

## **Competitive Growth of Design Concepts by Institute “Giprokoks” in the World Market of Engineering Service**

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The primary areas and ways to increase competitiveness of design concepts by “Giprokoks” in the world market of engineering service are described. Strategy, organizational-methodical approaches and innovations of the institute that provided competitive advantages are covered in the paper.

Keywords: “GIPROKOKS”, COMPETITIVENESS, ENGINEERING SERVICE, DESIGN CONCEPTS, INNOVATIONS, BY-PRODUCT COKING INDUSTRY

### **Introduction**

The material basis for development of global economy is the key branches of industrial production, and mining and smelting industry is the most important of them.

Mining and smelting industry of Ukraine is unique as, unlike other countries, it ensures a complete work cycle of mining and smelting production - from ore and black coal extraction to metal products output. Mining and smelting industry of Ukraine is among top ten of the greatest manufacturers and exporters. Almost 40 % of currency earnings in Ukraine were made by products of mining and smelting industry during the pre-crisis period. An integral element of the world and Ukrainian mining and smelting industry is coke and by-product process. Trends of development of coke and by-product process are in direct dependence on the common development of the world mining and smelting industry. However today, the significant non-conformity of raw-material base and needs of coke and by-product process is observed both in international and especially Ukrainian markets.

### **Results and Discussion**

It is necessary to mention that the volume of currency earnings from the export of domestic engineering service does not represent home potential of scientific and design companies. At present, knowledge economy becomes a basis for

development of leading countries in the world. Engineering can be considered in two aspects - as an element of economy system and also as a branch of material sector of economy (**Figure 1**).

The role of engineering grows in the international trade under conditions of globalization. Range of engineering service export causes excess supply and, as consequence, severe competition in the international market.

Now international market of engineering service for by-product coke industry is characterized by severe competition defined by unstable market conditions and excess supply. Seven companies except for Giprokoks offer engineering service in the world, namely: Uhde, in ThyssenKrupp group (Germany), Paul Wurth Italia (Italy), Biuro projektow Koksoprojekt (Poland), HUTNI PROJEKT Frydek-Mistek a.s. (Czech Republic), ACRE (China), Mecon Limited (India), Siemens VAI FINLAND (Finland). “Giprokoks”, Uhde and ACRE are leaders in the world by range of rendered services.

Operational experience of “Giprokoks” in the home and international markets confirms that success of engineering company is determined in many respects by following factors:

- relationship of technological level of industrial facility and its construction expenditures;
- relationship of industrial facility and current operation expenditures;
- conformity of engineering solutions regarding construction of industrial facilities to strategic interests of customer.

## Coke and By-Product Process

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The general list of competitive advantages and their estimation is summarized below for estimation of market position and prospects of Giprokoks in the market of engineering service in the field of by-product coke industry for potential customers. The competitive advantages of Giprokoks engineering service are as follows:

1. High level of scientific and technical solutions and innovations in the specified branch from scientific research to practical implementation of results. It is these two components - scientific achievements and participation in project implementation can be referred to key factors of success in the engineering service market for coke and by-product industry. Efficient development of scientific, design and implementation spheres of the institute is ensured by potential of own scientific-engineering school, competence of scientific and technical personnel. As a result, number of employees occupied in scientific and design fields of institute activity has increased in more than 1.5 times as compared to 2000.

2. Effective marketing activity. One of the basic conditions defining efficiency of marketing strategy of the company is a mechanism of target markets selection. Technical and marketing strategy of increment in the international business activity allowed institute "Giprokoks" to expand amount of investigations in 2009 in more than 10 times as compared to 2000.

3. Plants constructed by Giprokoks in 25 countries of the world have been operating properly for a long time.

4. Complex character of engineering services.

The summarized estimation of competitive position of Giprokoks in the markets of engineering service for by-product coke industry for each country was based on the given approach. The mentioned advantages are key factors of success on the engineering service market that is why their complex accomplishment allows engineering company to benefit. Today the institute's strategy ensures its certain competitive advantage in the markets of Russia, India, Brazil, European Union and other regions of the world.

Customers highly appreciate the institute's technological solutions accepted when designing coke-chemical units. Receipt of orders from Ukrainian and foreign companies expands possibilities of Ukrainian manufacturers, engineering plants and factories producing refractories. A substantial amount of domestic equipment (up to 60-70 %) has technical

characteristics satisfactory for export to the far abroad countries. Implementation of energy saving programs and technologies promote competitive growth of institute's scientific research results.

In Ukraine and CIS countries, institute "Giprokoks" is a unique engineering corporation focused on complex elaboration of design documentation for all facilities of coke and by-product process infrastructure.

Today, the substantial competitive advantage of engineering in coke and by-product process is integrated approach to engineering solutions, which ensures synergic effect as well as benefit. "Complex power saving technology of high-grade metallurgical coke production at JSC "Alchevskkoks" awarded by the State Prize of Ukraine in the field of science and technology is an example of such solution. The mentioned complex coke production technology represents a complete innovation with integrated long-term work of scientists, designers, constructors, production workers. A range of operations regarding working out and implementation of technology included:

- working out the concept of power saving high-grade metallurgical coke production technology;

- theory-experimental investigation of properties of domestic and imported coal;

- working out coal charge compacting and its carbonization technologies;

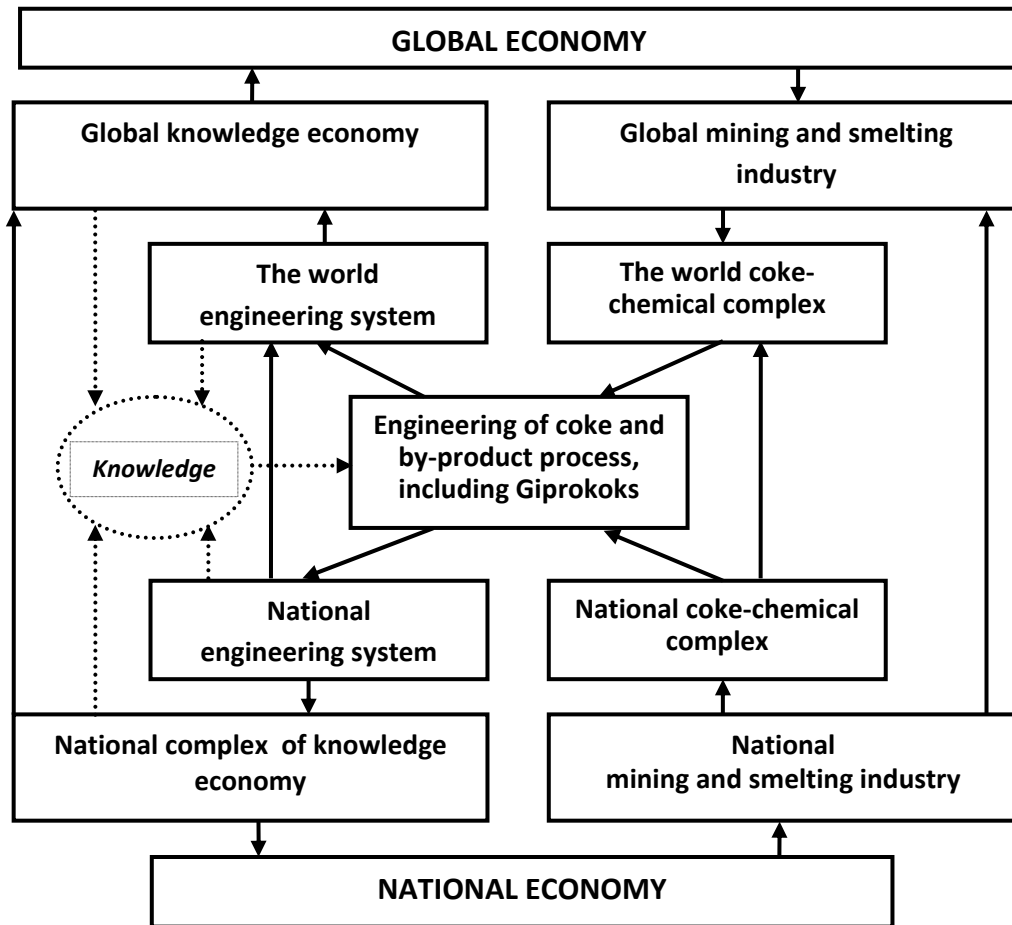
- working out coke furnace battery construction with chamber coking furnaces;

- working out and manufacture of equipment for compaction and loading of coal charge, and also for dry cooling of hot coal and effective utilization of its heat;

- construction and start-up of coke furnace battery 10-bis at JSC "Alchevskkoks".

The result of complex technology implementation at JSC "Alchevskkoks" was creation of the most powerful in Ukraine blast-furnace coke plant which has no analogues in the world by such characteristic as raw material quality to coke quality ratio. This ratio was ensured thanks to increase of domestic weakly sintering coal up to 70 % in the charge for carbonization. Application of dry quenching method along with coke quality enhancement has ensured a substantial decrease of environmental emission and energy resource saving.

All mentioned above indicates that success of home engineering companies in competitive struggle can be ensured only by means of working out and implementation of effective innovative engineering solutions.



**Figure 1.** Position of engineering of coke and by-product process in systems of the world and Ukrainian economies

Giprokoks has worked out and implemented Quality Control System for drawing up scientific and technical documentation. In 2001, this system was certificated on conformity with the State Standard of Ukraine ISO 9001:2009 and approved by the international society “Lloyd’s Register”. Among design and research institutes of Ukraine only Giprokoks has the quality certificate of international society “Lloyd’s Register”.

Competitive strength of the institute is not only advanced scientific research results, quality of projects, but also system of values defining purposeful and creative work of the whole institute’s personnel. The current system of values includes:

- compliance with the requirements of legislation, standards, specifications;
- high quality of projects, their social demand;

- application of new techniques, equipment and processes;
- financial stability of the institute;
- activity within the limits of Standard System of Quality Management of scientific and technical products;
- motivation system on the basis of estimation of achievements of institute hierarchical structures;
- constant growth in professional and cultural level of employees;
- satisfaction of requirements of customers, investors;
- analysis and marketing research.

In 2009, data about institute “Giprokoks” were recorded in many informational home and foreign issues. Annually, the institute takes part in 15-20 national and 15 international conferences, forums and exhibitions. In 2009, specialists of the

institute published 2 monographs and 30 papers in journals and proceedings of international conferences. 16 papers about institute were published. "Giprokoks" has 37 patents of Ukraine and 8 patents of Russia. In 2009, "Giprokoks" received 8 patents and approvals of new technologies and equipment for coke and by-product process.

The institute regularly participates in tenders on construction (redesign) of coke-chemical factories in foreign countries.

Win of tender in 2009 was an example of successful marketing and effective technical policy of Giprokoks. As a result, the contract on development and delivery of scientific and technical documentation for detailed engineering of coke furnace batteries No. 3, 4 at Intendente Camara Plant corporations USIMINAS (Brazil) was signed.

### Conclusions

All mentioned above demonstrate that success of domestic engineering companies in competitive struggle can be ensured only by working out and implementation of effective innovative design solutions and system operation in relation to growth of scientific and technical potential of engineering company.

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## Стратегия повышения конкурентоспособности проектных решений института «гипрококс» на мировом рынке инжиниринговых услуг

Рудыка В.И.

В статье показаны основные направления и пути повышения конкурентоспособности проектных решений Гипрококса на мировом рынке инжиниринговых услуг. Приведены стратегия, организационно-методические подходы и инновационные разработки института, обеспечившие ему конкурентные преимущества.