

HOW MILLIONAIRES LIVE • PRIVATE JET BY HONDA

JUNE • 2015

# Forbes



7 TIPS FOR HOLLYWOOD HOLIDAYS OF DREAMS  
**MARLON BRANDO'S ISLAND**

## HOLES TO EARTH

**IGOR KOČIŠ, GA DRILLING'S CEO**  
DISRUPTIVE TECHNOLOGY FOR OIL & GAS  
INDUSTRY AND FIVE INNOVATIONS,  
THAT CAN CHANGE YOUR LIFE

ISSN 1338-2527

Price 3€



9 771338 252003

THE INNOVATORS

# WHEN LIGHTNING CUT STONES

During seven long and hard years of developing a plasma deep drilling technology, the family business GA Drilling has undergone some very significant changes (in terms of the project itself, its financing and the customers as well).

PETER MATIJEK  
FOTO: MIRO NÓTA



Cracked stones and not far away from them a stacked heap of burned and torn steel pipes with pieces of previously melted, but now solidified steel. This material was not struck by lightning, nor has it been involved in an explosion, it was just used for drilling experiments on the grounds of the company, so fittingly named, GA Drilling. These grounds are located underneath the hill called Devinska Kobyla in Bratislava.

“Practically everyone knows what arc welding looks like” as the head of the company. Mr. Igor Kocis indicated. “Compared to classical welding methods, our device has a much higher current flow between the electrodes and thanks to this we are also able to reach much higher temperatures. From 5 000 to 20 000 degrees centigrade, which is more than the surface temperature of the sun.”

The fourth state of matter, plasma, has been in use for decades. Not just to weld with or to cut metals, but also to illuminate fluorescent lamps and TV displays. In order to be able to use plasma for drilling into hard stones on an industrial scale they need to solve a number of technical issues.”

We want to improve the lifespan of our electrodes up to tenths and even hundreds of days,” Mr. Kocis mentions just one of the issues. “Standard welding electrodes only last up to tens of minutes. The next technical issue for the development of this technology is that the device must be able to work under very high temperatures, high pressures and in the very small spaces of the deep borehole. Seemingly, such a simple idea, wouldn’t you say? Let’s go and use plasma to drill some stones! But it requires a lot of very precise small steps in order to be realized.”

*A seemingly simple idea can require a lot of precise small steps in order to be realized.*

IF YOU THINK, that you have already heard about the company GA Drilling then it might have something to do with the complex issues, it is trying to resolve. Almost seven years have passed since the founders even thought about this concept. The development of a new technology, besides the initial research, continuous construction of prototypes, the building and maintaining of a company and all the usual managerial decisions, have also required great expenses and radical strategic decisions.

The initial idea, with which the four founders came up seven years ago and which was to be driving force of the whole company, was more than just ambitious. Compared to a typical business opportunity, it was more like a dream. Back then, Igor Kocis, his father Ivan, his brother Dusan and their friend Tomas Kristofic didn’t “just” want to expand the industrial usage of plasma. They wanted to do a lot more. They wanted to shake the very foundations of the hidebound energetics sector. Their ambition, which they refuse to give up even after so many years, was perfectly reflected in the original name of the company Geothermal Anywhere. Their goal was to use new

drilling technologies to make reserves of geothermal energy accessible and, if it were possible, to do this everywhere, not just in countries that have active volcanoes like Iceland. They wanted to put geothermal energy to use even in places, where the useable reserves of energy are located very deep bellow the earth’s surface.

The founders asked the Vienna University of Technology to conduct a benchmark study, so that they could see which of the unconventional drilling technologies is the most suitable. Among the analysed approaches were water jet rock cutting, laser and electrical or chemical plasma. The electrical plasma passed the test with flying colors. They have decided to set up a new company and they were hoping to get all the necessary funds and resources from the venture capital funds in Silicon Valley. As Kocis says, “We have scheduled a number of meetings in the USA. They were supposed to take place towards the end of the year 2008.”

But on September the 15th the Lehman Brothers went bankrupt and on the 3rd of October the US congress approved of 700 billion dollars which were intended to bail out the banks. “We were enjoying high hopes for our cleantech projects when everything suddenly changed to something called the nuclear winter,” as the CEO of GA Drilling adds. “And we as a startup were asking for a lot of money and resources in order to start building a company with tasks that were very demanding in the department of infrastructure, and also to build laboratories and to create a highly qualified team.”

The founders of Geothermal Anywhere had to quickly find a new financing strategy, so they turned to the EU funds. They did not just utilize their own experiences with the submitting of projects FP7 or INTERREG IVA, but also the know-how of their partners from universities and the institute at the Slovak Academy of sciences, which have previously successfully submitted tens of projects. During its programming period between 2007 and 2013 the company successfully submitted its operational program for research and development for projects worth millions of Euros. “Thanks to that we started building the company from scratch, from the first laboratories,” as the CEO states, “we started cooperating with universities and the Slovak Academy of Sciences. It really did help us a great deal during those first two or three years and by 2011 our work bore its first fruit in the form of the first laboratory models and a company of 15 to 20 people altogether.”

Step by step they were forming a multidisciplinary team consisting of more than 70 people. Besides some managerial and administrative positions their priorities were electrical, mechanical and materials engineers and physicists. “During the first years we only approached people we knew personally, but of course we ran out. During these days it is not easy to find technicians in Slovakia, especially those in a very specific subject field and with plenty of experience.”

The company provides education for its employees in areas not covered at schools and universities. “This year we started a project



of our own university. Once a month for two days we provide education especially for middle management in the area of soft skills, project managing, process control and communication. In the future we would also like to provide education for university students.”

The company is currently opening a branch in the Czech Republic. The longer lasting branches of GA Drilling in London, Houston and Abu Dhabi, up until now, were more like a frontend, but in the next two or three years, these too, should offer customer support.

During a certain building phase of the company the funds from the EU and other investors were not enough to cover all the necessary expenses. (For a clearer demonstration of one of the less severe and everyday ones, just try to imagine how and at what expense you would be able to bring a huge three to four tone stone from a quarry located at the other side of Slovakia. This type of stone cannot be found anywhere else and it will not fit onto a truck, so you have no other choice but to drill into it. This given issue was not that hard to resolve in the end. Now, in the compound of the test center you will find big barrels filled with something called artificial stone. Crushed stone with all of the required properties which was easily hauled in using trucks and is now poured into a big block of cement.)

“As time went on we really needed financing and to seal partnerships with the industry. We also needed to clarify what

exactly we are going to focus on. We were just the designers, not the ones doing the actual drilling.”

But, by the year 2012, it became more and more clear that the initial vision to completely change the form of energy dependency in the world did not find investors with the necessary funds. As the CEO notes, “Companies focusing on geothermal energy, are very small and it is not possible to view them as customers for very long lasting and large scale research projects. On the other hand, the investors were very unwilling because our investment horizons were very long, from five up to seven years. It was a very difficult situation, but in the end we could meet with a few people from big mining companies, which were having problems with their expenses for drilling. We finally seized the opportunity on the market. It took a bit of a detour, but we made it.”

The small geothermal company aimed its sights at **THE BIG OIL INDUSTRY** during a time when the oil world itself was facing a huge crisis. During the whole course of the summer of 2010 oil was leaking out into the Gulf of Mexico from the exploded and submerged drilling platform Deepwater Horizon, owned by BP. Before the oil well could be sealed almost 5 million barrels of oil (800 million liters) leaked out. The costs to clean up the biggest oil disaster in the history of humankind, along with all of the costs for the lawsuits, are still growing exponentially by tenths of billions of dollars.

The head of GA Drilling claims about the disaster, “The disaster in the Gulf of Mexico caused uproar in the whole oil industry to find new means how to seal off oil wells. New regulations accepted by the individual states clearly state that, once the extraction of oil has been finished, the oil well needs to be sealed off in such a manner, that no pressure can build up and no oil will leak, not even in a hundred years. Thus the difficulty of extraction has increased so much, that in costs and expenses it is now comparable with nuclear power plants. Besides the costs necessary for the construction of a seal, we also have to take into account the costs for the so called decommissioning (plugging an oil well and the complete removal and abandonment of the drilling infrastructure) which can be just as expensive.”

Even though the oil industry is now facing a number of new issues with all of these new costs, it is still not facing the problem of lacking finances like the geothermal sector. But thanks to the willingness displayed by the giants in this industry, in an effort to cooperate with companies utilizing new technologies, the year 2012 for Geothermal Anywhere has become a time of breakthrough.

“We started working on activities which allow us to drill for the oil industry. In discussions with new partners we have also identified some applications useful for this sector. A whole new world has opened up to us,” as Mr. Kocis praises.

Currently GA Drilling (the company decided to adopt this new name, combining the acronym of the original name and depicts the focus on drilling, in May of 2013) is expanding its staff, building a new test facility and a new drilling infrastructure. Thus it is processing applications which it has evaluated as most important based on such indicators as time to market

and the actual costs and expenses. The CEO says, “It is not as difficult as drilling down many kilometers which does not just require the use of really expensive technologies, but it is also very demanding in terms of infrastructure. The advantage of the new focus of the company was also, for example, something which seemed minute at first. However it was a very systemic fact, that a drill hole is an already existing construction which is located in a known and a geologically mapped area.

In practice, when closing off a drill hole, it is especially important to remove the steel pipes, the so called casings, which often are damaged and rusted. It is also important to remove the concrete filling. Once all of this is removed, the given part of the drill hole is filled with new concrete which acts as an airtight seal. Compared to drilling procedures which reach much greater depths, this task should be easier, but not without its difficulties. “We expect it will take at least two years before our application will be prepared for testing on the oil fields of our partners. The production of an optimized rig or even of the specially required cables can take more than a year. During this phase it is not just about the duration of the research or testing.”

The North Sea is the most important area for GA Drilling, because it currently holds a number of extraction areas, which have been almost depleted or the extraction of oil is no longer profitable. This means that hundreds of wells will have to be properly abandoned. Using the traditional technology of tungsten carbide cutters makes this process very expensive and it can all cost up to a million or even tens of millions of Euros. Oil companies, even if under pressure from governments, are still trying to find a more effective and cost efficient way, how to abandon wells.

“Two years ago we agreed to cooperate with three companies, among which were the Norwegian Statoil and the American Weatherford. Statoil is one of the biggest oil companies in Europe and it is at the forefront of supporting new technologies,” as Mr. Kocis stated. “Today we have six partners. At first they were mostly our consultants and gave us the opportunity to take part in regular workshop. As a startup company it aided us immensely and helped us to move forward. We wouldn’t be able to afford something like that. We found our partners and acquired potential customers which are willing to contribute to the development

both financially as well as give us their mental support. They expect that the technology will help them save a lot of money.”

If we can implement plasma drilling into practice it will bring a great deal of benefits when compared to traditional technologies. Mr. Kocis explained, “When plasma touches the material, be it stone, concrete or steel, it starts to decay, melt or even evaporate at a rapid speed. In the case of rocks, the effects of thermal shocks ensue.” Thanks to the massive oxidation of steel, which occurs during this process and the decay of the material into little particles we lose one of the unpleasant problems connected with traditional methods. Namely the clogging

of the drill holes with steel shavings which act as a sort of “glue”.

The most important piece of knowledge for GA Drilling is the fact, that this process is many times faster than mechanical drilling. “We can reach speeds that are three or even ten times as fast.” So far there is still a great deal of hope for the new technology. It can still stay ahead of the traditional ones even after the efficiency of the process will be diminished as anticipated. Afterwards the new knowledge gathered from its practical use will probably have to be implemented.

**WHAT IS NOW STANDING** in the way of GA Drilling’s ultimate success? There are still some huge leaps which need to be made. The technology has to develop from a prototype, working under atmospheric conditions in water. Partial testing has shown that the technology is capable of working under a pressure of 500 atmospheres, but it still has to be capable of operating under real conditions, on land at first and later even on drilling platforms (offshore drilling).

The aforementioned real conditions mean that, in the case of undersea extractions, for example, a pressure

## ENERGY FROM THE EARTH

Igor Kocis about how GA Drilling came to be.

“We didn’t start out with drilling technologies. We got to them in due time and through fulfilling the needs of the client at first. We originally had a software company which focused on security. We were once in some compound we wanted to use for a development project and we found some abandoned wells and we got the idea to use them for the acquisition of geothermal energy. We had someone draw us up some projects and we found out that it costs a fortune in millions of Euros. We were a bit shocked that a concept that is so easy to imagine, is so expensive! However, we soon found out that the obstacles are much greater and all of the necessary costs are really just too big.

The geothermal park Geysers above San Francisco is already supplying almost a third of the city with electricity at an output of one gigawatt (which is about a quarter more than the output of the Gabčíkovo dams (editorial note). We also visited Iceland a couple of times and saw what geothermal energy is really about. The country is supplied by geothermal and hydroelectric energy and they produce more electricity than they can spend. They also have greenhouses on Iceland which they use to grow tropical fruit.

We are all sitting on such energy resources and yet we are still cold during the winter and pay a lot of money to import fuels needed for the production of electricity. So that you can understand it better, if you were to cool down 14 cubic kilometers of earth by 100°C, you would get enough energy to power the whole USA for a year. Geothermal energy is practically inexhaustible, easily distributable on a smaller scale and it does not require additional resources. But to achieve a practical use is a huge task to accomplish. Areas where you need to drill less than two kilometers represent only 5% of the surface of the Earth and are usually too far away from where they are needed. We really wanted to develop a technology that would enable us to extract this energy even in such states and regions like Slovakia.

of 500 atmospheres, which is equivalent to a depth of 5 kilometers under the surface of the sea, can occur in much shallower drill holes. “Deep wells do not utilize water but rather something called heavy liquids which have a density of twice and three times that of water. Just four kilometers deeper and you reach pressures which are greater than that at the bottom of the Marianna trench. For us this means, that we have to take into account, that the expenses of finances and time increase exponentially” as Mr. Kocis notes. “The financial aspects can increase up to millions of euros and the time needed for the production of a new and needed pressure chamber is more than a year. However, it should soon be at our disposal and then we will be able to fulfill one of the last conditions of our partners and proceed with the practical tests of the complete drilling apparatus under very high pressure.”

Even today GA Drilling is preparing for a test project which will include the construction of a complete infrastructure necessary

for drilling. The daily costs for the operation of a drilling platform in the North Sea can reach a total sum of a half million or even a million dollars. “If we want our partners to allow us entrance onto a drilling platform for two weeks, it is not as easy as trying out an alpha version of some computer program.”

The comparison with the most well-known type of innovative companies, the start-up, especially in its classical sense of a young software company, brings about interesting contrasts. The first one is that, compared to a start-up which develops an application every one or two years, and then sells a big share of it to the company investor, GA Drilling is still a family company even though they have a lot capital and their business is very time consuming. “From the majority owners, three of us are actually family, me, my brother and my father. The fourth majority owner, Tomas Kristofic, has been my very good friend since university and we have been doing business now for 20 years. We are a good team and each one of us carries his own weight around. Almost 20% of the company is owned by minority investors. On the one hand angel investors from Slovakia, who really did help us out in the beginning, especially the group around Neulogy and later on, a very important Austrian partner Schoeller-Bleckmann Oilfield Equipment.”

“The Austrian company is a strategic investor who works in our field and its business is to produce special nonmagnetic pipes. It has given us a great deal of support in the form of regular consultations in terms of strategy and in helping us to communicate with our large scale partners. Compared to them we are really small but still we have to give it our best at meetings so that we can be equals. Step by step we are building our credibility and expanding our activities not just in Europe and Houston, but also in the Middle East.

“One of the main company strategies was to remain an independent ownership as long as possible. Thanks to this, in the future, when the projects will already be on the table, we should be able to cooperate with all of our customers without any major restrictions,” as the CEO explains to us. “It is very important that the company owns 100% of the intellectual property.”

In its current state GA Drilling is not a core business for industrial partners. It is not their core intent to own a share of a very small company from Central Europe. “But we are still able to lower some of their operational costs by a significant amount. One of our main pillars is a business model we have developed in order to cooperate with industrial partners. For example, we offer them a priority access to technologies they will be able to use preferentially in the future. However, this does not make them a part or a member of our company.”

Is GA Drilling, as an innovative technological company, still a start-up? “In the past we were an IT company and from experience I can tell you that time management and costs are completely different in this sector. As an IT company we could reach this exact same level, from idea to market, in half a year, maybe a year maximum and with just tens of the costs spent. We are currently somewhere around 70-80% on our way to the market.”

One of the main terms associated with innovative companies, which has grown in popularity in the area of startups is something

called “the valley of death”. A period during which the costs for the development of a product and the sales are in an adverse ratio and the project might go bankrupt. “A few weeks ago we assessed that we have had and we still do have to walk plenty of those “valleys of death” .

There even might be more of them. So far, we have always managed to escape them and we continue to carry on and grow. Thanks to a financing plan with different sources of income from private investors, structural funds and EU funds, including bank finances, we are able to bridge the hard down periods of cash flow. Between realizing our investment plan and the actual acquisition of finances we sometimes have to wait even a few months.”

What are the possibilities if the project does not catch on in the oil industry? Or rather, what other usage is there for the know-how gathered at GA Drilling if the project doesn't work out? “Theoretically there is a whole number of applications in the sector of drilling. This question for us was a matter of life and death two years ago. Currently we are developing an application for decommissioning wells, which is a very costly task. If we can lower the cost of the complete process even by 20-30%, then that will be something for our partners to really sink their teeth into. Even in today's world, when the prices for oil are very low, we still have partners who are willing to invest their own resources into our project.”

The low oil prices are another example of a factor that could influence the whole system of the market for an innovative

company like GA Drilling. But the CEO is not in despair. “A very strategically advantageous decision was something we did at the beginning of last year. At that time we began to cooperate and focus on companies from the Middle East as well, like for example Saudi Aramco. From the viewpoint of diversification, this region shows a promise in the ability to secure the rest of financing needed for our project. We are currently negotiating about the strategic financing for our projects.”

There is probably just one more question left, if after two years you are able to finish the development phase of the primary product and you move on to the phase of entering the market, it will be approximately 10 years since you have had the initial idea. Have the founders ever thought about creating a project that would last their whole life?

“We certainly were not planning to sell the company as soon as possible. It is not very often that people stumble upon something that can grow to be really big and that can, if not change the world, at least drastically change the way a specific sector, segment or field used to function. I have stumbled upon something just like this. We are planning to build a strong service that would be capable of working in the field and of operating the devices. However, that will require a lot of financial investments and strong partnerships. Afterwards the time will come for models that will be a bit too much for just four people, who are currently the majority owners, to handle. But that time has not come yet.”•

