evaluation Behind Casing
- Surface Logging/Mud Logging Services
- Perforating services:
  - Expendable Hollow Retrievable Perforating Systems
  - Through Tubing Gun Systems
  - Horizontal Pump down Plug & Perf
- Tubing and casing gas tight patch setting
- Propellant Stimulation Services
- Rig-Less Well Plug and Abandonment Services
- Pipe Recovery Operations
- Production Logging

Find out more:

on www.gtservices.pl

Well log analysis

When accurate and timely well insight is a challenge, our Well Log Analysis Division delivers bespoke solutions for risk exploration and production management. As an innovative international supplier of services in the field of design, supervision, interpretation and documentation of well logging data we dedicate all our efforts on providing a full understanding of a reservoir.

GT's well log analysis team employs highly experienced geophysicists, geologists and petrophysicists with track-record from various regions of the globe. To obtain the best log analysis results for challenging drilling or production locations, we always take out-of-the-box approach with leading tailored solutions.With innovative solutions and powerful technological support we can interpret large well logs datasets in competitive turnround and precision.

R&D programs and innovative analytical solutions, developed in cooperation with scientific units.

KEY FACTS AND FIGURES

Our analysis of well logging data capabilities:

- Exploration of hydrocarbons in conventional and unconventional deposits (e.g. coalbed methane, tight gas, shale gas)
- Evaluation of resources and use of geothermal waters
- Exploration and documentation of mineral deposits (e.g. coal, salt, copper, sulfur, etc.)
- Underground storage of gas and fuels
- Technical measurements in deep boreholes, including reconstructed wells (e.g. cement evaluation, pipes/casing inspection)
- Geological and engineering studies
- Scientific research related to the identification and documentation of the geological structure of selected areas
- Multidimensional statistical methods using extensive sets of well log data (electro-facies, big data, machine learning)

Find out more:

on www.gtservices.pl

Geological drilling & geotechnical services

Our company has been providing geological and drilling services since 1978, offering a wide range of state-of-the-art, comprehensive surveys, including ground subsurface exploration for the needs of industrial and technical infrastructure, on land and at sea.

We also provide solutions for the offshore wind energy industry, in particular, **geotechnical and geological seabed surveys**, to determine the environmental conditions for offshore wind farms, as well as along the planned submarine power cables routes, connecting offshore wind farms with the coastal infrastructure.

Our story:

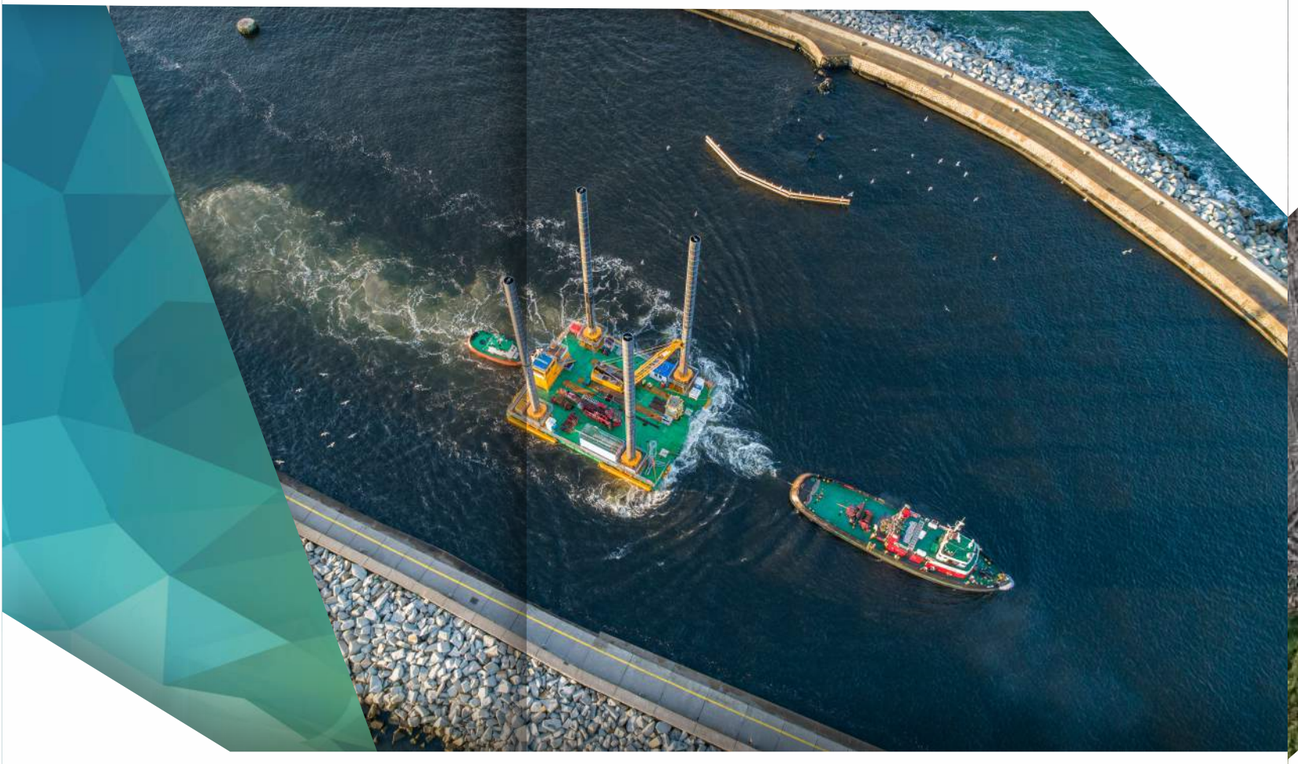
GT offshore movie

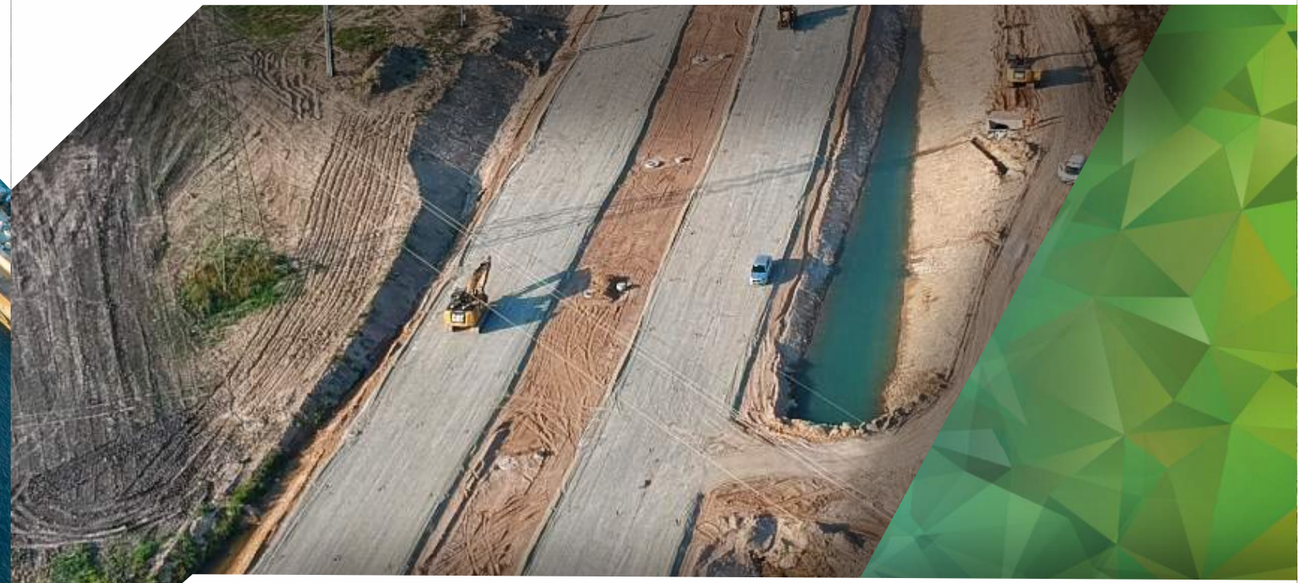
Engineering geophysics

Offering comprehensive engineering geophysics services since 1996, we are experienced in a wide spectrum of innovative surveys related to the exploration of the subsurface zone and the leader of modern comprehensive solutions in the field of non-invasive engineering geophysical surveys which do not disturb the ground nor the infrastructure.

The works carried out by Geofizyka Toruń are characterized by very good quality, timeliness and are carried out in accordance with the provisions of the geological and mining law.

Skanska





Our comprehensive experience:

- Geotechnical services
- Geological engineering services
- Geological services
- Hydrogeological services

Our most advanced and versatile equipment:

- **C-726 Self-elevating Platform** manufactured by Combifloat
- **Seabed SVC 500E vibrocorer**
- **Geomil Manta 200 CPT probe**
- **CRS 170 XL DUO sonic drilling rig** and other drilling rigs

Find out more:

on www.gtservices.pl

We are experienced in determining the geological properties for:

- Linear projects (roads, railways, gas pipelines, airports, dams)
- Setting out environmental conditions for offshore wind farms (OWF)
- Submarine mapping of power cable routes to connect offshore wind farms (OWF) with land
- Monitoring of the technical condition of building structures, roads, asphalt surfaces, embankments, flood embankments and dams
- Setting out ground-water and hydrogeological conditions (searching for drinking water)
- Monitoring of environmental conditions, landfills, setting out the range of pollution and contamination zones, of migration of pollutants
- Underground HDD drilling both on land and in water
- Detection of underground metal objects
- Setting out the condition of slopes and landslides
- Archeological exploration

Find out more:

on www.gtservices.pl

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