EXPO FUTURE ENERGY
Astana, Kazakhstan
June 10th – September 10th

Guide Partners

EXPO2017 ASTANA CZECH REPUBLIC | Důmyslnost řešení

MINISTRY OF INDUSTRY AND TRADE OF THE CZECH REPUBLIC

Kancelář prezidenta republiky

EXPO 2017 FUTURE ENERGY

Dear Friends,

One of the responsibilities of the President of the Czech Republic is to do everything possible to support Czech companies, which often face tough competition in their quests for new business opportunities. I am a well-known advocate of so-called economic diplomacy, meaning cooperation in the arenas of business and investment. I even believe that those politicians unable to express sufficient support for Czech companies should cast off any aspirations they have to serve in the public sphere. My experiences inform me that if unemployment is to fall and wages are to rise then no other path forward exists than to foster foreign interest in Czech products and technologies. And this is closely tied to the prosperity of Czech firms, and also Czech homes.

When I accepted an official invitation in 2014 from President Nazarbayev to visit the specialised exhibition EXPO 2017 in the Kazakh city of Astana, then not only was I paying consideration to the interests of the 35 Czech companies with representation in Kazakhstan, but also the numerous others that will be presenting themselves at EXPO 2017.

The theme of EXPO 2017 is "Future Energy" with a specific orientation towards renewable energy sources. And it is precisely in the field of energy technologies – spanning all sectors – that Czech firms find themselves at the very forefront of global development; it is far from coincidental that they are able to offer high-quality technology for reasonable prices.

At the same time, energy represents one of the most promising areas for bilateral cooperation between the Czech Republic and Kazakhstan, with many Czech companies from this sector expressing a long-term interest in the Kazakh market. And that, too, is one of the reasons why Kazakhstan – the ninth largest country in the world, and at the same time our most important partner in the Central Asian region – ranks among the 12 priority countries identified in the Export Strategy of the Czech Republic for the period 2012-2020.

I will undertake a visit to EXPO 2017 in Kazakhstan at the start of June in conjunction with a state visit to Vietnam. I will be accompanied by a large delegation of business representatives comprising of 60 business people. And on June 9, 2017, I will partake in the ceremonial opening of EXPO 2017 in Astana, after which I will have the honour of ceremonially opening the Czech national pavilion.

"Ingenious solutions" – that is the slogan selected for the Czech participation at EXPO 2017. I understand that there is no more apt manner with which to sum up the adeptness of Czech technology. The exhibits which will be presented in the Czech national pavilion represent the unique concepts and applications of the very best Czech professionals in the fields of energy and energetics. Interactive and educational exhibits will also be on display, accompanied by an expert programme of seminars and roundtables focused on entrepreneurs and representatives of state institutions who seek to promote exports.

I am delighted that my attendance at EXPO 2017 will help to support Czech firms in the field of energy. And I am also excited and delighted at the prospect of observing the successful cultivation of contacts and initial first steps which will culminate in new forms of business cooperation. And I hardly need add that insofar as Czech firms require any additional assistance, I am always ready and willing to advocate on their behalf.

Miloš Zeman, President of the Czech Republic

Photo on the front Page Expo 2017 Photo Expo 2017

••• CONTENTS PAGE •••

EXPO 2017 to showcase technologies

Alternative energy sources is certainly a sphere in which the Czech Republic has traditionally been seen as a global technological leader, says Jan Hamáček.

Jan Hamáček, Chairman of the Chamber of Deputies of the Parliament of the Czech Republic

This year's EXPO, which is taking place in the Kazakh capital city of Astana, represents a huge opportunity to present to the world the advanced nature of the energy--yielding technologies which Czech firms are currently able to offer. The main themes of the trade fair will be the future of the energy industry, finding ways to lower emissions and the means by which alternative energy sources can be tapped. And this is certainly an arena in which the Czech Republic has traditionally been considered a global technological leader. Indeed, this tradition does not merely hark back a few years, but rather a number of decades.

The location for EXPO 2017 was not chosen at random. For energy represents one of the most promising fields in Kazakhstan. Our country's advantage is that we have historically developed a very strong reputation in this region. Czech and local firms can boast countless examples of successful cooperation. Which means that EXPO 2017 represents a very strong opportunity to further consolidate this reputation.

I was able to visit Astana this February (see photos) during a tour of the region. I was surprised both by the scope and magnanimity of the arena being constructed for the EXPO trade fair, as well as by the advanced states of construction of the various exhibition halls, including the residential facilities. I was also able to inspect a miniature model of the final exhibition grounds and I must say that the design promises visitors a very exciting experience indeed. The citizens of Kazakhstan are extremely hospitable, which is why I remain convinced that the forecast 5.5 million visitors from more than 100 countries can easily be achieved. Based on what I have seen and read, I have many reasons to believe that this will be a very successful event.

Permit me to also wish the greatest of success to all of those, in particular Czech firms, partaking in the EXPO and negotiating for new contracts and orders. Around CZK 100 million has been spent on the Czech Republic's participation, and I am convinced that we have much to present to the world. The large number of countries taking part in the exhibition naturally also means a great number of potential business opportunities for our country.

A particular moment in Astana also convinced me that our Kazakh friends are truly looking forward to our participation in the EXPO. During my aforementioned visit, a billboard located on one of the city's main thoroughfares – one so far in advance of the actual event – advertised the attendance of Czech President Miloš Zeman at the event. Because the president has promised to pay an in-person visit to EXPO 2017. And so I will wholeheartedly keep my fingers crossed for the success of the Czech mission. I hope that it will affirm the reputation which we have so carefully built up prior to this event, and help set the tone for even greater things to come.

My sincere best wishes to you all.

Photo Jan Hamáček 3x

A Kazakh windfall

The post-Soviet republic of Kazakhstan possesses raw materials, has an interest in co-operation and is demonstrably stable.

Anna Uljačenková, Igor Záruba

Photo MPO

The Eurasian Economic Union (EAEU), the chief members of which are Russia, Kazakhstan and Belarus, represents a market of more than 180 million people. How important is this area for Czech companies?
We are following the Eurasian integration process with great interest. From a mid-term perspective one can anticipate a significant improvement in Czech companies' access to EAEU markets, whether due to the application of a unified customs rate, joint methods of non-tariff regulations, or a unified system of certifying goods. The EAEU can become a key element in the chain between Europe and the Asian-Pacific region. On the other hand, the Eurasian integration project faces strong competition in the form of Chinese infrastructure and economic projects undertaken as part of the One Belt, One Road initiative, and there are the internal economic problems faced by individual member states. The viability of this relatively grandiose project will become clear in the ensuing years.

From mid-June, Kazakhstan is hosting the EXPO 2017 exhibition, which is specifically emphasising the field of energy. Historically, Russia has been the country's most important business partner, but a significant Chinese delegation is also planning to attend the EXPO, led by China's head of state. In terms of the number of participating countries, Astana now ranks among the top five trade fairs. What is the significance of Czech participation from the point of view of Czech business?
The Ministry of Trade and Industry has undertaken a major effort to promote Czech business participation in Astana. And we believe Czech firms will be present at a prestigious event when it comes to EXPO 2017, providing a particularly excellent opportunity to show the global competition – and a region with a great demand for modern technologies – the advanced nature of the Czech energetics industry. In terms of energy production and distribution, and the overall field of energy and energetics, we offer the world a whole series of modern technological solutions, patents, top products, and compact technical machinery, which can be applied across the globe. And they are all marked by a common trait of ingenuity and dedicated planning, which is why we are heading to EXPO 2017 under the specifically chosen banner of "Ingenious Solutions". I am very glad that our exhibition will be visited by President Miloš Zeman.

Our pavilion is divided into two sections. The main exhibition will be devoted to unique Czech inventions, technological solutions, and the most modern products offered by Czech firms. We will also be presenting a unique electrically powered sporting aircraft concept in Astana; as well as a futuristic electric bus, which utilises nanotechnology; an electric power plant, which generates energy from the incineration of regular waste; a residential home, which creates and regulates its own energy usage, and many other ingenious solutions. We have also prepared a lighter and more playful second component of our exhibit, primarily for parents and children in the form of interactive energy-themed exhibits. The second floor of the Czech pavilion will include a selection of Czech national cuisine.

I am very much looking forward to participating in EXPO 2017 in Astana, and I am keeping my fingers crossed for all Czech exhibitors that their participation at this event will yield positive economic consequences.

Are you planning to personally visit the EXPO in Astana?
I plan to personally visit Astana along with a trade delegation, which is also attending INOPROM, one of the largest engineering trade fairs in the world taking place in Yekaterinburg (Russia) from 11-13 July. I would like to make a second visit to the EXPO during the second half of August accompanied by a trade delegation from the Chamber of Trade and Industry for CIS Countries (Komora SNS).

What is the current state of Czech-Kazakh economic ties? In what areas is the relationship strong, and in what areas is there room for improvement?
As has already been stated, economic ties with this country are very important for the Czech Republic. Czech-Kazakh ties are not weighed down by any negative past history. In my view, there is nothing preventing their further intensive consolidation. Kazakhstan holds great significance for the energy security of our country, is our third most significant petroleum exporter, and offers raw materials which we need. Our exports are primarily concentrated in the fields of energy and energetics, automobile manufacturing, and engineering. The one slight disadvantage is the relatively large distance between us, which limits the intensity of contacts. That is where is see the greatest room for improvement. We must support the consolidation of mutual contacts, and enable firms to engage on various levels. I am convinced that given the aforementioned factors Czech and Kazakh entrepreneurs will continue to build ties and generate a number of interesting business projects.

Jiří Havlíček (41)

Born in the town of Ledeč nad Sázavou. Graduated from high school in Čáslav and subsequently studied at the Faculty of Economics, University of Economics in Prague - VŠE. Completed his MBA studies at LIGS University in 2012, with a degree in marketing and communications.

From 1998-2000 served as a local party secretary for the Social Democrats, and subsequently spent two years working as head of department within the Central Financial and Tax Directorate, which falls under the Czech Ministry of Finance. After that worked as an economic adviser.

In 2003, began working at the Czech Trade and Industry Ministry, serving until 2005 as director of the minister's advisory board. From 2006-2010, worked as the chief manager and party secretary of the Social Democrats. Subsequently, from 2010-2013, was deputy mayor of the town of Čáslav.

In 2014, Havlíček was named Deputy Czech Minister of Trade and Industry, and also as head of office at this ministry responsible for administrative oversight. Took over as Minister of Trade and Industry on April 4. Speaks fluent English.

Flying bicycle set to wow visitors to Czech pavilion

An electric airplane or a model incinerator which creates more energy than it uses – such are the exhibits which are set to thrill visitors to the Czech pavilion, according to Jan Krs, commissioner of the Czech participation at EXPO 2017.

Tomáš Stingl

Photo EIS Anna Vacková

Jan Krs (57)

Studied international trade at Kiev state university. Served in Kazakhstan from 2000-2006 as a Czech trading consultant. Later worked as a consul in Yekaterinburg, Russia and also as a trade consultant in Moscow. He currently works for Azia Avto, which among other things, completes production of Škoda vehicles in Kazakhstan. He was selected from eight candidates to serve as the General Commissioner for the Czech participation at EXPO 2017 by the government last August. Jan Krs is a fan of sci-fi literature and also enjoys partaking in shooting sports.

The two-storey Czech pavilion at this year's EXPO 2017 will feature a number of exhibits, for example a foldable electric bicycle and a multifunctional bench which utilises solar energy. What, in your view, will most enthral visitors?
The electric airplane is certainly a very visually attractive exhibit. Add to that the flying bicycle, which is more of a curiosity really. Although it is certainly in the spirit of Czech ingenuity as illustrated by Jan Tleskač, the hero of a well-known novel by Jaroslav Foglar (Záhada hlavolamu, or The Mystery of Conundrum). In terms of new technologies, I believe that the waste incineration unit boasting a net positive energy balance represents a breakthrough new technology. We will be displaying a model of this unit. This could be a hit in Asia, given that so far such incinerators have been net energy users. And from my own past experiences as a trading consultant, I know that if you offer an incinerator somewhere outside of Europe which uses more energy to eliminate waste than it produces, then customers say: "We would rather haul off the waste to somewhere in the taiga or steppes".

Direct commercial presentations by firms are not permitted at this EXPO. So how will products from Czech companies be denoted?
It is permitted to place labels with the names of producers by exhibits. But more detailed information about the companies is not allowed.

Despite this, the EXPO is set to represent a major opportunity for Czech exporters to secure new deals. How will they be able to do this?
No-one can ban a businessperson from having a discussion, for example a Russian or Chinese counterpart, in the Czech restaurant. And we will also have a special conference room there with a capacity for 45 people, which can be used by Czech business representatives to hold formal presentations. The space can be used at no charge, all that is required is registering with us. Right now we still have plenty of free timeslots. And in this arena companies are perfectly free to give regular promotional presentations, for example for solar powered automobiles. The condition is that these events take place behind closed doors, and guests will have to have a special invitation to attend. In other words, according to EXPO rules, such events cannot be open to regular visitors to the trade fair.

Is President Miloš Zeman still expected to open the Czech pavilion?
Right now I don't have any information to the contrary. Miloš Zeman is expected to fly in to attend the ceremonial inauguration of the entire EXPO, which will take place on June 10; he will also partake in a ribbon-cutting ceremony at the Czech pavilion. Trade and Industry Minister Jiří Havlíček also has two visits scheduled. He will be accompanied by trade delegations. In his previous post as deputy trade minister (2014-17) he became thoroughly familiarised with the necessary preparations for the Czech participation at the EXPO.

Kazakh authorities have abolished visa requirements for Czechs this year so as to enable easier attendance at the EXPO. Will this non-visa requirement continue to exist after the world's fair is concluded?
I have unofficial information that this will be the case. Besides, Kazakhstan is already gradually abolishing visa requirements for all OECD member states. But I should note that visits not requiring a visa are only possible for 30 days, and only for tourism purposes.

How does Kazakhstan view the Czech Republic at present?
I think this very viewpoint was recently expressed by one Kazakh diplomat who basically said this: "We were so far away from each other, and throughout history we hardly ever met, and so we could do each other no harm..." In the modern era, Kazakhs are discovering Karlovy Vary and Prague, and are enthralled when they come across the ruins of some medieval castle on a Czech hill. They don't have such historical structures in their country. Many young Kazakhs are studying in the Czech Republic. And they are lauding cosmopolitan Prague for their lack of negative experiences with racism.

What is their attitude towards Czech goods?
They praise them as representing top European quality, and at a very reasonable price. And the EXPO will represent a further opportunity to foster ties with the Kazakh market. This year's theme is new technologies in the energy sector, and Czech firms are particularly strong in this field. And the Kazakh side needs to build up its energy-producing infrastructure.

Photo Expo 2017

The significance of Czech participation at EXPO 2017 in Astana

Eliška Žigová, Czech Ambassador to Kazakhstan

Prior to accepting an invitation to partake in EXPO 2017 in Astana, the Czech Republic carefully weighed all the aspects pertaining to such a decision. This is the first time in history that our country is partaking in a specialised EXPO; hitherto the Czech Republic has only presented itself at the regular general EXPO trade fairs. The most important argument for accepting the invitation was the event's very well selected thematic orientation (energy). Another key factor was the fact that Kazakhstan is among the 12 priority countries with whom the Czech Republic is seeking to develop economic ties.

Whether we realise it or not, a sufficient supply of energy represents a fundamental linchpin of our civilisation. Our dependency in this regard continues to increase – anyone who has ever endured a blackout will attest to that fact. On the other hand, we are also increasingly seeing the consequences, stemming primarily from energy usage, for our environment; in the long term, many current sources of energy face depletion insofar as they can be tapped in an economically feasible manner. Which is why a sharp increase in terms of production and utilisation of alternative energy sources is evident across the world. But such energy sources are often more expensive. Furthermore, their effective utilisation is also being thwarted by our inability to effectively store the energy we produce. This all represents a major challenge for the future. An apparent solution is the further development of new technologies, intelligent networks, and a change in behavioural habits on the part of industry as well as by ordinary citizens.

A strong interest

Which is why we are convinced that EXPO 2017 Astana will become a significant platform for the exchange of views and ideas, both on an academic and political level, and also from the points of view of businesses and citizens. Energetics-related technologies comprise a traditionally strong component of the Czech economy. Each year we export specialised electrical production equipment and machinery worth a total USD 4 billion. Our pavilion, and the exhibits within it, are conceived so as to offer potential paths forward for the energy and energetics industry, with an emphasis placed on innovative technological solutions.

We have received countless signals that suggest Czech firms and related parties have a strong interest in EXPO 2017 Astana. The event represents a welcome opportunity to present original Czech technologies and innovations on a global stage. And such presentations will be evident in the Czech pavilion throughout the duration of the trade fair. Our pavilion will also boast a floor housing a special conference room (right next to a Czech restaurant). We expect that this will serve as a key hub for meetings for industry representatives, offering the opportunity for visitors to acquaint themselves with the latest technologies and ideas at a single location. This, too, will contribute towards the innovation potential of the economies of all the partaking countries. We look forward to seeing you at the Czech pavilion.

Visualisation Arteo 3x

PEDAL POWER. A huge logo towers over the entrance to the Czech pavilion. The sign will be powered by electric bicycles open to the public. June 10 marks the ceremonial opening of this year's Astana trade fair. The future-themed exhibition will run for three months until September 10, 2017.

VIRTUAL ASTANA. During May, a stall touring Europe promoting EXPO 2017 made a stop in Prague. Visitors were able to don 3D glasses and "soar" through an animated model of the newly-constructed exhibition arena in Kazakhstan.

Photo EIS Anna Vacková 2x

OPPORTUNITY KNOCKS. The Czech pavilion will house between 350 and 400 people. It represents a unique opportunity for visitors to see a prototype of the SportStar EPOS sport aircraft, which uniquely boasts electric propulsion. The aircraft is hailed as the number-one attraction of the entire Czech exhibition. The Czech pavilion will also feature countless other exhibits, for example the largest gearbox in the world courtesy of Wikov, and also an electric folding bicycle.

Czechs operating and modernising hydroelectric power plants far beyond their own borders

For the Czech Republic, a landlocked country in the heart of Europe, waterways have a very specific geographical and economic significance. Three main European watersheds traverse Czech territory, dividing the continual divides of the North, Baltic and Black Seas. Water also plays a fundamental role in fuelling the Czech economy and its overall export potential.

Jan Žižka

Photo Lukáš Pelech

The Czech Republic lacks any mammoth-sized mountain ranges or major fast-flowing waterways, and so the potential for hydroelectric energy production is not comparable with that of the major world players in this field. Nonetheless, hydroelectric power still has a major tradition in the country. And the historically industrially-oriented Czech lands also boast top-quality mechanical engineering facilities, which traditionally have incorporated the production of turbines and other hydro-oriented machinery.

And so the Czech Republic has accumulated major experience in this field. To this day the Moravian town of Blansko remains a centre of modern engineering concepts, serving as the basis for hydroelectric construction and modernisation projects around the world. Presently, not only does the Czech Republic export hydroelectric machinery, and carry out full hydroelectric power plant realisation projects in other countries, but it also directly invests in, and operates, foreign hydroelectric power plants.

The Czech industrial tradition and strong orientation towards hydroelectric power – which globally remains the most significant source of renewable energy – has created a combination that continues to contribute towards significant economic growth.

Kaplan turbines

The Czech hydroelectric tradition has its roots in the discovery of a technology which would go on to become a global standard: "The blades of the water turbine must act as a water propeller and need to spin based on the amount of a liquid passing through them." So said Austrian inventor Viktor Kaplan about this fundamental eponymous discovery at the start of the 20th century – at a time when he worked at the German Technical University in Brno, the second largest Czech city and the capital of the historical region of Moravia.

In 1910, Viktor Kaplan built his first turbine research laboratory in the basement of the university. However the Austrian monarchy's education ministry only offered limited financial support for it to be outfitted. This led Kaplan to have to pay for most equipment out of his own pocket. Later, several successful hydroelectric laboratories emerged in the now independent country of Czechoslovakia. Today's modern hydroelectric laboratory in Blansko represents a direct continuation of this tradition.

But even back more than a century ago, Kaplan already succeeded in what today we would call the "commercialisation" of his new turbines project. Ignác Storek, a mechanical engineering and foundry firm, assisted Kaplan both in terms of equipping his laboratory and in the production of the new Kaplan turbines. Major opposition was encountered from the large industrial firms of the day, who feared losing their investments in the hitherto dominant technology, namely the Francis turbine. But in 1919, a Brno firm became the first to install a Kaplan turbine for an Austrian spinning factory in the town of Velm.

But that was just the beginning. The Kaplan turbine (pictured) subsequently became a major Czechoslovak export; and later, after the break-up of the country, a major Czech export. Naturally, local firms also devote their energies to the manufacturing of other kinds of turbines as well, including the cultivation of the associated engineering, service and sales-related industries.

The largest turbines in Europe

Many parts of the world can boast far larger hydropower structures than exist in the Czech Republic. Nonetheless, for many years water power has played a major role here. And even though its overall share of the total Czech power supply remains relatively small, we are seeing a current trend of an increased significance of pumped hydroelectric energy storage (PHES) stations. These energy "batteries" are necessary to balance out the inherent supply instability of other renewable energy sources such as solar and wind power.

The fact that numerous smaller electric power plants have "sprung up" in the Czech Republic, coupled with the construction of a number of larger hydroelectric dams, also offers fresh challenges to the aforementioned Czech engineering sector.

Most dams in the Czech Republic have been built along the Vltava river, a waterway viewed as one of the symbols of the nation, and made famous by composer Bedřich Smetana's celebrated symphony. There are nine dams in total, of which the first was constructed in the 1930s. The total installed hydroelectric power output along the Vltava river is 750 megawatts. (Hydroelectric power plants have also been built in Slovakia, primarily along the river Váh; albeit the largest hydropower installation in the country is the Gabčíkovo-Nagymaros Waterwork along the Danube.)

Magic eye

But Czechs tend to regard a far smaller installation as the "greatest wonder" of their country – namely the most powerful in the country, Dlouhé stráně Hydro Power Plant in northern Moravia, not far from the Polish border. This is a pumped storage plant, in operation since 1996. The reservoir sits at an elevation of 1,350 metres above sea level and has become a major tourist attraction. It is situated not far from the highest peak of the Hrubý Jeseník mountain range and has gained the nickname "magic eye".

The Dlouhé stráně Hydro Power Plant symbolises the wider emphasis »

» of Czech industry on various types of "hydropower batteries", and indeed turbine pumps represent one of the most significant products associated with Czech engineering. And today engineers from the town of Blansko are directly undertaking the reconstruction of turbines at Dlouhé stráně, as well as in a number of other pumped storage plants.

Czech firms are also securing contracts abroad. For example, they helped to supply parts for a turbine pump in the largest German pumped storage electricity plant Goldisthal.

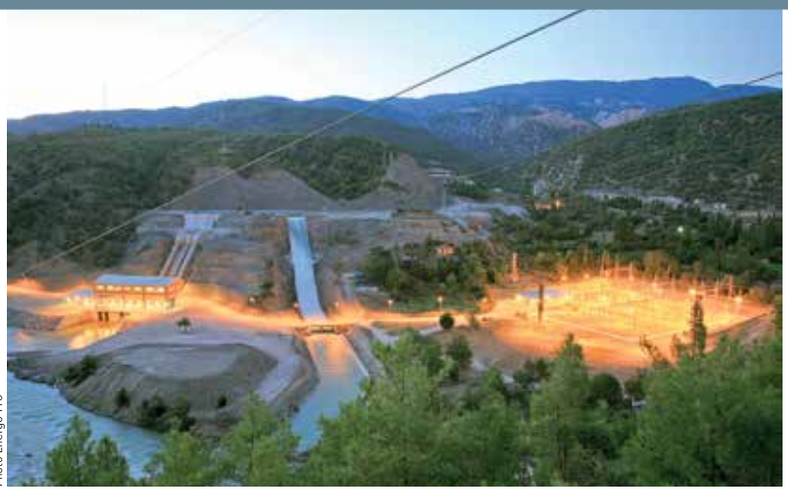

Photo Energo-Pro

READY IN THREE YEARS. Energy group Energo-Pro is to complete the construction of the largest privately-owned dam and electrical power plant complex in Turkey. The Alpaslan 2 project will create the ninth largest dam in Turkey, with the top eight owned by the Turkish state. The Resadiye hydropower works are situated on the river Murat in Mus province, southeast Turkey.

Among the global competition

After policy changes carried out in the 1990s, asides from the Czech state serving as operator of large hydroelectric power plants, Czech hydropower and its associated engineering branches also began to see private firms entering the fray. Even though many at the time believed that private sector participation would yield few profits, a new generation of entrepreneurs were nonetheless able to predict that, in fact, the opposite was true. Subsequent state subsidies for renewable energies – not just in the Czech Republic, but around the world – proved them right.

And Czech efforts in terms of producing turbines and other hydro-electrical power components has also seen them team up with counterparts from countries such as the US and Slovenia, with joint efforts frequently made to approach new third markets. At present, a Czech firm is also preparing for the production of turbines in Ankara, Turkey – a country whose demand for new energy resources is huge given its anticipated renewed economic boom.

In terms of supplying turbines, Czechs have found success on every continent. Specialities in this regard include providing turbines for water-powered mini power stations. And Czech firms export Kaplan, Francis, Pelton and other types of turbines of various designs. Exports head towards fellow European Union countries, as well as to many other far-off countries such as Canada, South Korea, Panama and Uganda.

International electricity plant operators

In recent decades, asides from exporting hydropower equipment and carrying out repairs to hydroelectric power plants in locations all around the world, Czechs have also focused on investing in electricity plants in countries such as Bulgaria, Georgia, and Turkey. They operate and modernise existing power stations, or partake in the construction of new ones.

State insurer EGAP (Export Guarantee and Insurance Corporation), which serves as the Czech Republic's formal export credit agency (ECA), has supported a whole series of similar projects. And this forms part of EGAP's long-term strategy to increase focus on insuring environmentally friendly energy sources (renewable and nuclear energy). Since 2005, around half of the energy projects to have gained such insurance fall under this umbrella.

From 2002-2004, Bulgaria became the country in which Czech investors carried out their first acquisitions of hydroelectric power plants. And that was certainly not by chance – even prior to the 1989 revolution Czechoslovaks were helping to construct electricity plants in Bulgaria. Following on from these acquisitions, many other Czech firms partook in the reconstruction of Bulgaria's hydropower facilities – including the power stations of the significantly sourced Sandanska Bistrica waterfall.

Only a few years later – from 2007-2009 – Czech entrepreneurs directed their attention towards a country further afoot in the Caucasus, namely the country of Georgia. Czech firm ENERGO-PRO has gradually become the largest energy supplier in the country, operating across 70 percent of Bulgarian territory. Not only have Czech entrepreneurs assumed the operation of 15 Georgian hydroelectric power plants, but they have also secured responsibility for the accompanying distribution system. (They also became the operators of the distribution network in Bulgaria.)

In turn, the project, supported by EGAP, brought fresh orders for a series of Czech firms who partook in the modernisation of the power distribution network.

Turkish opportunities

In 2010, EGAP also supported a subsequent investment by the same firm in Turkey. At the time, the Czech side bought five hydroelectric power plants from two Turkish firms. But that was far from the end of such ambitions in this country – especially when one factors in Turkey's pursuit of energy independence. That means Turkey requires sufficient energy sources so as to attain an ambitious goal of becoming one of the world's top 10 economies within a relatively short period of time.

Czech investments in foreign hydroelectric plants*

Electricity plant/cascade	Country	Installed output	Year of investment
Sandanska Bistrica cascade	Bulgaria	56,4 MW	2002
Pirinska Bistrica cascade	Bulgaria	50,0 MW	2013
Ladjanuri electricity plant	Georgia	112,5 MW	2007
Gumati cascade	Georgia	66,8 MW	2007
Shaori-Tkibuli cascade	Georgia	118,4 MW	2007
Resadiye cascade	Turkey	65,6 MW	2010
Karakurt electricity plant project	Turkey	99,5 MW	2011
Alpaslan 2 electricity plant project	Turkey	280,0 MW	2017

* (examples of larger cascades and electricity plants)

Source: Energo-Pro

Either way, the Czech side intends to make use of favourable conditions to purchase new electric plants, or to construct new ones on greenfield sites. In 2012, a project kicked-off to build a new damn and hydroelectric plant in Karakurt in north-eastern Turkey (pictured). The installed final output is set to be around 100 megawatts.

And Czech investors are also planning to bring into operation the hitherto largest ever electricity plant, with a projected output of 280 megawatts, in south-eastern Turkey. Specifically, the Czechs have taken over a project to build the large Alpaslan 2 hydroelectric power plant. This will be the largest private-owned hydroelectricity plant in Turkey, and will be the ninth-largest dam in Turkey in terms of the size of water containment.

Centre of research

Back in the Czech Republic local firms are consolidating a tradition of engineering and manufacturing, utilising not only the rich experiences gained from a variety of construction and project management activities, but also from the results of quality experimental research and development. And there is nothing at all surprising about the fact that the most modern hydroelectric research laboratory in the world can be found in the aforementioned south-Moravian town of Blansko; a site into which from 1952-1989 the Czechoslovaks concentrated almost all of their industrial hydropower development activities.

The most up-to-date hydropower research laboratory in Blansko went into operation at the end of 2011, and belongs to ČKD Blansko Engineering. Prior to the onset of production of end-product water turbines, pump turbines and pumps, the laboratory offers the possibility of testing new hydraulic solutions using physical models.

Laboratory tests enable the verification of energetics technologies, enabling proper final application both at home and across the globe. For example, tests were conducted on Francis turbine models for the Toro 3 hydroelectric power plant in Costa Rica and on a model of Kaplan turbines for a hydroelectric power plant project in Khoda Afarin, Iran. The labs even assist other technologies, such as those used in agriculture. For example, tests were conducted in the Czech Republic on model irrigation pumps for a pumping station in Gangaram, India.

Other projects include hydropower equipment across the likes of India, Sweden, Finland, Norway, Slovenia, Costa Rica, Ecuador and many other countries.

The author is a consultant for the energy projects of consultancy firm Hatcom

Kaplan-type siphon propeller turbines

A key global player in the debate over energy utilisation is set to partake in the EXPO trade fair held in the Kazakh city of Astana. MAVEL will represent the Czech Republic in the field of hydroeletric power. "We will bring a technology to Astana which does not require the construction of a separate electric power station buildings," says Jan Šíp, board member at firm Mavel.

Anna Uljačenková

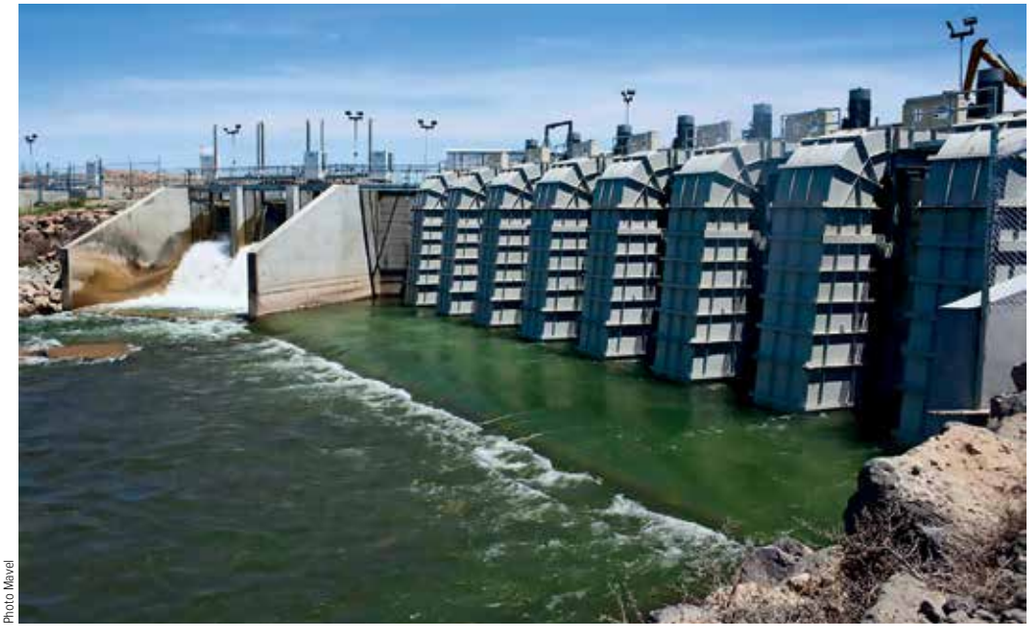

Photo Mavel

CZECH TURBINES HAVE GAINED MAJOR MARKET FOOTHOLDS AROUND THE WORLD. Eight electrical production units have been installed, courtesy of firm Mavel, near the city of Jerome, Idaho. Mavel is displaying the same type of turbine in Kazakhstan.

What are you bringing to the trade fair? What kind of solutions will you be presenting?
We are heading to the EXPO 2017 to present and demonstrate our top-of-the-line products, which offer a wide application, not just for the locality but across the entire region. We can break down the question into two areas: In the wider sense, we will present ourselves as a Czech-American manufacturing company, which is among the world leaders in terms of producing custom-tailored water turbine solutions. In specific terms we will be bringing along our unique, but simple-to-use, technology known as MT (Kaplan-type siphon propeller turbines), with visitors able to inspect a real working model (not a prototype). They will also be able to use an interactive information panel to design their own custom electric power station. The main advantage of this technology is that installation is quick and simple, and does not require the construction of a separate electric power station building.

How did MAVEL manage to become one of the official companies representing the Czech Republic at this event?
Our activities over the past two years prior to this EXPO certainly did not go unnoticed by the embassies of both countries, and so we also found ourselves on the radars of other organisations and institutions. An offer was then formally made to us to represent top Czech manufacturers at the EXPO, and we were honoured to accept.

How costly is such an event for you?
We produced our exhibit at our manufacturing plant at a cost of about one million crowns. We financed the production out of our own pockets, similarly to the other costs associated with participation in the EXPO. The turbine was presented to the organisers at the start of May.

Do you plan on leaving the unit behind in Kazakhstan?
It is a fully functional turbine, which is why we believe that it will surely find its future owner during the EXPO.

Will participation help you to find new customers over the longer term?
We believe that our participation will promote a general wider awareness of the quality of Czech manufacturing and engineering. From the long-term point of view, we anticipate that customers in the region will direct themselves more towards quality instead of merely the lowest price offered by the Chinese competition. If our expectations are fulfilled, then we can expect to gain a number of new orders.

What is the potential impact of participating in this EXPO – for example, how have they reacted in Belarus, where you have a couple of reference orders?
It is certainly a matter of great prestige for our company. One can say that our partners in the nations of the Eurasian Economic Union (the Russian Federation, Kazakhstan, Belarus, Armenia and Kyrgyzstan) view our participation in the EXPO in a very positive manner, with opportunities presented to utilise the offered synergies within supply systems, or in financing and insurance.

What is the state of the Kazakh market with regards to the Czech export potential for hydroelectric products?
This market boasts great potential, be it in the fields of the reconstruction and modernisation of existing hydroelectric plants, or with regards to building new ones.

Can you list your key reference orders around the world and also in the countries of the CIS?
Each successful reference order always helps to contribute towards our marketing activities and to strengthen faith in the MAVEL brand. Within the Eurasian Economic Union, reference orders in this region carry a greater weight in comparison with reference orders in other regions. It is primarily a question of trust and an awareness of the given environment. Our references in Belarus (for example the VE Grodnensakya and VE Polckaya hydroelectric plants built in conjunction with Technopromexport Moskva) or in Armenia (VE Yegesis hydroelectric plant) serve as examples of this.

Are you experiencing any changes in CIS markets with regards to renewable resources? What is the current state of the market in terms of attitudes to renewable and zero-emission energy sources?
Many CIS countries are actively tackling energy policy, and understand that utilising renewable resources represents an alternative path towards energy independence. And that is reflected in the growing support for utilising such resources.

What are the competitive advantages of using Czech companies in the CIS? And, conversely, what factors work against trade in this region?
In many countries we encounter a strong awareness of the quality of Czech manufacturing, cultivated by past successes in fulfilling commissions and reference projects from the Czechs. And so today Czech brands and products are regarded as having a mark of quality and reliability. In a general sense, any kind of instrument which inhibits the free flow of goods, people and capital, such as sanctions and embargoes, are not conducive to trade.

Projects of Mavel, a. s.

Country	Project name	Technology type	Number of units	Output	Year of realisation
Republic of Belarus	VE Grodnenskaya	Kaplan	5	18 870 kW	2012
Republic of Belarus	VE Polockaya	Kaplan	5	24 250 kW	2017
Republic of Armenia	VE Yegesis	Pelton	2	12 920 kW	2006
Ukraine	VE Novoshychi	TM5	3	120 kW	2013
Ukraine	VE Rosj 1	TM5	2	110 kW	2015

Source: Mavel

Czech hi-tech – nuclear energy and industry

Photo ČTK 2x

The successful operation of nuclear power plants and an ability to export nuclear industry products around the world. Both of these things apply to the Czech Republic. Nuclear energy can be listed as a form of Czech "hi-tech", attesting to the advanced levels of application and research across this field.

Jan Žižka

Although the Czechs do not possess their own specific kind of nuclear reactor, in the past Czech firms have still managed to prove their ability to build atomic reactors almost entirely by themselves – available evidence suggests the reactors account for around 90 percent of all such technology in operation in the country. Among the small exceptions to this rule we find the production of nuclear fuel, which the Czech Republic imports. But even in this field we still boast excellent know-how and services.

This expansive network of suppliers in the field of nuclear energy and energetics has impressed a number of global companies presently offering Czech industry business opportunities; such firms are also evaluating entering into potential strategic partnerships for the construction of new nuclear reactors – be that directly in the Czech Republic or abroad.

Since 2015, the interests of Czech industry in this regard have been represented by the Aliance české energetiky (Czech Power Industry Alliance), which is already in the process of agreeing future cooperation with top global players in the industry.

Pilsen – more than beer

The west Bohemian city of Pilsen is well known around the world for its top-quality Pilsen beers. But Pilsen's engineering plants have also produced more than 20 nuclear reactors of the Russian VVER variety. And last year the city celebrated the 60th anniversary of the Czech nuclear industry's formation, with firms from industrially oriented Ostrava and many other Czech (and Slovak) towns and cities also sharing credit.

AN ATTRACTIVE CONSTRUCTION-COMPLETION PROJECT. The need for construction to be completed on nuclear power plants at both Dukovany and Temelín is generating interest from investors. Asides from the traditional players, industrialists from Asian countries farther afield are also making themselves heard.

Naturally this development was also assisted by the construction of Czechoslovak nuclear power plants – at first in Slovakia, and then in Moravia and Bohemia. Today, the Czech Republic's nuclear power sources account for around a third of its electricity supply; by 2040 this amount is forecast to increase to around one-half.

Four blocks at the Dukovany nuclear power plant started producing electricity during the 1980s;

two reactors at the Temelín nuclear power plant came into operation at the start of the millennium. Czech reactors are among the most reliable in the world.

The Czech Republic plans to build further reactors, and is preparing an international tender to find a chief supplier, with whom close cooperation with the Czech industrial sector is anticipated. France, China, South Korea, the US, Japan and Russia have expressed an interest in providing their reactors.

What the Czech Republic offers

The construction of other nuclear power stations within Europe seems to be a very uncertain proposition at present. However, it is clear that without nuclear power the world cannot even come close to fulfilling international commitments to reduce greenhouse gas emissions.

For example, in Pilsen (to this day a notable centre of the nuclear industry) a realistic assessment of the present factors at play in the Czech Republic is forming the basis for future planning. This includes: experiences in operating existing nuclear power plants, their professional operators, professional state oversight, advanced nuclear industry, the world-famous Škoda brand (used today by a number of Czech companies), references from realised supplies to nuclear power plants abroad, and the declared support of the government to further develop nuclear power. Next, this verbal support must transform into real steps, which will lead to further development in both the energetics and related industrial manufacturing fields.

A unique Czech story

Given past ties, today Czech companies are in particular gaining commissions to build electric power stations in Russia, or to assist with projects in which the Russians are building such stations in other countries. Since the 1990s, close ties have also been developed, as part of this "unique nuclear energetics story", by the relatively small Czech Republic with industry partners in France and the US.

At present, the prospects for new reactor construction at both Dukovany and Temelín offer hope, as does the fact that more distant Asian countries have also expressed an interest in the Czech market. Such potential partners positively appraise Czech know-how, the qualified labour force, and also the geographical position of the Czech Republic in central Europe. There is also talk of a potential alliance between global firms and the Czech supply network in the construction of nuclear power plants in other European countries.

At issue is not merely the construction of new reactors, but also increasing the life-spans, safety and efficiency of existing ones. And that represents countless business opportunities. For example, Czech firms are increasing their list of reference activities connected with the maintenance and modernisation of the nuclear power plants in Dukovany and Temelín, and also with similar work carried out abroad.

A FOCUS ON ŘEŽ. The small village of Řež (a name that's difficult even for Czechs to pronounce) near Prague contains the LR-0 experimental reactor, one of the few in the world able to study the reactivity of salt.

Modernisation of electricity plants

Among the current Czech nuclear industry projects we find an update to the control and operation systems of the Hungarian Paks nuclear power plant. Furthermore, there is the modernisation of similar systems in atomic power stations in Ukraine. The Ukrainian project has received financing from the European Bank for Reconstruction and Development (EBRD) with the aim of increasing the security of nuclear power plants in the country.

But many other examples also exist. For example one recent commission of note involves the supplying of Czech containers to store spent fuel for the Flamanville nuclear power plant in France.

On the other hand, without commissions to build new nuclear power plants, the entire field would find itself in a tough position, losing hope for a viable way forward. In this regard, Czech firms presently have their hopes set on a project to complete construction of the Slovak Mochovce nuclear power plant. And other potential orders are also on the horizon, involving projects undertaken by Russia in third countries – be they in Finland, Hungary, or, potentially, in Jordan and Egypt.

Hopeful research

Research and development remains a major avenue for Czech opportunities. And the Ústav jaderného výzkumu Řež (Nuclear Research Institute Řež, ÚJV), not far from the Czech capital Prague, is continuing with its more than 60-year tradition. Even today, ÚJV Řež is gaining global recognition with its offerings of engineering, planning, analytical and scientific support for the operation and new construction of nuclear power plants. Among its recent successes are a collaboration contract with Finnish firm Fennovoima, which has ordered a new reactor from Russia.

And in 2016 one of the laboratories at ÚJV Řež won the Nuclear Technology Transfer Award from the prestigious American Electrical Power Research Institute for the implementation of a programme of managing the life-spans of power cables in Czech nuclear power plants. This research could – with only slight exaggeration – be of interest across the entire globe. ÚJV Řež is also one of only a few such laboratories in the world able to simulate accidents at nuclear power stations.

Research conducted in the small Czech village of Řež can serve as a testament to the fact that even in Europe the future of the nuclear power industry need not be bleak. Young researchers are coming to work at Řež from countries such as Italy, Germany and France, inspired by the lab's determination to continue work on viable nuclear research projects.

The author is a consultant for the energy projects of consultancy firm Hatcom

Photo František Zvoneček

An interactive electric bus model

Škoda Electric has developed its own electric vehicle network infrastructure, enabling its electric buses to transport urban commuters in places such as Pilsen or in the North Moravian town of Třinec. Visitors to Astana will see for themselves a unique Škoda electric bus model boasting a futuristic design. Students from the Academy of Arts, Architecture and Design in Prague (UMPRUM) collaborated on the design along with specialists from Pilsen-based Škoda Electric. Electric vehicles tend to be more reliable compared to diesel vehicles, and maintenance expenditures are also lower.

The prototype model on display in Astana merges two different design viewpoints. "It is based on the notion of a real vehicle, supplied by Škoda to customers. And so it conforms to the placement of individual technical components, the battery, and the traction motor, in a manner akin to our real vehicles. Art school students created their own, entirely electric unique bus design; and the whole model was created with the aid of 3D printing," says Tereza Hajná, a Promotions and Marketing expert at Pilsen-based Škoda Electric.

The model is also partially interactive – the Škoda vehicle on display at the exhibition will boast control features which enable interested parties to acquaint themselves with the modern technologies utilised in this Pilsen-made electric bus. "For example, pressing a traction battery button in the electric bus will bring up on-screen information about the unit's operation and parameters," explains Tereza Hajná.

So far Škoda Electric has produced a total of 13 fully low-floor electric buses, with a fourteenth currently in production for a client in Slovakia. At the start of this March, Třinec ceremonially christened 10 new Škoda electric buses to be used by the town's transit network. This has led to the firm becoming a leader in urban electric mobility systems in the Czech Republic. The buses are operated by Arriva Morava.

Škoda electric buses have replaced hitherto used diesel-powered buses for a number of key routes in Třinec. The vehicles are branded as Škoda Perun HE (High Energy). "Without exaggeration, the town of Třinec has become a pilot project which showcases the potential future direction of mass urban transit systems, and not just in the Czech Republic, but across all of Europe," says Škoda Electric sales director Radek Svoboda. During the day, these electric buses serve customers along routes spanning 110-150 kilometres. Battery recharging is carried out at night in depot facilities; each of the buses contains its own small recharging port. In future, the project is set to expand to include automatic recharging infrastructures directly situated at select stations, which will increase the mileage and overall utilisation of these vehicles even further.

Another two Škoda Perun HP buses have been in operation in Pilsen for roughly two years. The city now also houses a new Škoda charging station. Škoda Perun HP (High Power) urban electric buses are fully electric, 12 metres long, and feature fully low-floor access; they contain a quick-charging battery system which requires only 6-8 minutes to top up at end-stations. Such a topped-up electric bus can then travel a further 25 km, meaning that the buses can essentially operate without interruption. The entire electric bus development project in Pilsen, including the building of the recharging station, falls under the umbrella of the prestigious European Zero Emission Urban Bus System project, which is dedicated to various electro-mobility solutions in the field of public transportation; other participants include Barcelona, London, Stockholm, Münster, Bonn and Cagliari.

Škoda Perun electric buses are 100-percent battery-powered zero emission vehicles. Thanks to their low noise and environmentally friendly technology they are able to replace diesel-powered buses in historical city centres or residential areas. The benefits of electro-mobility are clear – towns and cities bustling with working commuters gain the advantages of an alternative form of transportation offering low noise and a reduction in emissions, representing a clear step down the road of sustainable development. The only limitation with regards to a wider uptake of electric buses is the initial cost of purchasing such vehicles. That is understandable give the new technology involved. But over time, the initiation of mass production will very likely cause the purchase price to fall. /red/

An electric bicycle – the fastest means of urban transportation

The exhibited highly robust SilverGo foldable electrical bicycle from producer AGOGS promises to be the fastest possible mode of urban transport for a distance of up to 5 km. And the electric bike is comfortable for usage of up to 20 km per day. A sufficient battery capacity, coupled with a re-charger, enables even longer day trips of even 150 km or 200 km per day.

Within Europe, Holland and Germany are furthest along in terms of expanding the electrical bicycle market. But even in the Czech Republic every tenth bicycle now sold features an electric motor. Bicycle riding is beginning to take on a particular social status. Thanks to high-end electrical bicycles, those "unable to afford a car" have been liberated by this new form of transportation. A modern manager can make use of an electrical bicycle for short stops around town, using taxis, car-sharing or trains for longer trips. Shopping and other domestic services are taken care of online, while mail order takes care of moving around larger items.

Multi-modality is a major advantage of foldable electric bicycles. Such a bike can be placed in the back of a car boot, or taken on board a bus or train; the bikes are easily folded to fit into an elevator, and can easily be stored even in a small home or office. And yet they can still be considered classic bicycles which can be ridden anywhere – on streets, off-road, without a driving licence in most countries and without (often unpleasant) motorbike helmets. And unlike a moped or scooter an electric bicycle weighs only around 20 kg, and so is easy to control.

The exhibited SilverGo foldable electric bicycle has been made by Czech firm ekolo.cz for a decade. But each year, new innovations and improvements are introduced. Maximum emphasis is placed by the manufacturer on the resilience and

Photo Agogs

quality of components because electric bicycles are designed for everyday usage, in all weather conditions, and essentially offer a greater scope of use than even recreational sporting bicycles. It not uncommon to traverse as much as 1,000 km annually with such a bike. Which is why most components are made from aluminium alloys; and, in particular, those parts of the frame which are subject to stress, are double laminated. The bicycles can be controlled via a display on the handlebars, or via the AGOGS Control Smartphone application using Bluetooth.

Undeniably, electric bicycles are replacing regular racing bicycles for transportation usage. But e-bikes also possess the potential for replacing cars and costly public transportation to a certain degree. If quality bicycle-use infrastructure is in place, and sufficient opportunity exists for safely parking bikes by schools, offices, institutions and so on, then most urban inhabitants will certainly select this cheap, fast and highly individual form of personal transportation. /red/

Technologically advanced electricity plant

You are presenting your efforts to renovate the Ledvice electrical plant at the EXPO. What are the merits of the technologies you have utilised?
The Elektrárna Ledvice power station represents the most technologically advanced electricity plant not just in the Czech Republic but across all of Central Europe. The utilised boiler creates a supercritical amount of steam and thus enables the attainment of a hitherto unthinkable 42,5 percent level of efficiency. The utilised technologies using electrostatic filters for so-called "wet" desulphurisation and dust extraction will ensure that environmental standards are met, with room to spare for the future too.

Photo ČTK

MODEL GENERATOR. Elektrárna Ledvice is a thermal power station owned by ČEZ and situated between the northern Bohemian towns of Ledvice and Bílina. Apart from producing electricity, the plant also produces heating energy primarily supplied to the towns of Teplice and Bílina. The power station was built between 1966-1969 with a total output of 640 megawatts. Modernisation is being undertaken by Škoda Praha.

Are you seeking, by your presence at the EXPO, to penetrate CIS markets? And will your participation help to open doors to customers in the countries of the Eurasian Economic Union?
In terms of utilising coal to produce electrical energy, it is precisely Kazakhstan which offers huge coal deposits and which has declared an interest in modernising its coal-powered plants. Other Asian regions have similar considerations. Meanwhile, the Central Asian and Transcaucasian states of the CIS are interested in the construction and modernisation of gas turbine plants, with which we also have experience. From this point of view we view our Czech EXPO participation as a notable factor supporting our efforts to penetrate into this part of the world.

What are you offering the global public, and are you applying the Ledvice model anywhere else in the world?
Coal-powered electrical energy production is on the rise precisely in Asia. The technological approach utilised in the case of Ledvice is very progressive on the one hand, while on the other it can also be described as a thoroughly tried and tested technology, which has also been installed in a number of other electricity plants in Europe and Asia. Asides from coal technology we are also able to offer our partners our advanced skills in terms of constructing and modernising gas turbine plants.

Andrej Žiarovský,
board member at Škoda Praha

Virtual powerstation

As part of the EXPO trade fair, Škoda Praha will present its cutting edge technology for modernising coal-powered electric plants. The firm will present a virtual model of Ledvické elektrárny entitled – Svět 3D elektrárny (3D World of a power station). Ledvice represents a reference commission for the firm, enabling a demonstration of a modernised coal-powered electric plant that has no chimney. This is achieved via a sophisticated and elegant technological solution which is also environmentally friendly.

In the first stage, waste gases are cleansed of ash, sulphur and particulate matter. Then, instead of being released through a chimney, the emissions head towards a cooling tower. ŠKODA PRAHA is not just seeking a global audience via its EXPO participation, it also sees Kazakhstan itself as a potential future market for its products. Kazakhstan possesses dozens of coal-powered plants which date back to the Soviet era. These are now outdated, experiencing functionality issues and in desperate need of modernisation.

Czech Republic a mini superpower in small aircraft production

In terms of aircraft production, the Czech mechanical engineering industry supplies both individual components and also produces and develops complete airplanes.

The Czech Republic is a global leader in the development and manufacturing of aircraft engines. It is also highly successful in producing smaller aircraft. During the 1990s, Czech producer Evektor-Aerotechnik exported 1,300 small two-seater EuroStar and SportStar light aircraft. Dozens of companies are involved in aircraft manufacturing in the Czech Republic. And the country is also a recognised producer of ultralight aircraft. For example, more than 200 Sport Cruiser type planes were delivered by the Kunovice-based firm Czech Sport Aircraft to the United States.

The electric-powered SportStar EPOS aircraft will be presented at the EXPO, courtesy of Evektor. The aircraft will form a central motif of the Czech EXPO exhibition, and will be presented in an attractive "up in the air" mounting above the heads of visitors. Visitors will be able to examine the craft from below, and also side-on from the pavilion's second floor.

Photo Petr Gaffer Šťěrba

"Utilising electric power for aircraft propulsion, with the aim of being more environmentally friendly and reducing emissions and also operating costs is a very hot subject in present-day aeronautics," says Evector's marketing director Martin Růžička. /red/

A complete production

With the assistance of the Czech government, an agreement was recently reached which will yield US investment into the Czech aircraft manufacturing industry. The Czech Republic will be the only country outside of the US in which General Electric engines are developed, produced and subsequently exported. Specifically, this relates to the GE H80 turboprop engine.

The world's most powerful gearbox from Czechia

You are presenting a wind power gearbox model in Astana. What is the potential for such technology, and the usage and supply potential for CIS market countries?
The part of the gearbox we are exhibiting in Astana is designed for the highest-output wind turbines currently available on the world market. However, I believe that application within CIS countries will not be forthcoming at present. But our product portfolio naturally also offers gearboxes for a 2-3 megawatt output, which is suited to these territories.

Photo Wikov

You have a reference order in Russia. How do you evaluate the prospects of this market? What can you offer to this market asides from wind power?
Wikov is relatively successful across CIS countries in terms of supplying gearboxes and motors for rail vehicles, primarily trams and metro trains, and also replacement gears for cement mills and ovens. We are able to offer full solutions, meaning the entire gear systems including long-distance diagnostics. And that is what customers expect today.

Are you seeking, by your presence at the EXPO, to penetrate CIS markets? And will your participation help to open doors to customers in the countries of the Eurasian Economic Union?
EXPO 2017 will primarily help us to increase the profile of the Wikov brand in such markets. Realistically, we expect that new deals will only emerge over time. But we view this as an investment in the future.

Martin Sychrovský, head of marketing at Wikov Industry

The competitive advantage of "lightness"

Wikov will project a large-scale photograph in Astana of its gigantic gearbox. Despite the fact that Wikov says its units offer the competitive advantage of "lightness", it has nonetheless proved logistically impractical to directly present this technology at the EXPO. Wikov technologies are centred on making significant size reductions in gearbox products. One reference order to be highlighted by Wikov MGI at the EXPO comprises the supply of 10 sets of the main component of a gearbox for what was the most powerful wind-powered electricity plant in the world. This order went to Samsung Heavy Industries.

The solution provided by Wikov saved its client around 17 tonnes in weight for each gearbox, a significant factor for the construction and installation of turbines. A conventional solution offered by competitors, and with a matching output and torque, would weigh in at about 80 tonnes.

Wikov has long co-operated with state export insurer EGAP in its export activities. Over the last 10 years the firm has insured its exports to China, India, Russia, Germany, South Korea and the Netherlands. In most cases, this pertained to supplying gearboxes for wind-powered electrical plants.

A functional waste processing model

A 3D model of the PTR POWER PLANT offers a clear impression of the look, functioning, spatial requirements, multifunctionality and energy requirements of this technology. "From start to finish", says Monika Pullmanová, director of research and development at HEDVIGA GROUP.

Photo Hedviga

What are you bringing to the EXPO, and what solutions will you promote?
We are heading there to present the results of our own research and development, among other things protected by a European patent. It represents the combining of material and the energy utilisation of organic materials, primarily waste materials (rubber, plastic, biomass, TAP).

Is your exhibit a functional model?
The exhibit, which we created specially for the EXPO as a 3D model PTR POWER PLANT, is not only a functional PTR technology model, but it also demonstrates the practical possibilities of utilising "slow thermic decomposition". And the 3D model PTR POWER PLANT will not only illustrate the appearance but also the functioning, spatial requirements, degree of multifunctionality, energy usage, how much electrical energy is created, how much heat and how much fuel. Simply from start to finish...

Have you actually built a working version of this solution anywhere in the world?
Yes. London, Rainham Low-Emission Zone. The first installation of PTR technology is situated there – the PTR 1000 kW6, a unit which represents a daily capacity of 24 tonnes of rubber. The PTR 1000 kW6 in London was designed for processing rubber with a concurrent production of certified solid and liquid fuel and electric energy with an output of 1MWh and 1MWh of heat.

And thanks to this London unit, and the experiences gained in its production and installation, new financial opportunities have opened up for Hedviga offering clients references and know-how.

How have your business partners reacted to your participation at the EXPO? Will your position there as an official Czech representative firm lead to an increase in orders over the long term?
The EXPO 2017 represents a major opportunity for us. We are starting to hear from companies in China, Russia, India and Iran; furthermore in Kazakhstan a PTR project is already in the early stages of development. And it is in Kazakhstan that we would like to build a pilot electrical production unit, as well as another one in central Russia.

Are you seeking to expand your footprint at the EXPO beyond Kazakhstan further into the other countries of the Eurasian Economic Union (Russia, Belarus and others)? Do you have business interests in such countries?
We view our scope both in geographical terms, spanning countries such as Kazakhstan, Russia, Azerbaijan and China, and more importantly in technological terms. Our PTR technology also represents a fusion of energy-producing apparatus and utilisation of materials, the production of fuels, smart heating modules, and a typically very Czech search for resourceful solutions and innovation. /red/

••• COMPLETING THE CIRCLE •••

Slow thermal decomposition (in Czech: PTR) represents an innovative technological solution, which transforms complex organic materials into less complex ones via managed thermic transformation. That means turning waste into fuel, and then, in a cogeneration, or combined heat and power (CHP) unit, the fuel is used to power motors and create electrical energy and heat.

Research and development of PTR technologies has been under way since 2010, when the first idea arose to create independent semi-mobile units which can create liquid and solid fuels from tyres, which is used to ensure the energy self-sufficiency of the unit in utilising liquid fuels to produce electricity, while also creating a net surplus energy balance in the sale of solid carbonaceous fuel with coke-like properties.

Over the ensuing seven years of research and development of PTR technology, the initial idea and vision was transformed via innovation of individual technological units, as well as the independent development of bi-fuel-cogeneration. More than 150 various input materials were tested, leading the circle to close. Hedviga protected its unique technical solution both via a series of patents – including a European patent – and also via utility model intellectual property rights.

The ingeniousness of PTR technologies, and continuing research and development in the field of thermic changes, is providing Hedviga with a major head-start in this field and the potential to react to the needs of the market and companies. One such example is the presently hotly debated subject of utilising generated waste waters and the development of local black-out sources. /red/

Photo EXPO 2017 5x

GASTRONOMICAL EXPECTATIONS. A wild game restaurant will form part of the Czech exhibition. Its motto "The Czech forest" is designed to align with the central theme of the overall international trade fair, namely "Future Energies". The restaurant will highlight both the beauty of the Czech countryside and the history and culture of Czech gastronomy. Traditional and game delicacies will be offered. The eatery will be open each day from 10am to 10pm. It will have a capacity of 42 seats at tables and a further five at the bar, which will serve Budvar beer.

The senior chef is Filip Bárta, a longstanding member of the International Gurman Club (IGC). He served in similar positions at the EXPO 2005 Aichi in Japan and the EXPO 2010 Shanghai in China. He also guided the culinary offerings in Milan at the Czech and Slovak national EXPO pavilions.

EXPO 2017 – Important dates for the Czech representation

June 10 – exhibition formally opens

Several heads of state are scheduled to attend the inaugural event, including Czech President Miloš Zeman. He will also partake in a ribbon-cutting ceremony to open the Czech pavilion.

June 19-20 – Future Energies congress

A two-day international congress entitled "Future Energies" represents a significant accompanying event at the EXPO trade fair. Among the items on the agenda are the exploration of the possibilities of merging energetics and sustainable development and issues surrounding the providing of education for a new generation of engineers in the energy industry.

July 10-13 – conference on Czech energetics

A conference entitled "Czech Experiences in Energetics" is planned for the period in the run-up to Czech national day. A hall within the Czech pavilion will host a meeting between experts from both the Czech Republic and other countries in order to discuss modern Czech technologies utilised for gaining energy from nuclear, gas, coal and also hydroelectric and other renewable sources.

July 15 – Czech national day

One of the features of the Czech national day will be a procession beckoning attendees to visit the Czech pavilion, while there will be a special Czech cultural and specialist programme. Czech Trade and Industry Minister Jiří Havlíček is scheduled to attend the event.

September 10 – EXPO exhibition formally concludes

Three months after the EXPO 2017 opening, a gala ceremony will mark the formal conclusion of the trade fair.

Photo Expo 2017

At the Czech pavilion you will also see

A CONCEPT FOR HOMES WITH NEAR-ZERO ENERGY CONSUMPTION

Fénix Group is seeking to revolutionise domestic energy use. The company has created an electrically heated home with a near net zero overall energy consumption. A large proportion of energy is gained via the use of solar panels in conjunction with a battery storage system. This enables the utilisation of buildings themselves as active components in overall energy generation as part of a "smart grid". A prototype house was built by Fenix in collaboration with the Czech Technical University in Prague (ČVUT). The firm will present the technology, and the overall idea of a house plugging in to power grids in both directions, at the EXPO 2017 in Astana where it will have a model of its interactive energy-efficient home on display.

DEMONSTRATION OF ENGINEERING CAPABILITIES IN A DEMANDING PROJECT

TECHNODAT implements 3D PLM solution by Dassault Systèmes to industrial customers and provides their manufacturing and development processes with more effective and modern approach.

With the assistance of elite applications CATIA, ENOVIA, DELMIA, SIMULIA or EXALEAD associated in 3DEXPERIENCE Platform makes development and innovations faster and more efficient.

TECHNODAT is focused to improve customers products and processes over their products for more than 25 years. TECHNODAT managed to establish a strong technical and business base in the Czech Republic and Slovakia which guarantees high quality services for all customers.

SMART SOLAR BENCHCES BRING THE MOST MODERN TECHNOLOGIES TO PUBLIC SPACES

CAPASITTY smart solar benches by the company FULL Capacity are public space benches, which bring the most modern technologies to public spaces and assist in their "smartification". Functions:

- Photovoltaic panels mean the benches do not require a connection to the mains electricity supply.
- Charging mobile devices (telephones, tablets etc.) via a USB plug or via wireless induction (Qi standard).
- Providing wi-fi internet access via a GSM modem.
- Monitoring:
- Air quality
- Humidity, temperature and noise levels.
- Individual monitoring (user numbers, amount of supplied energy and data, pedestrian numbers around bench etc.) /red/

EXPO2017 ASTANA CZECH REPUBLIC | Ingenuity of implementation

A model of a Kaplan turbine from ČKD Blansko Engineering, a.s

FROM THE CZECH REPUBLIC TO KAZAKHSTAN

Kaplan turbines have been conquering the global market for nearly 100 years. The next chapter in their history will be written in Astana...

MINISTERSTVO PRŮMYSLU A OBCHODU

Guarantor of Czech Participation
at the Expo 2017 Future Energy international trade fair
June 10 to September 10, 2017