



COMPREHENSIVE PROGRAM

for cooperation

of National Technical University of Ukraine

"Igor Sikorsky Kyiv Polytechnic Institute"

in Education, Science

and Innovation

with the People's Republic of China

at a New Stage

2019

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PREAMBLE

Whereas, building upon the traditions of friendship and mutual understanding between the Chinese and Ukrainian peoples; and,

whereas, based on the provisions of the following Agreements between the Government of Ukraine and the Government of the People's Republic of China:

- 1) "On Scientific and Technical Cooperation" dated April 27, 1992;
 - 2) "On Cooperation in the Field of Exploration and Use of Outer Space for Peaceful Purposes" dated May 20, 1996;
 - 3) "On Mutual Recognition of Documents about Education and Degrees" dated December 11, 1998,
 - 4) "On Technical and Economic Cooperation" dated January 25, 2013;
 - 5) "On Economic-Technical Cooperation" dated December 05, 2013;
 - 6) "On technical and economic cooperation" dated January 27, 2015;
- and,

whereas, assisting scientists, teachers, and students of universities of Ukraine and the universities of the People's Republic of China in the development of cooperation; and,

whereas, intending to raise the cooperation of the Igor Sikorsky KPI with partners in the People's Republic of China to a new level and contribute to the development of economic cooperation between our countries at a new stage;

now, therefore, Igor Sikorsky KPI hereby makes the following proposals – as the integral parts of the Complex program of Cooperation of the Igor Sikorsky KPI with the educational, scientific and innovative spheres of the People's Republic of China.

1. INTRODUCTION. DEVELOPMENT OF THE IGOR SIKORSKY KPI IN THE PERIOD OF INDEPENDENT UKRAINE. NEW PRIORITIES FOR INTERNATIONAL COOPERATION

Proposals for the Comprehensive Program of Cooperation of the Igor Sikorsky KPI in education, science and innovation with the People's Republic of China at the new stage arise both from the history and traditions of the world-renowned research and educational schools of the KPI, as well as the priorities given to the activities of the KPI in terms of international cooperation, which have been set in recent years.

The characteristics of these new priorities are described in **Section 1**.

1.1. "Visiting card" of KPI: the main features of history and present time.

- Milestones of the Igor Sikorsky KPI development:

1898 – the **foundation** of the Kyiv Polytechnic Institute named for Emperor Alexander II;

1995 – the Kyiv Polytechnic Institute was granted the status of the National Technical University of Ukraine;

2003 – the National Technical University of Ukraine "Kyiv Polytechnic Institute" in Bologna University joins the Great Charter of Universities (**Magna Charta Universitatum**);

2007 – Igor Sikorsky KPI was granted the status of a **research university**.

- **Twelve institutions of higher education, 11 academic and branch scientific institutions, and two factories were spin-offs from KPI.**

- KPI was given high **awards by the Governments of Bulgaria, Poland, and the Socialist Republic of Vietnam** for outstanding achievements in the field of training engineers.

- **KPI plays an important role in shaping Government policies** in the field of higher technical education, science, and innovation in Ukraine.

- KPI is the first university in Ukraine that **has entered the world's university rankings** since 2012 (Quacquarelli Symonds (QS), etc.).

- KPI has ranked **first in the national TOP-200 ranking** over the past 10 years;
- **Igor Sikorsky KPI is the largest technical university and the largest "manufacturer" of engineers** in Ukraine under 39 Bachelor's, 92 Master's and 82 Ph.D. degree programs.
- 25% of all students of Ukrainian technical universities attend the KPI.
- Innovative Ecological System of KPI, whose nucleus is Science Park "Kyivska Polytechnika," **brings annually 100-150 startups to national and foreign markets**; it is the highest indicator in Ukraine.
- **KPI is the main institution of higher education and science for the defense industry complex of Ukraine.** More than 40 types of weapons were developed, six of them have gone into service already.
- **KPI is the only university in Ukraine that develops micro- and nanosatellites and puts them into the orbit of the Earth.** At present, the preparations are well underway for the launch of the third nanosatellite PolyITAN-3.
- **The KPI has one of the most powerful cybersecurity schools in the world.** The Igor Sikorsky KPI team **dcua** was recognized as the best among more than 12,000 white hat hackers teams from around the world in the 2016 CTFtime ranking; in 2018 this team was a leader in the competition again.
- The International **UNESCO Chair** in Higher Technical Education, Applied System Analysis and Informatics has been operating at the KPI since January 1999.
- KPI is the center of the Ukrainian Scientific and Educational Telecommunication Network **URAN (Ukrainian Research and Academic Network)**, which is the national representative of Ukraine in the Pan-European Science and Education Network GEANT.
- Over **50 joint international educational and research centers**, such as the Ukrainian-Chinese, Ukrainian-Polish, Ukrainian-French, Ukrainian-German, Ukrainian-Japanese, etc. have been established at the KPI, as well as joint educational and research units with the participation of transnational companies (Boeing, IBM, Dow Chemical, Jeppesen,

Hewlett Packard, Delcam, Siemens, Rigaku, HAAS, etc.). They act as international bridges of cooperation in education and science based on curricula designed to meet the needs of global markets.

- **KPI has the largest number of partners in the PRC among universities and companies – more than 22 partners** including Harbin Institute of Technology, Beijing Polytechnic University, Zhejiang University, Shanghai Research Institute of Precision Devices, Shandong Academy of Science, Huawei Technologies Co., Ltd., Zhejiang Golden Egg Science and Technology, etc.

And partners increase in number year after year.

1.2. From 1991 to 2010-2012.

This stage of University's development began with the final phase of the existence of the Soviet Union and spanned conditionally nearly 20 years of Ukraine's independence.

The transition from a centralized economy to the market one, a substantial modification in its structure in new geographic and political boundaries, radical change in the principles of interaction with the outside world required deep rethinking of the fundamental principles and the role of higher education in Ukraine.

Meeting this challenge, the KPI has formulated a new concept of its further development. The concept lies in its transformation from the model of the big polytechnic institute, which was firmly embedded in the centralized economy of the former U.S.S.R. and engaged in educational and research work, pursuing narrow specialties, to the model of the European technical university providing universal cross-training to meet the new needs of society.

Firstly, the universalization of education and research required the combination and harmonization of the fundamental-natural, engineering, technical, and humanitarian components of the training of new generation specialists.

To this end, 10 new faculties, educational and research institutes, more than 50 departments were established. Over 150 new specialties and

specializations were initiated, and an interdisciplinary approach to the organization of educational process and research strengthened.

In the years under review, the contingent of Igor Sikorsky KPI students rose by 12,000 and exceeded 40,000, and together with teachers, scientists, staff, the family of Igor Sikorsky Kyiv Polytechnic Institute totaled 50,000 holders of advanced human knowledge.

Secondly, tackling new tasks facing the society in that period, Igor Sikorsky Kyiv Polytechnic Institute established institutions within its structure on a national scale:

- the first in Ukraine State Polytechnic Museum;
- Science Park "Kyivska Polytechnika" and Innovative Ecosystem "Sikorsky Challenge" branched out into 10 Ukrainian regions, which became the first high-tech breakthroughs island in the country;
- Research and education information network URAN, which is the national representative of the pan-European network GEANT in Ukraine, providing its information resources to leading universities and research centers throughout this country;
- more than 50 international centers in conjunction with international organizations and multinational companies that pursue the practical integration of Igor Sikorsky Kyiv Polytechnic Institute into the world and European research and education area.

Thus, regarding the scope and content of its activities, Igor Sikorsky Kyiv Polytechnic Institute became the much larger organization than an institution of higher learning in its traditional sense during this period.

According to the world university ranking Quacquarelli Symonds (QS), and others, Igor Sikorsky Kyiv Polytechnic Institute entered 4% of the world's most authoritative universities, became a major educational, scientific and innovation center, methodological center of the state, island of breakthroughs in a number of high-tech areas, center for educating new generation professionals who are the true patriots of Ukraine.

1.3. From 2010-2012 up to the present.

In 2012 the University adopted a new development strategy. Under this strategy based on interdisciplinary, innovative training programs and the activities of more than 50 international scientific and educational centers and the Innovative Ecosystem "Sikorsky Challenge", Igor Sikorsky Kyiv Polytechnic Institute develops policies for the state to make a gradual transition from a low-tech and raw materials economy to a high-tech and competitive one.

New realities forced to add one more task to the development strategy of the University: the task of strengthening the defense capability of the state. In a few months, Igor Sikorsky Kyiv Polytechnic Institute has intensified engineering developments and training of personnel to be employed in the military-industrial complex.

In particular, the University has become the developer of more than 40 new dual-use and special-purpose technologies, six of them have already been put into service. Also, Igor Sikorsky Kyiv Polytechnic Institute expanded considerably the training of personnel to be employed by security services, law-enforcement agencies and the Armed Forces of Ukraine.

Looking into the future through the prism of objective laws of the development of nature and society, the staff of Igor Sikorsky Kyiv Polytechnic face a number of new global and regional challenges that have already begun to change the world order and exert direct influence on Ukraine.

The objectivity of this process is dictated by the fourth industrial revolution proclaimed at the World Economic Forum annual meeting in Davos in 2015.

According to its content, during the next decade the world economy will be transformed in the following areas:

- automation,
- digitalization,
- robotization,
- artificial intelligence,
- development of the internet of things.

Owing to global "digitization," a need to do "outdated" engineering work is rapidly decreasing already.

Igor Sikorsky Kyiv Polytechnic Institute responds to this challenge by enhancing analytical, forecasting work on the development prospects of each sector of the economy, as well as by deepening interaction with the high-tech labor market.

The global energy crisis related to a reduction in reserves of fossil fuels, particularly anthracite in Ukraine, requires the energetic development of renewables.

Reducing people's access to clear drinking water (potable water supply accounts for 55% in Ukraine) entails the intensification of the development of new water purification technologies.

The growth of global diseases: cancer, cardiovascular diseases, AIDS, tuberculosis and cerebrovascular disease, among others, require the accelerated development of biomedical engineering, biology equipment and biotechnologies.

Significant climate change events caused by industrial and human influence on the global environment should unite Igor Sikorsky KPI scientists – biologists, chemists, environmentalists, sustainable development experts using interdisciplinary approaches as the base – to find solutions to these problems, other challenges and risks of today.

New geopolitical realities set urgent tasks of not only strengthening the defense capability of the state but also raising the competitiveness of the Ukrainian economy.

Led by Academician Mykhailo Zgurovsky, the group of scientists of the International Council for Science, the Committee on System Analysis of the Presidium of the National Academy of Sciences of Ukraine, Igor Sikorsky Kyiv Polytechnic Institute, Institute for Applied Systems Analysis of the Ministry of Education and Science of Ukraine and the National Academy of Sciences of Ukraine, the World Data Center for Geoinformatics and Sustainable Development and the Agrarian Superstate Foundation, developed eight scenarios for the socio-economic development strategies of Ukraine in the medium-term (until 2020) and long-term (until 2030) time horizons, one of which you can see below.

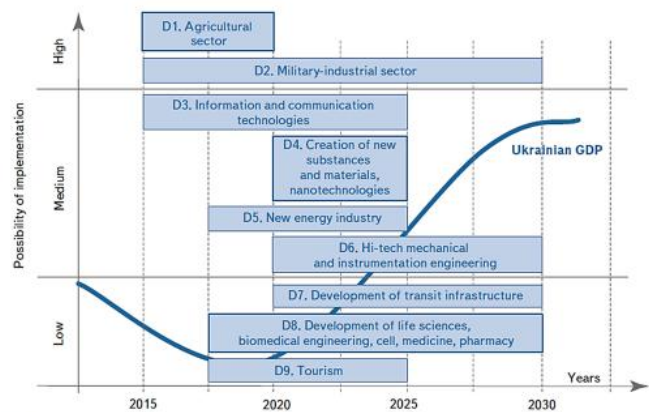


Fig. 5.1. TIME CHART OF ACTIVATION OF THE MAIN CLUSTERS OF THE UKRAINIAN ECONOMY

The diagram shows how likely 9 clusters of the economy of Ukraine can act as drivers of social and economic development for a period ending in 2030.

Among these drivers are the Agrarian Sector, Military-Industrial Complex, Information and Communication Technologies, New Substances and Materials, Nanotechnology, New Energy Industry, High-Tech Mechanical and Instrumental Engineering, Transit Infrastructure Development, Development of the Life Sciences, Biomedical Engineering, Medicine, Pharmacy, Tourism.

New KPI priorities given to international cooperation arise from the "FORESIGHT AND THE CONSTRUCTION OF THE STRATEGIES OF SOCIO-ECONOMIC DEVELOPMENT OF UKRAINE".

Based on fundamental and applied research, it is necessary to accelerate the development of the topical engineering directions of the university, including:

- aircraft technology,
- space technology,
- modern material science,
- communications systems,
- cyber defense systems,
- artificial intelligence systems,
- and many others.

On the other hand, the growing phenomena of aggression, populism, inequalities between people, corruption, demographic changes, terrorism, and crime make our social scientists focus on the elaboration of a new vision of the place and role of Ukraine and Igor Sikorsky Kyiv Polytechnic Institute in a conflicting world.

These realities compel Igor Sikorsky Kyiv Polytechnic Institute, as the country's leading educational and research center, to elaborate new approaches to training of specialists with new thinking, high human values, the true patriots of Ukraine who will be able to overcome these challenges.

Igor Sikorsky Kyiv Polytechnic Institute continues to improve the model of a research university by combining knowledge-intensive, high-tech engineering education, competitive science, and innovation, constantly enforcing the component of extensive fundamental knowledge in this model.

An improvement in the quality of specialists' training and scientific research is becoming critical at the present stage.

It is possible to do so through the further development of scientific and engineering schools, their close ties with the high-tech labor market based on the model of dual education, innovative interaction and deepening of the processes of internationalization of the University, and the expansion of international cooperation.

So, Igor Sikorsky KPI's priorities given to international cooperation in a certain time perspective ending in 2030 are cited in this section.

One of the most important directions of Igor Sikorsky KPI in this international sphere is the expansion of cooperation with partners from the People's Republic of China.

The above priorities specify proposals for cooperation with partners in the People's Republic of China. The following sections represent these proposals.

2. ACTUAL DIRECTIONS OF COOPERATION WITH PARTNERS FROM THE PEOPLE'S REPUBLIC OF CHINA AT THE NEW STAGE. PROPOSALS FOR COOPERATION

2.1. Cooperation in the field of education.

2.1.1. The role of the KPI in the field of education for Ukraine and the world, including the training of specialists for the People's Republic of China.

Igor Sikorsky Kyiv Polytechnic Institute is the largest "manufacturer" of engineers in Ukraine under 39 Bachelor's, 92 Master's and 82 Ph.D. degree programs.

25% of all students of Ukrainian technical universities attend the KPI.

Igor Sikorsky Kyiv Polytechnic Institute performs this important mission not only for Ukraine but also in the international sphere and plays the role of a powerful international educational center of engineering.

A deep-seated tradition of international education was now well established throughout its 120-year history: Igor Sikorsky Kyiv Polytechnic Institute has trained more than 7,000 engineers for 67 countries including China.

THE QUANTITY OF PRC'S CITIZENS GRADUATED FROM KPI: IN TOTAL – MORE THAN 1000

In 50ies-60ies of the last century	112
During two last decades	791
Now	40

The outstanding alumni who graduated from Igor Sikorsky Kyiv Polytechnic Institute in the 1950s-1960s:

**THE QUANTITY OF PRC CITIZENS
GRADUATED FROM KPI:
IN TOTAL – MORE THAN 1000**

**Outstanding graduates of Igor Sikorsky Kyiv
Polytechnic Institute in 1950-1960 years:**



**Member of CPC Central Committee,
Governor of Province,
Minister of Civil Aviation of PRC
LIU TSZENFEN**



何光远

**1992—1997 Member 14th CPC
Central Committee,
Minister of Machinery and
Electronics Industry of PRC
HE GUANGYUAN**

A number of citizens of the People's Republic of China, who graduated from Igor Sikorsky Kyiv Polytechnic Institute:

- 112 in the 1950s-1960s;
- 791 in the past two decades;
- 40 get training today;
- a total of more than 1,000 specialists have been trained.

Igor Sikorsky Kyiv Polytechnic Institute was the first among Ukrainian universities to receive license # 163801 to retrain Chinese specialists. Only seven universities around the world were granted such license in 2015.

Igor Sikorsky Kyiv Polytechnic Institute would like to see more Chinese citizens attending it, including those obtaining post-graduate education.

Over 50 joint international educational and research centers, such as the Ukrainian-Chinese, Ukrainian-Polish, Ukrainian-French, Ukrainian-German, Ukrainian-Japanese, etc. have been established at Igor Sikorsky Kyiv Polytechnic Institute, as well as joint educational and research units with the participation of transnational companies (for example, Boeing, IBM, Dow Chemical, Jeppesen, Hewlett Packard, Delcam, Siemens, Rigaku, HAAS, etc.). They act as international bridges of cooperation in education and science based on curricula designed jointly to meet the needs of global markets.

Through joint establishments with the UN, the European Union, NATO and others (UNESCO, UNIDO, WIPO), Igor Sikorsky Kyiv Polytechnic Institute not only represents Ukraine in international organizations but also implements programs, focusing on their areas of activity.

Examples:

– five-year UNIDO educational project on training of specialists at Igor Sikorsky Kyiv Polytechnic Institute through the Resource Efficient and Cleaner Production Center as a broad educational platform of the Igor Sikorsky KPI;

– James Martin Center for Nonproliferation Studies of the Middlebury Institute of International Studies at Monterey and the Ministry of Education and Science of Ukraine identified Igor Sikorsky Kyiv Polytechnic Institute as the basic university to build and implement the National Platform for Training in Physical Nuclear Safety Technologies;

– The curriculum under master's and Ph.D. degree programs in sustainable development and management was offered to 12 countries of the Black Sea region through BSUN (Network of Universities of the Black Sea Region), which includes 110 universities of the countries of the Black Sea Economic Cooperation.

All the above KPI educational platforms and many others can be available for cooperation in education with Chinese partners.

Thus, Igor Sikorsky Kyiv Polytechnic Institute is ready and has the strong potential to carry out an international mission to train specialists, including those from the People's Republic of China, in various fields covering modern breakthrough scientific, technological and innovative directions.

To this end, it would be expedient:

– to ensure the presence of Igor Sikorsky Kyiv Polytechnic Institute on information websites designed for entrants from the People's Republic of China, including websites in the Chinese language;

– to disseminate information about the University, particularly admission opportunities, among the recruitment partners.

Also, the "KPI Portfolio of Joint Educational Projects" is offered to partners from the People's Republic of China. It consists of:

- educational project in the form of "Preparatory Department of Distant Learning";
- educational project in the form of "Training Center":
 - a) at Igor Sikorsky Kyiv Polytechnic Institute;
 - b) at facilities of a foreign partner;
- educational project "Bachelor's/Master's Degree Program";
- educational project "International Campus Network Program."

2.1.2. To expand the training of citizens of the People's Republic of China in English (undergraduate, postgraduate, Ph.D.) at the Igor Sikorsky KPI.

Igor Sikorsky Kyiv Polytechnic Institute is ready to expand the training of citizens of the People's Republic of China in English (undergraduate, postgraduate, Ph.D.), which enables them to pursue specialties in the following areas:

- space;
- aviation;
- power engineering,
- Information Technology;
- cybersecurity;
- biomedical engineering;
- new materials;
- and other specialties that will be considered as important for the training of Chinese specialists and postgraduate studies (postgraduate courses).

2.1.3. Joint training programs.

It is proposed to launch joint programs of the "Double Diploma" type ("Diploma of Two Partner Universities") under certain schemes.

The most suitable schemes are 2 + 2 or 1 + 3.

Under the scheme 2 + 2 (bachelor's degree program), Chinese citizens may study at a Chinese university and in the 1st and 2nd year, and at Igor Sikorsky Kyiv Polytechnic Institute in the 3rd and 4th year.

Under the scheme 3 + 1, Chinese citizens may study in China during the first year, and at Igor Sikorsky Kyiv Polytechnic Institute in the 2nd, 3rd and 4th year.

They master basic disciplines at Chinese universities, while they study special subjects and get hands-on training in Ukraine, where there are specialized and tangible facilities designed for practical work.

On completion of studies bachelors receive a diploma from Igor Sikorsky Kyiv Polytechnic Institute and a Chinese partner university.

Such form of cooperation envisages training under harmonized programs in the specialties, which are chosen by partners.

In recent years, Igor Sikorsky Kyiv Polytechnic Institute has been negotiating with all Chinese partners about such areas.

Therefore, it is necessary to identify universities in China, which can become the partners of Igor Sikorsky Kyiv Polytechnic Institute, negotiate with these partners to agree on curricula that will be of interest to both parties, as well as to harmonize these curricula and start training.

It is also proposed to take on work among large Chinese corporations (for example, Huawei, Tencent, Tiens, etc.) on the organization of dual education programs at the training and research facilities of Igor Sikorsky Kyiv Polytechnic Institute.

2.1.4. Joint Educational Units. The idea of "distributed laboratories" in education, "twinning" laboratories.

Igor Sikorsky Kyiv Polytechnic Institute is ready to negotiate with Chinese partners about the establishment of joint educational units.

In recent years, the initial stages of such negotiations have been conducted with several universities and research centers based in the People's Republic of China, namely Huizhou University, Guangzhou University (Guangdong Province) and the Qilu University of Technology (Shandong Province), as well as with Guangzhou Vanlead Group Co.

Also, Igor Sikorsky Kyiv Polytechnic Institute is ready to negotiate for the transfer of innovative training technologies under franchise agreements, conclude contracts for the organization and transfer of the author's courses that are copyrighted, as well as secured by intellectual property rights and property rights.

Igor Sikorsky Kyiv Polytechnic Institute is ready to consider the proposals made by universities, research centers, companies and other organizations of China for establishing joint educational laboratories on its campus – these proposals are attractive for investment in the University.

Igor Sikorsky Kyiv Polytechnic Institute takes a keen interest in such a promising form of cooperation.

According to the idea of "Distributed Training and Research Laboratories, Centers, Supporting Points" in the realm of education, the labs should consist of the twin parts: one part is built at Igor Sikorsky Kyiv Polytechnic Institute and the second part at a partner university in the PRC.

Educational projects, such as "Double Diploma" ("Diploma of Two Partner Universities"), may be implemented on their basis as well under the schemes "2 + 2", "3 + 1", "1 + 1", etc.

2.1.5. Academic mobility.

Igor Sikorsky Kyiv Polytechnic Institute would like to extend academic mobility through cooperation with the People's Republic of China.

There is a number of such success stories today. Students and postgraduates of the Igor Sikorsky Kyiv Polytechnic Institute had the opportunity to participate in scholarship programs for academic mobility in cooperation with the Harbin Polytechnic University, Xi'an Jiaotong University and the Beijing Institute of Technology. Nine students of Igor Sikorsky Kyiv Polytechnic Institute had studied under such programs in Harbin since 2014.

To deepen this form of cooperation between our countries, we propose to increase the number of Chinese universities for the purpose of exchanging students, negotiate and draw up standard contractual documents in order to consolidate their results.

2.1.6. Cultural and artistic direction.

15 artistic amateur groups engage in creative activities at the KPI Center of Culture and Arts on a regular basis, five of them having the title of the national group. In the 2017/2018 academic year 192 cultural and artistic events were held, five groups took first places in the city competitive festival of folk art, particularly in the competitive review of vocal-choral art, choreography, the fine arts and decorative-applied arts. In addition, these groups toured in eight countries (International Festival "12th Festival of Traditional Art" in Poznan, Poland, on August 22-28, 2018); International Festival in the town of Loreto, Italy, on July 2-11, 2018; Budapest, Hungary, on March 15-20, 2018; Tbilisi and Batumi, the Republic of Georgia, on June 6-10, 2018; and the Festival of Choirs on the island of Sardinia, Italy; among others.

To deepen cooperation and promote cultural exchanges, we offer to organize the participation of our groups in international festivals and contests.

2.1.7. Sports direction.

The KPI Center of Physical Education and Sports fosters students' physical fitness. It comprises nine sports clubs (basketball, football, volleyball, aerobics, fitness, swimming, triathlon, freestyle wrestling, judo, boxing, weight lifting, track-and-field athletics, rugby, archery, orienteering, sports tourism, rock climbing, etc.). The members of these clubs are masters of sports and candidates for the master of sports of international and national class, winners of All-Ukrainian (56 winners) and International competitions (11 winners), namely:

student Viktor Ivakhnenko – gold medal in a world championship, 1st place in the European championship among students, 1st place in the Ukrainian men's weightlifting championship;

student Vladyslav Liaskovych – first places in Ukrainian wrestling championships;

student Olexander Desiatnyk – 1st place in the Ukrainian orienteering championship;

student Oksana Lisova – 1st place in the Ukrainian triathlon championship;

student Arina Tarasevych – 3rd place in the Winter Triathlon (Aquathlon) Championship of Ukraine.

To deepen cooperation between countries and set the standards of leisure, promote healthy lifestyles among young people, popularize sports as well as to uphold sports and cultural traditions, **we propose** coordinating the participation of KPI students, KPI partners in China and sports teams in international competitions.

2.1.8. Social direction.

To deepen cooperation between countries, promote a conscious choice of healthy lifestyles, prevent negative phenomena among young people, involve students in the volunteer movement and social activity, we offer the joint preparation and implementation of social projects.

2.1.9. Software for studying the Ukrainian language with the help of English as interlingua – "Golden Gates to Ukrainian".

We propose to use the software "Golden Gates to Ukrainian" to study Ukrainian language with the help of English as interlingua for entrants who contemplate studying in Ukraine (the product was created in 2002 on the recommendation of the HE Extraordinary and Plenipotentiary Ambassador of the People's Republic of China to Ukraine, Mr. Lee Goban).

2.2. Cooperation in the field of science.

2.2.1. Prioritization.

Section 1 outlines the KPI priorities in the field of science and innovation, which are aimed at the earliest launch of drivers of Ukraine's socio-economic development.

Among these priorities are topical engineering directions of the university, which develop on the basis of fundamental and applied research as well as go forward in the innovation sphere, plotting the path to commercialization:

- aircraft technology,
- space technology,
- modern material science,
- communications systems,
- cyber defense systems,
- artificial intelligence systems,
- and many others.

These priorities should be under negotiation with Chinese partners and more specialized areas of cooperation are to be identified.

It is necessary to start drawing up joint project proposals for national and international scientific grant programs under which Igor Sikorsky Kyiv Polytechnic Institute and its Chinese partners could participate in international

calls, compete for real financing and – through such form (scientific and technical cooperation) – run the entire system of interaction geared to sustainable cooperation.

2.2.2. Joint overarching interdisciplinary projects according to modern priorities.

At present, Igor Sikorsky Kyiv Polytechnic Institute does not have large interdisciplinary projects on order from China (such as the UNIDO project at the University on the operation of the Resource Efficient and Cleaner Production Center in Ukraine described in Section 2.1.1.).

Igor Sikorsky Kyiv Polytechnic Institute will be interested in such projects and contracts that have characteristics of large overarching interdisciplinary projects at the interstate level, and the contracts, which scientists and students endeavor to carry out at the University.

We are ready to raise cooperation with China to a new level: to carry out major interdisciplinary projects on the state orders of China, including projects for defense purposes.

2.2.3. Joint laboratories, centers, bureaus and other collaborative structures in the field of science. The idea of "distributed laboratories" in the field of science, "twinning" laboratories.

Igor Sikorsky Kyiv Polytechnic Institute is ready to consider the proposals made by universities, research centers, companies, and other organizations of China to establish joint research laboratories on its campus – such proposals are attractive for investment in the University.

Igor Sikorsky Kyiv Polytechnic Institute will take a keen interest in such a promising form of establishing cooperation.

According to the idea of "Distributed Training and Research Laboratories, Centers, Supporting Points" in the field of science, the labs should consist of the twin parts: one part is built at Igor Sikorsky Kyiv Polytechnic Institute and the second part at a partner university in the People's Republic of China.

2.2.4. Preparation of Doctors of Philosophy and Doctors of Sciences as a factor in deepening cooperation between scientists of China and Ukraine.

Igor Sikorsky Kyiv Polytechnic Institute is ready to expand cooperation in this direction.

Signed in May 2018, the Agreement between the Igor Sikorsky Kyiv Polytechnic Institute and the Qilu University of Technology (Shandong Province) to train specialists for the People's Republic of China at the KPI under Ph.D. programs serves as an example of this type of cooperation. The directions of training and topics of scientific research shall be agreed by both parties before the commencement of the admissions campaign.

2.2.5. Involvement of students in scientific and technical cooperation.

The S.O. Lebedev and V.M. Glushkov international open student programming olympiad KPI-OPEN has already been taking place at Igor Sikorsky Kyiv Polytechnic Institute for 13 years. Chinese students also participate in this competition.

To deepen cooperation between the countries, we propose to increase the number of universities – participants from the People's Republic of China – and invite Chinese companies to be the co-organizers of the Olympiad, etc.

2.3. Cooperation in the field of innovation.

2.3.1. Innovative Ecosystem and startup festival Sikorsky Challenge.

Igor Sikorsky Kyiv Polytechnic Institute has the well-developed Innovation Ecosystem, whose nucleus are the Science Park "Kyivska Polytechnika," the startup school and the international startup festival Sikorsky Challenge.

Through these establishments, Igor Sikorsky Kyiv Polytechnic Institute is the largest manufacturer of startups in Ukraine. Every year the University pushes 100-150 startups for negotiations with national and international investors.

We invite interested Chinese companies and investors to participate in the Sikorsky Challenge Festival, engage in the work of the international jury

for the Festival, as well as to negotiate for the acquisition of startups by Chinese businesses.

2.3.2. Supporting point (platform) of the Innovation Ecosystem of the KPI and the Science Park "Kyivska Polytechnika" in Hangzhou.

It is proposed to set up the Supporting Point (platform) of the KPI Innovation Ecosystem and the Science Park "Kyivska Polytechnika" in Hangzhou, Zhejiang Province, in cooperation with Golden Egg Science and Technology Co., Ltd., a partner from the People's Republic of China.

The purpose of this project is to start bringing the best KPI startups to Chinese and international markets.

2.3.3. Confucius Institute at the Igor Sikorsky KPI, whose feature will be functioning in the KPI Innovation Ecosystem.

The establishment of the Confucius Institute, thereby raising the level of instruction in Chinese at the largest technical university of Ukraine (with the use of the capabilities of the Confucius Institute), will provide a solid economic basis for deepening Ukrainian-Chinese science-innovation and industrial relations over the long term, becoming the important factor in developing the Ukrainian-Chinese cooperation by and large.

(Mr. Wang Dujun, First Secretary of the Chinese Embassy in Ukraine, did similar work at the Belarusian National Technical University in Minsk in 2014).

2.3.4. First-line legal procedures.

It is necessary to elaborate legal procedures for securing rights on the objects of intellectual property created in conjunction with Chinese partners – in equal parts with respect to each party or proportional to a contribution made by each party, which should be decided in the course of talks.

It is necessary to classify such talks by type, draw up standard documents for the purpose of distributing and securing copyright, rights on jointly created objects of intellectual property rights, as well as distributing property rights.

2.4. General principles of cooperation development.

2.4.1. Mutually beneficial cooperation and investment attractiveness.

In 2017 the Academic Council established the basic principles of the Igor Sikorsky KPI policy in terms of cooperation with foreign partners as follows:

to select the international proposals that have investment attractiveness for Igor Sikorsky Kyiv Polytechnic Institute (establish laboratories at the KPI campus; remunerate KPI scientists for work by order of foreign universities, research centers, firms and enterprises at the expense of funds transferred by customers to the KPI accounts in Kyiv-based banking institutions; adhere to the principle of securing rights on the created objects of intellectual property on a fifty-fifty basis at the least estimate (no less than in equal parts with respect to each party), etc.

The above concept is not an imperative, as niceties should be under negotiation with foreign partners, while a principled approach is based on the understanding that cooperation should be mutually beneficial.

2.4.2. Igor Sikorsky KPI would like to deepen cooperation with the provinces of Shandong, Guangdong, Zhejiang, Sichuan, Liaoning, Heilongjiang, and Hebei, as well as to establish cooperation with other provinces on the principles outlined in the above sections.

2.4.3. Strengthening the role of the Ukrainian-Chinese Center of the Igor Sikorsky KPI

We ask to recommend the Chinese authoritative co-founders of the Ukrainian-Chinese Center, who could strengthen its scientific, technical and innovative direction.

2.4.4. On the way to entrepreneurial university.

The system of higher education becomes a separate sphere of the economy. Trends in higher education are pushing universities for a change in the model from a research to entrepreneurial university.

The entrepreneurial university is a higher education institution that – through a combination of fundamental and practical knowledge – generates the marketable educational, research and innovative products, which can be commercialized in the domestic and foreign markets for educational, scientific-technical services and innovation.

The implementation of such vision of entrepreneurial universities' activity requires the organization of the relevant system of a knowledge transfer, which – in terms of feasibility – ensures full interaction between entrepreneurial universities and the environment, and its management. The knowledge transfer is intended to lead to innovation in the economy and the public sphere.

It is from this standpoint that Igor Sikorsky Kyiv Polytechnic Institute plans to establish cooperation with international partners, including partners from the People's Republic of China.

2.4.5. The draft Comprehensive Program is open for discussion, amendments, clarifications by both authorities and the research and educational community.

Proposals for the draft "Comprehensive Program..." have been made by the Working Group in accordance with Igor Sikorsky KPI Order # 5/168 dated 09/17/2018:

Chairman: K.V. Yudkova;

Coordinator: A.P. Shysholin;

***Members: P.M. Yablonskyi, I.V. Litvinov,
V.I. Dmytrenko, N.M. Pozharska,
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